THE UNIVERSITY OF ADELAIDE CALENDAR 1992

Volume II Part B

Faculties of:
Agricultural and Natural Resource Sciences
Architecture and Planning
Dentistry
Engineering
Mathematical and Computer Sciences
Medicine
Science

ADDRESS FOR CORRESPONDENCE

Correspondence should be addressed as follows:

About courses (and related matters such as admission, examinations, scholarships and prizes), educational matters generally; and other matters, including staff appointments of all kinds: *to*

The Registrar.

About financial matters, and matters relating to the buildings and grounds: *to*

The Deputy Registrar (Resources)

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ISSN 0810-0349

The University of Adelaide publishes the following official publications:

CALENDAR VOLUME I

Published biennially in May.
Containing general information, including: The University Act, Principal Officers of the University, Statutes, Standing Orders of the Senate, The Elder Conservatorium of Music, Institutions, Foundations and Colleges of the University, Public Lectures and Courses, Service Departments and Divisions of the University, Scholarships and Prizes, Societies Associated with the University.

CALENDAR VOLUME IA

Published biennially in February alternating with Volume I.
Containing: The Almanac, Membership of Council, Committees, Faculties and Boards, Staff (at 1 January), Amendments made to Volume I during the previous year.

CALENDAR VOLUME II (published in two parts: Part A and B — $24 each including postage, student price $8 excluding postage)

Published annually in December of previous year.
Containing: Regulations, Schedules and Syllabuses of courses.
Volume II, Part A — Faculties of Architecture and Planning, Arts, Economics and Commerce, Law, Mathematical and Computer Sciences, Performing Arts.
Volume II, Part B — Faculties of Agricultural and Natural Resource Sciences, Architecture and Planning, Dentistry, Engineering, Mathematical and Computer Sciences, Medicine, Science.

ANNUAL REPORT (available from the Office of Planning and Communication)

Published annually in September of the following year.

RESEARCH REPORT (available from the Office of Planning and Communication)

Published annually in October of the following year.
Containing: Research grants awarded, staff bibliography.

FINANCIAL STATEMENTS (available from Accountant)

Published annually in August of the following year.

STATISTICS (the Office of Planning and Communication)

Published annually in September.
Containing: Staff statistics, student statistics by subject and course.

THE ARMS OF THE UNIVERSITY

The heraldic description of the Coat of Arms is as follows:

Per pale Or and Argent an Open Book proper edged Gold on a Chief Azure five Mullets, one of eight, two of seven, one of six and one of five points of the second, representing the Constellation of the Southern Cross;

and the Motto associated with the Arms is—

Sub cruce lumen

"The light (of learning) under the (Southern) Cross"

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The information in this volume is correct as at 11 October, 1991.

FACULTY OF AGRICULTURAL AND NATURAL RESOURCE SCIENCES

REGULATIONS, SCHEDULES AND SYLLABUSES

Waite Campus:

Roseworthy Campus:

DEGREE OF

BACHELOR OF AGRICULTURAL SCIENCE

REGULATIONS

1. There shall be an Ordinary and an Honours degree of Bachelor of Agricultural Science.

2. (a) The Council, after receipt of advice from the Faculty of Agricultural and Natural Resource Sciences, shall from time to time prescribe schedules defining:

(i) the subjects of study for the degree:

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

(c) Schedules made by the Council and syllabuses approved by the Executive Committee of the Education Committee shall be published in the next edition of the University Calendar.

3. To qualify for the Ordinary degree a candidate shall comply with the provisions of Schedules II and IV, or V.

4. (a) To qualify for the Honours degree a candidate shall complete the requirements for the Ordinary degree and comply with the provisions of Schedule III.

(b) A candidate who satisfies the requirements of sub-regulation (a) of this regulation shall be awarded the Honours degree of Bachelor of Agricultural Science, but the Faculty shall decide within which of the following classes and divisions the degree shall be awarded:

First Class

Second Class

Division A

Division B

Third Class

(c) A candidate who fails to obtain an Honours classification may be awarded the Ordinary degree provided the candidate has in all other respects completed the work for that degree.

(d) Candidates may not enrol for a second time for the Honours course if they (i) have already qualified for Honours, or (ii) have presented for examination but failed to obtain Honours, or (iii) have withdrawn from the Honours course unless the Faculty on such conditions as it may determine permits re-enrolment.

5. Except by permission of the Faculty of Agricultural and Natural Resource Sciences, a candidate shall not enrol in any subject for which the pre-requisite work prescribed in the syllabus for that subject has not been satisfactorily completed.

6. A candidate shall not be eligible to present for examination unless the prescribed classes have been regularly attended and the written, practical or other work required has been completed to the satisfaction of the teaching staff concerned.

7. In determining the candidate's final result in a subject the examiners may take into account assessments of the candidate's written, practical or other work, and the results of other examinations in that subject provided that the candidate has been given notice at the beginning of the course of study for the subject of the way in which such assessments will be taken into account and of their relative importance in the final result.

8. There shall be three classifications of pass in any subject for the Ordinary degree, as

follows: Pass with Distinction, Pass with Credit, Pass. If the list of candidates who pass be published in two divisions, a pass in the higher division may be prescribed in the appropriate syllabus as prerequisite for admission to another subject. A candidate with a lower division pass who wishes to gain a higher division pass shall be allowed to repeat the subject, subject to the provisions of Regulation 2. There shall also be a classification of Conceded Pass. A candidate may present for the Ordinary degree only a limited number of subjects for which a Conceded Pass has been awarded, as specified in Schedule II.

9. Notwithstanding results in individual subjects, a candidate shall be deemed to have passed the whole of the first or the second year provided the total mark obtained at final examinations in all the subjects that constitute the year and the lowest mark obtained in any one subject thereof meet such requirements as the Faculty may determine from time to time.

10. A candidate may be granted a supplementary examination in a subject only in circumstances approved by the Department administering such subject and consistent with any expressed Council policy.

11. (a) A candidate who fails to pass in a subject or who obtains a lower division pass and who desires to take the subject again shall, unless exempted wholly or partially therefrom by the chairman of department concerned, again complete the required work in that subject to the satisfaction of the teaching staff concerned.

(b) A candidate who has twice failed to obtain a Division I pass or higher in the examination in any subject shall not enrol for the subject again, or for any other subject which in the opinion of the Faculty contains a substantial amount of the same material, except by permission of the Faculty and under such conditions as the Faculty may prescribe.

(c) For the purposes of subregulations (a) and (b) of this regulation, a candidate who is refused permission to sit for an examination, or who fails to attend the examination in any subject although eligible to do so, shall be deemed to have failed to pass the examination.

12. A candidate who has passed equivalent examinations in the University or elsewhere or who has other qualifications may, on written application, be granted such exemption from the requirements of these regulations as the Council on the recommendation of the Faculty of Agricultural and Natural Resource Sciences may determine.

13. If in any year/semester the student enrolment for a particular subject offered by the Faculty is less than the minimum specified by the Faculty, that subject may not be offered.

Regulations allowed 24 February, 1983.
Amended: 17 Jan. 1985: 8; 24 Mar. 1988: 5; 20 July, 1989: 3, 8, 10, 11(c), 13. Awaiting allowance: 3, 2(b).

DEGREE OF

BACHELOR OF AGRICULTURAL SCIENCE

SCHEDULES

(Made by the Council under Regulation 2)

NOTE: Syllabuses of subjects for the degree of B.Ag.Sc. are published below, immediately after the schedules. For syllabuses of subjects taught for other degrees and diplomas, see the table of subjects at the end of the volume.

SCHEDULE I: ARRANGEMENT OF COURSE

1. The course for the Ordinary degree shall occupy four years of full-time study or equivalent.

2. It is not necessary for a candidate to take all the subjects of any one level simultaneously or to complete all the subjects set out for one level before enrolling for any subject of the following level provided that the pre-requisite subjects have been passed. But a candidate who desires to take a third level subject before completing all compulsory first and second level subjects must obtain the permission of the Dean.

3. In addition to the general degree specified under Schedules II-IV the option for candidates to major in Viticulture or Oenology is described under Schedule V.

SCHEDULE II: THE ORDINARY DEGREE

1. To qualify for the Ordinary degree a candidate shall satisfactorily complete the requirements of the subjects listed below, subject to such conditions and modifications as may be specified or allowed by the regulations to the value of at least 96 points which satisfy the following requirements.

(a) A candidate shall satisfactorily complete Level I subjects to the value of at least 24 points.

(b) A candidate shall satisfactorily complete Level II subjects to the value of at least 24 points.

(c) A candidate shall satisfactorily complete Level III subjects to the value of at least 48 points, taken in the third and fourth years of the course. Under the provisions of Regulation 8, a candidate may be deemed to have satisfactorily completed a Level III subject for which a Conceded Pass has been awarded. A Conceded Pass may only be awarded in a Level III subject with a value of 3 points or less. Subjects passed at the Conceded Pass level to a maximum total value of six points may be presented towards the degree.

2. COMPULSORY SUBJECTS

(a) Level I Subjects

(Note: The points value of subjects is indicated after each subject title.)

2247 Agriculture, Environment and Society*	3	6878 Chemistry I	6
3174 Biology I	6	5683 Earth Science I*	3
6976 Biomathematics and Statistics*	3	7267 Genetics IW	3

* Candidates intending to study Level II and Level III subjects in the Faculties of Science or Mathematical and Computer Sciences or Economics and Commerce in the Bachelor of Agricultural Science degree may, with the permission of the Dean, enrol in and count towards the degree *one only* of 2136 Geology I *and* 9786 Mathematics I in place of the corresponding subjects listed in clause 2 *or* 8461 Economics I in place of 2247 Agriculture, Environment and Society or 2847 Agricultural Production and Economics. Students wishing to enrol in Level II subjects in the Statistics Department will require a pass in Mathematics I, at least a credit in Biometry and approval of the Head of that Department.

(b) **Level II Subjects**

(1992)

3689 Agricultural Microbiology II	3	7931 Biometry	3
2448 Agricultural Zoology II	3	1692 Botany IIA	6
6553 Biological Chemistry	6	7267 Genetics IW	3

(1993)

9339 Agricultural Botany	3	2448 Agricultural Zoology II	3
3689 Agricultural Microbiology II	3	6553 Biological Chemistry	6
2847 Agricultural Production & Economics*	3	7931 Biometry	3
		5681 Earth Science II	3

3. LEVEL III SUBJECTS

6209 Agricultural Production	1.5	9039 Agricultural Practice and Policy	1.5
5286 Agricultural Experimentation**	3		

and any of the following subjects offered in the following departments and faculties to the value of 42 points taken in the third and fourth years of the course. Subjects taken in the Faculties of Economics and Commerce, Mathematical and Computer Sciences and Science to the value of no more than 20 points may be counted towards the degree of Bachelor of Agricultural Science. The subjects 5286 Agricultural Experimentation and 6209 Agricultural Production will normally be taken in the third year of the course, and 9039 Agricultural Practice and Policy during the fourth year.

The subjects 6209 Agricultural Production and 9039 Agricultural Practice and Policy will be offered for the last time in 1993. In 1994 the compulsory subject 7972 Agricultural Practice, Policy and Communication (3) will be offered and will normally be taken in the third year of the course.

Some of the subjects listed below are only offered in alternative years. See syllabuses for details.

Agricultural Technology

4725 Pasture Agronomy and Professional Practice	3		

Animal Sciences

8049 Animal Breeding and Genetics	3	7318 Animal Physiology A (Systems)	3
3172 Animal Cell and Molecular Biotechnology	3	1617 Animal Physiology B (Regulations)	3
7906 Animal Diseases and Control	3	4148 Animal Products and Production	3
1907 Animal Nutrition, Growth and Development	3	4522 Reproductive Biology and Technology	3
		1114 Research Project: Animal Sciences	3

Business and Extension

7521 Farm Management Systems	3		

Crop Protection

4078 Biology of Insects	3	3416 Plant Disease and the Environment	3
2471 Crop Protection	3	6265 Plant Pathogens and Pathogenicity	3
6129 Ecological Biochemistry	3	4763 Population Ecology of Insects	3
5480 Insect Behaviour	3	1616 Research Project: Crop Protection	3
7126 Mycology	3		

* Candidates intending to study Level II and Level III subjects in the Faculties of Science or Mathematical and Computer Sciences or Economics and Commerce in the Bachelor of Agricultural Science degree may, with the permission of the Dean, enrol in and count towards the degree *one only* of 2136 Geology I *and* 9786 Mathematics I in place of the corresponding subjects listed in clause 2 *or* 8461 Economics I in place of 2247 Agriculture, Environment and Society or 2847 Agricultural Production and Economics. Students wishing to enrol in Level II subjects in the Statistics Department will require a pass in Mathematics I, at least a credit in Biometry and approval of the Head of that Department.

** Candidates counting 4523 Data Analysis and 1675 Linear Models II towards the degree are exempt from 5286 Agricultural Experimentation.

Horticulture, Viticulture and Oenology

8103	Grape and Wine Chemistry/ Microbiology* 3	8645	Reproductive Horticulture 3
1018	Horticultural Production 3	2174	Viticultural Production A* 3
5882	Horticultural Science 3	5153	Viticultural Production B 3
		6637	Research Project: Horticulture, Viticulture and Oenology 3

Plant Science

9446	Advanced Biometry 3	3434	Mineral Nutrition of Plants 3
8593	Advanced Plant Breeding 3	5501	Principles of Plant Breeding 3
7583	Agricultural Biotechnology 3	2404	Plant Growth and Development 3
9417	Biological Chemistry in Agriculture 3	3575	Plant Response to the Environment 3
8271	Crop and Pasture Ecology 3	5501	Principles of Plant Breeding 3
9867	Crop Physiology III 3	4001	Research Project: Plant Science 3
7630	Genetic Technologies for Plant Improvement 3		

Plant Science and Animal Sciences

7531	Applied Genetics 3

Soil Science

2330	Pedology 3	6470	Soil Fertility 3
4449	Research Project: Soil Science 3	1936	Soil Management and Conservation 3
4633	Soil Biology and Biochemistry 3		

4. (a) No candidate will be permitted to count for the degree any subject together with any other subject that, in the opinion of the Faculty, contains a substantial amount of the same material; and no subject may be counted twice towards the degree.

(b) No candidate may present the same part subject, section of a subject, unit of a subject or option in more than one subject for the degree.

5. Candidates who commenced their courses of study for the degree prior to 1989 may qualify for the degree by fulfilling the requirements of the present regulations and schedules, with such modifications as the Faculty may deem necessary to ensure that subjects validly passed under previous regulations and schedules may be counted under the present schedules.

6. (a) Candidates from other faculties in the University or from other tertiary educational institutions may, on written application to the Registrar, be granted such status in appropriate subjects in the course for the degree of Bachelor of Agricultural Science as the Faculty in each case may determine. Those from within the University will, however, be required to satisfy the examiners in the subjects 6209 Agricultural Production and 9039 Agricultural Practice and Policy. Those from other institutions may be granted status in 6209 Agricultural Production but only in exceptional circumstances; and they will not be granted status in 9039 Agricultural Practice and Policy.

(b) Extra study as prescribed by the Head of the department concerned may be required in nominated subjects before such candidates enter the course.

7. Under the provisions of Regulation 9, a student may be granted a Faculty Pass in Level I and Level II of the course notwithstanding results in individual subjects, provided that the average mark obtained at annual examinations for all the subjects at that Level is 50 or over, and at least 45 in any one subject. Moreover:

(a) a Faculty Pass shall not be granted if the subject which the student has failed is a prerequisite for a compulsory subject to be undertaken by the student at a higher Level;

(b) a student who has been granted a Faculty Pass in Level I or II shall not be permitted to take any subject in succeeding Levels for which the pre-requisite had been failed;

(c) a student who has been granted a Faculty Pass in Level I or II and who wishes to take a subject at Level III, having failed its pre-requisite in the Level in which the Faculty Pass was granted, shall only be permitted to take that subject after having passed the pre-requisite.

* Not available until 1994/1995.

8. When, in the opinion of the Faculty of Agricultural and Natural Resource Sciences, special circumstances exist, the Council, on the recommendation of the Faculty in each case, may vary the provisions of Clauses 1-7 above.

NOTES (not forming part of the schedules);

Work required to complete an Adelaide degree.

(i)Students from other universities and tertiary educational institutions who are granted status under clause 6 of these schedules will be required to complete at least the whole of the work of the final year of the course at Adelaide in order to qualify for the degree; and (ii) a student who has completed at Adelaide at least the first three years of the degree, or the equivalent, may with permission of the Faculty be permitted to complete the requirements of the degree at another institution.

(iii)Subjects will be offered subject to the availability of staff and sufficient enrolments.

SCHEDULE III: THE HONOURS DEGREE

1. Before entering upon the requirements for an Honours course a candidate must obtain the approval of the Head of Department that will take responsibility for providing relevant supervision. Approval will depend on the candidate's academic record up to the time of application. Normally such approval should be sought at the end of the third year of the course for the Ordinary degree. Whenever possible the planning of subjects to be counted towards the degree should begin at the end of the second year.

2. A candidate for the Honours degree shall complete the final year of the course but, as specified by the Faculty from time to time, at a standard generally higher than that required for the Ordinary degree. Candidates enrolling for the Honours degree would normally undertake one less elective subject at Level III and, in addition, shall satisfactorily complete an advanced course as set out in the syllabuses for one of the following subjects (points value as indicated below) so that a minimum of 54 points, representing a six point overload, is completed at Level III for the Honours degree:

8874	Honours Animal Sciences	9
9168	Honours Crop Protection	9
8309	Honours Economics (B.Ag.Sc.)	9
6345	Honours Environmental Science and Rangeland Management	9
6832	Honours Horticulture, Viticulture and Oenology	9
4856	Honours Plant Science (B.Ag.Sc.)	9
4164	Honours Soil Science	9

3. The work of the Honours year shall normally be completed in the final year of study. The Faculty may permit a candidate to present the work over a period of not more than two years on such conditions as it may determine.

SCHEDULE IV: PRACTICAL EXPERIENCE

Before a candidate shall be admitted to the Ordinary or Honours degree, he/she must provide satisfactory evidence of the completion of a minimum of 13 weeks of practical agricultural experience and other contact with the farming industry as approved by the Practical Experience Administrator.

The appropriate experience may be spread over the 4 years of the course.

On completion of the practical experience requirements (and no later than 31 March of the year in which the candidate is admitted to the degree) each candidate is required to submit to the Practical Experience Administrator evidence that the practical experience requirements have been satisfactorily completed.

Candidates who have completed an appropriate diploma or degree may be exempted from the practical experience requirement of the course. Candidates should discuss these requirements on first enrolment in the course with the Practical Experience Administrator.

General

The objective of the practical experience requirements is to provide the student with first-hand experience, knowledge and understanding of the complex operation of modern farming and of agricultural and related industries. The student will be expected to gain practical experience with a wide range of farm operations, first-hand appreciation of the interaction of the physiological, biological and economic and social factors in on-farm decision-making, and understanding of the industrial and governmental infrastructure that services primary industry.

Farm Experience

(a) The primary farm. Each student will choose, with the help of the Practical Experience Administrator early in the degree course, one farm for study. The student will be required, with the help of the farmer and his family, to gain a thorough knowledge of the nature and operation of this farm. This will necessitate several periods of work on the selected farm, in different years and at different seasons, plus other visits and correspondence. A minimum of eight weeks of working experience will be expected. A full written report on experiences gained on this farm will be submitted during the final year of the degree course.

(b) Each student will be expected to gain farm experience in at least two other agricultural areas (i.e., different from that of the primary farm above). This experience may be used when writing the final report for contrast and comparison with the primary farm. A list of agricultural areas is provided by the Practical Experience Administrator. Help in the choice of farms can be provided.

A minimum of 12 weeks' farm experience will be required (total for sections (a) and (b) above).

Students attending vacation courses and camps in elective subjects may seek to have the time counted towards the farm experience requirement.

Industry Experience

A minimum of one week will be spent with industrial firms, government departments and statutory bodies servicing the agriculture industry. The relevance of this experience may be mentioned in the final report.

SCHEDULE V: MAJOR IN VITICULTURE OR OENOLOGY

1. To major in Viticulture or Oenology a candidate shall comply with the general requirements listed in Schedule II, Clause I and satisfactorily complete the requirements of the subjects listed below. Candidates shall also satisfactorily complete two additional subjects (Ordinary degree) and one additional subject (Honours degree) from Level III subjects listed under Clause 3 of Schedule II.

2. SUBJECTS FOR MAJOR IN VITICULTURE

YEAR 1

Subject Code	Semester Code	Name of Subject	Points
2247	1	Agriculture, Environment and Society	3
5683	1	Earth Science I	3
6976	2	Biomathematics and Statistics	3
7267	2	Genetics IW	3
3174	F	Biology I	6
6878	F	Chemistry I	6

YEAR 2 (from 1993)

3689	1	Agricultural Microbiology II	3
8712	1	Agricultural Zoology (Invertebrates)	1.5

Subject Code	Semester Code	Name of Subject	Points
4791	1	Horticulture, Viticulture and Oenology	1.5
9339	2	Agricultural Botany	3
7931	2	Biometry	3
5681	2	Earth Science II	3
9100	2	Engineering Science	3
6553	F	Biological Chemistry	6
		YEAR 3 (from 1994)	
8392	1	Agricultural Business	3
2471	1	Crop Protection	3
5882	1	Horticultural Science	3
1242	1	Viticultural Science	3
7972	2	Agricultural Practice, Policy and Communication	3
7685	2	*Horticultural Marketing I *or*	
7648		*Horticultural Business Management	3
7708	2	Viticultural Engineering and Operations	3
2174	2	*Viticultural Production A *or*	
5153		*Viticultural Production B	3
		YEAR 4, ORDINARY DEGREE (from 1995)	
9079	1	Industry Experience and Case Study (Viticulture)	3
3066	1	Irrigation Science	3
7685	2	*Horticultural Marketing I *or*	
7648		*Horticultural Business Management	3
2174	2	*Viticultural Production A *or*	
5153		*Viticultural Production B	3
5892	2	Winemaking Principles	3
6637	F	Research Project: Horticulture, Viticulture and Oenology	3
		YEAR 4, HONOURS DEGREE (from 1995)	
9079	1	Industry Experience and Case Study (Viticulture)	3
3066	1	Irrigation Science	3
7685	2	*Horticultural Marketing I *or*	
7648		*Horticultural Business Management	3
2174	2	*Viticultural Production A *or*	
5153		*Viticultural Production B	3
5892	2	Winemaking Principles	3
6832	F	Honours Horticulture, Viticulture and Oenology	9

* Students must complete both of the paired subjects, the year in which each is undertaken being determined by its availability.

3. SUBJECTS FOR MAJOR IN OENOLOGY

YEAR 1 — See under Major in Viticulture.

YEAR 2 — See under Major in Viticulture except 2497 Wine Technology IIAG instead of 5681 Earth Science II.

Subject Code	Semester Code	Name of Subject	Points
		YEAR 3 (from 1994)	
8392	1	Agricultural Business	3
9263	1	Sensory Science A	3

Subject Code	Semester Code	Name of Subject	Points
1242	1	Viticultural Science	3
5443	1	Wine Production	3
7972	2	Agricultural Practice, Policy and Communication	3
8435	2	*Unit Processing *or*	
5974		*Winery Engineering III	3
2174	2	*Viticultural Production A *or*	
8103		*Grape and Wine Chemistry/Microbiology	3
4452	2	*Winery Design and Management *or*	
9761		*Bottling, Packaging and Marketing	3
		YEAR 4, ORDINARY DEGREE (from 1995)	
9099	1	Industry Experience (Oenology)	3
6445	1	Sensory Science B	3
8435	2	*Unit Processing *or*	
5974		*Winery Engineering III	3
2174	2	*Viticultural Production A *or*	
8103		*Grape and Wine Chemistry/Microbiology	3
4452	2	*Winery Design and Management *or*	
9761		*Bottling, Packaging and Marketing	3
6637	F	Research Project: Horticulture, Viticulture and Oenology	3
		YEAR 4, HONOURS DEGREE (from 1995)	
9099	1	Industry Experience (Oenology)	3
6445	1	Sensory Science B	3
8435	2	*Unit Processing *or*	
5974		*Winery Engineering III	3
2174	2	*Viticultural Production A *or*	
8103		*Grape and Wine Chemistry/Microbiology	3
4452	2	*Winery Design and Management *or*	
9761		*Bottling, Packaging and Marketing	3
6832	F	Honours Horticulture, Viticulture and Oenology	9

* Students must complete both of the paired subjects, the year in which each is undertaken being determined by its availability.

4. Candidates will be required to attend the following tours:

Year 1: a three day tour during September to horticulture, viticulture and winemaking regions of South Australia and Victoria.

Year 3: a tour of one week's duration to viticulture and winemaking regions of Australia.

DEGREE OF

BACHELOR OF AGRICULTURAL SCIENCE

SYLLABUSES

Text-books:

The lists of the text-books were correct at the time that this Volume went to press. It is possible however that amendments to these lists will be made before the start of lectures; and, if so, students attending classes will be notified appropriately by the lecturer concerned.

In general, students are expected to have their own copies of text-books; but they are advised to await advice from the lecturer concerned before buying any particular book. Only the prescribed edition of any text-book should be bought.

Reference books:

Although lists of books and journals for reference purposes are regarded as important, details have not been included in this Volume. These will however be issued from time to time by the departments concerned. It is hoped that all books and journals set for reference will be available to be consulted in the Barr Smith Library and/or the Waite Campus or Roseworthy Campus Libraries.

Examinations:

For each subject students may obtain from the department concerned details of the examination in that subject including the relative weights given to the components (e.g. such of the following as are relevant: assessments, semester tests, essays or other written or practical work, final written examinations, *viva voce* examinations).

LEVEL I

2247 Agriculture, Environment and Society

Level: I.

Points value: 3.

Duration: Semester I.

Contact hours: 3 lectures and 1 tutorial per week.

Content: Of all human activities, agriculture has had the most profound effect on our physical, biological and social environment. With the continued growth in the world's population, it will be necessary at least to maintain current levels of agricultural production as well as minimise the adverse effects on the environment of any increased productivity. Modern agriculture and its management face changing sets of opportunities and threats which arise in part out of complex mixes of new technologies, economic development, dynamic international policies, increasingly competitive world markets and growing awareness of the importance of natural environments.
This subject is an introduction to the scope of Australian agriculture and its importance to Australian society. It covers topics such as the contribution of Australia to world agriculture, the physical and biological basis of agriculture, the impact of agriculture on the environment, the impact of agricultural chemicals and a description of the major rural industries. Some of the environmental, social, ethical and economic issues faced by Australia's rural industries will be discussed.

Assessment: Essays (3) 30%, tutorial exercises 20% and final examination 50%.

Text-Books/Reference Books/Prescribed Reading: List of recommended texts will be provided at first lecture.

3174 Biology I

Level: I.

Points value: 6.

Syllabus: See under B.Sc. in Faculty of Science.

6976 Biomathematics and Statistics

Level: I.

Points value: 3.

Duration: Semester II.

Assumed knowledge: Year 12 Mathematics IS.

Restriction: 5543 Statistics I; 9786 Mathematics I; 4357 Mathematics IH; 3617 Mathematics IM. Available only to students in B.Ag.Sc. course and B.App.Sc. (N.R. Man't).

Contact hours: 4 lectures and 2 computer lab sessions per week.

Content: The subject is intended to equip students with basic skills in mathematics and statistics, as an introduction to the use of quantitative methods in agriculture. Where possible, examples and data sets drawn from agricultural and biological sciences will be used. The course will involve the use of modern computing methods.
Topics will include: periodic, exponential and trigonometric functions, matrices and linear equations, integrals, differential equations; data collection and presentation, probability distributions, principles of experimentation (randomization and application), estimation, hypothesis testing, confidence intervals, regression and correlation and elementary analysis of variance.
As part of the course, students will study an extended biomathematical application and complete a group project involving data collection and analysis in a biological context.

Assessment: Formal examination (at least 70%); exercise, practicals and project work (at most 30%).

References: Mead, R. & Curnow, C. R., *Statistical methods in agriculture and experimental biology* (Chapman & Hall); Arya, J. C. & Lardner, R. W., *Mathematics for the biological sciences* (Prentice/Hall International Inc.).

6878 Chemistry I

Level: I.

Points value: 6.

Syllabus: See under B.Sc. in Faculty of Science.

5683 Earth Science I

Level: I.

Points value: 3.

Duration: Semester I.

Restriction: 2136 Geology I; 5339 Geology IW.

Contact hours: Semester 1 lectures of 2136 Geology I, 9 three-hour practicals and 4 half-day field trips per semester.

Content: Semester IA: *Our lively planet:* Spaceship Earth has one interactive environmental system comprising the geosphere, hydrosphere, biosphere and atmosphere. The geological time scale. From weathering to sedimentation in humid, arid and glacial environments.

Planetary processes on Earth, Moon and Mars. Rivers, deltas, coasts and continental shelves. Coral reefs and limestones, ancient and modern. Salt formations.
Semester IB: *Life on Earth:* The biosphere interacts with the rocks, water and air of the Earth's skin. The evolution of life is responsible for fossil fuels, climatic change and the fossil record. The first three billion years. The last half billion years. Atmospheres and oceans; icehouses and greenhouses. Extinctions, cycles and catastrophes.
Soils: formation and fertility. Ground water and hydrology. Construction materials.
Applied geology; coastal processes, dam sites and construction, relevant case histories.

Assessment: End of Semester theory examination (50%). Practical examinations, laboratory work and field excursions (attendance and report) comprise a compulsory and non-redeemable component (50%). A minimum of 40% must be obtained in both the theory and practical sections to pass.

Text-books: Skinner, B. J. & Porter, S. C., *Physical geology* (John Wiley & Sons, 1987).

7267 Genetics IW

Level: I.

Points value: 3.

Duration: Semester II.

Assumed knowledge: 3174 Biology I.

Restriction: 7940 Genetics and Evolution I; 6424 Genetics ID.

Contact hours: 6 hours per week.

Content: Heredity and variation; Genes and chromosomes; Linkage; Chromosomes and evolution; Properties of the genetic material and molecular organisation of chromosomes; Genetics of bacteria and viruses; Gene manipulation; Population genetics and evolution; Genetic diversity of agriculturally important plants; Quantitative inheritance; Principles of plant and animal breeding; Application of molecular genetics to agriculture.

Assessment: One 3-hour paper (80%); assignments (20%).

Text-books: Hartl, D. L., Freifelder, D. & Snyder, L. A., *Basic genetics* (Jones and Bartlett, 1988).

LEVEL II

9339 Agricultural Botany

Availability: Offered in 1993.

Level: II.

Points value: 3.

Duration: Semester II.

Pre-requisites: 3174 Biology I.

Assumed knowledge: 3174 Biology I.

Restriction: 3673 Botany II, 1692 Botany IIA.

Contact hours: 2 lectures and 1 four-hour practical per week.

Content: The botanical and physiological aspects of plants of agricultural significance, emphasising the acquisition of skills required to identify those plants and to relate the structure of the various plant organs and tissues to their function and physiology. This will include the general principles of phylogeny and taxonomy of higher plants including the features used in classification, and the use of floras and keys. Species identification and anatomy will be addressed for the major agricultural families: Poaceae, Chenopodiaceae, Fabaceae, Brassicaceae, Asteraceae, Apiaceae, Solanaceae, Rosaceae, Vitaceae, Rutaceae

and Myrtaceae. Speciation, crop domestication and weed taxonomy will also be considered. The relationship between structure and function will be addressed in terms of plant growth regulating chemicals in the control of root and shoot growth, and in the control of floral initiation and fruit growth. These processes will also be investigated in terms of plant responses to environmental influences including light, water and temperature; the interaction of environmental effects; the synthesis of response; and implications for plant phenological cycles.

Assessment: To be advised at first lecture.

Text-books: To be advised at first lecture.

3689 Agricultural Microbiology II

Level: II.

Points value: 3.

Duration: Semester I.

Pre-requisites: 3174 Biology I (Div. I).

Restriction: 5677 Agricultural Microbiology and Zoology.

Contact hours: 2 lectures, 1 four-hour practical session per week.

Content: The role of micro-organisms in agriculture and related environments. Topics covered include the biology and classification of bacteria, fungi and viruses important in agricultural situations, nutrient cycling, micro-organisms as pathogens, symbionts and agents of biological control, genetically modified micro-organisms, microbiology of food and animal fodder.

Assessment: Theory examination (80%) and practical books (20%).

Text-books: To be advised.

2847 Agricultural Production and Economics

Availability: Available from 1993.

Level: II.

Points value: 3.

Duration: Semester II.

Pre-requisites: 2247 Agriculture, Environment and Society.

Contact hours: 2 lectures and 4 hours practical/farm visit per week.

Content: A general introduction to the basic practices of Australian agricultural production including the operation of the pastoral system, mixed farming enterprises of the cereal zone, higher rainfall enterprises and irrigated agriculture. Approximately half of the lecture course is devoted to the description and study of the economics and marketing of agricultural commodities. The remainder of the lectures and most of the practical program is concerned with the description and evaluation of production units including crop, pasture, horticulture, viticulture and animal enterprises.

Assessment: Examination, essay and practical/farm visit reports.

Text-Books/References: To be announced at first lecture.

2448 Agricultural Zoology II

Level: II.

Points value: 3.

Duration: Semester I.

Pre-requisites: Biology I.

Restriction: 8712 Agricultural Zoology (Invertebrates); 5677 Agricultural Microbiology and Zoology.

Contact hours: 2 lectures, 1 four-hour practical per week.

Content: The aim of this subject is to introduce the basic concepts of invertebrate and vertebrate taxonomy, physiology and function with particular emphasis on organisms of agricultural significance. The first half of the subject deals with invertebrates within a taxonomic framework and covers molluscs, nematodes, annelids, and arthropods. The remainder deals with vertebrates including their physiological systems, production, disease control and biotechnology.

Assessment: Theory examination 80%, practical books 20%.

Text-books: To be advised.

8712 Agricultural Zoology (Invertebrates)

Availability: Available from 1993.

Level: II.

Points value: 1.5.

Duration: First half of Semester I.

Pre-requisites: 3174 Biology I.

Restriction: 2448 Agricultural Zoology II.

Contact hours: 2 lectures, one four-hour practical per week.

Content: The aim of this subject is to introduce the basic concepts of invertebrate taxonomy, physiology, ecology and function with particular emphasis on organisms of agricultural significance. The subject deals with organisms within a taxonomic framework and covers molluscs, nematodes, annelids, and arthropods.

Assessment: Theory examination (80%); practical books (20%).

6553 Biological Chemistry

Level: II.

Points value: 6.

Duration: Full year.

Pre-requisites: 6878 Chemistry I, 3174 Biology I.

Restriction: 1874 Chemistry IIA.

Contact hours: 2 lectures and 1 four-hour practical per week.

Content: A study of the chemistry and biochemistry of plant, animal and microbial components as well as consideration of the chemistry of synthetic compounds such as herbicides and pesticides and their effect on cell metabolism. The following topics will be included: chemistry and metabolism of carbohydrates, lipids, proteins and nucleic acids, thermodynamic analysis of energy exchanges in the cell, biochemistry of muscle action, photosynthesis, photorespiration and fermentative processes, nitrogen fixation, chemistry of natural and artificial additives used in the food industry, structural features of herbicides and pesticides that contribute to their reactivity plus consideration of their behaviour in the soil. Attention will be given to the relevant enzymology and impact of molecular biology in the understanding of the above processes. Practical classes will provide the opportunity for students to gain experience in a range of chemical and biochemical techniques and skills.

Assessment: Exams (60%), practical classes and exercises (30%), essay (10%).

Text-books: Will be advised at first lecture.

7931 Biometry

Level: II.

Points value: 3.

Duration: Semester II.

Pre-requisite: 5543 Statistics I (pre-1989: 5543 Statistics IH).

Contact hours: 2 lectures and 1 three-hour practical a week.

Content: An extension of statistical methods and mathematical topics of importance in agricultural and wine sciences. Topics covered include: sampling methods, tests of significance, simple and multiple regression, introduction to the design of experiments and analysis of variance (both parametric and non-parametric). The GENSTAT5 statistical package is utilized extensively throughout the subject.

Assessment: Continuous assessment of regular written assignments 20% and examinations 80%.

Reading Lists: No text-book is recommended. A list of reference books will be available beforehand and at first lecture.

1692 Botany IIA

Availability: Will not be offered after 1992.

Level: II.

Points value: 6.

Duration: Full year.

Restriction: 3673 Botany II.

Pre-requisite: 3174 Biology I (div. I).

Assumed knowledge: 6878 Chemistry I.

Contact hours: 3 lectures a week; 6 hours practical work a week for equivalent of 20 weeks; ecology camp equivalent to 27 hours practical time.

Content: As for 3673 Botany II (see syllabus under B.Sc. in the Faculty of Science) but omitting the plant project (Semester I) and 4 weeks of teaching in Semester II.

Assessment: As for 3673 Botany II.

Text-books: As for 3673 Botany II.

5681 Earth Science II

Availability: Offered in 1993.

Level: II.

Points value: 3.

Duration: Semester II.

Pre-requisites: 5683 Earth Science I.

Contact hours: 26 lectures, 6 tutorials and approximately 40 hours of practical work including 2 one-day weekend field trips.

Content: The major topics considered are: Soil materials: organic, inorganic components of soils and their influence on soil properties and land use. Physical, chemical and biological properties of soils: soil structure, infiltration, storage and movement of water, salinity, chemical fertility, cation and anion exchange, soil biology. Soil conservation: wind and water erosion, causes and effects of erosion, land evaluation, methods of controlling degradation and erosion, reclamation.

Assessment: Practical work and written assignments; end of semester examination.

Text-books: No textbooks are recommended for purchase but references will be given throughout the course.

9100 Engineering Science

Availability: Available from 1993.

Level: II.

Points value: 3.

Assumed knowledge: Year 12 Mathematics IS.

Duration: Semester II.

Contact hours: 6 hours per week.

Content: Fundamental concepts: force, work, power, energy, pressure. Fluids: principles of hydrostatics, elementary hydrodynamics. Properties of fluids, behaviour of real fluids under reduced pressure, elementary pressure-wave theory, fluid pumping. Stress analysis: stress, strain, deformation and failure in elementary components. Thin-walled pressure vessel theory. Electricity: physiology of electric shock, elementary DC and AC circuit theory, single and 3 phase AC power, AC meter types and applications.

Assessment: Includes practicals, assignments and written examination.

Text-books/Reference books: To be advised.

4791 Horticulture, Viticulture and Oenology

Availability: Offered in 1993.

Level: II.

Points value: 1.5.

Duration: Second half of Semester I.

Pre-requisites: 3174 Biology I.

Assumed knowledge: Level I.

Contact hours: 6 hours per week.

Content: Introduction to horticultural crops in Australia, viticultural regions and practices in Australia and the world, and wines and wine production techniques used in Australia and the world.

Assessment: Includes assignments and written examinations.

Text-books: Textbooks and references will be indicated during the subject.

2167 Wine Technology

Availability: Offered in 1993.

Level: II.

Points value: 3.

Duration: Semester II.

Pre-requisites: 4791 Horticulture, Viticulture and Oenology.

Assumed knowledge: Level I.

Contact hours: 6 hours per week.

Content: Grape quality, harvesting criteria, fermentation variables and production procedures for table, sparkling and fortified wines. Basic quality control principles and analyses methods used in winemaking, including sensory evaluation of juices and wine.

Assessment: Includes practicals, assignments and written examinations.

Text-books: Text-books and reference material will be indicated during the subject.

LEVELS III AND IV

AGRICULTURAL TECHNOLOGY

3066 Irrigation Science III

Level: III.

Points value: 3.

Pre-requisites: 9100 Engineering Science.

Duration: Semester I.

Contact hours: 6 hours per week.

Content: Irrigation principles: evapotranspiration and soil moisture budget, crop requirements (peak rate and crop factor), adjustment for salinity (leaching fraction), sprinkler and dripper characteristics, sprinkler and dripper layout, hydraulics of pressure, irrigation systems, irrigation scheduling.

Assessment: Practicals, assignments and written examinations.

Text-books/References: To be advised.

4725 Pasture Agronomy and Professional Practice

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 2834 Agronomic Principles (pre-1989: 3756 Agronomy and Plant Breeding III).

Assumed knowledge: 5008 Agronomic Practices.

Contact hours: 2 lectures and 1 four-hour practical period a week.

Content: An advanced programme covering the ecology, production, management and utilization of pastures with emphasis on the integration of crops, pastures and livestock, including fodder conservation and supplementary feeding in farming systems in various ecological zones and socio-economic situations in Australia and overseas. The role of the pasture agronomist in national and international research and development, consulting and other professional activities.

Assessment: 3-hour examination, essay, and evaluation of practical reports.

References: Alexander, G. and Williams, O. B. (eds.), *The pastoral industries of Australia* (Sydney U.P., 1973); Leeper, G. W. (ed.), *The Australian environment*, 4th edn. (CSIRO/MUP, 1970); Moore, R. M., *Australian grasslands* (ANU, 1970); Wheeler, J. L., Pearson, C. J. & Robards, G. E., *Temperate pastures: their production, use and management* (Australian Wool Corporation/CSIRO, 1987).

5974 Winery Engineering III

Level: III.

Points value: 3.

Pre-requisites: 9100 Engineering Science.

Duration: Semester II.

Contact hours: 6 hours per week.

Content: The first law of thermodynamics, the refrigeration cycle, components of refrigeration systems, heat transfer, fermentation loadings, carbon dioxide properties,

nitrogen properties, winery gas systems, steam properties and winery steam systems, pasteurization, centrifugation and filtration.

Assessment: To be advised.

Text-books: To be advised.

7708 Viticultural Engineering and Operations

Level: III.

Points value: 3.

Pre-requisites: 1242 Viticultural Science.

Duration: Semester II.

Contact hours: 6 hours per week.

Content: Machinery operation and application of agricultural chemicals — safety procedures, acts and regulations. Power and torque, engine characteristics, power transmission, traction, hydraulics. Introduction to electronics. Buildings and services. Trellis and fence design, load characteristics, stress analysis. Principles and practices of vineyard operations including tractor and machinery operation, spray equipment calibration and spray application. Trellis construction. Irrigation system operation. Pruning and propagation. This unit includes visits to commercial vineyards.

Assessment: Assignments, tutorials, practicals and written examinations.

Text-books/References: To be advised.

ANIMAL SCIENCES

8049 Animal Breeding and Genetics

Availability: Odd years only from 1993.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 5677 Agricultural Microbiology and Zoology, 7931 Biometry and 7940 Genetics and Evolution I.

Assumed knowledge: 7531 Applied Genetics *or* 4863 Genetics II recommended.

Contact hours: 2 lectures, 1 hour tutorial and 2 hour practical a week.

Content: The principles of a quantitative genetic inheritance are developed to study the continuing improvement in productivity of farm livestock through genetic means. Topics covered include the genetical structures of the livestock industry in Australia. Basic concepts in the development of breeding programs, genetic value and artificial selection; relationship and inbreeding; quantitative inheritance, prediction of breeding value (heritability); prediction of genetic progress; comparison of selection programs; multi-trait selection; indirect selection; selection indices; mating systems; development of breeding objectives and selection criteria; natural selection; estimation of variance components and impact of new biotechnologies on animal improvement.

Assessment: Approximately 20% by regular assignments, exercises and essays; 80% by final examination.

References: Falconer, D. S., *Introduction to quantitative genetics* (Longman); Nicholas, F. W.,

Veterinary genetics (Oxford University Press); Van Vleck, L. D., Pollak, E. J., Oltenaeu, E. A. B., *Genetics for the animal sciences* (W. H. Freeman, New York).

3172 Animal Cell and Molecular Biotechnology

Availability: Odd years only.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisite: 7583 Agricultural Biotechnology.

Restriction: 1544 Biotechnology in Animal Production.

Contact hours: 2 lectures and 1 four-hour practical a week.

Content: Gene expression and control in animal cells. Cell division, regulation and differentiation. Experimental production and uses of antibodies, natural and synthetic vaccines, synthetic growth promotants. Rumen microbial genetics and genetic engineering of rumen microflora. Genetic engineering in animal cells. Biotechnology in forensic science, animal production.

Assessment: 3 hour written examination 60%, practical reports 20% and essay 20%.

Text-book: Announced at first lecture.

7906 Animal Diseases and Control

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 5677 Agricultural Microbiology and Zoology *or* 2448 Agricultural Zoology II.

Contact hours: 2 lectures and one practical per week.

Content: Students should become familiar with the principal agents of infectious diseases (viral, bacterial, and invertebrate) of animals. Modern methods of viral classification (replication methods) will necessarily be described. The molecular strategies employed by various pathogens in the evasion of host defences will be outlined. This will lead to the description of virulence genes of pathogens, and to attempts to design vaccination strategies against the pathogens. Work to date in this area will be reviewed, as will the prospectus for future large-scale vaccination of animals against diseases of importance.
The Practical/Project side will have students using previously described virulence genes of bacteria as probes for the pathogens. They will make their own attenuated strains of bacteria for vaccine use. They will examine viral genome form, and detect viruses in body fluids and tissue culture cells.

Assessment: 3 hour written exam (60%), practicals (20%) and essay (20%).

Text-books/References: These will be advised at subject commencement.

1907 Animal Nutrition, Growth and Development

Availability: Even years only.

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisite or Co-requisite: 7318 Animal Physiology A (Systems).

Contact hours: 2 lectures and 1 four-hour practical a week.

Content: A study of the analysis and composition of feeds; the essential nutrients and their metabolic roles; symptoms of, and correction of, nutrient deficiency states including trace

elements; ration formulation for livestock; nutrient supply from pastures and manipulation of nutrient supply to increase the productive efficiency of animals; manipulation of animal growth.

Assessment: 3 hour written examination 60%, practical reports 20% and essay 20%.

Text-book: McDonald, P., Edwards, R. A. & Greenhalgh, J. F. D., *Animal nutrition.* (Longman).

7318 Animal Physiology A (Systems)

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisite: 5677 Agricultural Microbiology and Zoology.

Contact hours: 2 lectures and 1 four-hour practical a week.

Content: The basic properties of mammalian cells. The physiology of the cardiovascular, immune, respiratory, nervous, digestive and excretory systems will be dealt with in detail, and the skeleton, muscle and skin will be considered.

Assessment: 3 hour written examination 60%, practical reports 20% and essay 20%.

Text-books: Frandson, R. D., *Anatomy and physiology of farm animals,* 4th edn. (Lea & Febiger); Dyce, K.M., Sack, W.D. and Wensing, C.J. S.(ed.) *Textbook of veterinary anatomy* (W.B. Saunders).

1617 Animal Physiology B (Regulation)

Availability: Yearly from 1992.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 7318 Animal Physiology A (Systems).

Contact hours: 2 lectures and 1 four-hour practical a week.

Content: Nervous, metabolic, and hormonal control of animal function and productivity; adaption, thermoregulation, water and electrolyte balance, pharmacology and toxicology, special senses (ear, eye and nose), integrative physiology.

Assessment: 3 hour written examination 60%, practical reports 20% and essay 20%.

Text-book: Frandson, R. D., *Anatomy and physiology of farm animals,* 4th edn. (Lea & Febiger).

4148 Animal Products and Production

Availability: Odd years only.

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisite: 5677 Agricultural Microbiology and Zoology.

Contact hours: 2 lectures and 1 four-hour practical a week.

Content: A study of the main animal products (meat, milk, eggs, wool and other fibres); their formation and composition, and factors influencing these, including the commonly encountered infectious, parasitic and metabolic disease of farm animals. Extensive and intensive animal production systems, and management of these to increase production efficiency will be examined. End-uses of each of the products (i.e. secondary industry) and a consideration of the biological use of waste will also be included.

Assessment: 3 hour written examination 60%, practical reports 20% and essay 20%.

Text-book: Reid, R. L. (ed.) *A manual of Australian agriculture,* 4th edn. (William Heinemann).

4522 Reproductive Biology and Technology

Availability: Odd years only.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisite: 7318 Animal Physiology A (Systems).

Contact hours: 2 lectures and 1 four-hour practical a week.

Content: The anatomy, physiology and endocrinology of the male and female reproductive systems. Gamete production, sexual behaviour, seasonal breeding, pregnancy, growth and development of the fetus, and lactation are discussed with an emphasis on agriculturally important species, although comparisons are made with other eutherian mammals, marsupials and birds. The technologies of artificial insemination, in vitro fertilisation and embryo transfer are introduced, and practicals allowing hands-on experience are an integral component of the course.

Assessment: 3 hour written examination 60%, practical reports 20% and essay 20%.

Text-books: Johnson, M. H. & Everitt, B. P., *Essential reproduction,* 2nd edn., (Blackwell); Cole, H. H. & Cupps, P. T., *Reproduction in domestic animals,* 3rd edn., (Academic Press); Austin, C. R. & Short, R. V., *Reproduction in mammals,* 2nd edn., (Cambridge).

1114 Research Project: Animal Sciences

Level: III.

Points value: 3.

Duration: Semester I or II. In some cases in particular due to seasonal constraints, a project may be conducted over Semester I and II.

Pre-requisites: 7318 Animal Physiology A plus one other course work subject offered by the Department of Animal Sciences.

Co-requisites: At least one other course work subject offered by the Department of Animal Sciences.

Contact hours: No formal contact hours but students are expected to spend at least 10 hours of practical work a week for 1 semester (or equivalent) on their project.

Content: The subject comprises a small research project to be undertaken during the 4th year of the course under the supervision of a staff member in the Department of Animal Sciences. Students wishing to undertake a research project should consult with the Head of the Department before the beginning of the 4th year.

Assessment: Details of the assessment procedure will be provided prior to commencement of the project.

8874 Honours Animal Sciences

Note: Students wishing to take the Honours degree in Animal Sciences must consult the Head of the Department before beginning the fourth year but preferably before beginning the third year. Students cannot enrol in this subject and 1114 Research Project (Ordinary Degree).

Level: IV.

Points value: 9.

Duration: Full year.

Pre-requisite: Pass in all subjects chosen at levels I, II and III of the B.Ag.Sc. degree course and credit in 2318 Animal Physiology A (Systems) and a credit in one other level III subject offered by the Department of Animal Sciences, or equivalent.

Co-requisite: A sufficient number of semester subjects offered by the Department of Animal Sciences so that by the end of the fourth year, the student will have completed 5 course work units offered by the Department.

Contact hours: At least 10 hours per week during Semesters I and II and at least 30 hours per week for 4 weeks during the month of February, or during the other vacations, working on the project and in relevant discussions, reading or preparation of an Honours thesis.

Requirements: A research project undertaken in the Department under supervision, during the fourth year, equivalent to three semester subjects, one of which is taken in lieu of a course work subject, but the other two would be an overload in the fourth year. The research project will commence in February.

Assessment: Honours thesis, 60%, 3 seminars (Honours project and 2 on other topics) usually 10% each and an open-book assessment of a published paper 10%.

BUSINESS AND EXTENSION

8392 Agricultural Business

Availability: Yearly from 1994.

Level: III.

Points value: 3.

Assumed knowledge: Level II.

Contact hours: 6 hours per week.

Content: Business Finance: circular flow of funds, business risks and the role of management, the financial structure of a business, basic accounting principles, valuation, interpretation of financial accounts, sources of business finance, profit planning and control, business operations and the law, contracts, the law of agency and principle, negotiable instruments. Business Management: management principles and practices: evolution and current state. Management processes, especially planning and controlling. Decision-making: utility, decision-making under risk and uncertainty. Authority: power, influence, authority, delegation, organisation structure. Behaviour of individuals and groups: communication, motivation, leadership.

Assessment: Includes assignments and written examinations.

Text-books: Text-books and reference material will be indicated during the subject.

7521 Farm Management Systems

Level: III.

Points value: 3.

Duration: Semester II.

Contact hours: 5 hours per week.

Content: This subject is designed to encourage students to apply a systems approach to the analysis and planning of the dryland farm in South Australia. The syllabus includes the principles underlying the integration of crops, pastures and livestock in the farming system, the relationships between various environmental, economic and biological components of

farming systems for the purpose of effective management, techniques to evaluate the performance of the dryland farm in terms of its technical and economic sustainability and flexibility, define major factors limiting performance, plan improvements and altemative management strategies to improve performance within the constraints imposed upon the farm business, and compare the projected performance of the proposed system with the performance of current farming policy. Visits will be made to a number of dryland farming enterprises in the Mid-North to analyse system performance and propose development and management strategies that will lead to an improvement in technical and economic sustainability. Considerable student participation is required.

Assessment: By assignment based on farm visits.

Text-books: To be advised.

7648 Horticultural Business Management

Availability: Alternate years from 1995.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 8392 Agricultural Business.

Assumed knowledge: Level II.

Contact hours: 6 hours per week.

Content: Evaluation of the place of horticulture in the economy and of the individual horticultural business. Budgeting, cash flow, profitability, gross margins, investment. Machinery and labour: substitutability, evaluation and use of each. Marketing: introduction to marketing, appropriate marketing methods. Taxation: main effects on the owner of a horticultural business. Communications skills, organisational skills, interpersonal skills, management skills.

Assessment: Examination and assignments.

Text-books: Text-books and reference material will be indicated during the subject.

7685 Horticultural Marketing I

Availability: Alternate years from 1995.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 8392 Agricultural Business.

Assumed knowledge: Level II.

Contact hours: 6 hours per week.

Content: Appropriate application of general marketing management theory to horticultural commodities and products in the light of the requirements of specific horticultural marketing systems and with an emphasis on international markets. Preparation and class presentation of marketing plans, in both academic case and real world contexts, at the level of the individual firm, horticultural industry and geographic region. Strategic analysis of topical issues as they occur.

Assessment: Examination and assignments.

Text-books: Text-books and reference material will be indicated during the subject.

4452 Winery Design and Management

Availability: Alternate years from 1994.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 5443 Wine Production and 8392 Agricultural Business.

Assumed knowledge: Level II.

Contact hours: 6 hours per week.

Content: Winery management: the production function: its nature, interaction with other functions, application. Plant location and layout and materials handling: principles and application, winery design and distillery and winery effluent disposal. Planning management and control of production: principles, planning, balancing, operations management, quality control inventory management and control. Information: communication on the job, management information systems, information flow, CAD and CAM. Personnel management: principles, management of personnel in large and small wineries. Legislation: industrial, health, welfare and safety, taxation, equal opportunity, other.

Assessment: Written assignments and written examinations.

Text-books: Text-books and reference material will be indicated during the subject.

CROP PROTECTION

The management and control of insects, nematodes, plant diseases and weeds are major costs of production of agricultural commodities in Australia and the rest of the world. The Department of Crop Protection deals with the biology of these groups of organisms and options for managing them when they become pests. Students wishing to specialise in entomology are encouraged to enrol in Biology of Insects, Crop Protection, Insect Behaviour, and Population Ecology of Insects. Those who wish to specialise in plant pathology should enrol in Plant Pathogens and Pathogenicity, Plant Disease and the Environment, and Mycology. Students interested in weeds and their control should enrol in Crop Protection. Ecological Biochemistry spans the disciplines of plant pathology, entomology, and weed science. Advanced students can explore more specialised topics in a Research Project or by enrolling in Honours in their fourth year.

4078 Biology of Insects

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisite: 5677 Agricultural Microbiology and Zoology (pre-1989: 5114 Agricultural Zoology). Students without such qualification must obtain permission of the Chairman of Department before enrolling.

Assumed knowledge: 7940 Genetics and Evolution I.

Contact hours: 2 lectures and 4 hours of practical work a week.

Content: After a brief review covering the internal anatomy of insects and the processes involved in metamorphosis, excretion and reproduction, a number of specific topics will be explored in more detail, including:— morphological and biological characteristics of the major insect orders; life histories of selected pest and beneficial species; sociality, caste

formation and nest building in termites; sound production—methods and functions; feeding mechanisms; adaptations and biology of vertebrate ectoparasites; insects as disease vectors of plants and animals; production and function of silk in insects and arachnids; mimicry and defensive adaptations; sociality and parasitism in the Hymenoptera.
The practical component will examine collecting techniques; identification of adult insects to family level; identification of immature stages and feeding damage. A requirement of the course is the presentation of a well-curated insect collection.

Assessment: Written examination 45%, practical examination 35% and insect collection 20%.

Text-book: C.S.I.R.O., *Insects of Australia,* (M.U.P.). All other required references available in the Waite Institute and Barr Smith Libraries.

2471 Crop Protection

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: None.

Contact hours: 2 lectures and 1 four-hour laboratory practical a week.

Content: This subject will provide a co-ordinated introduction to the theory and practice of crop protection from pest and diseases using agrichemicals and cultural, genetic and biological controls and will serve as a basis for more specialized subjects. Topics considered are: Development of pesticides, including the history of pesticide development, registration and environmental testing, main structural types, action spectra and mechanisms of action. Factors leading to the appearance of resistant pest populations; resistance mechanisms. Control of Insects. The types of insect pests. Types and uses of insecticides. Strategies and tactics for managing insect pests (biological, cultural, genetic and chemical control; integrated pest management). Economics of managing insect and other crop pests. Control of plant diseases. The diagnosis of disease. Chemical control of fungi and nematodes. Strategies and tactics for managing disease outbreaks (biological, cultural, genetic and chemical methods of control). Control of Weeds. The need for weed control, by herbicides. Factors influencing the uptake of soil and foliage applied herbicides. Environmental fate of herbicides. Consideration of the major herbicide groups: Phenoxyacetic and benzoic acid herbicides; triazines, dimethylureas and bipyridyls; dinitroanilines; sulfonureas; glyphosate.

Assessment: Final examination plus practical exercises.

Text-books: Text books and research papers indicated during course.

6129 Ecological Biochemistry

Level: III.

Points value: 3.

Duration: Semester II.

Assumed knowledge: All compulsory Level II subjects.

Contact hours: 2 lectures and 4 hours of practical work a week.

Content: Evolution of defence strategies of plants — physical and chemical barriers to penetration and metabolic changes associated with the pathogenic state. Allelopathy. Manipulation of natural defence mechanisms into agronomically important crops. The influence of secondary metabolites (non-protein amino acids, polyphenols, cyanogenic glucosides, terpenes) on the exploitation of plants by pathogens and herbivores, including man.

Assessment: Details at first lecture.

Text-books: Details at first lecture.

5480 Insect Behaviour

Availability: Odd years only.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 4078 Biology of Insects (pre-1989: 1036 Entomology III), or equivalent approved by Head of Department prior to enrolment.

Contact hours: 2 lectures and 4 hours of practical work a week.

Content: This subject will take an evolutionary perspective on animal behaviour using insects as examples. Topics will include nervous co-ordinating mechanisms, genetics and development of behaviour, orientation and movement, behavioural ecology, mating and reproduction, communication, and social systems of insects.

Assessment: Written examination 60%, practicals, project and tutorials 40%.

Text-books: Text-books and research papers provided during subject and available in the Waite Institute and Barr Smith Libraries.

7126 Mycology

Availability: Even years only.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 5677 Agricultural Microbiology and Zoology or its equivalent approved by the Head of Department prior to enrolment.

Contact hours: 2 lectures and 1 four-hour laboratory practical a week.

Content: Aspects of the biology of fungi, including classification, ecology, physiology, genetics and molecular biology, will be covered. Emphasis will be placed on fungi that are pathogens of economically important crops. Fungi of importance in industry, biotechnology and medicine will also be considered.

Assessment: Final examination and practical books examined.

Text-books: Text books and research papers indicated during course.

3416 Plant Disease and the Environment

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisite: 5677 Agricultural Microbiology and Zoology or its equivalent approved by the Head of Department prior to enrolment.

Contact hours: 2 lectures and 1 four-hour laboratory practical a week.

Content: An environmentally responsible approach to plant disease that aims to give an understanding of the causes of plant disease. It will examine the relation of fungi, viruses, nematodes and bacteria to plant disease, the environmental factors that regulate plant disease and the survival and dispersal of organisms involved in plant disease. Emphasis will be placed on environmentally benign methods of control.

Assessment: Final examination and practical books examined.

Text-books: Text books and research papers will be indicated during the course.

6265 Plant Pathogens and Pathogenicity

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisite: 5677 Agricultural Microbiology and Zoology or its equivalent approved by Head of Department prior to enrolment.

Contact hours: 2 lectures and 1 four-hour laboratory practical a week.

Content: The characteristics of nematodes, fungi, viruses and bacteria, which cause plant disease, how they grow, find and infect healthy plants and their subsequent growth and reproduction in the host with the production of disease symptoms and deleterious effects on plant growth.

Assessment: Final examination and practical books examined.

Text-books: Text books and research papers indicated during course.

4763 Population Ecology of Insects

Availability: Even years only.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 7931 Biometry or equivalent approved by Head of Department prior to enrolment.

Contact hours: 2 lectures and 4 hours of practical work a week.

Content: The following aspects of the population ecology of insects:— rates of increase of populations; the ecological significance of diapause; population aspects of dispersal; the influence of weather, resources, mates and natural enemies on the population dynamics of insects; concepts of population stability, regulation and resilience.

Assessment: By written examination and practical books; details given at commencement.

Text-books: References to text-books and journals provided during course.

1616 Research Project: Crop Protection

Level: IV.

Points value: 3.

Duration: Semester I or II, or under special circumstances due to seasonal constraints, during part of the summer vacation.

Pre-requisites: At least 55% in each of two Level III subjects offered by the Department.

Co-requisites: Students should consult with the Head of Department.

Contact hours: There are no formal contact hours but students are expected to spend at least 10 hours of practical work a week for one semester (or equivalent) on their project.

Content: The subject comprises a small research project to be undertaken during the fourth year of the course under the supervision of a staff member in the Department. Students wishing to undertake a research project should consult the Head of the Department before the beginning of the fourth year. The subjects presented as pre-requisites should be relevant to the area of the research project.

Assessment: Details of the assessment procedure will be provided prior to commencement of the project.

Text/Reference books: Will be advised by the Head of Department if necessary.

9168 Honours Crop Protection

Level: IV.

Points value: 9.

Duration: Full year.

Pre-requisites: Pass in all Level I, II and III subjects of the B.Ag.Sc. degree course, and a credit in at least two Level III subjects offered by the Department of Crop Protection.

Co-requisites: Two additional Level III subjects offered by the Department of Crop Protection. These subjects should be relevant to the proposed research project and be approved by the Head of Department. At the discretion of the Head of the Department, a relevant subject taught by another Department may be accepted.

Contact hours: Equivalent to three Level III subjects.

Requirements: Students wishing to undertake an honours degree should consult the Head of Department as soon as their intention is known, but no later than the end of Semester II in the third year of their course. Each candidate will be assigned a research project in an area of entomology, plant pathology, or weed science, which will be carried out under the supervision of one or more members of academic staff. The results will be presented in a dissertation and a seminar at the end of the subject. Candidates will begin studies on 1st February.

Assessment: Details of assessment will be provided at the start of the course.

Text-books: None.

ECONOMICS

For syllabuses of Economics subjects that may be counted towards the degree of B.Ag.Sc., see syllabuses under the degree of B.Ec. in the Faculty of Economics and Commerce.

8309 Honours Economics (B.Ag.Sc.)

Note: Students wishing to take the Honours degree in Economics should consult the Head of the Department of Economics and Commerce during the second semester of their third year of the B.Ag.Sc. Ordinary degree.

Availability: Unavailable.

Level: IV.

Points value: 9.

Duration: Full year.

Pre-requisites: 2100 Economic Theory III (Credit).

Co-requisite: To be finalized with Economics Department.

Requirements: After consultation, each candidate will be assigned a research project, which will be carried out under supervision. The results will be presented in a dissertation at the end of the course. A candidate may also be required to prepare a seminar. Candidates will begin studies on 1st February.

Assessment: Details issued at the beginning of the course.

ENVIRONMENTAL SCIENCE AND RANGELAND MANAGEMENT

6345 Honours Environmental Science and Rangeland Management

Level: IV.

Points value: 9.

Duration: Full year.

Pre-requisites: A credit or higher standard, in two Level III subjects approved by the Head of the Department or with special permission of the Head of Department.

Co-requisites: 8318 Rangelands Ecology (offered intensively in January) and a Level III subject appropriate to the candidate's interests, with approval of the Head of Department of Environmental Science and Rangeland Management.

Contact hours: Not applicable. This subject comprises a full honours year's work.

Requirements: After consultation, each candidate will be assigned a research project which will be carried out under supervision. The results will be presented in a dissertation at the end of the course. A candidate may also be required to prepare an essay and give a seminar.

Assessment: A full written statement will be provided.

Text-books: None.

HORTICULTURE, VITICULTURE AND OENOLOGY

Specialisation in Horticultural Science. Students offering a specialisation in Horticultural Science will be required to present at least one out of 3575 Plant Response to the Environment and 2404 Plant Growth and Development together with 5882 Horticultural Science, 8645 Reproductive Horticulture, 1018 Horticultural Production and 6637 Research Project: Horticulture, Viticulture and Oenology or 6832 Honours Horticulture, Viticulture and Oenology.

9761 Bottling, Packaging and Marketing

Availability: Alternate years from 1994.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 5443 Wine Production.

Assumed knowledge: Level II.

Contact hours: 6 hours per week.

Content: Bottling and packaging technology and associated quality control procedures, including properties of materials, purchasing and quality control of packaging inputs, bottling system design, international and Australian wine laws and regulations, research and technological trends. Visits will be made to appropriate commercial plants. Marketing: Content of this subject is designed to give winemakers an appreciation of the role, language and techniques of wine marketing. Topics covered include consumer behaviour, market research, advertising and promotion, public relations and strategic planning.

Assessment: Includes practicals, assignments and written examinations.

Text-books: Text-books and reference material will be indicated during the subject.

8103 Grape and Wine Chemistry/Microbiology

Availability: Even years from 1994.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 6553 Biological Chemistry; 3689 Agricultural Microbiology II.

Contact hours: 6 hours per week.

Content: A study of the current research in the field of wine chemistry, acidity parameters, oxidation and reduction, sulphur dioxide and ascorbic acid, metals, fining agents, colour and phenolic compounds, flavour compounds, advanced analytical methods used in grape and wine analysis. A study of the microbiology of yeasts, bacteria and Botrytis cinerea associated with winemaking. Physiology and biochemistry of yeast and lactic acid bacterial growth; fermentation kinetics; yeast and bacteria behaviour and by-product formation in fermenting must and wine; yeast genetics and strain development; yeast technology; malolactic fermentation; methods used for the accurate identification of yeasts and bacterial strains.

Assessment: Practicals, assignments and written examinations.

Text-books: Text-books and reference material will be indicated during the subject.

1018 Horticultural Production

Availability: Even years only.

Level: III.

Points value: 3.

Duration: Semester II.

Co-requisites: 3575 Plant Response to the Environment or 2404 Plant Growth and Development.

Contact hours: 2 lectures and 4 hours practical work a week (3 hours practical work may be replaced by a tutorial or lecture for part of the semester).

Content: The practical application of the scientific principles of horticultural production. Cropping systems in both the open and protected environment. Establishment of horticultural enterprises and training methods for crops. The basis of irrigation and drainage methods and aspects of pruning, harvesting, plant protection and crop nutrition.

Assessment: Includes a final examination and practical reports during Semester.

Text-books: Text books and references indicated during subject.

5882 Horticultural Science

Level: III.

Points value: 3.

Duration: Semester I.

Co-requisites: 3575 Plant Response to the Environment or 2404 Plant Growth and Development.

Contact hours: 2 lectures and 4 hours practical work a week (3 hours practical work may be replaced by a tutorial or lecture for part of the semester).

Content: The scientific principles underlying horticultural production including aspects of plant physiology in relation to the environment. Growth cycles, organic nutrition and the accumulation of reserves. Methods of vegetative and sexual propagation, the use of

rootstocks and the physiology of the propagation processes. Breeding improvement and cultivar development. Classification of crops in relation to national and international horticultural industries.

Assessment: Includes a final examination and practical reports during semester.

Text-books: Text books and references indicated during subject.

9099 Industry Experience (Oenology)

Availability: Yearly from 1995.

Level: III.

Points value: 3.

Duration: Semester I plus summer vacation periods beginning in Years 2 and 3.

Pre-requisites: 2167 Wine Technology.

Assumed knowledge: Level II.

Contact hours: Minimum of 12 weeks.

Content: Students gain practical experience for a minimum of 12 weeks and are to provide a detailed report on winery operations. During this time they are expected to be involved in winery operations from grape receival to bottling and packaging of finished wine, and to complete specific tasks associated with the above operations. Students are to gain exposure to business and management practices including the distribution and selling of wine. The emphasis is to gain hands-on commercial experience of the winemaking process.

Assessment: Includes practicals, reports and assignments.

Text-books: Text-books and reference material will be indicated during the subject.

9079 Industry Experience and Case Study (Viticulture)

Availability: Yearly from 1993.

Level: III.

Points value: 3.

Duration: Semester I plus summer vacation periods beginning in Years 2 and 3.

Assumed knowledge: Level II.

Contact hours: Minimum of 12 weeks.

Content: A minimum of 12 weeks' work experience in approved horticultural enterprises. Experience in a range of operations, for example, foliar spraying in spring, irrigation system management, yield estimation, disease and pest control, harvesting and preparation for marketing, the emphasis and expectation being on gaining hands-on commercial experience of selected horticultural practices. A study of the resources of the business; assessment of the practices associated with the horticultural enterprises to evaluate the efficiency of the operations.

Assessment: Includes practical report and assignments.

Text-books: Text-books and reference material will be indicated during the subject.

8645 Reproductive Horticulture

Availability: Odd years only.

Level: III.

Points value: 3.

Duration: Semester II.

Co-requisites: 3575 Plant Response to the Environment or 2404 Plant Growth and Development.

Contact hours: 2 lectures and 4 hours practical work a week (3 hours practical work may be replaced by a tutorial or lecture for part of semester).

Content: The physiological principles underlying the flowering and fruiting of horticultural crops. Floral initiation in relation to dormancy, the bearing habit and biennial bearing, floral development, anthesis and pollination requirements of crops. Fruit set, development and maturity, including methods used for fruit thinning and the physiological basis of fruit drop and fruit ripening.

Assessment: Includes a final examination and practical reports during semester.

Text-books: Text books and references indicated during subject.

9263 Sensory Science A

Availability: Yearly from 1995.

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 2167 Wine Technology.

Assumed knowledge: Level II.

Contact hours: 6 hours per week.

Content: A systematic and critical appraisal of wine with emphasis on the factors contributing to style and overall assessment, and the judging of wine for style and quality. Topics include the assessment of juices, the assessment of wines during the winemaking process, the flavour characteristics of the major varieties, the diversity of wine styles, the features affecting flavour perception, spoilage characteristics, the effect of technological practices on wine quality, palate evaluation tests, determination of component threshold levels, methods of carrying out screening procedures for wine judge selection, evaluation of wines by scoring, judging procedures, evaluating judge performance, methods of statistical analysis, arrangement and conduct of sensory evaluation panels, qualitative descriptive analysis.

Assessment: Includes practical tasting exercises, assignments and written examination.

Text-books: Text-books and reference material will be indicated during the subject.

6445 Sensory Science B

Availability: Yearly from 1995.

Level: IV.

Points value: 3.

Duration: Semester I.

Pre-requisites: 9263 Sensory Science A.

Assumed knowledge: Level II.

Contact hours: 6 hours per week.

Content: Sensory evaluation of food and beverages, analysis and interpretation of difference and threshold tests, scaling methods, pre and post evaluation taster performance; the design, conduct, analysis and reporting of sensory experiments; profiling, free choice profiling, quantitative descriptive analysis, multivariate analysis, consumer testing, design of a sensory evaluation laboratory.

Assessment: Examination and assignments.

Text-books: Text-books and reference material will be indicated during the subject.

8435 Unit Processing

Availability: Alternate years from 1994.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 5443 Wine Production.

Assumed knowledge: Level II.

Contact hours: 6 hours per week.

Content: Principles and practices of wine clarification, stabilisation and distillation. Protein, tartrate, metal, colour, oxidative and microbiological stability of wine. Wine clarification using settling, centrifugation, filtration and fining. An introduction to the operation of batch and continuous stills, the production, composition and handling of brandy and fortifying spirit. Legal requirements in the production and handling of spirits.

Assessment: Includes practicals, assignments and written examinations.

Text-books: Text-books and reference material will be indicated during the subject.

2174 Viticultural Production A

Availability: Even years from 1994.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 9339 Agricultural Botany.

Contact hours: 2 lectures plus 1 four-hour practical per week.

Content: The principles behind the establishment of a viticultural enterprise comprising site selection, choice of planting material and the design and establishment of the vineyard. Trellising design, pruning principles, practices and mechanisation, and crop harvesting. The relationship between production aspects and the physiology of the vine including phenology and shoot development, effect of node position on fruitfulness, interaction with climate response to pruning, trellising and canopy management. The unit includes visits to commercial vineyards.

Assessment: Examination (50%); assignments (30%); practical reports (20%).

Text-books: Text-books and reference material will be indicated during the subject.

5153 Viticultural Production B

Availability: Odd years from 1995.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 9339 Agricultural Botany.

Contact hours: 2 lectures plus 1 four-hour practical per week.

Content: The management aspects of the vineyard including pests and diseases of grapevines, their recognition and control, and principles of plant protection, particularly spray application technology. Soil management comprising weed control, plant nutrition and tissue analysis. The response of the grapevine to irrigation and salinity including plant and soil moisture determination and irrigation scheduling. Use of growth regulators, propagation and table and drying grape techniques. The unit includes visits to commercial vineyards and service companies.

Assessment: Assignments (50%); written examination (40%); practical examination (10%).

Text-books: Text-books and reference material will be indicated during the subject.

6637 Research Project: Horticulture, Viticulture and Oenology

Availability: Horticultural Science — Current. Viticultural Science and Oenology — from 1994.

Level: III.

Points value: 3.

Duration: The project may be taken in either or over both Semesters I and II.

Pre-requisites: At least 55% in each of two Level III subjects offered by the Department.

Co-requisites: An additional Level III subject offered by the Department.

Contact hours: There are no formal contact hours but students are expected to spend at least 10 hours a week of practical work for 1 semester (or equivalent) on their project.

Content: The subject comprises a small research project to be undertaken during the 4th year of the course under the supervision of a staff member in the Department. Students wishing to undertake a research project should consult the Head of Department before the beginning of 4th year.

Assessment: Details will be provided by the Head of Department.

Text-books: Text-books and reference material will be indicated during the subject.

6832 Honours Horticulture, Viticulture and Oenology

Availability: Horticultural Science — Current. Viticultural Science and Oenology — from 1994.

Level: IV.

Points value: 9.

Duration: Full year.

Pre-requisites: Credits in two Level III subjects offered by the Department.

Co-requisites: An additional two Level III subjects offered by the Department.

Contact hours: No formal contact hours.

Requirements: Intending candidates should consult the Head of Department and potential supervisors during October of Year III, and should be prepared to commence studies in the Department on or about 1 February. After consultation, each candidate will be assigned a research project which will be carried out under supervision. The results will be presented in a dissertation at the end of the unit. A candidate may also be required to prepare an essay and give a seminar.

Assessment: Procedures will be discussed at the beginning of Semester I.

Text-books: Text-books and references will be indicated during the subject.

MATHEMATICAL AND COMPUTER SCIENCES

For syllabuses of Mathematical and Computer Sciences subjects that may be counted towards the degree of B.Ag.Sc., see syllabuses under the degree of B.Sc. in the Faculty of Mathematical and Computer Sciences.

PLANT SCIENCE

A range of subjects is offered allowing students to pursue particular interests in basic or applied plant science including biochemistry, physiology, nutrition and molecular biology, plant breeding, agronomy and biometry.

Students intending to make a career in Plant Breeding are advised to take the subjects 7531 Applied Genetics or 4863 Genetics II and 5501 Principles of Plant Breeding, 8493 Advanced Plant Breeding and 7630 Genetic Technologies for Plant Improvement. The following additional subjects are recommended: 7483 Agricultural Biotechnology, 6265 Plant Pathogens and Pathogenicity and 3416 Plant Disease and the Environment.

Students who wish to pursue a career in Agronomy are advised to take 9867 Crop Physiology III, 8271 Crop and Pasture Ecology, 3434 Mineral Nutrition of Plants and 4725 Pasture Agronomy and Professional Practice. The following additional subjects are recommended; 2471 Crop Protection, 5501 Principles of Plant Breeding, 1936 Soil Management and Conservation, 6740 Soil Fertility and 3416 Plant Disease and the Environment.

9446 Advanced Biometry

Availability: Even years.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 5286 Agricultural Experimentation.

Restriction: 8837 Biometry III.

Contact hours: 3 lectures and 2 tutorials per week.

Content: A selection of topics from the following: fractional replication; confounding; incomplete block designs; spatial analysis of large field trials; components of variance models; genotype x environment analysis (joint regression analysis and cluster analysis); multivariate analysis (principal components, factor analysis, Hotelling's T^2 and the linear discriminant function); harmonic regression and transformations; design and analysis of repeat measures data; non-linear regression; epidemiological methods (logistic regression). As well as GENSTAT 5, the statistical packages STATISTIX, SAS, REML and S will be utilized.

Assessment: Class exercises (10%); individual assignment (30%); final examination (60%).

Text-books: No text-book is prescribed. A list of reference material is provided at the first lecture and available beforehand.

8593 Advanced Plant Breeding

Availability: Odd years only.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 5501 Principles of Plant Breeding and 7531 Applied Genetics or 4863 Genetics II.

Contact hours: 2 lectures and a 1 four-hour practical a week.

Content: Breeding for specific objectives—yield, processing quality, resistance to diseases and pests. Genetics of host-pathogen interactions. Biometrical analysis of breeding methods, parent evaluation, effectiveness of early generation selection. Genetic bases of various breeding methods.

Assessment: By examination, essays and practicals.

7583 Agricultural Biotechnology

Level: III.

Points value: 3.

Duration: Semester I.

Assumed knowledge: All compulsory Level II subjects.

Contact hours: 2 lectures plus 4 hours practical work a week.

Content: The theoretical and practical basis of biotechnology as applied to agriculture. The topics included are: plant tissue culture for plant propagation, plant breeding and genetic engineering, the use of recombinant DNA methods to express foreign proteins in bacteria and yeasts and to produce transgenic plants and animals, the production and use of antibodies, synthetic vaccines, enzyme engineering, and the application of biotechnology in the areas of bacteria and fungi, composting and wine and beer production.

Assessment: Details at first lecture.

Text-books: Details at first lecture.

9417 Biological Chemistry in Agriculture

Availability: Even years only.

Level: III.

Points value: 3.

Duration: Semester II.

Assumed knowledge: All compulsory level II subjects.

Contact hours: 2 lectures plus 4 hours practical work a week.

Content: The physico-chemical bases for agronomically important plant-microbe interactions and the principles and applications of current instrumental procedures (GC/MS, NMR, IR, HPLC) to the solution of major agricultural problems. Topics will include the role of soil microorganisms in metabolism, degradative processes, cellulose utilisation, hydrocarbon utilisation, the opine concept, selective toxicity in agriculture and biological control mechanisms.

Assessment: Details at first lecture.

Text-books: Details at first lecture.

8271 Crop and Pasture Ecology

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 1692 Botany IIA or 9339 Agricultural Botany.

Restriction: 2834 Agronomic Principles.

Contact hours: 2 lectures and 1 four-hour practical per week.

Content: Crops and pastures are plant communities that are managed mainly for the production of food and fibre. Those used in agriculture range from natural vegetation to specialised, sown annual monocultures. It is important to understand how these communities function if they are to be productive. Crop and Pasture Ecology examines the structure and functioning of agricultural plant communities, the environmental factors that affect their distribution and productivity, and the genetic basis for their adaptation to particular environments. Topics that will be covered include an examination of the similarities to, and differences between sown and natural communities, the effects of climate on the

distribution and productivity of crops and pastures, interaction between a crop and its environment, competition, the impact of the grazing animal and the importance of genetic diversity among plants to adaptation to the environment and to agricultural productivity.

Assessment: Examination (50%); practical reports (30%); essays (20%).

Text-books: Announced in first lecture.

9867 Crop Physiology III

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 1692 Botany IIA or 9339 Agricultural Botany.

Restriction: 3507 Crop Agronomy.

Contact hours: 2 lectures and 1 four-hour practical per week.

Content: The development of appropriate management techniques and adapted cultivars of crop and pasture plants requires knowledge of the environmental constraints to growth and yield and of how plants in crops respond to environmental stresses. Crop physiology is a subject that examines the interaction between crops in the field and their environment. Discussions will concentrate on the crop and pasture canopy as the unit of organization and the subject will analyse how productivity is affected by the field environment and the genetic and managerial means by which the adverse effects of environmental stress can be reduced and yield improved. The physiological basis for these practices will be stressed. Topics include solar radiation and crop production, water use by crops and water use efficiency, gas exchange by plant communities, dry matter production and partitioning, cereal and legume physiology, nitrogen fixation, the use of physiological characteristics in plant breeding, and case studies of important grain crops.

Assessment: Examination (50%); practical exercise (30%); essay (20%).

Text-books: Announced at first lecture.

7630 Genetic Technologies for Plant Improvement

Availability: Even years only.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 1875 Genetics and Evolution I and 7531 Applied Genetics or 4863 Genetics II.

Assumed knowledge: 5501 Principles of Plant Breeding or equivalent.

Contact hours: 2 lectures and 1 four-hour practical a week.

Content: Chromosomal engineering and cytogenetic procedures. Gene mapping in crop plants. Polyploidy, interspecific hybridization and gene transfer from related species and genera. Haploid breeding, anther culture, embryo rescue, tissue culture and somaclonal variation. Cytoplasmic and genic male sterility and incompatibility systems in breeding. Induced mutations in breeding.

Assessment: By examination, essays and practicals.

3434 Mineral Nutrition of Plants

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 1692 Botany IIA or 9339 Agricultural Botany.

Restriction: 7723 Crop Nutrition and Nitrogen Fixation in Legumes.

Contact hours: 2 lectures and 1 four-hour practical per week.

Content: An advanced course which takes its brief from the acute deficiency in minerals of most South Australian soils, and the pre-eminent role of nutrition in successful agricultural production in this State. Topics are discussed in a context of both agricultural and horticultural industries, and include factors affecting nutrient acquisition by roots, diagnosis and correction of macro and micronutrient problems, fertiliser strategies, nutritional effects on produce quality, nutrition and disease resistance, genetic control of adaptation to nutrient limitations in soils, the role of symbiotic dinitrogen fixation, nutritional aspects of nitrogen fixation. A practical course supplements the lectures by providing hands-on experience of the important issues.

Assessment: Examination (50%); practical reports (30%); reviews and essays (20%).

Text-books: Announced at first lecture.

2404 Plant Growth and Development

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 1692 Botany IIA or 9339 Agricultural Botany.

Restriction: 1670 Developmental Physiology of Crop Plants.

Contact hours: 2 lectures and 1 four-hour practical per week (1 lecture may be replaced by a tutorial for part of the semester).

Content: The form and structure of plants is controlled by a complex interaction of genetic and environmental factors. An understanding of plant growth and development involves a consideration of plant physiology, biochemistry and molecular genetics. The co-ordination of these fields of research is permitting a gradual elucidation of the mechanisms involved in plant cell growth and differentiation. This subject begins with the cell and progresses through an examination of vegetative growth (stems, roots and shoots) and reproductive development (flowers, fruits and seeds). Examples will emphasise agricultural and horticultural species. Topics include the molecular basis of differentiation, hormonal and environmental control of growth and development, accumulation of storage substances, sexual reproduction and senescence. Practical classes offer the opportunity to investigate aspects of plant growth and development through the design and execution of small experimental projects.

Assessment: Final examination (60%); practical reports (20%); essay (20%).

Text-books: Text-books and research papers for reference indicated during the course.

3575 Plant Response to the Environment

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 1692 Botany IIA or 9339 Agricultural Botany.

Restriction: 2778 Ecophysiology of Plants; 4543 Environmental Physiology of Crop Plants.

Contact hours: 2 lectures and 1 four-hour practical per week (1 lecture may be replaced by a tutorial for part of the semester).

Content: The growth and yield of crop plants is determined by the response of the physiological and biochemical processes of the plant to the environment. This subject focusses upon the principal processes determining plant performance and the major environmental factors, including light, temperature, water, salinity, aeration, gravity and

biotic factors which determine the growth of the plant in the field. Environmental responses to the normal range of temperature, light, water, etc. will be examined as well as stress reactions. Crop species will be used as examples and the response to the environment will be examined from a physiological, biochemical and molecular perspective where appropriate. Practical classes will investigate environmental responses to selected environmental variations. Students will be encouraged to design and execute their own experiments.

Assessment: Final examination (60%); practical reports (20%); essay (20%).

Text-books: Text-books and research papers for reference indicated during course.

5501 Principles of Plant Breeding

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 1875 Genetics and Evolution I.

Contact hours: 2 lectures and 1 four-hour practical a week.

Content: An introductory subject covering the role of plant improvement in agriculture. The impact of new high-yielding cultivars on agronomic practice and world food production. Sources of variation and conservation of genetic resources. Breeding methods of self pollinated and cross pollinated crops. Field plot procedures. Cultivar testing and recommendation. Plant Variety Rights.

Assessment: By examinations, essays and a practical examination.

4001 Research Project: Plant Science

Level: IV.

Points value: 3.

Duration: Semester I or II.

Pre-requisites: At least 55% in each of two Level III subjects offered by the Department.

Co-requisites: An additional Level III subject offered by the Department.

Contact hours: There are no formal contact hours but students are expected to spend at least 10 hours a week of practical work for one semester (or equivalent) on their project.

Content: The subject comprises a small research project to be undertaken during the fourth year of the course under the supervision of a staff member in the Department. Students wishing to undertake a research project should consult the Head of the Department before the beginning of the fourth year. The subjects presented as pre-requisites and co-requisite should be relevant to the area of the research project.

Assessment: Details will be provided by the Head of the Department.

Text-books: Will be advised by the Head of the Department if necessary.

4856 Honours Plant Science (B.Ag.Sc.)

Level: IV.

Points value: 9.

Duration: Full year.

Pre-requisites: A Credit or higher standard in at least two Level III subjects offered by the Department of Plant Science.

Co-requisite: Two additional Level III subjects offered by the Department. As with the pre-requisites these should be relevant to the proposed research project and be approved by the Head of the Department. At the discretion of the Head of the Department a relevant subject taught by another department may be accepted.

Requirements: A candidate will be required to undertake a research project under the supervision of one or more members of academic staff and present seminars and a thesis on their research work. The research project could be undertaken in one of the following areas: Agronomy, Biometry, Crop Physiology and Biochemistry, Plant Molecular Biology or Plant Breeding. Intending candidates should consult the Head of the Department of Plant Science and potential supervisors during the third year and be prepared to begin studies in the Department at the beginning of February.

Assessment: Thesis (90%); seminar (10%).

Text-books: None.

PLANT SCIENCE AND ANIMAL SCIENCES

7531 Applied Genetics

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 7940 Genetics and Evolution I or 7267 Genetics IW.

Restriction: 4863 Genetics II.

Contact hours: 2 lectures and 1 four-hour practical per week.

Content: This course is designed to provide a background in applied genetic systems for students in agriculture and natural resource sciences. Topics covered include chromosome structure and behaviour, segregation, linkage and linkage analysis, genetic mapping, quantitative genetics and selection theory, population genetics, breeding systems, extrachromosomal inheritance, polyploidy and chromosome aberrations.

Assessment: To be advised at first lecture.

Text-books: To be advised at first lecture.

SCIENCE

For syllabuses of Science subjects that may be counted towards the degree of B.Ag.Sc., see syllabuses under the degree of B.Sc. in the Faculty of Science.

SOIL SCIENCE

2330 Pedology III

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 5683 Earth Science I and 5681 Earth Science II, or 2136 Geology I.

Restriction: 6821 Soil Formation.

Contact hours: 2 lectures 4 hours practical per week and a 6-day field camp.

Content: Geochemistry, mineral weathering and clay formation. Soil genesis and processes. Value, purpose and execution of survey, mapping and classification of soils. Regional and global distribution of soils. Influence of climate, lithology and land form on the origin and development of soils. Practical work related to the above topics will include the description and classification of soil and rock sections under the light microscope and field excursions. The subject provides an understanding of the distribution, classification and properties of soils, and the methods by which they are mapped and assessed for agricultural and engineering use.

Assessment: Written and practical examination at the end of the semester; assessment of practical and field work.

Text-books: No textbooks are recommended for purchase but references will be given throughout the course. Particular reference will be made to the following texts: Dixon, J. B. & Weed, S. B., *Minerals in soil environments* (2nd edn.) (Soil Science Society of America, 1989); Wilson, M. J., *A handbook of determinative methods in clay mineralogy* (Blackie, 1987); Yariv, S. & Cross, H., *Geochemistry of colloid systems for earth scientists* (Springer-Verlag); Soil Survey Staff, *Soil taxonomy* (United States Department of Agriculture, Soil Conservation Service, 1975); Newman, A. C. D., *Chemistry of clays and clay minerals* (Longman Scientific and Technical, 1987); Moore, D. M. & Reynolds, R. C., *X-Ray diffraction and the identification and analysis of clay minerals* (Oxford University Press, Oxford, 1989).

4633 Soil Biology and Biochemistry

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: All Level I subjects.

Contact hours: 2 lectures and 4 hours of practical work (or equivalent) a week.

Content: The subject provides an appreciation of the interactions among plants, microorganisms and animals in the soil. The roles played by organisms in the decomposition of organic materials and availability of nutrients. The soil biomass and enzymes in soils. The biology of the rhizosphere and its relations with the chemical and physical properties of soil.
Practical work will consist of laboratory exercises related to the above topics.

Assessment: Examination, essay and practical assignments.

Text-books: Paul, E. A. and Clark, F. E., *Soil microbiology and biochemistry* (Academic Press). Additional reading lists will be distributed.

6470 Soil Fertility

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: All Level I subjects.

Contact hours: 2 lectures and 4 hours practical work (or equivalent) a week.

Content: The subject provides an understanding of processes in the soil which influence the availability to plants of nutrients in the soil and added fertilizers. The occurrence and reactions of nutrient elements in the soil. Effects of acidity, alkalinity and redox potential. Ion movement in soils and the relationship between root growth and nutrient uptake. Assessment of nutrient availability. Principles of fertilizer application; reactions of fertilizers with the soil and the efficiency of fertilizer use by plants. Practical work will consist of laboratory exercises related to the above topics.

Assessment: Examination, essay and practical assignments.

Text-books: Finck, A., *Fertilizers and fertilization* (Verlag Chemie); Stevenson, F. J., *Cycles of soil C, N, P, S, Micronutrients* (Wiley); Wild, A., *Russell's soil conditions and plant growth*, 11th edn. (Longman).

1936 Soil Management and Conservation

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: All Level I subjects.

Contact hours: 2 lectures and 4 hours practical work (or 2 lectures, 3 hours practical work and 1 hour tutorial) a week.

Content: The subject covers a number of topics important for students of agriculture and horticulture, and for others with interests in the management of the soil resource. Topics include: soil management for crop production (soil physical and mechanical requirements in relation to crop characteristics); soil hydrology (the hydrologic cycle and how this may be modified by management practices, and salt balance and management); soil structure (its degradation and amelioration); and soil erosion and its control (raindrop impact, the stability of the flow of run-off water, formation of rills and gullies, management of run-off water, wind erosion). Practical work will consist of laboratory exercises related to the above topics.

Assessment: Examination, essay, tutorials and practical assignments.

Text-books: Wild, A., *Russell's soil conditions and plant growth*, 11th edn. (Longman). Additional reading lists to be distributed.

4449 Research Project: Soil Science

Level: III.

Points value: 3.

Duration: The project may be undertaken in either or over both Semesters I and II.

Pre-requisites: At least 55% in each of two level III subjects offered by the Department of Soil Science.

Co-requisites: Two level III subjects offered by the Department of Soil Science other than those serving as pre-requisites.

Contact hours: There are no formal contact hours, but students are expected to spend at least 10 hours of practical work a week for one semester (or the equivalent) on their projects.

Content: The subject consists of a small research project of the student's choosing on a topic acceptable to the Department of Soil Science. It will be undertaken during the 4th year of the course.

Assessment: An oral examination, a seminar and a written report on the project.

4164 Honours Soil Science

Level: IV.

Points value: 9.

Duration: Full year.

Pre-requisite: At least a Credit in two level III subjects offered by the Department of Soil Science, and passes (with a mean score of not less than 55%) in five other level III subjects or equivalent. Students must also have completed all level I and level II subjects required for the Ordinary B.Ag.Sc. degree.

Co-requisites: At least 4 level III subjects offered by the Department of Soil Science must be taken over the third and fourth years of the course.

Requirements: This subject comprises a substantial research project of the student's choosing on a topic acceptable to the Department of Soil Science. Students wishing to undertake an honours degree should talk to the Head of the Department as soon as their intention is known, and in any event, no later than the end of the second semester during the third year of their course. Research topics will be decided in December and full-time work within the Department must begin no later than February 1. The workload of full-time honours students is equivalent to 125% of a "normal" fourth year. Candidates will be required to present 2 seminars on their work and to present their results in a report.

Assessment: Based mainly on the research project and the marks achieved in the co-requisite level III subjects.

VARIOUS DEPARTMENTS

5286 Agricultural Experimentation

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 7931 Biometry.

Contact hours: 2 lectures and 1 two-hour practical class a week.

Content: The philosophy of science and the experimental method. Topics covered include: Latin squares, factorial designs, split-plot designs, analysis of covariance, nested designs, components of variance models, transformation of data, multivariate methods. An appropriate computer package will be used for the analysis of data sets.

Assessment: Approximately 15% by regular written assignments; approximately 15% by an individual assignment; approximately 70% by final examination.

Reading: No text-book is recommended. A list of reference books provided beforehand and at the first lecture.

9039 Agricultural Practice and Policy

Level: III.

Points value: 1.5.

Duration: Semester I.

Pre-requisite: 6209 Agricultural Production.

Contact hours: 2 two-hour sessions a week.

Content: The course aims to develop and improve communication skills through the opportunity for dialogue with prominent individuals in different sectors of the agriculture industry, to develop experience in the delivery of public seminars and the ability to write on broad issues affecting agriculture and to broaden understanding of the role of science in the agricultural industries. A series of invited lectures/seminars on selected topics of current interest including agricultural extension, international agriculture, government policies and agriculture, new crops and animals for agriculture. Preparation by each student of a short talk and a major seminar presentation on a topical scientific or policy issue affecting agriculture.

Assessment: 2 essays plus seminar presentations.

7972 Agricultural Practice, Policy and Communication

Availability: Offered from 1994.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 2847 Agricultural Production and Economics.

Contact hours: 6 hours per week.

Content: The aims of this subject are the development of a mature understanding of the place of agriculture in society and the refinement of students' abilities in written and spoken communication. Invited speakers explore important issues involving current practices and the future of agriculture in Australia and the world. Communication of technical information to specialists and lay persons through various media is developed. Emphasis is placed on student participation in questions, discussions and workshops. Job seeking skills are also covered.

Assessment: Will be based on a series of essays, projects, a seminar and class participation.

Text-books: To be advised at the commencement of the subject.

6209 Agricultural Production

Level: III.

Points value: 1.5.

Duration: Semester II.

Contact hours: 2 one-hour lectures and 2 hours of discussion or demonstration a week.

Content: The natural climate and vegetation of the State are assessed and the history of land clearance followed to the present day where increase in the total area farmed is no longer a component of increase in total production. The problems of meeting current demands for land for farming, recreation, industry and urban development are discussed. Brief outlines are given of the current status of each of the major extensive agricultural industries—cereal production, other grain crops, pastures, sheep production, beef production and dairying. A session is devoted to an examination of the integration of animal and crop production in a stable, dry-land farming system. Study of more intensive systems such as the established horticultural industries.

Assessment: Written examination and an essay.

Tours: Each student will be expected to attend the following tours: (i) the South East region, normally immediately following the final examination of the second year; (ii) the Northern districts, normally during the third year and (iii) the River area at the beginning of the fourth year. The Northern Tour is only available to students enrolled in 6209 Agricultural Production in their third-year of study, except under special circumstances approved by the Faculty. Further information from the Office of the Dean.

GRADUATE CERTIFICATES IN AGRICULTURAL BIOTECHNOLOGY CROP PROTECTION SOIL AND WATER QUALITY SOIL CONSERVATION

Note: Postgraduate tuition fees may apply to these courses.

REGULATIONS

1. There shall be Graduate Certificates in:
   Agricultural Biotechnology
   Crop Protection
   Soil and Water Quality
   Soil Conservation.

2. An applicant for admission to the course of study for one of the above-named Certificates shall:

   (i) have qualified for admission to a degree of the University, or to a degree of another university or institution, accepted for the purpose by the Faculty of Agricultural and Natural Resource Sciences; and

   (ii) have obtained the approval of the Dean (or nominee) of the Faculty of Agricultural and Natural Resource Sciences.

3. Subject to the approval of the Council the Faculty may, in special cases and subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for the Certificate a person who does not qualify for admission to the course under Regulation 2 but has given evidence satisfactory to the Faculty of fitness to undertake work for the Certificate.

4. To qualify for the Certificate a candidate shall satisfactorily complete a course of study and comply with conditions as prescribed in the relevant schedule.

5. Except with the special permission of the Faculty the course for each Certificate shall be completed in 17 weeks' full-time study and not more than two years part-time study.

6. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

   (i) the subjects of study for each Certificate; and

   (ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates for each Certificate.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

7. There shall be three classifications of pass in each subject for the Certificate: Pass with Distinction, Pass with Credit, and Pass.

8. (a) A candidate who fails in a subject and desires to take the subject again shall again

attend lectures and satisfactorily do such written and practical work as the professor or lecturer concerned may prescribe, unless specifically exempted therefrom after written application to the Registrar for such exemption.

(b) A candidate who has twice failed the examination in any subject or division of a subject may not enrol for that subject again except by special permission to be obtained in writing from the Registrar and then only under such conditions as may be prescribed.

(c) For the purpose of this regulation a candidate who is refused permission to sit for examination, or who fails, without a reason accepted by the Dean of Agricultural and Natural Resource Sciences (or nominee), to attend all or part of a final examination (or supplementary examination if granted) after remaining enrolled for at least eight teaching weeks of that semester, shall be deemed to have failed the examination.

9. Notwithstanding the foregoing regulations a candidate who has been enrolled for the degree of Master of Agriculture, and who as such a candidate has completed the work prescribed herein for a Graduate Certificate and who has not been awarded the Master's degree shall, on written application to the Registrar, be awarded the appropriate Graduate Certificate, subject to the student's discontinuing candidature for the degree of Master of Agriculture.

Regulations awaiting allowance.

GRADUATE CERTIFICATES IN AGRICULTURAL BIOTECHNOLOGY CROP PROTECTION SOIL AND WATER QUALITY SOIL CONSERVATION

SCHEDULES

SCHEDULE I: COURSE OF STUDY

1. A candidate shall satisfactorily complete, as specified in the Schedules, subjects of study (for the relevant Certificate) the subject or subjects amounting to a total of 16 points to qualify for the award of the Certificate.

2. Candidates wishing to enrol in a subject for which they do not have the necessary preliminary knowledge may be required to take such bridging studies prior to the commencement of their Certificate studies as may be deemed appropriate by the Dean of the Faculty of Agricultural and Natural Resource Sciences (or nominee).

3. To complete a course of study, a candidate, unless exempted by the Faculty, shall:

(a) regularly attend the prescribed lectures, tutorials, workshops and seminars; and

(b) undertake such computing work, practical work, field work and case studies, and such reading, written and oral work and pass such examinations, as the Faculty may prescribe.

4. Each candidate's course of study must be approved by the Dean of the Faculty of Agricultural and Natural Resource Sciences (or nominee) at enrolment each year.

5. When, in the opinion of the Faculty, special circumstances exist, the Council, on the recommendation of the Faculty, may vary the provisions of clauses 1 to 4 above.

SCHEDULE II: AGRICULTURAL BIOTECHNOLOGY: SUBJECTS OF STUDY

1. The following shall be the subjects for the Graduate Certificate in Agricultural Biotechnology:

The core subject 7073 Advanced Agricultural Biotechnology (10 points), and one of 5606 Plant Biotechnology, 8949 Animal Biotechnology, or 9538 Food and Microbial Biotechnology (each 6 points).

SCHEDULE III: CROP PROTECTION: SUBJECTS OF STUDY

1. The following shall be the subjects for the Graduate Certificate in Crop Protection:
The core subject 3656 Advanced Crop Protection (13 points) and one elective from 7906 Animal Diseases and Control, 4078 Biology of Insects, 8271 Crop and Pasture Ecology, 7521 Farm Management Systems, 5882 Horticultural Science, 7126 Mycology or 3416 Plant Disease and the Environment (each 3 points).

SCHEDULE IV: SOIL AND WATER QUALITY: SUBJECTS OF STUDY

1. The following shall be the subject for the Graduate Certificate in Soil and Water Quality: xxxx Soil and Water Quality (16 points).

SCHEDULE V: SOIL CONSERVATION: SUBJECTS OF STUDY

1. The following shall be the subjects for the Graduate Certificate in Soil Conservation: The core subject 3816 Soil Conservation (10 points) and *either* 3556 Soil Survey and Land Evaluation (6 points) *or* 6665 Soil Management (6 points).

GRADUATE CERTIFICATES IN AGRICULTURAL BIOTECHNOLOGY CROP PROTECTION SOIL AND WATER QUALITY SOIL CONSERVATION

SYLLABUSES

AGRICULTURAL BIOTECHNOLOGY

7073 Advanced Agricultural Biotechnology (10 points).
5606 Plant Biotechnology or 8949 Animal Biotechnology or 9538 Food and Microbial Biotechnology (each 6 points).
See Master of Agriculture syllabuses for details.

CROP PROTECTION

3656 Advanced Crop Protection (13 points).
7906 Animal Diseases and Control, or 4078 Biology of Insects, or 8271 Crop and Pasture Ecology, or 7521 Farm Management Systems, or 5882 Horticultural Science, or 7126 Mycology or 3416 Plant Diseases and the Environment (each 3 points).
See Master of Agriculture syllabuses for details.

SOIL AND WATER QUALITY

4322 Soil and Water Quality (16 points).
See Master of Agriculture syllabuses for details.

SOIL CONSERVATION

3816 Soil Conservation (10 points).
3556 Soil Survey and Land Evaluation (6 points) or 6665 Soil Management (6 points).
See Master of Agriculture syllabuses for details.

DEGREE OF

MASTER OF AGRICULTURE

Note: Postgraduate tuition fees may apply to this course.

REGULATIONS

1. There shall be a degree of Master of Agriculture.

2. The following may be accepted as a candidate for the degree: (a) a person who has qualified in the University of Adelaide for the Honours degree of Bachelor of Agricultural Science; or

(b) a person who holds in another university a qualification accepted by the Faculty of Agricultural Science as being equivalent to the Honours degree of Bachelor of Agricultural Science in the University of Adelaide; or

(c) a person who has qualified in the University of Adelaide for the degree of Bachelor of Agricultural Science or who holds in another university a qualification accepted by the Faculty of Agricultural and Natural Resource Sciences as being equivalent for this purpose to the degree of Bachelor of Agricultural Science in the University of Adelaide, and who has had at least three years of practical experience approved by the Faculty.

(d) A person who has successfully completed a Graduate Certificate of in the relevant field at a high standard as specified in the Schedules.

3. With the approval of the Board of Graduate Studies acting with authority wittingly devolved to it by Council the Faculty may, in exceptional circumstances and subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for the degree a person who does not qualify under Regulation 2, but who has given evidence satisfactory to the Faculty of fitness to undertake work for the degree.

4. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the degree; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

5. A candidate shall be admitted on probation. The period of probation shall not exceed six months. At the end of the period each candidate's performance shall be reviewed by the Faculty of Agricultural and Natural Resource Sciences and the candidature confirmed, with or without special conditions, or terminated.

6. If in the opinion of the Faculty of Agricultural and Natural Resource Sciences, a candidate is not making satisfactory progress the Faculty may, with the consent of the Council, withdraw its approval of the candidature and the candidate shall cease to be enrolled for the degree.

7. To qualify for the degree a candidate shall:

(a) on completion of any preliminary work which may be prescribed in the schedules and after consultation with the Head of the department of which the candidate's supervisor or senior supervisor is a member, submit in writing to the Registrar, for approval by the

Faculty, the programme of advanced study and project work as prescribed in the schedules and designed to extend over one calendar year,

(b) undertake an approved programme of advanced study and project work under the direction of a supervisor or supervisors who shall be members of the academic staff of the University and appointed by the Faculty, but the Faculty may also appoint an external supervisor.

(c) pass such examinations on the candidate's course of advanced study as may be required by the Faculty; and

(d) present a dissertation embodying the results of the candidate's project work.

8. (a) Except by permission of the Faculty, the whole of the work for the degree must be completed within the University.

(b) Subject to such conditions as it may determine in each case, the Faculty may permit project work to be undertaken outside the University provided that it can be satisfied:

(i) that this will result in academic benefit to the candidate;

(ii) that there will be adequate contact and interaction between the candidate and the candidate's internal supervisor(s);

(iii) that the supervisor's access to any experimental work, the candidate's availability for seminars and other discussions, and the publication of results will not thereby be prejudiced.

9. (a) On completion of work the candidate shall lodge with the Registrar three copies of the dissertation prepared in accordance with directions given to candidates from time to time.

(b) Unless the Faculty expressly approves an extension of time in a particular case the dissertation shall be submitted within eighteen months of the date of enrolment.

(c) On the submission or re-submission of the dissertation the Faculty shall nominate examiners who may recommend that it:

(i) be accepted subject to such amendments as the examiners may have suggested; or

(ii) be accepted subject to satisfactory oral examination; or

(iii) be not accepted but be sent back to the candidate for revision and re-submission; or

(iv) be rejected.

10. A candidate who fulfils the requirements of these regulations and satisfies the examiners shall, on the recommendation of the Faculty, be admitted to the degree of Master of Agriculture.

11. A candidate who holds a Graduate Certificate in Soil Conservation or Agricultural Biotechnology or Crop Protection or Soil and Water Quality shall surrender the Graduate Certificate before being admitted to the degree of Master of Agriculture in that field.

Regulations allowed 29 January, 1981.

Amended: 4 Feb. 1982: 6, 8: 26 Feb. 1983: 4, renumbering 5-10: 1 March 1984: 2. 21 Feb. 1991: 3. Awaiting allowance: 2(d), 4(b), 11.

DEGREE OF

MASTER OF AGRICULTURE

SCHEDULES

SCHEDULE I: PRELIMINARY WORK

1. A person whose qualifications have been accepted under either section (a) or section (b) of Regulation 2 shall be deemed to have satisfied the requirements of this schedule.

2. Before being admitted either under section (c) or Regulation 2 or under Regulations 3 a person shall complete the requirements of this schedule by undertaking, and satisfying the examiners in, such courses of study and/or other work as may in his/her case be prescribed by the Faculty of Agricultural and Natural Resource Sciences.

SCHEDULE II: COURSES OF STUDY AND PROJECT WORK

The Programme of study and project work shall consist of:

(a) supervised project work which shall be approximately one-third of the work for the degree;

(b) graduate courses and seminars and such other relevant courses as may be prescribed by the Faculty of Agricultural and Natural Resource Sciences, which shall make up approximately two-thirds of the work for the degree.

DEGREE OF

MASTER OF AGRICULTURE

This degree is awarded on the satisfactory completion of a programme of work, normally undertaken within the University, consisting of advanced study and a supervised project which includes a dissertation embodying the results of the project work. The programme will extend over twelve to eighteen months, depending on the nature of the project activity, if taken full-time, and over not less than two and not more than five calendar years if taken part-time.

SYLLABUSES

Text-books:

Students are expected to procure the latest edition of all text-books prescribed.

Examinations:

For each subject students may obtain from the department concerned details of the examination in that subject including the relative weights given to the components (e.g. such of the following as are relevant: assessments, term or mid-year tests, essays or other written or practical work, final written examinations, *viva voce* examinations).

AGRICULTURAL BIOTECHNOLOGY

A course in agricultural biotechnology, consisting of three of the following five subjects, will be offered in 1992, commencing February 1.

Students will take the Semester I subject 7073 Advanced Agricultural Biotechnology, which is the core component of the coursework, together with Semester II 8747 Project Work in Agricultural Biotechnology, and one of the three subjects (all Semester I) 5606 Plant Biotechnology, 8949 Animal Biotechnology, or 9538 Food and Microbial Biotechnology, amounting to a total of 24 points for the award of the degree.

7073 Advanced Agricultural Biotechnology

Duration: 15 weeks (2 weeks before Semester I, Semester I).

Points value: 10.

Contact hours: 100 lectures and tutorials, with associated practical work.

Content: After an intensive revision course in Biochemistry, Genetics and Molecular Biology, and Physiology, students will be introduced to the theory and practice of biotechnology in Agriculture. Techniques important in the construction of transgenic plants and animals will be reviewed, as will the desirable properties of such constructs. The expression of eukaryotic proteins in microbial systems will be described.

Assessment: Final examination and practical books examined.

Text-books: Text-books and research papers indicated during course.

8747 Project Work in Agricultural Biotechnology

Duration: Semester II.

Points value: 8.

Requirements: This is a supervised project of 3-4 months, and will be unique for each

candidate. The project topic will be dependent upon a candidate's interests and experience, and will be chosen, by consultation between candidate and supervisor, by the end of Semester I.

ELECTIVES

8949 Animal Biotechnology

Duration: Semester I.

Points value: 6.

Contact hours: 85 lectures and tutorials, and 60 hours of practical work.

Content: Description of aims of biotechnology (both in Australia and worldwide) in the improvement of animals in agriculture, as applicable to animal quality, quantity, reproductive efficiency, and disease resistance. The animal cell cycle-differentiation , induction, stress and repair. Cell transformation. Embryonic stem cells, growth and development. Cellular immunology and antibody technologies. Gene manipulation in animals; gene therapy and targeting. Germline and somatic manipulation. Ruminant microbiology, ecology, manipulation. Disease control /synthetic vaccines. Animal reproductive technologies: physiology, IVF, embryo splitting and animal cloning, fertility control. Animal breeding and genetics. The subject will conclude with an intensive 2-week course with 2 lectures and 6 hours of practical work each day. Candidates will take tissue of animal origin and extract nucleic acid. This will be characterised and manipulated by cloning either of DNA directly or cDNA copies of RNA. Clones obtained will be screened for genes of interest.

Assessment: Final examination and practical work examined.

Text-books: Text books and research papers indicated during course.

9538 Food and Microbial Biotechnology

Duration: Semester I.

Points value: 6.

Contact hours: 85 lectures and tutorials, and 60 hours of practical work.

Content: Fermentations which yield alcohol, bread, and other edibles. Fermentations in the conversion of indigestible materials to food sources; relevance to natural resource conservation. Fermentations for food acids. Non-fermentative microbial products of commercial importance. Polysaccharides as gelling agents or glues. Detoxifying enzymes. Microbial enzymes in processing. Recombinant protein production by microbes. Bacterial, yeast, and baculoviral expression systems. Examples: new immunomodulators, and synthetic immunogens. Environmental microbiology. Microbial leaching. Microbes and industrial pollution. Soil microbiology. Microbes in normal soil processes. Interactions with pesticides and pollutants. Pesticides and non-target microbes. Microbes in detoxification and clean-up of soil, pulping, composting, plant growth, biocontrol. The practicalities of the new biotechnology. Regulation in the area, particularly as applicable to products generated from rDNA. The subject will conclude with an intensive 2-week course with 2 lectures and 6 hours of practical work each day. Candidates will take tissue of microbial origin and extracted nucleic acid will be characterised and manipulated by cloning either of DNA directly or cDNA copies of RNA. Clones obtained will be screened for genes of interest.

Assessment: Final examination and practical work examined.

Text-books: Text books and research papers indicated during course.

5606 Plant Biotechnology

Points value: 6.

Duration: Semester I.

Contact hours: 85 lectures and tutorials, and 60 hours of practical work.

Content: The structure of the three plant genomes (nuclear, mitochondrial and plastid). Plant development and differentiation. Plant tissue culture techniques and applications in plant propagation, breeding and disease resistance. Selection systems for transgenic plants. Direct DNA transfer to protoplasts and plant regeneration. Meristem methods, transformation via the pollen pathway, liposome injections and the particle gun. Vectors and promoter systems available for plant transformation. Resistance to insects, viruses, fungi, bacteria, herbicides. Manipulation of flower colour, fruit ripening, and nutritional value. Potential to engineer complex characters such as nitrogen fixation, yield. Use of DNA markers in molecular plant breeding. The processing of plant products (quality assessment, malting and brewing, baking). Flavours and food additives from plants. The subject will conclude with an intensive 2-week course with 2 lectures and 6 hours of practical work each day. Candidates will take tissue of plant origin and extract nucleic acid. This will be characterised and manipulated by cloning either of DNA directly or cDNA copies of RNA. Clones obtained will be screened for genes of interest.

Assessment: Final examination and practical work examined.

Text-books: Text books and research papers indicated during course.

CROP PROTECTION

A course in advanced crop protection will be offered in 1992 commencing July 1. Some candidates may be required to undertaken preliminary work prior to this date.
Students will take the subject 3656 Advanced Crop Protection being the core component of the course work together with 4322 Project Work in Crop Protection and one of the electives listed in Schedule III of the Graduate Certificate in Crop Protection, amounting to a total of 24 points to qualify for the award of the degree.

3656 Advanced Crop Protection

Points value: 13.

Duration: 17 weeks.

Contact hours: 125 lectures with associated tutorials and practical work.

Content: Population dynamics: the interaction of organisms and their environments; numbers in time and space; the analysis of population data; models of population growth; the influence of environmental components on the rate of increase of populations; theories of outbreaks. The biology of insect pests, plant pathogens and weeds; types of pests. Quantitative methods; sampling populations in time and space; computing and data analysis; the assessment of damage to crops; economic thresholds. Chemical control: formulation and mode of action of agricultural chemicals; uses and abuses of chemicals for pest control; spray technology; putting the chemical where the pest is; resistance and the management of resistance; the environment fate of agricultural chemicals; minimizing the dose and frequency of spray applications.
Plant resistance and biotechnology: The evolution and nature of natural resistance, physical and chemical, constitutive and induced; the potential for manipulation into crop plants.
Non-chemical control: biological control with insects, micro-organisms and other organisms; hygiene and cultural control; modifying the crop or the crop environmental behaviour-modifying chemicals; genetic methods. Simulation of the growth of populations of organisms; predicting peak seasonal numbers; optimal control strategies. Integration of crop protection practices; data input; implementation; extension, economic and social factors. Quarantine and legislation.

4322 Project Work in Crop Protection

Points value: 8.

Duration: 6-12 months depending upon seasonal constraints.

Requirements: A supervised project in an area as close as possible to the candidate's specific interests will be agreed in consultation between the candidate and lecturers. Agreement on the topic must be reached before the end of semester 2.

ELECTIVES

Details of the elective subjects may be found in the syllabuses for the degree of Bachelor of Agricultural Science. The content will be supplemented with advanced tutorials and seminars.

SOIL AND WATER QUALITY

A course in Soil and Water Quality will be offered in 1992 commencing March.
Students will take the subject 4322 Soil and Water Quality, together with 7983 Project Work in Soil and Water Quality amounting to a total of 24 points to qualify for the degree.

4322 Soil and Water Quality

Points value: 16.

Duration: 17 weeks.

Contact hours: 150 lectures and associated practicals and field work.

Content:

Sources of pollution, definitions and terminology; introduction to the principles of toxicology and risk assessment.

Processes determining the fate of pollutants: physical and solvent properties of water, solubility, solvation, osmotic pressure; properties of colloids, sedimentation of colloidal particles, flocculation and dispersion, surface properties of inorganic and organic soil colloids; microbiological breakdown.

Adsorption from solution: nature and strength of adsorption, soil properties affecting adsorption, sediments and colloids as vehicles for pollutants.

Water movement through and over soil; soil structure, erosion, permeability/hydraulic conductivity.

Transport processes in soils: diffusion, convective flow, hydrodynamic dispersion; monitoring and modelling of pollutant movement.

Properties of various classes of pollutants: chemical properties, stability, adsorption, degradation pathways, persistence; source of pollution, monitoring, management and rehabilitation of affected sites; toxicology.

Specific pollutants: inorganic, heavy metals, nutrients, salts; colloids/sediments; organics, synthetic/natural; pesticides and their metabolites; microbiological breakdown of organics, microbes in detoxification and clean-up of soil; waterborne diseases, analytical methodology and treatments; wastewater/sewage treatments, health and legislation.

7983 Project Work in Soil and Water Quality

Points value: 8.

Duration: 6-12 months.

Requirements: A supervised project, equivalent to about 4 months full-time work if undertaken within the University or up to 12 months if the project takes place at an accredited outside institution, will be decided upon for each candidate in consultation with lecturers, preferably before commencement of the course and certainly by half-way through the course. The project will be chosen to be as close as possible to any specific interests of the candidate or the candidate's employing organisation.

SOIL CONSERVATION

A course in soil conservation, consisting of three of the following four subjects will be offered in 1992, commencing July 1.
Students will take the subject 3816 Soil Conservation, being the core component of the course work, together with 8754 Project Work in Soil Conservation and either 3566 Soil Survey and Land Evaluation or 6665 Soil Management, amounting to a total of 24 points to qualify for award of the degree. The content of the subjects 3566 and 6665 may be varied from time to time to accommodate the changing requirements of students.

3816 Soil Conservation

Points value: 10.

Duration: 10 weeks.

Contact hours: 100 lectures and associated practical classes.

Content: Soil materials: minerals and organic matter, distribution in profiles. Biological activity in soils. Hydrologic cycles: climate, soil water. Physical degradation: water erosion, wind erosion. Chemical degradation: salinity, acidity, pollution, nutrient deficiencies. Economics of soil conservation. Legislation of soil conservation. Extension of soil conservation.

8754 Project Work in Soil Conservation

Points value: 8.

Duration: Full year.

Requirements: A supervised project, equivalent to about 4 months of full-time work if undertaken within the University or up to 12 months if the project takes place at an accredited outside institution, will be decided upon for each candidate, in consultation with lecturers, preferably before commencement of the course and certainly by half-way through the course. The project will be chosen to be as close as possible to any specific interests of the candidate (or, for example, the candidate's employing organisation).

ELECTIVES

3556 Soil Survey and Land Evaluation

Duration: 7 weeks.

Points value: 6.

Contact hours: 50 lectures and associated practical classes plus 2 weeks field studies.

Content: Description and classification of soils; geographic information systems and remote sensing; soil variability; land capability evaluation; property and catchment planning. Tillage and residue management; amelioration of structure; management systems for agriculture, forestry and recreation. 2 weeks soil survey and analyses.

6665 Soil Management

Points value: 6.

Duration: 7 weeks.

Contact hours: 50 lectures and associated practical classes plus 2 weeks field studies.

Content: Description and classification of soils; geographic information systems and remote sensing; land capability evaluation; property and catchment planning. Tillage and residue management; amelioration of soil structure; management of systems for agriculture, forestry and recreation. 2 weeks field studies and assessment of management systems.

DEGREE OF

MASTER OF AGRICULTURAL SCIENCE

REGULATIONS

1. (a) Subject in each case to the applicant's academic qualifications being accepted by the Faculty of Agricultural and Natural Resource Sciences as sufficient, the following persons may become candidates for the degree of Master of Agricultural Science: (i) Bachelors of Agricultural Science; (ii) other graduates.

(b) Subject to the approval of the Board of Graduate Studies acting with authority wittingly devolved to it by Council, the Faculty may, in special cases and subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for the degree a person who does not hold a degree of a university but has given evidence satisfactory to the Faculty of fitness to undertake work for the degree.

2. A candidate who holds the Honours degree of Bachelor of Agricultural Science or its equivalent in a university recognised by the University of Adelaide may proceed to the degree of Master of Agricultural Science at the expiration of one year from the date of the candidate's admission to the Honours degree of Bachelor: no other candidate shall proceed to the degree before the expiration of two years from the date of the beginning of the candidature.

3. Subject to conditions determined in each case, a graduate of a university recognised by the University of Adelaide may be allowed by the Council to proceed to the degree in compliance with these regulations. Every such candidate must spend at least two consecutive academic semesters or twelve calendar months at the University of Adelaide or at an institution approved for the purpose by the University of Adelaide.

4. (a) Unless a candidate has completed one year of full-time study beyond that prescribed for the Ordinary degree and this study is approved by the Faculty, or has obtained an Honours degree at the University or at another university recognised for the purpose, the candidate shall spend a qualifying period, the length of which shall be prescribed by the Faculty on the recommendation of the department concerned, on supervised study or research before the candidate is permitted to continue with candidature. Such qualifying period shall date from a time recommended by the department concerned and approved by the Faculty.

(b) On completion of such qualifying period as may be prescribed under (a) above, the candidate's progress will be reviewed by the Faculty after departmental assessment based on (i) written examination at Honours level or (ii) satisfactory progress with a research programme or (iii) both. The Faculty may then permit the candidate to continue the candidature or may grant the candidate permission to transfer the candidature to that for another degree or may terminate the candidature.

5. The Faculty of Agricultural and Natural Resource Sciences shall annually review the progress of candidates for the degree. If in the opinion of the Faculty a candidate is not making satisfactory progress the Faculty may, with the consent of the Council, withdraw its approval of the candidature and the candidate shall cease to be enrolled for the degree.

Before making a recommendation for termination of candidature to the Council the Faculty shall notify the candidate of its intention so to do and shall permit the candidate to offer within one month such explanation as the candidate can for the lack of satisfactory progress. If, notwithstanding any submission made by the candidate, the Faculty decides to recommend termination of the candidature, the candidate shall be informed accordingly and shall have the right of appeal within one month to the Council and any such appeal shall be considered by the Council at the same time as it considers the Faculty's recommendation.

6. To qualify for the degree a candidate shall submit a thesis upon an approved subject and shall adduce sufficient evidence that the thesis is the candidate's own work. The thesis shall give the results of original research or of an investigation on which the candidate has been engaged. A candidate may also submit other contributions in Agricultural Science in support of the candidature.

7. Every candidate shall give at least two semesters' notice of intended candidature, and shall indicate therewith in general terms the subject of the research work or investigation on which the candidate proposes to submit a thesis. The Faculty of Agricultural and Natural Resource Sciences, if it approves the subject of research, may appoint a supervisor to guide the candidate in the candidate's work.

8. A candidate may proceed to the degree by full-time or part-time study, or as an external student. Except by special permission of the Faculty, the work for the degree shall be completed and the thesis submitted:

(i) in the case of a full-time candidate, not less than one year and not more than three years from the date at which candidature was accepted by the Faculty; or

(ii) in the case of a part-time or external candidate, not less than two years and not more than six years from the date at which candidature was accepted by the Faculty.

9. The Faculty shall appoint a Board of Examiners to report upon the thesis and any supporting papers that the candidate may submit. The Board of Examiners may require any candidate to pass an examination in the branch of science to which the candidate's original research or investigation is cognate.

10. On completion of work the candidate shall lodge with the Registrar three copies of the thesis prepared in accordance with directions given to candidates from time to time.*

11. A candidate who complies with the foregoing conditions and satisfies the Board of Examiners shall, on the recommendation of the Faculty of Agricultural and Natural Resource Sciences, be admitted to the degree of Master of Agricultural Science.

Regulations allowed 14 December, 1950.

Amended: 16 Mar. 1961: 1,9; 4 Oct, 1962: 1,7; 21 Dec. 1972: 4; 28 Feb. 1974: 2; 23 Jan. 1975: 5; 15 Jan. 1976: 9; 4 Feb. 1982: 9; 12 Feb. 1987: 4(a), 8, renumbering 9, 10, 11; 20 July, 1989: 3, 7. 21 Feb. 1992: 1.

*Published in "Guidelines on Higher Degrees by Research and Specifications for Thesis": see Contents.

ASSOCIATE DIPLOMAS IN

APPLIED SCIENCE (AGRICULTURAL PRODUCTION)
APPLIED SCIENCE (FARM MANAGEMENT)
APPLIED SCIENCE (HORSE HUSBANDRY AND MANAGEMENT)
WINE MARKETING

ORDINARY AND HONOURS DEGREES OF

BACHELOR OF APPLIED SCIENCE (AGRICULTURE)
BACHELOR OF APPLIED SCIENCE (NATURAL RESOURCES MANAGEMENT)

ORDINARY DEGREE OF

BACHELOR OF APPLIED SCIENCE (WINE SCIENCE)

GRADUATE DIPLOMAS IN

AGRICULTURE
NATURAL RESOURCES
WINE

REGULATIONS

1. There shall be the following Associate Diplomas, Degrees and Graduate Diplomas:
   Associate Diploma in Applied Science (Agricultural Production)
   Associate Diploma in Applied Science (Farm Management)
   Associate Diploma in Applied Science (Horse Husbandry and Management)
   Associate Diploma in Wine Marketing
   The ordinary and honours degrees of Bachelor of Applied Science (Agriculture)
   The ordinary and honours degrees of Bachelor of Applied Science (Natural Resources

Management)
The ordinary degree of Bachelor of Applied Science (Wine Science)
Graduate Diploma in Agriculture
Graduate Diploma in Natural Resources
Graduate Diploma in Wine

2. The Council, after receipt of advice from the Faculty of Agricultural and Natural Resource Sciences, may from time to time prescribe schedules defining:

(i) the subjects of study for the various awards;

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates; and

(iii) for each award, requirements relating to
- admission
- enrolment
- assessment, examinations and academic progress
- attendance and completion of work required
- status
- qualification for the award
- programmes of study
- student appeals
- syllabuses.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

3. These regulations shall be replaced by new regulations, to be made by the Council not later than September 1993, that are consistent in style and format with the regulations governing other awards offered by the University.

Regulations allowed: 21 February 1991. Awaiting allowance: 1.

ASSOCIATE DIPLOMAS IN

APPLIED SCIENCE (AGRICULTURAL PRODUCTION)
APPLIED SCIENCE (FARM MANAGEMENT)
APPLIED SCIENCE (HORSE HUSBANDRY AND MANAGEMENT)
WINE MARKETING

ORDINARY AND HONOURS DEGREES OF

BACHELOR OF APPLIED SCIENCE (AGRICULTURE)
BACHELOR OF APPLIED SCIENCE (NATURAL RESOURCES MANAGEMENT)

ORDINARY DEGREE OF

BACHELOR OF APPLIED SCIENCE (WINE SCIENCE)

GRADUATE DIPLOMAS IN

AGRICULTURE
NATURAL RESOURCES
WINE

SCHEDULES

Definitions

For the purposes of these Schedules, the following definitions shall apply.
Academic day—is a day on which lectures, tutorials, laboratory sessions and practical work are timetabled, and any day in the promulgated study vacation/examination period.
Admission—into a course involves acceptance of an offer of a place in a course by an applicant, and payment of such fees and charges as may be determined by Council from time to time.

Assumed (subject)—is a subject which students are advised to complete before attempting a more advanced subject, and a knowledge of which is assumed.

Award—is a graduate diploma, degree or associate diploma which is conferred by the University upon completion of a course.

Commencing student—a student is a commencing student in a course if the student has enrolled for the first time in that course.

Complete (or Pass) a subject—means that a student must obtain a grade of Distinction, Credit or Pass for a subject, or a Conceded Pass.

Conceded Pass—is a pass conceded to a student, under certain conditions, to enable the student to graduate from a course.

Continuing student—a student is a continuing student in a course if the student has re-enrolled in that course.

Course—a prescribed programme of subjects to be completed for an award.

Course Adviser—an academic member of Faculty appointed by the Faculty to oversee a course.

Co-requisite—a subject specified by a Department which must be taken concurrently with a particular subject, unless the subject has already been passed.

Dean (of Faculty)—means the Dean of the Faculty of Agricultural and Natural Resource Sciences.

Elective subject—is a subject which may, subject to course requirements and the satisfaction of pre-requisites, be chosen from a specified group of subjects offered by the University.

Enrolment—in a subject by a student is the act of notifying the Registrar on the appropriate form, together with the payment of applicable fees, within the period specified by Council, that the student intends to undertake the subject for the purpose of obtaining a final grade.

Examination—means any formally supervised examination in a subject held at a fixed time and place.

Exemption—is dispensation granted from part of the requirement of a subject when a student has previously completed study of certain aspects of the subject to the satisfaction of the Subject Co-ordinator.

Extenuating circumstances—are any substantial unforeseen emotional or physical events which in the opinion of the Subject Co-ordinator prevent the student handing in an assignment on time or from sitting for an examination or test.

External course—a course of study taken in the external mode.

External mode—a student is enrolled in a subject in the external mode if that student is studying from teaching material especially prepared for off-campus students.

External student—a student enrolled only in subjects offered in a particular semester in the external mode.

Faculty—is the Faculty of Agricultural and Natural Resource Sciences.

Full-time course—a course available to students on a full-time basis.

Full-time student—a student enrolled in subjects in the internal mode which, in a particular semester, amount to 75% or more of the load specified in the programme of study for the course as being a full-time study load for that course.

Grade—is a final assessment in a subject.

Graduation—from a course is the conferring of the award appropriate to that course, either at a graduation ceremony or in absentia.

Internal mode—a student is enrolled in a subject in the internal mode if classes are attended during the semester.

Internal student—a full-time or part-time student.

Mixed-mode student—a student who, in a particular semester, is permitted to enrol in some subjects in the internal mode and others in the external mode.

Part-time course—a course available to part-time students.

Part-time student—a student enrolled in subjects in the internal mode which, in a particular semester, amount to less than 75% of the load specified in the programme of study for the course as being a full-time study load for that course.

Preclusion—of a student is the decision by Council not to permit a student to enrol for

further studies in a course under the provisions of Clause 4C of Chapter XXV of the Statutes.

Pre-requisite—is a subject specified by a Department in which a grade of Pass or better must be obtained prior to enrolment in a particular subject.

Semester—a period (normally 13 teaching weeks) specified by the Council for the presentation of subjects within the courses of study. There are two semesters in each year.

Status—may be granted to an undergraduate student in some subjects on the basis of studies completed successfully in another tertiary course. Status may also be granted on the basis of extensive relevant work experience.

Streams—in a course are several prescribed sets of subjects, one set of which the student chooses to take.

Subject—is an amount of work specified by a Department, normally completed over the duration of one semester, for which a final assessment is recorded.

Subject Co-ordinator—of a subject is a member of the academic staff appointed by the relevant Head of Department to be responsible for the presentation and assessment of that subject.

Unit value—of a subject is a measure of the number of hours of work expected of a student in that subject. One unit represents approximately 2.4 hours of work (including lectures, tutorials, practicals, laboratory work and private study) per week. (Unit values will apply to subjects in 1992 only.)

Withdrawal—from a subject or a course by a student is the act of notifying the Registrar on the appropriate form and within the period specified by the Council that the student no longer intends to continue enrolment in the subject or the course.

Working Day—is a 24 hour period following a set deadline, excluding Saturdays, Sundays and public holidays.

SCHEDULE I: ADMISSION

1. Admission requirements—undergraduate courses

(1) Normal admission

(a) General requirements

For admission to the above degree courses, an applicant must have completed Year 12 in South Australia with a minimum aggregate score specified by Council from time to time, or the equivalent.

For admission to the above associate diploma courses, an applicant must have completed Year 12 in South Australia with a minimum aggregate score specified by Council from time to time, or the equivalent. An applicant who holds a TAFE stream 3100-3300 award which is equivalent to a year of full-time study and who has also completed Year 11 will be deemed to have met the academic requirements for admission to the associate diploma courses.

(b) Particular requirements

For admission to the Bachelor of Applied Science (Agriculture), an applicant must hold a South Australian Class 1 Drivers Licence or interstate equivalent.

For admission to the associate Diploma of Applied Science courses an applicant must have obtained:

(i) for the Farm Management course, at least one year of acceptable farm work experience undertaken after the completion of secondary studies.

(ii) for the Horse Husbandry and Management course, experience with horses of a nature and for a period acceptable to the Faculty.

(c) Exceptions

Notwithstanding the requirements specified in (1)(a) and (1)(b) of this Schedule an applicant who does not meet these requirements may be admitted at the discretion of Faculty if Faculty is of the opinion that the applicant has reasonable prospects of success in the course.

Preference in selection for admission may be given to applicants who have obtained relevant experience or who have undertaken certain subjects in secondary school.

(2) Mature Age admission
Mature Age admission is available to those who have, or will have reached the age of 21 years by 1st January of the year in which they seek admission.
Mature Age admission does not require any precisely defined academic attainment but depends upon an assessment by the Faculty of the applicant's ability to complete the course.

2. Admission requirements—postgraduate courses
(1) Normal admission
Applicants for admission to postgraduate courses must normally hold an undergraduate degree or diploma of the University of Adelaide or the former Roseworthy Agricultural College or another academic qualification accepted by the Faculty as sufficient for the purpose. With Faculty approval admission to some postgraduate courses may be available to applicants without the required undergraduate qualification but with other attainments or experience.
(2) Particular requirements
For admission to the Graduate Diploma in Wine, the following specific requirements apply:
(a) applicants for Categories V(b) and V(c) of the Viticulture stream must have gained a minimum of six (6) months' viticultural experience or similar before commencing the course. This experience need not have been in one six-month block but may have been accumulated over a period of time.
(b) applicants for Categories O(b) and O(c) of the Wine Technology stream must have gained a minimum of six (6) months' winery experience including a vintage period before commencing the course. This experience need not have been in one six-month block but may have been accumulated over a period of time.

SCHEDULE II: ENROLMENT

1. Eligibility for enrolment
No student may be enrolled in a course unless an offer of a place in the course has been made and an acceptance has been received, and all the conditions for enrolment as prescribed in this Schedule have been met, including the payment of all fees and charges.

2. Period when enrolment must be completed
All students (commencing, continuing and external) shall enrol prior to the commencement of first semester on a date or dates determined by Council from time to time.
A charge will be made by the University in cases of late enrolment.

3. Responsibility for correct enrolment
Each student is responsible for ensuring that he/she is correctly enrolled each semester. This includes ensuring that
(1) information required on all enrolment forms is complete and correct;
(2) the subjects are part of the course in which the student is enrolled;
(3) pre-requisites have been met;
(4) the number of subjects taken does not (without the approval of the Course Adviser) exceed a normal load;
(5) all other enrolment conditions, including the payment of fees, are met by the date(s) specified.

4. Last date for enrolment in a subject
Except with the permission of the Subject Co-ordinator and the Course Adviser, the final date by which an internal student may enrol in a subject for the above degrees and diplomas is the Friday of lecture week 2 in either semester or the Friday of lecture week 2 of Semester 2 for Code V (Vacation) subjects or 31st March for subjects presented over the whole of the year.
The Subject Co-ordinator and the Course Adviser may approve enrolment in a subject after the dates specified but not later than 31st March (for a first semester subject or a subject presented over the whole of the year) or 31st August (for a second semester subject or a Code V (Vacation) subject).
Applications to add a subject must be made on an Amendment to Enrolment form available from the Student Records Office at the Roseworthy Campus. If a subject is added

after the dates specified in Paragraph 1 of this Clause, the Amendment to Enrolment form must be signed by the Subject Co-ordinator and the Course Adviser.
External students may add subjects to their enrolment up until the Friday before the start of semester, provided that a place is available in the quota for any subject(s) chosen. Applications to add a subject must be made in writing on an Amendment to Enrolment form and lodged in the Student Records Office at the Roseworthy Campus. If time does not permit, the request should be made by telephone to the Student Records Office at the Roseworthy Campus with confirmation in writing; notification by facsimile will be accepted.

5. Enrolments in additional subjects
Students may only enrol in subjects additional to those required to meet course requirements, or as permitted in Clause 9 of this Schedule, with the approval of the Course Adviser.

6. Pre-requisites
The pre-requisite for a particular subject is a condition or set of conditions which must be met by a student before being permitted to enrol in that subject. Subject pre-requisites are specified in the University Calendar.
(1) Equivalent subjects
Where a student has not met the pre-requisite for a subject as specified in the University Calendar the Subject Co-ordinator, after consultation with the Course Adviser, may approve the student's enrolment in the subject on the basis of either
(a) the completion of other subjects deemed to be equivalent to the pre-requisite, or
(b) the demonstration by the student of other experience which suggests the student would be able to complete the subject successfully.
(2) Grades and pre-requisites
The following grades will not satisfy pre-requisite requirements: Conceded Pass, Fail, Withdrew-fail and the following grades used by Roseworthy Agricultural College up until (and including) 1990—F, F*, N, WF.
An I (Incomplete) or WH (With-held) recorded for a subject will not satisfy a pre-requisite.
(3) Failure to meet a pre-requisite
Enrolment in a subject is invalid if a student has not met the pre-requisite, other than as permitted under Clauses 6(1)(a) and 6(1)(b) above. A student who enrols in a subject in anticipation of passing its pre-requisite must withdraw from the subject if the pre-requisite is subsequently failed.
(4) Status
The granting of status in a subject is equivalent to a pass in the subject for pre-requisite purposes. However, a student may not, without the permission of the Course Adviser, enrol in a subject in anticipation of being granted status in its pre-requisite.
(5) Changes to pre-requisites
A student shall not be disadvantaged by any change in pre-requisites for subjects in a course provided that the student remains continually enrolled in the course. Should a student withdraw from a course and be subsequently re-admitted the student will be required to satisfy pre-requisites applying at the time of re-admission.

7. Mixed mode enrolment
An internal student may apply to enrol in one or more external subjects in a semester. Permission may be granted, for example, to avoid a timetable clash, or to allow a student to graduate sooner than would be possible if time were to be spent waiting for a subject to be offered internally.
Application by an internal student for permission to take an external subject must be made to the Student Records Office at the Roseworthy Campus. Approval will be granted only with the consent of the Course Adviser, and will be subject to a place being available in the subject quota. Internal students may not add an external subject to their enrolment after the second week of semester.

8. Transfer from the internal to the external mode
Subject to the availability of subject offerings and to quotas, a student may transfer from enrolment in the internal mode to enrolment in the external mode and vice versa provided the enrolment is completed within the time specified in Clause 4 of this Schedule.
Application for permission to effect such a transfer must be made to the Course Adviser

and the result of the application lodged with the Student Records Office at the Roseworthy Campus.
Any additions to a student's enrolment must be lodged with the Student Records Office at the Roseworthy Campus by 5.00 p.m. on the dates, and under the conditions specified in Clause 4 of this Schedule.

9. Variations to course
Under special circumstances, Faculty, on the recommendation of the relevant Course Adviser, may approve the variation of a student's course by permitting the replacement of stream or elective subjects with subjects from other courses or streams, either from another tertiary institution or from The University of Adelaide, provided that
(1) such variation may not exceed 10% of the total unit value or points for the course, as appropriate; and
(2) approval for such variation is given by Faculty before the student enrols in the alternative subject or subjects; and
(3) any subject presented as a replacement for an elective in a course must be at least at the same level as the course in which the student is enrolled.

10. Refusal of enrolment
Enrolment may be refused by the University if
(1) a student is indebted to the University by reason of non-payment of any fee or charge, and has failed to make satisfactory settlement of indebtedness after receipt of due notice.
(2) a student is overseas, unless the requirements of enrolment (including attendance at residential schools) are fulfilled.
(3) a student who is not a permanent resident of Australia has not met all the requirements laid down by the Department of Employment, Education and Training.

11. Withdrawal from subjects
(1) Notification of withdrawal
Students must notify their withdrawal from subjects on the Amendment to Enrolment form available from the Student Records Office at the Roseworthy Campus.
(2) Permitted time for withdrawal
Students may withdraw from a subject without incurring an academic penalty
(a) until 5.00 p.m. on the Friday of the ninth teaching week in either first or second semester, as appropriate;
(b) up until 5.00 p.m. on the Friday of the fourth teaching week of second semester if the subject is presented over the whole of the year;
(c) up until 5.00 p.m. on the Friday of the ninth teaching week of second semester for a Code V (Vacation) subject.
If withdrawal is effected within these deadlines, WNF will be recorded for the subject.
(3) Late withdrawal
If withdrawal is effected after the deadlines specified in 11(2) above, WF will be recorded for the subject except
(a) if upon application by the student the Head of Department, on the recommendation of the Subject Co-ordinator, approves a WNF being recorded for a late withdrawal, or
(b) if the Head of Department, on the recommendation of the Subject Co-ordinator, approves a WNF being recorded for a student who takes leave from a course of study at the end of a semester when one half of a subject which extends over two semesters, has been completed.
(Comment: The HECS Liability which a student has incurred will stand for any subject for which a withdrawal occurs after 31st March (for a first semester subject or a full-year (Code F) subject) or after 31st August (for a second semester subject or Vacation (Code V) subject), whether the withdrawal is with or without academic penalty (that is, whether WF or WNF has been recorded)).
(4) Withdrawal in the last three weeks of a semester
Applications for withdrawal without penalty from a subject in the last three weeks of a semester will not normally be granted. Instead, in cases of proven extenuating circumstances, the Subject Co-ordinator may approve an extension of time to complete the subject, and/or, where the student is prevented from sitting the final examination, the Subject Co-ordinator may approve a special examination.
Only where the misadventure is such as to prevent the student from completing the subject

within a reasonable time (usually the end of the second week of the following semester) is withdrawal without academic penalty likely to be approved.

12. Withdrawal from a course

A student who wishes to withdraw from his/her course must notify the Student Records Office at the Roseworthy Campus on the appropriate form.

13. Leave of absence

Students may apply to take leave of absence from any of the above courses. The closing date for lodging such an application with the Student Records Office at the Roseworthy Campus is 5.00 p.m. on Friday of the second teaching week of the semester in which leave is required.

(1) Students must apply to the Registrar in writing to take leave of absence, specifying the semester(s) in which they wish to take leave.

(2) The subjects of a student who takes leave of absence will be deleted from the student's record for that semester.

A late application from an enrolled student will be treated as an application for withdrawal from all subjects as provided in Clause 11 of this Schedule.

(3) A late application for leave of absence from a student who is not enrolled will be considered at the discretion of the Course Adviser. Where leave is refused and the student fails to re-enrol, the student will be withdrawn from the course.

(4) Students granted leave of absence shall re-enrol as continuing students when they resume their course. Such students will be sent enrolment instructions by mail at the appropriate time.

14. Failure to re-enrol

Students eligible for re-enrolment in one of the above courses who do not enrol and have not applied for leave of absence, will be withdrawn from the course by the Registrar. Before withdrawing a student, the Registrar shall write to the student at the last known address shown on the student's file, asking the student to show cause why withdrawal should not be effected. Withdrawn students must re-apply for admission to the course in accordance with the admissions regulations should they later wish to resume their studies.

SCHEDULE III: ASSESSMENT

1. Responsibility for assessment

The Subject Co-ordinator appointed by the Head of Department is responsible to the Head for deciding the manner in which a subject will be assessed, and for awarding a grade to each student enrolled in the subject.

2. Informing students of assessment schemes

(a) Details of assessment to be given in writing

At the beginning of each semester, (by the beginning of the second week of classes for internal students, and in Booklet 1 of the subject material for external students) students will be provided with a subject outline by the Subject Co-ordinator. Subject outlines will include the following:

Administrative information

- the subject number and name;
- the name of the Subject Co-ordinator;
- the number and type of class hours per week, if appropriate;
- details of residential schools, if appropriate; and
- details of any trips and/or tours to be undertaken.

Academic information

- the subject description, including the aims and objectives of the subject, as detailed in the official Course Document (and as modified from year to year by the Subject Co-ordinator, in conjunction with the Course Adviser and, if necessary, with the approval of Faculty);
- the method in which the subject material will be presented (lectures, tutorials, practicals, directed self-learning);
- what is expected of the students, particularly related to directed self-learning aspects of

the presentation of the subject;
- editorial and other standards with which the students must comply;
- a semester plan for the subject showing the relative weighting of major components of the subject;
- details of which sessions (if any) are designated for compulsory attendance;
- prescribed textbooks and references; and
- details of farm practice, field studies and the like to be undertaken.

Assessment information
- the work to be submitted for assessment which counts towards the final grade;
- other work which may or may not be assessable, which does not count towards the final grade, but which must be submitted to meet subject requirements;
- the relative weighting of each item assessed;
- any special requirements which must be satisfied for a student to pass the subject (for example, whether a pass must be obtained in both the assignment work and the examination);
- the date for the submission of each piece of work; and
- the dates of any tests to be administered.

Examination information
- whether an examination is to be conducted and, if so, the duration and format of the examination;
- the weighting given to the examination mark in the final grade.

Students must also be informed of the availability of staff members teaching the subject for consultation, and have their attention drawn to the section "Information for Students" in the Calendar.

(b) No assessable work to be due after week 13
No assessable work in subjects which have a final examination may have a due date falling after the completion of lecture week 13 of any semester.

3. Grades
The work of all students in each subject will be reported in terms of the following grades: Distinction; Credit; Pass; Conceded Pass; Status granted; Fail; Withdrew-fail; Withdrew (not a fail).
If a subject is incomplete because it is conducted over more than one semester, CN will be recorded; if it is incomplete because work is still outstanding and an extension of time has been granted, or because a result is not available at the time the notification of results are prepared for students, WH (With-held) will be recorded.

4. Conceded Pass
(1) A student may present for any of the following courses:
Associate Diploma in Applied Science (Agricultural Production)
Associate Diploma in Applied Science (Farm Management)
Associate Diploma in Applied Science (Horse Husbandry and Management)
Associate Diploma in Wine Marketing
Bachelor of Applied Science (Agriculture)
Bachelor of Applied Science (Natural Resources Management)
Bachelor of Applied Science (Wine Science).
a conceded pass in a maximum of two semester-length subjects or one year-long subject.

5. Compulsory Attendance
Attendance at, and participation in, all designated classes, trips and tours is compulsory.
In the case of illness of a student or of a member of the student's immediate family, or of other extenuating circumstances, attendance may be excused but associated work must be completed to the satisfaction of the Subject Co-ordinator. In the event of illness of the student a medical certificate must be produced; in the event of illness of a member of the immediate family a medical certificate together with a statement confirming that no suitable alternative arrangements could be made must be provided; for extenuating circumstances, other suitable evidence must be provided. Medical certificates, or such other evidence as may be required must be lodged with the Student Records Office at the Roseworthy Campus as soon as practicable, but normally within three (3) working days.
Note: In interpreting this Clause, immediate family will include any person domiciled with

or under the immediate responsibility of, the student concerned and each case will be considered on its merits.

6. Plagiarism

A student may not submit as his/her own work that which has been derived from another source, other than when properly acknowledged in the appropriate manner, nor may he/she improperly assist or obtain assistance from any other student.

SCHEDULE IV: ACADEMIC PROGRESS

1. The academic progress of students is liable to review in terms of Clause 4C of Chapter XXV of the Statutes and the attendant policy of the Faculty as determined from time to time.

SCHEDULE V: EXAMINATIONS

(The following Clauses refer specifically to the above courses. Students are advised to refer to the Rules for Conduct of Examinations which are to be found elsewhere in Volume II of The University of Adelaide Calendar.)

1. Examination period

Examinations will be conducted at the end of each semester, during the approved examination period, and in accordance with Statute XVII.

2. Strict observance of the timetable

No student may take an examination at any time other than on the day and at the time it is timetabled.

External supervisors are required to certify that the requirements of this Clause have been adhered to.

If it is established that a student sat an examination other than on the day and at the time it is timetabled, the student will receive zero marks for that examination.

3. Application for special consideration

(1) Permanent or prolonged disability

Where a student suffers from a physical disability or other handicap which may be a disadvantage in written examinations, the student may apply in writing to the Registrar (such application to be lodged with the Student Records Office at the Roseworthy Campus) no later than three weeks before the commencement of the promulgated examination period (or within such further time as the Registrar may in special cases permit), for special conditions or provisions when the examinations are taken.

A medical certificate specifying the severity and duration of the disability or handicap and its effect on the student's ability to take examinations, must accompany the application.

(2) Illness and misadventure

Where a student

(a) suffers a prolonged illness during a semester and believes that that illness has prejudiced his/her performance in the subject; or

(b) is prevented by illness, or other cause beyond the student's control, from attending an examination in a subject; or

(c) immediately prior to an examination was affected by illness or other cause which the student believes seriously prejudiced performance at the examination; or

(d) is to a substantial degree adversely affected by illness or other cause beyond the student's control during the course of an examination, and either during or immediately after the examination, reports the fact to the senior supervisor

the student may, as soon as practicable after the examination, and in any case not later than three working days following the final day of the promulgated examination period, report the circumstances in writing to the Student Records Office at the Roseworthy Campus and request that they be taken into account when assessing the result of the examination. Where, due to illness or other cause, the student is personally unable to take the action required by this Clause, some other person may report the circumstances on the student's behalf.

Where an application is lodged on the grounds of illness or injury, a medical certificate, specifying the severity and duration of the condition and its effect on the student's ability to take examinations, must accompany the application. The University reserves the right to stipulate that acceptance of a medical certificate is subject to confirmation by a medical practitioner nominated by the University.

4. Deciding applications for special consideration

(1) Permanent or prolonged disability

Applications for special consideration lodged under Clause 3(1) of this Schedule shall be referred to the Subject Co-ordinator for decision. Where the Subject Co-ordinator believes that the student's disability would disadvantage the student in an examination conducted under normal conditions, the Subject Co-ordinator may approve special conditions for the student.

(2) Illness and misadventure

Applications for special consideration lodged under Clause 3(2) of this Schedule shall be referred to the Subject Co-ordinator for decision. The Subject Co-ordinator in consultation with the Head of Department may

(a) approve a special examination for the student; or

(b) decide the student's grade by some other means.

Applications for special consideration lodged under Clause 3(2) of this Schedule will not normally be approved where:

- a student's work commitments prevented attendance at a scheduled examination; or
- a student missed an examination by mis-reading the examination timetable.
- an external student fails to nominate an external supervisor when requested to do so.

SCHEDULE VI: STATUS

1. Status

A student may be granted status for subjects in any of the above courses by the Head of a Department. Status may be granted in one of two ways:

(1) Transfer Status

Transfer status may be granted by virtue of subjects completed in another course at the University or the former Roseworthy Agricultural College, or by virtue of subjects completed at another educational institution approved by the University for the purpose of this Schedule.

(2) Proficiency Status

Proficiency status may be granted where the student demonstrates proficiency in the subject matter of a subject to the satisfaction of the Head of a Department, who shall decide the method of assessment after consultation with the Subject Co-ordinator.

Where a student has failed a subject at the University of Adelaide or at the former Roseworthy Agricultural College he/she may not apply for proficiency status in the subject in lieu of repeating it.

Where status has been granted, the number of subjects required to complete a course shall be reduced by the number of subjects for which status has been granted.

Where status has not been granted a student may request exemption from part of the subject. The Subject Co-ordinator will make all decisions on the granting of exemption.

2. Limits on the Granting of Status

Normally status will only be considered for subjects passed within the previous ten years.

Status may be granted on a subject-for-subject basis or on the basis of subject for group of subjects.

Status will be granted only for subjects which meet the academic requirements of the award towards which credit is sought.

The following maximum status can be given:

(1) Postgraduate awards

Status will not be granted in graduate diploma courses on the basis of undergraduate subjects previously presented for any other award.

The maximum status which may be granted towards a graduate diploma is an aggregate of 5 points.

(2) Undergraduate awards
A student may be granted status in no more than one-half of the total requirements for the award as defined in Schedule VIII.

3. No Partial or Conditional Status
Status will not be granted for part of a subject. Neither will a student be granted conditional status.
Students who do not receive full status in a subject may apply for exemption from part or parts of the subject.

4. Applications for Transfer Status
(1) Application Form
An application for transfer status must be made on the appropriate form available from the Student Records Office at the Roseworthy Campus and must be lodged with that Office.
(2) Documentation
Applications must be accompanied by
— certified copies of transcripts of academic qualifications;
— an explanation of the grading system used, supplied by the institution where the studies being offered for status were taken;
— a photocopy of subject outlines taken from an institution's Calendar or Handbook for the year in which the subjects were successfully completed.
Subject outlines provided should include
- detailed list of the topics covered in the subject;
- the size and duration of the subject (for example, 3 hours per week for 15 weeks);
- the prescribed text book(s) and recommended readings.

If the subject outlines do not include this information it should be supplied separately.
— a certified translation if any of the documents is not in English.

(3) Deciding Applications
Applications will be referred to the Head of Department for decision. In reaching a decision the Head will be guided by recommendations made by the Subject Co-ordinators.
(4) Notification and Recording of the Decision
Students will receive advice, in writing from the Registrar, of the results of their applications. Subjects for which a student receives status will be shown as such on the student's transcript. No grades will be shown for such subjects.

5. Applications for Proficiency Status
(1) Application Form
An application for proficiency status must be made on the appropriate form available from the Student Records Office at the Roseworthy Campus and must be lodged with that Office.
(2) Subjects not open to challenge
A list of subjects which the Head of Department has decided are not open to an application for proficiency status will be kept in the Student Records Office on the Roseworthy Campus and promulgated from time to time.
(3) Supporting Statement
The student must provide on the application form the basis upon which he/she believes he/she is proficient in the subject. Appropriate documents (for example a statement from an employer regarding work experience) should accompany the application.
(4) Deciding Applications
The Head of Department will decide which subjects in the courses in his/her Department are open to an application for proficiency status.
Applications will be referred to the Head of Department who, after consultation with the Subject Co-ordinator, will decide:
(a) whether or not a particular student's application for proficiency status should be granted; and
(b) if an examination is required, where and when the examination is to be conducted and whether the examination is to be written or oral, or a combination of written and oral, or a demonstration of skill.
(c) what costs (to be met by the applicant) are involved in any special assessment.

(5) Notification and Recording of the Decision
Students will receive advice, in writing from the Registrar, of the results of their applications.
Subjects for which a student receives proficiency status will be shown as having been granted status on the student's transcript. No grades will be shown for such subjects.

6. Status between Courses offered at the Roseworthy Campus
Where a student is permitted to transfer from one Roseworthy course to another Roseworthy course, or where a student, having either graduated from, withdrawn from or been precluded from a Roseworthy course is admitted to a different Roseworthy course, the student may apply for transfer status or proficiency status in the new course on the basis of study undertaken in the earlier course.
Where such a student is granted either transfer or proficiency status, the subjects for which status has been granted will be shown as "status granted" on the student's new course record and transcript.
In the case of subjects common to both courses, the result from the previous course may be counted towards the current course, and status is not given.

7. Review of Applications
A student who is dissatisfied with a decision not to grant him/her status in a subject should follow the procedures for appeal as set out in Schedule X: Student Appeals.

SCHEDULE VII: QUALIFYING FOR AN AWARD

1. To be entitled to an award a student
(1) shall, unless otherwise approved by the Council, have completed the appropriate course of study prescribed in Schedule VIII or IX;
(2) shall have completed all subjects specified in the appropriate section of Schedule VIII or IX;
(3) shall complete satisfactorily any practical requirements, such as industry experience, which may be specified as part of the course of study;
(4) shall attend such tours, trips or field study exercises which may be specified as part of the course of study;
(5) shall meet the provisions of other conditions prescribed from time to time by the Council.

2. Changes to course of study
In all cases in which the regulations, schedules or syllabuses affecting the course of study for an award are repealed, suspended or altered, the Faculty may allow students who have enrolled under those regulations, schedules or syllabuses to complete their course of study thereunder, but may impose such conditions or modifications as it may deem desirable.

SCHEDULE VIII: COURSES OF STUDY

Note: Semester Codes referred to in the Programmes of Study in this Schedule are:

1 = First Semester
2 = Second Semester
F = Subject taught over the whole of the year
V = Subject completed in a Vacation.

1. Graduate Diploma in Agriculture
For the award Graduate Diploma in Agriculture a student will satisfy the following requirements:
1. complete not fewer than 24 points, comprising
(a) a minimum of 8 points from the Group A subjects, and
(b) a project of at least 4 points from Group C, and
(c) the balance, up to a maximum of 12 points, from other graduate subjects from Group A or Group B, additional or larger projects, undergraduate subjects or a combination of these.

2. obtain a grade of Pass or better in all subjects.

This course is available in both the internal and the external modes, although not all subjects are available externally.

GRADUATE DIPLOMA IN AGRICULTURE

Subject Code	Semester Code	Name of Subject	Points
		GROUP A	
5796	1	Agribusiness	2
1328	1	Extensive Livestock	4
4826	2	Marketing G	2
2805	F	Agricultural Economics and Policy	4
8597	F	Agricultural Engineering	4
7518	F	Communications and Agricultural Extension	4
6363	F	Crops and Pastures G	4
1581	F	Dryland Farming Systems	4
8749	F	Farm and Vineyard Business Management	4
8338	F	Horticulture	4
7602	F	Intensive Livestock	4
1058	F	Rural Sociology	4
2793	F	Social Psychology	4
3065	F	Soil Conservation G	4
		GROUP B	
5297	1	Natural Resources Management	4
5293	2	Environmental Systems	4
5979	2	Natural Resources Economics	4
5635	F	Integrated Land Systems Studies	4
9991	F	Land Use Systems and Planning	4
8130	F	Natural Resources Methodology	4
		GROUP C	
2762	F	Project IA	4
3205	F	Project IB	4
8171	F	Project IC	4
8512	F	Project ID	4
2783	F	Project IIA	8
4182	F	Project IIB	8
3185	F	Project III	12

2. Bachelor of Applied Science (Agriculture)

For the degree Bachelor of Applied Science (Agriculture) a student shall complete all subjects listed for First Year, Second Year and Third Year in the Programme of Study, including one of the streams

Dryland Farming
Livestock Production
Horticulture and Irrigation
Equine

BACHELOR OF APPLIED SCIENCE (AGRICULTURE)

Subject Code	Semester Code	Name of Subject	Units
		FIRST YEAR	
6325	1	Biology IB	4
1380	1	Biometry and Experimentation	3
2686	1	Communications and Learning	3
9404	1	Farming Systems	4
8466	1	Introduction to Systems	3
8773	1	Chemistry and Introductory Biochemistry	4
2636	2	Soils and Climatology I	4
7658	2	Agricultural Engineering I	4
8478	2	Animal Science and Production	4
1776	2	Microbiology and Entomology (2 points)	4
1947	2	Plant Science and Production	4
6668	F	Farm Skills I	4
2703	V	Farm Skills IA (on-Campus)	5
		SECOND YEAR	
		Core Subjects	
9848	1	Agricultural Engineering II	4
4637	1	Integrated Pest Management	4
3341	2	Accounting and Budgeting	4
9357	2	Biochemistry and Plant Science	4
9495	F	Agricultural Seminars I	2
8181	F	Farm Skills II (Stream-specific)	3
6315	V	Farm Skills IIA (off-Campus)	5
		Dryland Farming Stream	
7026	1	Animal Science I	6
7333	1	Crops and Pastures I	4
7957	2	Animal Science II	3
8237	2	Crops and Pastures II	4
2535	2	Soil Conservation and Management	3
		Livestock Production Stream	
7026	1	Animal Science I	6
7333	1	Crops and Pastures I	4
7957	2	Animal Science II	3
4004	2	Animal Science III	3
	1 or 2	Elective	3
		Horticulture and Irrigation Stream	
7280	1	Basic Irrigation	3
7020	1	Horticultural Systems	5
8403	2	Production Horticulture	4
	1 or 2	Electives	6

Subject Code	Semester Code	Name of Subject	Units
		Equine Stream	
7026	1	Animal Science I	6
7333	1	Crops and Pastures I	4
4472	1	Horse Husbandry I	3
1511	2	Horse Husbandry II	3
	1 or 2	Elective	3
		THIRD YEAR	
		Core Subjects	
5068	1	Economics, Policy and Marketing	5
1534	2	Business Law and Finance	5
6847	2	Integrated Land Management	3
3958	F	Extension and Sociology	5
8340	F	Project/Case Study	4
3384	F	Agricultural Seminars II	2
		Dryland Farming Stream	
1022	1	*Beef, Sheep and Goat Production IA	3
1505	2	*Dryland Farming Systems IA	3
6420	2	*Dryland Farming Systems IB	4
	1 or 2	Electives	9
2611	F	*Beef, Sheep and Goat Production IB	4

*At least one of these subjects must be taken at 4 units.

		Livestock Production Stream	
7180	1	Animal Science IV	4
1022	1	+Beef, Sheep and Goat Production IA	3
6512	2	+Pig and Poultry Production IA	3
9605	2	+Pig and Poultry Production IB	4
8763	2	+Dairy Production IA	3
9237	2	+Dairy Production IB	4
	1 or 2	Electives	6
2611	F	+Beef, Sheep and Goat Production IB	4

+Students take two of these (at least one of which is to be at 4 units) as stream subjects and may take the third as an elective.

		Horticulture and Irrigation Stream	
9586	1	Horticultural Crops IB	4
5498	2	Horticultural Marketing	3
5855	2	Irrigation Systems Design	6
	1 or 2	Electives	5
		Equine Stream	
1412	1	#The Pleasure and Working Horse Industry IA	3
3770	1	#The Pleasure and Working Horse Industry IB	4
5265	1	#The Racing Industry IA	3
9025	1	#The Racing Industry IB	4
2410	2	Horse Business and Regulations	3
2578	2	Horse Stud Management	4

Subject Code	Semester Code	Name of Subject	Units
	1 or 2	Elective	3

#At least one of these subjects must be taken at 4 units.

ELECTIVES (YEARS 2 AND 3)

There is an Elective component in each Stream.

Dryland Farming to the value of at least	9 units
Livestock Production to the value of at least	9 units
Horticulture/Irrigation to the value of at least	11 units
Equine to the value of at least	6 units

Elective subjects are chosen from the following list. In addition, students in a given stream may select subjects from other streams as electives provided that any pre-requisites have been satisfied.

Subject Code	Semester Code	Name of Subject	Units
9696	1	Horticultural Crops IA	3
3513	1	Irrigated Crops and Pastures	3
6407	1	Seed Production and Plant Breeding	3
8085	2	Advanced Marketing	3
4765	2	Lotfed Animal Production	3
7493	2	Water Supplies and Irrigation	3
2631	F	Project/Case Study (Additional)	2

3. Associate Diploma in Applied Science (Agricultural Production)

For the award Associate Diploma in Applied Science (Agricultural Production) a student shall complete all subjects listed in the Programme of Study for both years of the course.

3.1 Under special circumstances approval may be given by the Faculty for appropriate subjects to be substituted from other courses into the Agricultural Production course. The total value of such subjects shall not exceed 25% of the total units for the course.

ASSOCIATE DIPLOMA IN APPLIED SCIENCE (AGRICULTURAL PRODUCTION)

Subject Code	Semester Code	Name of Subject	Points
		FIRST YEAR	
6122	1	Resources for Management	3
3427	2	Communications and Statistics	3
2481	2	Horticulture I	2
1395	F	Biology and Pest Control	3
1208	F	Basic Farm Workshop Structures and Services	3
9965	F	Soils, Climatology and Agronomy	3
3492	F	Introductory Animal Production	3
7591	F	Agricultural Practice IA	4
		SECOND YEAR	
5514	1	Horticulture II	2
3763	1	Human Resource Management AD, or	2
4911	2	Commercial Practice A	2

Subject Code	Semester Code	Name of Subject	Points
9311	2	Animal Production IVA	2
4228	F	Agronomy IIA	4
7890	F	Agricultural Practice IIA	4
7690	V	Agricultural Experience A	3
		Stream 1	
7838	1	Animal Production IIIAP	3
7581	1	Small Seeds Production A	2
3812	F	Project and Seminars I	2
		Stream 2	
7152	F	Agricultural Machinery	4
4984	F	Project and Seminars IA	3

Students will take either Stream 1 or Stream 2 in Second Year.

4. Associate Diploma in Applied Science (Farm Management)
For the award Associate Diploma in Applied Science (Farm Management) a student shall complete all subjects listed for both years of the course in the Programme of Study.

ASSOCIATE DIPLOMA IN APPLIED SCIENCE (FARM MANAGEMENT)

Subject Code	Semester Code	Name of Subject	Points
		FIRST YEAR	
2023	1	Farm Accounting FM	3
6122	1	Resources for Management	3
3427	2	Communications and Statistics	3
7701	2	Farm Budgeting and Planning Techniques	3
1395	F	Biology and Pest Control	3
1208	F	Basic Farm Workshop Structures and Services	3
9965	F	Soils, Climatology and Agronomy	3
3492	F	Introductory Animal Production	3
		SECOND YEAR	
5992	1	Farm Business Finance FM	3
3763	1	Human Resource Management AD	2
9311	2	Animal Production IVA	2
1119	2	Farm Business Management	2
7152	F	Agricultural Machinery	4
4228	F	Agronomy IIA	4
4098	F	Principles of Marketing, Policy and Commercial Law	4
4263	F	Integrative Farm Studies A	3

5. Associate Diploma in Applied Science (Horse Husbandry and Management)
For the award Associate Diploma in Applied Science (Horse Husbandry and Management) a student shall complete all subjects listed for both years of the course in the Programme of Study, including one of the streams

Racing
Equitation

ASSOCIATE DIPLOMA IN APPLIED SCIENCE (HORSE HUSBANDRY AND MANAGEMENT)

Subject Code	Semester Code	Name of Subject	Units
		FIRST YEAR	
		Core Subjects	
7203	1	Anatomy and Physiology	6
5186	1	Computer Applications	2
7939	1	Farm Mechanics	4
1732	1	Introductory Horse Husbandry	5
8445	1	Introductory Training and Management	2
7577	2	Agronomy IE	4
2293	2	Horse Handling IA	3
2323	2	Breeding Management	5
1524	2	Commercial Practice	4
1541	F	Stable Management I	5
		Racing Stream	
1535	2	Training and Management I	4
		Equitation Stream	
4658	2	Equitation I	4
		SECOND YEAR	
		Core Subjects	
6999	1	Horse Handling IB	2
5471	1	Horse Health	5
8199	1	Horse Nutrition and Genetics	4
5124	1	Human Resource Management A	4
1265	1	Stable Management and Education to Saddle and Harness	6
3670	2	Project (HM)	3
		Racing Stream	
5524	1	Training and Management II	4
6554	2	Horse Handling II	12
		Equitation Stream	
2975	1	Equitation II	4
3279	2	Equitation and Instructional Skills	12

6. Graduate Diploma in Natural Resources

For the award Graduate Diploma in Natural Resources a student shall satisfy the following requirements:

1. complete not fewer than 24 points from one of the following options:

		Points
Option 1	Group A	20
	Group B	4
Option 2	Group B	12
	Group C	12

2. obtain a grade of Pass or better in all subjects.

This course is available in the external mode only.

GRADUATE DIPLOMA IN NATURAL RESOURCES

Subject Code	Semester Code	Name of Subject	Points
		GROUP A	
5297	1	Natural Resources Management	4
5293	2	Environmental Systems	4
5979	2	Natural Resources Economics	4
9991	F	Land Use Systems and Planning	4
8130	F	Natural Resources Methodology	4
		GROUP B	
1328	1	Extensive Livestock	4
6363	F	Crops and Pastures G	4
1581	F	Dryland Farming Systems	4
7518	F	Communications and Agricultural Extension	4
5635	F	Integrated Land Systems Studies	4
8200	F	Natural Resources Project I	4
1058	F	Rural Sociology	4
3065	F	Soil Conservation G	4
		GROUP C	
6846	F	Natural Resources Project II	12

7. Bachelor of Applied Science (Natural Resources Management)

7.1. The programme of study for students who commenced the course prior to 1992 is set out below.

For the degree Bachelor of Applied Science (Natural Resources Management) a student shall complete all subjects listed for First Year, Second Year and Third Year in the Programme of Study, including one of the streams

Environmental Rehabilitation

Land Assessment

Wildlife and Pest Management

BACHELOR OF APPLIED SCIENCE (NATURAL RESOURCES MANAGEMENT)

Subject Code	Semester Code	Name of Subject	Units
		FIRST YEAR	
6325	1	Biology IB	4
9404	1	Farming Systems	4
4349	1	Introduction to Environmental Systems	4
3618	1	Communication, Media and Extension	4
8773	1	Chemistry and Introductory Biochemistry	4
2636	2	Soils and Climatology I	4
6191	2	Botany	4
8755	2	Data Collection and Analysis	4
1955	2	Hydrology	2
1776	2	Microbiology and Entomology	4
4512	2	Vertebrate Zoology	4
6526	2	Geomorphology	2
5721	F	Field Studies I	4
		SECOND YEAR	
		Core Subjects	
6076	1	Ecology of Populations	4
8349	1	E.I.A. Methodology	4
8220	1	Fauna Survey and Habitat Assessment	4
9505	1	Mapping, Surveying and Remote Sensing	4
3394	1	Personal Communication	2
8278	2	Vegetation Survey	4
4163	2	Economics of Resource Management	4
4565	2	Ecology of Communities	4
1546	F	Seminar I	2
1382	F	Field Studies II	6
		Environmental Rehabilitation Stream	
8411	1	Environmental Chemistry I	4
		Land Assessment Stream	
3799	2	Geographic Information Systems I	4
		Wildlife and Pest Management Stream	
8189	V	Vertebrate Pest Control	4
		THIRD YEAR	
		Core Subjects	
5561	1	Aboriginal Land Use and Management	2
7887	1	Environmental Law	4
3386	1	Integrated Catchment Management	4
9929	2	Ecology and Management of Agricultural Systems	4
2280	2	Systems Modelling	4
1284	F	Seminar II	2
1564	F	Field Studies III	6

Subject Code	Semester Code	Name of Subject	Units
		Environmental Rehabilitation Stream	
2776	2	Pollution and Waste Management	4
4058	2	Land Rehabilitation and Soil Conservation	4
	2	Electives	8
		Land Assessment Stream	
4426	1	Crops and Pastures	4
4058	2	Land Rehabilitation and Soil Conservation	4
9232	2	Remote Sensing and Land Capability Assessment	4
	2	Elective	4
		Wildlife and Pest Management Stream	
4637	1	Integrated Pest Management	4
9920	2	Fauna Management	4
	2	Electives	8

ELECTIVES (YEARS 2 AND 3)

There is an Elective component in each Stream.

Environmental Rehabilitation to the value of	8 units
Land Assessment to the value of	4 units
Wildlife and Pest Management to the value of	8 units

Elective subjects should be chosen from the following list of subjects available at Roseworthy Campus so that the workloads in the second semester of each of Years 2 and 3 are roughly equal. 8189 *Vertebrate Pest Control* (4 units) is available during the Summer Vacation to students from the Environmental Rehabilitation and Land Assessment Streams but there is a quota on enrolments. Other suitable electives may be available from the subjects offered at the North Terrace or Waite Campuses.

Subject Code	Semester Code	Name of Subject	Units
8035	2	Behavioural Ecology*	2
6062	2	Ecology and Management of the Arid Zone	4
1270	2	Ecology and Management of Forests and Woodlands	4
8691	2	Ecology and Management of Freshwater Systems	4
4638	2	Recreation Management*	4

Electives should be chosen after consultation with the Course Adviser.

* Not available in 1992.

7.2 The first year of the Programme of Study for students who commence the course in 1992 is set out below.

Subject Code	Semester Code	Name of Subject	Points
8057	1	Biology INR	3
7151	1	Chemistry IHA	3
2247	1	Agriculture, Environment and Society	3
1775	1	Field Studies IA	3
3283	2	Soils	3
8728	2	Diversity of Australian Higher Plants and Animals	4

Subject Code	Semester Code	Name of Subject	Points
6976	2	Biomathematics and Statistics	3
1776	2	Microbiology and Entomology	2

8. Graduate Diploma in Wine

For the award Graduate Diploma in Wine a student must complete all subjects specified in the Programme of Study for the stream of the course in which the student is enrolled.

GRADUATE DIPLOMA IN WINE

Subject Code	Semester Code	Name of Subject	Units
		VITICULTURE STREAM	
		Category V(a)	
6830	2	Graduate Viticulture II	13
8749	F	Farm and Vineyard Business Management	6
7388	F	Graduate Viticultural Engineering	8
3287	F	Graduate Project I	9
		Category V(b) and Category V(c)	
1124	1	Graduate Viticulture I	7
6830	2	Graduate Viticulture II	13
7388	F	Graduate Viticultural Engineering	8
9533	F	Graduate Project II	6
		or	
8749	F	Farm and Vineyard Business Management	6
8783	F	Graduate Sensory Evaluation III	2
		WINE TECHNOLOGY STREAM	
		Category O(a)	
6153	1	Graduate Wine Microbiology I	8
7551	2	Graduate Sensory Evaluation II	3
4568	2	Graduate Wine Technology II	5
8697	2	Graduate Wine Technology III	5
6641	F	Graduate Project III	15
		Category O(b) and Category O(c)	
5545	1	Graduate Sensory Evaluation I	3
3479	1	Graduate Wine Technology IV	3
2739	2	Graduate Wine Microbiology II	4
4568	2	Graduate Wine Technology II	5
8879	F	Graduate Sensory Evaluation IV	2
9427	F	Graduate Wine Technology I	10
3287	F	Graduate Project I	9

9. Bachelor of Applied Science (Wine Science)

9.1. For the degree of Bachelor of Applied Science (Wine Science) a student who commenced the course prior to 1992 shall complete all subjects listed for First Year, Second Year and Third Year in the Programme of Study, including one of the streams

Oenology

Viticulture

BACHELOR OF APPLIED SCIENCE (WINE SCIENCE)

Subject Code	Semester Code	Name of Subject	Units
		FIRST YEAR	
1127	1	Biology IC	4
1576	1	Chemistry IA	8
3244	1	Information Processing	3
3800	1	Introduction to Wine Science	5
3572	2	Biochemistry	6
8574	2	Climatology and Soils	4
4251	2	Engineering	4
2326	1 or 2	Statistics	3
6291	2	Viticulture I	5
6096	2	Wine Microbiology I	5
		SECOND YEAR	
		Oenology Stream	
7454	1	Grape and Wine Analysis (O)	6
2563	1	Sensory Evaluation I	3
3669	1	Viticulture II (O)	4
4634	1	Wine Technology I	6
5459	1	Winery Operations	5
3303	2	Business Finance I	3
2102	2	Sensory Evaluation II	4
6787	2	Tour I (O)	1
5736	2	Wine Microbiology II	8
4575	2	Wine Technology II	5
2917	2	Winery Engineering	4
		Viticulture Stream	
6565	1	Grape and Wine Analysis (V)	5
2563	1	Sensory Evaluation I	3
2312	1	Viticulture II (V)	5
4634	1	Wine Technology I	6
5459	1	Winery Operations	5
7280	1	Basic Irrigation	3
3303	2	Business Finance I	3
4896	2	Tour I (V)	1
4052	2	Vineyard Operations	5
5103	2	Viticulture III	6
2826	2	Viticultural Engineering	5

Subject Code	Semester Code	Name of Subject	Units
		THIRD YEAR	
		Oenology Stream	
2080	1	Viticulture V	3
8144	1	Winery Experience	8
7463	2	Marketing I	3
2791	2	Tour II (O)	1
6640	2	Wine Technology III	4
8233	2	Wine Technology IV	5
8372	2	Winery Management	4
4420	F	Business Management I	3
2709	F	Sensory Evaluation III	6
		Viticulture Stream	
9393	1	Horticultural Technology	2
6079	1	Vineyard Experience and Case Study	10
7463	2	Marketing I	3
6198	2	Tour II (V)	1
3933	2	Vineyard Business Management	8
2426	2	Viticulture IV	8
4420	F	Business Management I	3
2709	F	Sensory Evaluation III	6

Note: Students commencing the Wine Science course in 1992 will enrol in the Bachelor of Agricultural Science and will follow the course detailed in the Schedules for the Bachelor of Agricultural Science, Schedule V: Major in Viticulture or Oenology.

10. Associate Diploma in Wine Marketing

For the award Associate Diploma in Wine Marketing a student shall complete all subjects listed in the Programme of Study for both years of the course.

This course is available in both the internal and the external modes.

ASSOCIATE DIPLOMA IN WINE MARKETING

Subject Code	Semester Code	Name of Subject	Units
		FIRST YEAR	
6972	1	Advertising, Promotion and Public Relations	3
3956	1	Computing	3
6923	1	Grape and Wine Production	3
4750	1	Introductory Marketing	3
4135	1	Sales and Communications	3
4021	1	Sensory Evaluation IA	3
4603	2	Accounting and Financial Management	4
7110	2	Consumer Behaviour	4
3733	2	Managerial Economics	3
4194	2	Market Research — Quantitative	3
3478	2	Wine in Society	2
3451	2	Wine Marketing in Australia	2
2712	V	Market Experience	4

Subject Code	Semester Code	Name of Subject	Units
		SECOND YEAR	
1559	1	Commercial Law	3
4154	1	International Marketing I	3
1012	1	Market Research — Qualitative	3
1142	1	Viticulture	4
2167	1	Wine Technology	5
1141	2	Business Management	3
5508	2	Group Marketing Studies	3
7614	2	Sensory Evaluation IIA	6
3345	2	Strategic Marketing	5
5627	2	Tour (undertaken in intra-semester break)	1
8923	F	Individual Project	4

SCHEDULE IX: HONOURS DEGREE OF BACHELOR OF APPLIED SCIENCE (AGRICULTURE) AND BACHELOR OF APPLIED SCIENCE (NATURAL RESOURCES MANAGEMENT)

1(a). Each Honours degree shall require one year of full-time study including a supervised research project.

(b) The Honours degree of Bachelor of Applied Science (Agriculture) may be taken in the Departments of:

Agricultural Technology
Business and Extension
Crop Protection
or Plant Science

or, with the approval of the Faculty in each case, in a subject taught by another department of the University.

(c) The Honours degree of Bachelor of Applied Science (Natural Resources Management) component of the coursework may be taken in the Department of Environmental Science and Rangeland Management, or, with the approval of the Faculty, in another Department of the University.

2. A candidate may proceed to the Honours degree in one of the above subjects provided that the candidate has obtained, before enrolment, the approval of the Department concerned, and of the Faculty if the Department is in another Faculty of the University.

3. A candidate for the Honours degree in any subject shall not begin the final year Honours work in that subject until he or she has qualified for the Ordinary Degree of Bachelor of Applied Science (Agriculture, Natural Resources Management, or Wine Science) or has qualified for a degree regarded by the Faculty of Agricultural and Natural Resource Sciences as equivalent, and has completed such pre-requisite subjects as may be prescribed in the syllabus.

4. When, in the opinion of the Faculty of Agricultural and Natural Resource Sciences, special circumstances exist, the Council, on the recommendation of the Faculty in each case, may vary the provisions of clauses 2, 3 and 4 above.

SCHEDULE X: STUDENT APPEALS

(Note: The following shall apply subject to any general policy promulgated by the University as a result of a review currently being undertaken.)

1. Request for a re-evaluation of any assessed work

(1) A student who is dissatisfied with a grade given for any assessed work in a subject shall, in the first instance, consult the Subject Co-ordinator concerned directly. This shall be done

within ten (10) working days, or in exceptional circumstances at the discretion of the Registrar, from the notification of the grade to the student.

(2) In the event that the matter is unresolved at this point, the student will consult with the Subject Co-ordinator's immediate supervisor.

(3) If, after the process of consultation, the student still considers that the grade awarded for the piece of work is below his/her reasonable expectations, the student may request that the piece of work be re-marked.

(a) A request for a re-mark must be made in writing and lodged with the Student Records Office at the Roseworthy Campus within ten (10) working days of the return of the assignment to the student. In making the request the student must offer cogent justification for a re-mark.

The request will be referred to the appropriate Head of Department who, after considering the reasons provided by the student and after consultation with the Subject Co-ordinator, will within ten (10) working days, either,

(i) re-mark the assignment or have it re-marked by another member of the academic staff of the University or of another institution who has the relevant expertise, or

(ii) deny the request on the grounds that insufficient evidence has been produced by the student to warrant a re-mark. If it is decided to deny the request, the Head of Department will consult the Dean of Faculty about the decision.

(b) Work to be re-marked is not to be altered.

(c) The work may be submitted only once for re-marking.

(d) The mark awarded in the re-mark shall stand, subject to any appeal to the Student Academic Appeals Committee.

(Note: The implication of Paragraph (3)(d) is that as a result of a re-mark a grade may be raised or lowered or may remain unchanged.)

(4) If a student wishes to challenge the grade received after a re-mark, he/she may lodge an appeal within ten (10) working days of the notification of the result of the re-mark with the Secretary of the Student Academic Appeals Committee on the grounds that:

(a) the assessment requirements specified in the subject description distributed to students at the beginning of term were not adhered to, or were inadequately specified, and/or

(b) no adequate explanation of the grade has been given and/or in the opinion of the student the grade is below the student's reasonable expectations.

2. Request for re-evaluation of a Final Grade given for a Subject

(1) Any student who is dissatisfied with a final grade given for a subject shall in the first instance consult with the Subject Co-ordinator involved in the assessment. This shall be done within ten (10) working days, or in exceptional circumstances at the discretion of the Registrar, from the notification of the final grade to the student.

(2) In the event that the matter is unresolved at this point the student will consult the Subject Co-ordinator's immediate supervisor.

(3) If, after the process of consultation, a student wishes to challenge the grade received the student may lodge an appeal with the Secretary of the Student Academic Appeals Committee within ten (10) working days after the consultation with the Subject Co-ordinator's supervisor on the grounds that:

(a) the assessment requirements specified in the subject description distributed to students at the beginning of term were not adhered to, or were inadequately specified, and/or

(b) no adequate explanation of the grade has been given and/or in the opinion of the student the grade is below the student's reasonable expectations.

3. Procedure to be followed by a student who has been notified that he/she has been precluded

(1) A student whose progress has been reviewed by Faculty in terms of Schedule IV and who is deemed to be liable for preclusion will be asked to show cause why he/she should not be precluded. Students so notified will be supplied with copy of the document *Academic Progress: Application of Clause 4C of Chapter XXV of the Statutes — Information for Students* in which the procedures to be followed by students in lodging an appeal are set out.

4. Request for reconsideration of a decision made by a Committee of the University
(1) A student who believes that a decision made by a Committee of the University is unjust, unreasonable or harsh may request reconsideration of that decision.
A student has the right to request reconsideration of a decision regarding
(a) limitations placed on the student's programme of study.
(b) status applications which have been unsuccessful.
(c) classification of the student as having made unsatisfactory progress in his/her course of study.
(d) exclusion of the student from certain subjects, either by the imposition of quotas or by making other changes, which would make it impossible for the student to complete his/her course of study.
(e) variation of administrative procedures in such a way as to prevent the student from completing a course of study, or to disadvantage the student in significant ways.
(2) The request for reconsideration shall be lodged in writing with the Secretary of the relevant committee within ten (10) working days from the time of the student being notified of the decision.
(3) Prior to, or at the time of, the reconsideration by the appropriate committee, the student may provide any information he/she feels should be taken into account when the committee is reconsiderating the issue.
(4) If the student is still dissatisfied with the decision after it has been reconsidered by the original Committee, he/she may lodge a written appeal to the Student Academic Appeals Committee with the Secretary of that Committee. Such an appeal must be lodged within ten (10) working days, or in exceptional circumstances at the discretion of the Registrar, of the notification in writing of the Committee's decision.

ASSOCIATE DIPLOMA IN APPLIED SCIENCE (AGRICULTURAL PRODUCTION)

SYLLABUSES

2912 Agricultural Practice I

Availability: Continuing students only.

Level: I.

Unit value: 6.

Duration: Full year.

Pre-requisite: Students should have a South Australian Class 1 Driver's Licence endorsed to Class 2 for on-Campus use.

Contact hours: 13 days' practical work experience, plus 13 three-hour demonstrations. Two-day shearing and wool classing practicals in vacation.

Content: Practical experience—students are rostered to work on all farm enterprises where basic skills and knowledge in production agriculture are developed.
Farm operations—practical demonstrations on a broad range of farm enterprise operations are presented and involve students in developing their skills.
Wool harvesting programme—demonstrations and practical experience in shearing and wool classing are presented in conjunction with the Australian Wool Corporation.

7591 Agricultural Practice IA

Level: I.

Points value: 4.

Duration: Full year.

Pre-requisites: Students should have a South Australian Class 1 Driver's Licence endorsed to Class 2 for on-Campus use.

Contact hours: 13 days' practical work experience, plus 13 three-hour demonstrations. Two-day shearing and wool classing practicals in vacation.

Content: Practical experience — students are rostered to work on all farm enterprises where basic skills and knowledge in production agriculture are developed. Farm operations — practical demonstrations on a broad range of farm enterprise operations are presented and involve students in developing their skills. Wool harvesting programme — demonstrations and practical experience in shearing and wool classing are presented in conjunction with the Australian Wool Corporation.

4291 Agronomy I

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: Basic biology, soil science and climatology.

Contact hours: 26 hours of lectures and 26 hours of practicals.

Content: The principles and practices of cereal crop and pasture production. The importance of achieving yield potential in crops and pastures. Factors reducing yields in crops and pastures—weed competition, time of seeding, soil-borne diseases.
Practical work includes recognition and identification of common crop and pasture cultivars, weeds, pests and diseases. A collection of common weeds, crops and pastures is an important component of this subject.

9283 Animal Production I

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 2 hours of lectures and 1 one-hour tutorial per week.

Content: This subject deals with basic studies in the following: anatomy of farm animals (particularly sheep and cattle), physiology of digestion and the principles of nutrition, physiology of reproduction and lactation, the normal pattern of growth and development of farm animals, and its relationship to meat science, the principles of animal genetics and animal breeding, principles of animal health and disease control, physiology of fibre growth and development.

6040 Animal Production IIA

Availability: Continuing students only.

Level: I.

Unit value: 2.

Duration: Semester II.

Assumed knowledge: 9283 Animal Production I.

Contact hours: The equivalent of 1 lecture and 1 one-hour practical per week.

Content: The annual cycle and/or cycle of production for the following industries: sheep (wool and meat production), beef cattle and horses; the measurement of productivity and examination of associated characteristics for these forms of livestock; the history and descriptions of breeds of commercial relevance in Australia; size, distribution and organisation of these animal industries.

3678 Animal Production IIB

Availability: Continuing students only.

Level: I.

Unit value: 2.

Duration: Semester II.

Assumed knowledge: 9283 Animal Production 1.

Contact hours: The equivalent of 1 lecture and 1 one-hour practical per week.

Content: The annual cycle and/or cycle of production for poultry, pig and dairy industries; the measurement of productivity and examination of associated characteristics for these livestock; the history and descriptions of breeds of commercial relevance in Australia; size, distribution and organisation of these animal industries.

1208 Basic Farm Workshop Structures and Services

Level: I.

Points value: 3.

Duration: Full year.

Assumed knowledge: Year 10 Maths.

Contact hours: 1 one-hour lecture and 1 two-hour practical per week.

Content: Basic arc and oxy welding, motor mechanics, concreting, fencing and surveying. Sufficient engineering theory is presented to enable students to solve elementary design problems for farm water supply systems, fences, buildings and electric circuits.

Assessment: Assignments/tests (20%); practical tasks (30%); examination (50%).

References: To be advised.

3518 Basic Horticulture

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester II.

Contact hours: 2 hours of lectures and 1 one-hour practical per week.

Content: The importance of horticulture to mankind and the economic value of horticultural crops in South Australia; environmental factors in horticultural production; perennial plant growth and its control, including pruning principles; the propagation of horticultural crops; flowering and fruit production.

1395 Biology and Pest Control

Level: I.

Points value: 3.

Duration: Full year.

Contact hours: 2 hours lectures per week; 1 x 2 hour practical per fortnight.

Content: Cell biology: structure and function of cells, cell division, mitosis and meiosis. Mendelian genetics. Classification and nomenclature: description and morphological characteristics of viruses and the kingdoms Monera, Protista, Fungi, Plantae and Animalia.
Intro. to ecology: biosphere, biogeochemical cycles, nutrient budgets, trophic levels, communities and populations, succession, carrying capacity, competition, symbiosis, and predator-prey relationships.
Entomology: basic insect anatomy, reproduction and life cycles, insect feeding behaviour, key inspect pests and beneficials; monitoring and control strategies.
Plant pathology: pathogens, biotrophs or necrotrophs; key diseases; monitoring and control strategies.
Occ. health and safety: issues will be included when and where appropriate.

Assessment: Theory exam 50% (mid year 25%; final 25%); Prac. exam 20% (mid year 10%; final 10%); Insect Colln. 20%; Disease Colln. 10%.

Text-books: Fenemore, P. G., *Plant pests and their control* (Butterworths); Raven, P. H. & Johnson, G. B., *Biology*, 2nd ed. (Times Mirror/Mosby).

8140 Biology IA

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 2 lectures per week and 1 two-hour practical each fortnight.

Content: Cell biology: structure and function of cells, cell division, mitosis and meiosis.

Mendelian genetics. Classification and nomenclature: description and morphological characteristics of viruses and the kingdoms Monera, Protista, Fungi, Plantae and Animalia. Ecology: biosphere, biogeochemical cycles, nutrient budgets, trophic levels, communities and populations, succession, carrying capacity, competition, symbiosis, and predator-prey relationships.

1506 Communication I

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Semester II.

Contact hours: 4 hours per week.

Content: Communications in theory and practice. Why communicate? Why study communications? Methods of studying communications, communications models, feedback, report and letter writing: format, style, framework; informal and formal communications, non-verbal communications; writing for the media; speaking, especially public speaking—posture, voice, timing, script, aids, overhead projector; preparation of material for other media such as audio and video tapes, slides, charts, aids.

Assessment: Report (20%); essay (25%); seminar (20%); practical work (35%).

Text-books: To be advised.

3427 Communications and Statistics

Level: I.

Points value: 3.

Duration: Semester II.

Contact hours: Communications: 26 hrs lectures, 26 hrs practicals. Statistics: 14 hrs lectures, 12 hrs practicals.

Content: Communication: Theory and practice; communications models; report and letter writing; informal and formal communication; non-verbal communication; speaking — particularly public speaking; preparation of material for other media such as audio tapes, slides, charts, aids. Statistics: Experimental design, sampling, frequency tables and diagrams; mean, median, mode; standard deviation; ANOVAR: one- and two- way, factorial experiments; linear correlation and regression.

Assessment: Communications — by assignment and seminar work (67%); statistics — by practical work and final exam (33%).

Text-books: As advised.

7661 Decision Support Systems

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Full year.

Contact hours: Statistics—2 hours per week of lectures and tutorials. Computing—7 hours lectures plus 2 hours per week (equivalent) self-directed learning package.

Content: Statistics—lectures on experimental design, sampling, frequency tables and diagrams, mean and median, mode, standard deviation, interval estimates, one-way ANOVAR, two-way ANOVAR, factorial experiments, linear correlation and regression. Practicals on randomisation and sampling, frequency tables and diagrams, measures of central tendency, ANOVAR, linear correlation and regression.

Information Systems—lectures on information systems for rural businesses and the role of computers; introduction to the use of word-processing, spreadsheets, and a database program; communicating with other computers; evaluation of software; evaluation of hardware. Practicals on the use of word-processors, spreadsheets, data-base and communications packages.

Assessment: Computer Practical Exam (36%); Computer Term paper (12%); Computer Theory Exam (12%); Statistics Practicals (15%); Statistics Theory Exam (25%).

Text-books: To be advised.

9678 Engineering IB

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 1 one-hour lecture and 1 two-hour practical per week.

Content: An introduction to welding, workshop techniques and automotive mechanics.

1103 Engineering II

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 9678 Engineering IB.

Contact hours: 1 one-hour lecture and 1 two-hour practical per week.

Content: Topics covered include: forces, moments, power and efficiency; tractor performance—engine and traction; tractor matching and efficient operation; tillage, seeding, fodder conservation and harvesting equipment; occupational safety, health and welfare requirements.

2481 Horticulture I

Level: I.

Points value: 2.

Duration: Semester II.

Contact hours: 2 hours of lectures and 1 one-hour practical per week.

Content: The importance of horticulture to mankind and the economic value of horticultural crops in South Australia; environmental factors in horticultural production; perennial plant growth and its control, including pruning principles; the propagation of horticultural crops; flowering and fruit production.

3492 Introductory Animal Production

Level: I.

Points value: 3.

Duration: Full year.

Contact hours: 2 lectures and 2 hours of practical per week.

Content: Anatomy of farm animals, digestion and nutrition, reproduction and lactation, growth and development and relationship to meat science, genetics and animal breeding, health and disease control, fibre growth and development; production cycles for sheep,

beef, horse, poultry, pig and dairy industries; measurement of productivity, associated characteristics; history, distribution, size and organization of these animal industries.

Assessment: Assignments and practicals (5) (40%); examination (60%).

Text-books/References: References and prescribed reading will be advised.

7093 Pest and Disease Control

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 8140 Biology IA.

Contact hours: 2 lectures per week and 1 two-hour practical per fortnight.

Content: Entomology: basic insect anatomy (internal and external); reproduction and life cycle; insect feeding behaviour; key insect pests and beneficials; monitoring and control strategies. Plant pathology: pathogens; biotrophs or necrotrophs; key diseases; monitoring and control strategies. Occupational Health and Safety: matters of occupational health and safety will be included when and where appropriate.

8284 Resource Management

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 2 lectures and 1 tutorial per week.

Content: The management process and its relationship to components of the course and the components of the system in which rural enterprises operate; the decision-making process; capital and borrowing requirements; time, money and interest rates; investment opportunities; characteristics of land; capability assessment; alternatives to ownership; buying and selling of land; natural resources; labour as a resource.

Assessment: Assignments (50%); two tests (25% each).

Text-books: To be advised.

6122 Resources for Management

Level: I.

Points value: 3.

Duration: Semester I.

Contact hours: 3 hours of lectures, 1 hour of tutorial and 2 hours of practicals per week.

Content: An introduction to capital, land, the environment, labour, and information as resources available to the manager of a rural enterprise. Practicals introduce students to the use of computers to manage information — particularly the use of wordprocessors, databases and spreadsheets.

Assessment: Written assignments (50%); Theory and Practical exams at end of semester (50%).

Text-books: Avison, D. E., *Mastering business microcomputing* (Macmillan, 1987).

1257 Soils and Climatology

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 14 hours of lectures and 28 hours of practical work.

Content: This subject will introduce students to the basic concepts of soil science and climatology. It will provide a basis for understanding soil and climate effects on plant growth. Soils—texture, structure, profiles, classification, survey, organic matter, chemistry, density, volume, moisture and nutrients. Climate—solar radiation, temperature, pressure, winds, precipitation, evaporation, growing seasons.
Practical sessions include soil tests, field tour, soil texture and structure, soil water and nutrients, weather stations and instruments, solar radiation, temperature and interpreting weather maps.

9965 Soils, Climatology and Agronomy

Level: I.

Points value: 3.

Duration: Full year.

Assumed knowledge: Basic Biology.

Contact hours: 1 lecture per week, 1 one-hour tutorial or lecture each fortnight, 1 three-hour practical each fortnight.

Content: Soils and Climatology: composition, profile description, fertility, physical and chemical properties, essential nutrients, nutrient availability, soil and plant analysis, fertilisers, degradation of soils; components of weather, their determination and interpretation from maps and satellite photographs, Australian climates, growing seasons, microclimates.
Agronomy: the principles and practices of cereal crop and pasture production. The importance of achieving yield potential in crops and pasture. Factors reducing yields in crops and pastures, e.g. weed competition, soil-borne diseases, foliar diseases, nutritional factors.
Practical work includes recognition and identification of common crop and pasture cultivars, weeds, pests and diseases. A collection of common weeds, crops and pastures is an important component of this subject.

Assessment: Soils and Climatology: Examination at end of Semester I (25%); Practical exam at end of Semester I (15%); Assignment/reports (10%). Agronomy: Examination at end of Semester II (25%); Practical exam at end of Semester II (10%); Weed collection and journal (15%). Students must pass all sections in order to obtain a pass.

Text-books: Bureau of Meteorology, *Observing the weather: the Australian cooperative observers' guide* (Dept. of Science).

References: Hasenbuiller, R. L., *Soil science and practices* (3rd edn.) (W. B. Brown & Co.); Bureau of Meteorology, *Manual of meteorology, part 1, general meteorology* (Department of Science); Pratley, J. E. (ed.), *Principles of field crop production* (Unversity Press); Wheeler, J. L., Pearson, D. J. & Robards, G. E. (eds.), *Temperate pastures* (Australian Wool Corporation/CSIRO).

4467 Advanced Horticulture

Availability: Continuing students only.

Level: II.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: 3518 Basic Horticulture.

Contact hours: 2 lectures and 2 hours of practicals/tutorials each week.

Content: This subject covers the technical knowledge and professional competence required to manage a commercial fruit/vegetable/nut growing enterprise and the cultural requirements of potential alternative crops.
The syllabus includes crop characteristics and seasonal management operations used in the viticulture, pome fruit, citrus and stone fruit industries and in vegetable, berry, nut and alternative crops.

3590 Agricultural Experience

Availability: Continuing students only.

Level: II.

Unit value: 8.

Duration: Summer Semester.

Contact hours: 20 to 120 days' practical work experience, the duration to be determined by the Subject Co-ordinator. A student with no previous agricultural experience will be required to complete 24 weeks of approved agricultural experience, while a student who has had 12 months' agricultural experience will be required to undertake 4 weeks of experience on an approved commercial enterprise other than the home farm.

Content: In addition to the off-Campus farm experience, students may be required to participate in a Tour programme which will provide them with the opportunity to evaluate alternative forms of agricultural production, research, management practices, agricultural processing and servicing organisations.

7690 Agricultural Experience A

Level: II.

Points value: 3.

Duration: Summer Semester.

Contact hours: 20 to 120 days' practical work experience, the duration to be determined by the Subject Co-ordinator. A student with no previous agricultural experience will be required to complete 24 weeks of approved agricultural experience, while a student who has had 12 months' agricultural experience will be required to undertake 4 weeks of experience on an approved commercial enterprise other than the home farm.

Content: In addition to the off-Campus farm experience, students may be required to participate in a Tour programme which will provide them with the opportunity to evaluate alternative forms of agricultural production, research, management practices, agricultural processing and servicing organisations.

7152 Agricultural Machinery

Level: II.

Points value: 4.

Duration: Full year.

Contact hours: 1 lecture and 2 hours practical per week.

Content: Basic engineering concepts — forces, movements, power and efficiency, tractor performance and matching. Tillage, seeding, fodder conservation, spraying and harvesting equipment — principles of operation. Introduction to electronic components, their operation and use. Application of electronics in monitoring agricultural equipment. Power transmission systems — oil hydraulics components and operation, vee belt and chain drives. Materials handling and storage.

Assessment: Theory examination (50%); assignments (30%); practical reports (20%).

References: Culpin, Claude, *Farm machinery*, 11th ed. (Collins, Ward, Lindsay and Rickman); DDIP, *Tillage equipment*; Vickers, *Mobile hydraulics*.

5070 Agricultural Practice II

Availability: Continuing students only.

Level: II.

Unit value: 6.

Duration: Full year.

Pre-requisite: 2912 Agricultural Practice I.

Contact hours: 26 days' practical work experience including 8 one-hour tutorials with Enterprise Managers.

Content: Practical experience—students are rostered to work on all farm enterprises where skills and knowledge in all areas of production agriculture are further developed.
Enterprise management—students are involved in the management issues of their elective enterprise and are required to undertake a problem-solving contract which addresses one of the issues and provides practical recommendations.

7890 Agricultural Practice IIA

Level: II.

Points value: 4.

Duration: Full year.

Pre-requisites: 2912 Agricultural Practice I.

Contact hours: 26 days' practical work experience including 8 one-hour tutorials with Enterprise Managers.

Content: Practical experience — students are rostered to work on all farm enterprises where skills and knowledge in all areas of production agriculture are further developed.
Enterprise Management — students are involved in the management issues of their elective enterprise and are required to undertake a problem-solving contract which addresses one of the issues and provides practical recommendations.

7849 Agronomy II

Availability: Continuing students only.

Level: II.

Unit value: 6.

Duration: Semester I.

Assumed knowledge: 4291 Agronomy I.

Contact hours: 3 hours of lectures and 3 hours of practicals per week.

Content: The principles and practices of cereal and broadleaf crop production. World distribution and production, crop rotations, tillage practices (including minimum or reduced tillage), trash working, stubble mulching, time of sowing and seeding rates, growth and development, fertilizer requirements, weed control (including selection and application of herbicides), choice of varieties, pests and diseases (including selection and application of sprays, etc.), harvesting, storage and utilisation, pure seed production, cereal hay production and utilisation.

4228 Agronomy IIA

Level: II.

Points value: 4.

Duration: Full year.

Assumed knowledge: 9965 Soils Climatology and Agronomy.

Contact hours: 5 hours per week.

Content: Cereal and broadleaf crop production: distribution, rotations, tillage, seeding, growth and development, fertilisers, weed and pest control, harvesting, storage, utilisation, seed and hay production, choice of varieties. Comparison of conventional and organic farming techniques. Use of computer crop models.
Pastures: distribution, improvement, establishment, feed value, growth, reaction to cutting and grazing, management, annuals and perennials, legumes and/or grasses, utilisation, fodder conservation, irrigation, seed production, fodder crop.

Assessment: Written theory exams (50%); Practicals and practical exams (30%); Field assignments (projects) (20%).

Text-books: References announced at first lecture.

5123 Agronomy III

Availability: Continuing students only.

Level: II.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 4291 Agronomy I; 7849 Agronomy II; 1257 Soils and Climatology.

Contact hours: 2 lectures per week and 1 tutorial and 1 three-hour practical each fortnight.

Content: The feed value of pastures; pasture establishment; how pastures grow and react to grazing and cutting; pasture management (fertilizers, weeds, insect pests, diseases, grazing management); annual and perennial legumes and grasses, grass/legume mixtures; pasture utilisation strategies; fodder conservation (hay and silage); irrigated pastures; fodder crops for grazing; pastures of humid tropical and sub-tropical areas.
Laboratory work includes identification of pasture cultivars and assessment of hay quality.
Field work includes practice in assessing the condition of pastures for management purposes, simple field trials for comparing the production of pasture cultivars and the effects of management factors, and visits to farms and research centres.

7838 Animal Production IIIAP

Level: II.

Points value: 3.

Duration: Semester I.

Assumed knowledge: 9283 Animal Production I; 3678 Animal Production IIB.

Contact hours: 6 hours per week.

Content: This subject deals with dairy cattle, pigs and poultry. Dairy cattle: this section gives a working knowledge of the management of a dairy farm as well as an understanding of the manufacturing and marketing sectors of the dairy industry. Pigs and Poultry: this section deals with the physical resources required for modern intensive pig and poultry production and the management practices used in the respective industries. It also looks at various aspects of the chicken meat, egg and pig industries.

5649 Animal Production IIIA

Availability: Continuing students only.

Level: II.

Unit value: 6.

Duration: Semester I.

Assumed knowledge: 9283 Animal Production I; 3678 Animal Production IIB.

Contact hours: 6 hours per week.

Content: This subject deals with dairy cattle, pigs and poultry. Dairy cattle: this section gives a working knowledge of the management of a dairy farm as well as an understanding of the manufacturing and marketing sectors of the dairy industry.
Pigs and Poultry: this section deals with the physical resources required for modern intensive pig and poultry production and the management practices used in the respective industries. It also looks at various aspects of the chicken meat, egg and pig industries.

9706 Animal Production IV

Availability: Continuing students only.

Level: II.

Unit value: 5.

Duration: Semester II.

Assumed knowledge: 6040 Animal Production IIA.

Contact hours: 2 lectures, 1 one-hour tutorial and 1 two-hour practical session per week.

Content: Recent developments in the optimization of beef cattle and sheep fertility; growth and wool production; assessment of quality in wool and meat products; a study of local and overseas markets for beef and sheep products.

9311 Animal Production IVA

Level: II.

Points value: 2.

Duration: Semester II.

Assumed knowledge: 6040 Animal Production IIA.

Contact hours: 2 lectures, 1 one-hour tutorial and 1 two-hour practical session per week.

Content: Recent developments in the optimization of beef cattle and sheep fertility; growth and wool production; assessment of quality in wool and meat products; a study of local and overseas markets for beef and sheep products.

1524 Commercial Practice

Availability: Continuing students only.

Level: II.

Unit value: 4.

Duration: Semester II.

Contact hours: 3 lectures and 1 one-hour tutorial per week.

Content: Law: Australian legal system, duty of care in tort, law of contract, agency, insurance, cheques, consumer law, business structure, occupational safety, health and welfare.
Marketing: marketing concept, consumer behaviour, the marketing environments, the marketing mix, the marketing plan.
Financial Management: introduction to small business and financial management, managing working capital, managing long lived assets, sources of finance, planning financial structure, analysis and interpretation of financial statements, budgeting, cost/volume/profit analysis, making tactical decisions.

Assessment and *Text-book* information for 4911 Commercial Practice A apply here also.

4911 Commercial Practice A

Level: II.

Points value: 2.

Duration: Semester II.

Content: Law: Australian legal system, duty of care in tort, law of contract, agency, insurance, cheques, consumer law, business structure, occupational safety, health and welfare.
Marketing: marketing concept, consumer behaviour, the marketing environments, the marketing mix, the marketing plan.
Financial Management: introduction to small business and financial management, managing working capital, managing long lived assets, sources of finance, planning financial structure, analysis and interpretation of financial statements, budgeting, cost/volume/profit analysis, making tactical decisions.

Assessment: Assignments (40%); examination (60%).

Text-books: McMahon, R., *Financial management for small business*, CCH, 1986; Vermeesch, R. B. & Lindgren, K. E., *Business law of Australia* 5th ed., Butterworth, 1986 or Latimer, P., *Australian business law*, 1988 edn., CCH or Yorston, Fortescue and Turner, *Australian mercantile law*, 17th ed., Law Book Co., 1985; Hearne, James, *Marketing for managers*, Arnold; November, Peter, *Practical marketing in Australia*, Wiley and Sons.

3131 Engineering III

Availability: Continuing students only.

Level: II.

Unit value: 3.

Duration: Full year.

Assumed knowledge: 1103 Engineering II.

Contact hours: 1 lecture and 1 two-hour practical per week.

Content: Topics include: oil hydraulics—pumps, controls and actuators; electronics—components, operation of agricultural monitors; vee belt and chain drives; materials handling equipment.

7226 Engineering IV

Availability: Continuing students only.

Level: II.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: Basic mathematics.

Contact hours: 1 lecture, 1 tutorial and 1 two-hour practical per week.

Content: An introduction to farm building design, fencing, electric circuits and motors and simple water reticulation systems. Students will undertake basic surveying exercises and solve elementary design problems.

5514 Horticulture II

Level: II.

Points value: 2.

Duration: Semester I.

Assumed knowledge: 3518 Basic Horticulture.

Contact hours: 2 lectures and 2 hours of practicals/tutorials each week.

Content: This subject covers the technical knowledge and professional competence required to manage a commercial fruit/vegetable/nut growing enterprise and the cultural requirements of potential alternative crops.
The syllabus includes crop characteristics and seasonal management operations used in the viticulture, pome fruit, citrus and stone fruit industries and in vegetable, berry, nut and alternative crops.

5124 Human Resource Management A

Availability: Continuing students only.

Level: II.

Unit value: 4.

Duration: Semester I.

Contact hours: 2 hours of lectures and 2 hours of tutorials per week.

Content: Organisational structure and objectives, human resource planning, work study, recruitment, selection, induction, training, development, motivation, appraisal, rewards and benefits, safety, health and welfare issues, industrial relations, dismissal, supervision, leadership.

Assessment: Assignments (85%); tutorials (15%).

Text-books: To be advised.

3763 Human Resource Management AD

Level: II.

Points value: 2.

Duration: Semester I.

Contact hours: 2 hours of lectures and 2 hours of tutorials per week.

Content: Organisational structure and objectives, human resource planning, work study, recruitment, selection, induction, training, development, motivation, appraisal, rewards and benefits, safety, health and welfare issues, industrial relations, dismissal, supervision, leadership.

Assessment: Assignments (85%); tutorials (15%).

Text-books: To be advised.

8116 Project (AP)

Availability: Continuing students only.

Level: II.

Unit value: 3.

Duration: Semester II.

Contact hours: Formal contact between student and Supervisor during the project is by mutual agreement.

Content: Projects may comprise some or all of literature reviews, field trials, laboratory experiments, industry surveys, seminars and written reports. It is the student's responsibility to discuss his/her project with the Subject Co-ordinator (and members of staff who will supervise the project).

3812 Project and Seminars I

Level: II.

Points value: 2.

Duration: Full year.

Contact hours: Formal contact between student and supervisor during the project is by mutual agreement. Seminar programme reorganized annually.

Content: Projects may comprise some or all of literature reviews, field trials, laboratory experiments, industry surveys, seminars and written reports. It is the student's responsibility to discuss his/her project with the Subject Co-ordinator (and members of staff who will supervise the project).
Agricultural seminars are given throughout the year on a wide range of topics by a number of people from both off and on Campus. Students and staff who attend the seminars are encouraged to question seminar speakers and discuss points raised by the speakers.

Assessment: Project 95%; seminars 5%, based on written report(s). N.B. Students must attend at least 80% of seminars (or approved make-up seminars) in order to pass the subject.

Text-books: Not applicable.

4984 Project and Seminars IA

Level: II.

Points value: 3.

Duration: Full year.

Contact hours: Formal contact between students and supervisor during the project is by mutual agreement. Seminar programme reorganized annually.

Content: Projects may comprise some or all of literature review, field trials, laboratory experiments, industry surveys, seminars and written reports. It is the student's responsibility to discuss his/her project with the Subject Co-ordinator (and members of staff who will supervise the project). Project and Seminars IA has a larger project requirement than Project and Seminars I.
Agricultural seminars are given throughout the year on a wide range of topics by a number of people from both off and on Campus. Students and staff who attend the seminars are encouraged to question seminar speakers and discuss points raised by the speakers.

Assessment: Project 95%; seminars 5%, based on written report(s). N.B. Students must attend at least 80% of seminars (or approved make-up seminars) in order to pass the subject.

Text-books: Not applicable.

6998 Seminars

Availability: Continuing students only.

Level: II.

Unit value: 1.

Duration: Full year.

Contact hours: Five two-hour sessions per semester.

Content: Throughout the year agricultural seminars are given on a wide range of topics by a number of people from both off and on Campus. Students and staff who attend the seminars are encouraged to question seminar speakers and discuss points raised by the speakers.

8474 Small Seeds Production

Availability: Continuing students only.

Level: II.

Points value: 4.

Duration: Semester I.

Assumed knowledge: 4291 Agronomy I.

Contact hours: 2 lectures per week and 1 tutorial and 1 three-hour practical per fortnight.

Content: The Small Seeds industry and its importance. The Seeds Act and associated regulations; seed quality testing; importance of Certified Seed and means of providing it to farmers. Selection of cultivars. Establishment, management and harvesting of dryland and irrigated small seeds crops (annual medics and clovers, perennial clovers, grasses and lucerne). Pollination of seed crops; maintenance of genetic integrity. Seed cleaning, grading and storage. Cultivar development and commercialisation; Plant Variety Rights.

7581 Small Seeds Production A

Level: II.

Points value: 2.

Duration: Semester I.

Assumed knowledge: 4291 Agronomy I.

Contact hours: 2 lectures and 1 tutorial and 1 three-hour practical per fortnight.

Content: The Small Seeds industry and its importance. The Seeds Act and associated regulations; seed quality testing; importance of Certified Seed and means of providing it to farmers. Selection of cultivars. Establishment, management and harvesting of dryland and irrigated small seeds crops (annual medics and clovers, perennial clovers, grasses and lucerne). Pollination of seed crops; maintenance of genetic integrity. Seed cleaning, grading and storage. Cultivar development and commercialisation; Plant Variety Rights.

ASSOCIATE DIPLOMA IN APPLIED SCIENCE (FARM MANAGEMENT)

SYLLABUSES

4291 Agronomy I

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: Basic biology, soil science and climatology.

Contact hours: 26 hours of lectures and 26 hours of practicals.

Content: The principles and practices of cereal crop and pasture production. The importance of achieving yield potential in crops and pastures. Factors reducing yields in crops and pastures—weed competition, time of seeding, soil-borne diseases.
Practical work includes recognition and identification of common crop and pasture cultivars, weeds, pests and diseases. A collection of common weeds, crops and pastures is an important component of this subject.

9283 Animal Production I

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 2 hours of lectures and 1 one-hour tutorial per week.

Content: This subject deals with basic studies in the following: anatomy of farm animals (particularly sheep and cattle), physiology of digestion and the principles of nutrition, physiology of reproduction and lactation, the normal pattern of growth and development of farm animals, and its relationship to meat science, the principles of animal genetics and animal breeding, principles of animal health and disease control, physiology of fibre growth and development.

6040 Animal Production IIA

Availability: Continuing students only.

Level: I.

Unit value: 2.

Duration: Semester II.

Assumed knowledge: 9283 Animal Production I.

Contact hours: The equivalent of 1 lecture and 1 one-hour practical per week.

Content: The annual cycle and/or cycle of production for the following industries: sheep (wool and meat production), beef cattle and horses; the measurement of productivity and examination of associated characteristics for these forms of livestock; the history and

descriptions of breeds of commercial relevance in Australia; size, distribution and organisation of these animal industries.

1208 Basic Farm Workshop Structures and Services

Level: I.

Points value: 3.

Duration: Full year.

Assumed knowledge: Year 10 Maths.

Contact hours: 1 one-hour lecture and 1 two-hour practical per week.

Content: Basic arc and oxy welding, motor mechanics, concreting, fencing and surveying. Sufficient engineering theory is presented to enable students to solve elementary design problems for farm water supply systems, fences, buildings and electric circuits.

Assessment: Assignments/tests (20%); practical tasks (30%); examination (50%).

References: To be advised.

8140 Biology IA

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 2 lectures per week and 1 two-hour practical each fortnight.

Content: Cell biology: structure and function of cells, cell division, mitosis and meiosis. Mendelian genetics. Classification and nomenclature: description and morphological characteristics of viruses and the kingdoms Monera, Protista, Fungi, Plantae and Animalia. Ecology: biosphere, biogeochemical cycles, nutrient budgets, trophic levels, communities and populations, succession, carrying capacity, competition, symbiosis, and predator-prey relationships.

1395 Biology and Pest Control

Level: I.

Points value: 3.

Duration: Full year.

Contact hours: 2 hours lectures per week; 1 x 2 hour practical per fortnight.

Content: Cell biology: structure and function of cells, cell division, mitosis and meiosis. Mendelian genetics. Classification and nomenclature: description and morphological characteristics of viruses and the kingdoms Monera, Protista, Fungi, Plantae and Animalia.
Intro. to ecology: biosphere, biogeochemical cycles, nutrient budgets, trophic levels, communities and populations, succession, carrying capacity, competition, symbiosis, and predator-prey relationships.
Entomology: basic insect anatomy, reproduction and life cycles, insect feeding behaviour, key inspect pests and beneficials; monitoring and control strategies.
Plant pathology: pathogens, biotrophs or necrotrophs; key diseases; monitoring and control strategies.
Occ. health and safety: issues will be included when and where appropriate.

Assessment: Theory exam 50% (mid year 25%; final 25%); Prac. exam 20% (mid year 10%; final 10%); Insect Colln. 20%; Disease Colln. 10%.

Text-books: Fenemore, P. G., *Plant pests and their control* (Butterworths); Raven, P. H. & Johnson, G. B., *Biology*, 2nd ed. (Times Mirror/Mosby).

1506 Communication I

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Semester II.

Contact hours: 4 hours per week.

Content: Communications in theory and practice. Why communicate? Why study communications? Methods of studying communications, communications models, feedback, report and letter writing: format, style, framework; informal and formal communications, non-verbal communications; writing for the media; speaking, especially public speaking—posture, voice, timing, script, aids, overhead projector; preparation of material for other media such as audio and video tapes, slides, charts, aids.

Assessment: Report (20%); essay (25%); seminar (20%); practical work (35%).

Text-books: To be advised.

3427 Communications and Statistics

Level: I.

Points value: 3.

Duration: Semester II.

Contact hours: Communications: 26 hrs lectures, 26 hrs practicals. Statistics: 14 hrs lectures, 12 hrs practicals.

Content: Communication: Theory and practice; communications models; report and letter writing; informal and formal communication; non-verbal communication; speaking — particularly public speaking; preparation of material for other media such as audio tapes, slides, charts, aids. Statistics: Experimental design, sampling, frequency tables and diagrams; mean, median, mode; standard deviation; ANOVAR: one- and two- way, factorial experiments; linear correlation and regression.

Assessment: Communications — by assignment and seminar work (67%); statistics — by practical work and final exam (33%).

Text-books: As advised.

7661 Decision Support Systems

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Full year.

Contact hours: Statistics—2 hours per week of lectures and tutorials. Computing—7 hours lectures plus 2 hours per week (equivalent) self-directed learning package.

Content: Statistics—lectures on experimental design, sampling, frequency tables and diagrams, mean and median, mode, standard deviation, interval estimates, one-way ANOVAR, two-way ANOVAR, factorial experiments, linear correlation and regression. Practicals on randomisation and sampling, frequency tables and diagrams, measures of central tendency, ANOVAR, linear correlation and regression.
Information Systems—lectures on information systems for rural businesses and the role of computers; introduction to the use of word-processing, spreadsheets, and a database program; communicating with other computers; evaluation of software; evaluation of hardware. Practicals on the use of word-processors, spreadsheets, data-base and communications packages.

Assessment: Computer Practical Exam (36%); Computer Term Paper (12%); Computer Theory Exam (12%); Statistics Practicals (15%); Statistics Theory Exam (25%).

Text-books: To be advised.

9678 Engineering IB

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 1 one-hour lecture and 1 two-hour practical per week.

Content: An introduction to welding, workshop techniques and automotive mechanics.

1103 Engineering II

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 9678 Engineering IB.

Contact hours: 1 one-hour lecture and 1 two-hour practical per week.

Content: Topics covered include: forces, moments, power and efficiency; tractor performance—engine and traction; tractor matching and efficient operation; tillage, seeding, fodder conservation and harvesting equipment; occupational safety, health and welfare requirements.

4547 Farm Accounting

Availability: Continuing students only.

Level: I.

Unit value: 6.

Duration: Semester I.

Contact hours: 6 hours of lectures and tutorials per week, plus a farm visit.

Content: Why financial recording?—guidance, planning data, control. What to record—financial and physical records. Financial and Management Accounting as an information system; concepts and skills relevant to single entry cash analysis systems and double entry accounting systems. The Profit and Loss Account—description and problem areas. Valuations; depreciation; what is profit? The Balance Sheet—layout and analysis. The capital account—proving accounts; sources and disposition of funds statement; computerised recording systems.

Assessment: 4 assignments (10% each); 2 assignments (20% each); examination (20%).

Text-books: To be advised.

2023 Farm Accounting FM

Level: I.

Points value: 3.

Duration: Semester I.

Contact hours: 6 hours of lectures and tutorials per week, plus a farm visit.

Content: Why financial recording? — guidance, planning data, control. What to record — financial and physical records. Financial and Management Accounting as an information system; concepts and skills relevant to single entry cash analysis systems and double entry accounting systems. The Profit and Loss Account — description and problem areas.

Valuations; depreciation; what is profit? The Balance Sheet — layout and analysis. The capital account — proving accounts; sources and disposition of funds statement; computerised recording systems.

Assessment: 4 assignments (10% each); 2 assignments (20% each); examination (20%).

Text-books: To be advised.

7701 Farm Budgeting and Planning Techniques

Level: I.

Points value: 3.

Duration: Semester II.

Assumed knowledge: 8284 Resource Management; 4547 Farm Accounting.

Contact hours: 6 hours of lectures and tutorials per week.

Content: Marginalism; the production function; factor/product relationships; product/product relationships; opportunity cost; cost analysis, gross margin budgeting, limitations of gross margins; the combination and selection of enterprises, allocation of feed cost to livestock categories; partial budgets. The complete budget, developmental budgeting and budgeting over time; budgeting for risk — probability theory, sensitivity analysis, break-even analysis and parametric budgets. Machinery economics and the alternatives to machine ownership; computers in budgeting.

Assessment: Assignments and tutorial work (50%); examination (50%).

Text-books: To be advised.

5399 Farm Planning and Budgeting Techniques

Availability: Continuing students only.

Level: I.

Unit value: 6.

Duration: Semester II.

Assumed knowledge: 8284 Resource Management
4547 Farm Accounting.

Contact hours: 6 hours of lectures and tutorials per week.

Content: Marginalism; the production function; factor/product relationships; product/product relationships; opportunity cost; cost analysis, gross margin budgeting, limitations of gross margins; the combination and selection of enterprises, allocation of feed cost to livestock categories; partial budgets. The complete budget, developmental budgeting and budgeting over time; budgeting for risk—probability theory, sensitivity analysis, break-even analysis and parametric budgets. Machinery economics and the alternatives to machine ownership; computers in budgeting.

Assessment: Assignments and tutorial work (50%); examination (50%).

Text-books: To be advised.

3492 Introductory Animal Production

Level: I.

Points value: 3.

Duration: Full year.

Contact hours: 2 lectures and 2 hours of practical per week.

Content: Anatomy of farm animals, digestion and nutrition, reproduction and lactation, growth and development and relationship to meat science, genetics and animal breeding, health and disease control, fibre growth and development; production cycles for sheep,

beef, horse, poultry, pig and dairy industries; measurement of productivity, associated characteristics; history, distribution, size and organization of these animal industries.

Assessment: Assignments and practicals (5) (40%); examination (60%).

Text-books/References: References and prescribed reading will be advised.

7093 Pest and Disease Control

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 8140 Biology IA.

Contact hours: 2 lectures per week and 1 two-hour practical per fortnight.

Content: Entomology: basic insect anatomy (internal and external); reproduction and life cycle; insect feeding behaviour; key insect pests and beneficials; monitoring and control strategies. Plant pathology: pathogens; biotrophs or necrotrophs; key diseases; monitoring and control strategies. Occupational Health and Safety: matters of occupational health and safety will be included when and where appropriate.

8284 Resource Management

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 2 lectures and 1 tutorial per week.

Content: The management process and its relationship to components of the course and the components of the system in which rural enterprises operate; the decision-making process; capital and borrowing requirements; time, money and interest rates; investment opportunities; characteristics of land; capability assessment; alternatives to ownership; buying and selling of land; natural resources; labour as a resource.

Assessment: Assignments (50%); two tests (25% each).

Text-books: To be advised.

6122 Resources for Management

Level: I.

Points value: 3.

Duration: Semester I.

Contact hours: 3 hours of lectures, 1 hour of tutorial and 2 hours of practicals per week.

Content: An introduction to capital, land, the environment, labour, and information as resources available to the manager of a rural enterprise. Practicals introduce students to the use of computers to manage information — particularly the use of wordprocessors, databases and spreadsheets.

Assessment: Written assignments (50%); Theory and Practical exams at end of semester (50%).

Text-books: Avison, D. E., *Mastering business microcomputing* (Macmillan, 1987).

1257 Soils and Climatology

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 14 hours of lectures and 28 hours of practical work.

Content: This subject will introduce students to the basic concepts of soil science and climatology. It will provide a basis for understanding soil and climate effects on plant growth. Soils—texture, structure, profiles, classification, survey, organic matter, chemistry, density, volume, moisture and nutrients. Climate—solar radiation, temperature, pressure, winds, precipitation, evaporation, growing seasons.
Practical sessions include soil tests, field tour, soil texture and structure, soil water and nutrients, weather stations and instruments, solar radiation, temperature and interpreting weather maps.

9965 Soils, Climatology and Agronomy

Level: I.

Points value: 3.

Duration: Full year.

Assumed knowledge: Basic Biology.

Contact hours: 1 lecture per week, 1 one-hour tutorial or lecture each fortnight, 1 three-hour practical each fortnight.

Content: SOIL: composition, profile description, fertility, physical and chemical properties, essential nutrients, nutrient availability, soil and plant analysis, fertilisers, degradation of soils.
CLIMATOLOGY: components of weather, their determination and interpretation from maps and satellite photographs, Australian climates, growing seasons, microclimates.
AGRONOMY: the principles and practices of cereal crop and pasture production. The importance of achieving yield potential in crops and pasture. Factors reducing yields in crops and pastures, e.g. weed competition, soil-borne diseases, foliar diseases, nutritional factors.
Practical work includes recognition and identification of common crop and pasture cultivars, weeds, pests and diseases. A collection of common weeds, crops and pastures is an important component of this subject.

Assessment: Soils and Climatology: Examination at end of Semester I (25%); Practical exam at end of Semester I (15%); Assignment/reports (10%). Agronomy: Examination at end of Semester II (25%); Practical exam at end of Semester II (10%); Weed collection and journal (15%). Students must pass all sections in order to obtain a pass.

Text-books: Bureau of Meteorology, *Observing the weather: the Australian cooperative observers' guide* (Dept. of Science).

References: Hasenbuiller, R. L., *Soil science and practices* (3rd edn.) (W. B. Brown & Co.); Bureau of Meteorology, *Manual of meteorology, part 1, general meteorology* (Department of Science); Pratley, J. E. (ed.), *Principles of field crop production* (Unversity Press); Wheeler, J. L., Pearson, D. J. & Robards, G. E. (eds.), *Temperate pastures* (Australian Wool Corporation/CSIRO).

7152 Agricultural Machinery

Level: II.

Points value: 4.

Duration: Full year.

Contact hours: 1 lecture and 2 hours of practical per week.

Content: Basic engineering concepts — forces, movements, power and efficiency, tractor performance and matching. Tillage, seeding, fodder conservation, spraying and harvesting equipment — principles of operation. Introduction to electronic components, their operation and use. Application of electronics in monitoring agricultural equipment. Power Transmission systems — oil hydraulics components and operation, vee belt and chain drives. Materials handling and storage.

Assessment: Theory examination 50%, assignments 30%, practical reports 20%.

References: Culpin, Claude, *Farm machinery*, 11th ed., Collins, Ward, Lindsay and Rickman; DDIP, *Tillage equipment*; Vickers, *Mobile hydraulics*.

7849 Agronomy II

Availability: Continuing students only.

Level: II.

Unit value: 6.

Duration: Semester I.

Assumed knowledge: 4291 Agronomy I.

Contact hours: 3 hours of lectures and 3 hours of practicals per week.

Content: The principles and practices of cereal and broadleaf crop production. World distribution and production, crop rotations, tillage practices (including minimum or reduced tillage), trash working, stubble mulching, time of sowing and seeding rates, growth and development, fertilizer requirements, weed control (including selection and application of herbicides), choice of varieties, pests and diseases (including selection and application of sprays, etc.), harvesting, storage and utilisation, pure seed production, cereal hay production and utilisation.

4228 Agronomy IIA

Level: II.

Points value: 4.

Duration: Full year.

Assumed knowledge: xxxx Soils Climatology and Agronomy.

Contact hours: 5 hours per week.

Content: Cereal and broadleaf crop production: distribution, rotations, tillage, seeding, growth and development, fertilisers, weed and pest control, harvesting, storage, utilisation, seed and hay production, choice of varieties. Comparison of conventional and organic farming techniques. Use of computer crop models.
Pastures: distribution, improvement, establishment, feed value, growth, reaction to cutting and grazing, management, annuals and perennials, legumes and/or grasses, utilisation, fodder conservation, irrigation, seed production, fodder crop.

Assessment: Written theory exams 50%; Practicals and practical exams 30%; Field assignments (projects) 20%.

Text-books: Not applicable. References announced at first lecture.

5123 Agronomy III

Availability: Continuing students only.

Level: II.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 4291 Agronomy I; 7849 Agronomy II; 1257 Soils and Climatology.

Contact hours: 2 lectures per week and 1 tutorial and 1 three-hour practical each fortnight.

Content: The feed value of pastures; pasture establishment; how pastures grow and react to grazing and cutting; pasture management (fertilizers, weeds, insect pests, diseases, grazing management); annual and perennial legumes and grasses, grass/legume mixtures; pasture utilisation strategies; fodder conservation (hay and silage); irrigated pastures; fodder crops for grazing; pastures of humid tropical and sub-tropical areas.
Laboratory work includes identification of pasture cultivars and assessment of hay quality.
Field work includes practice in assessing the condition of pastures for management purposes, simple field trials for comparing the production of pasture cultivars and the effects of management factors, and visits to farms and research centres.

9706 Animal Production IV

Availability: Continuing students only.

Level: II.

Unit value: 5.

Duration: Semester II.

Assumed knowledge: 6040 Animal Production IIA.

Contact hours: 2 lectures, 1 one-hour tutorial and 1 two-hour practical session per week.

Content: Recent developments in the optimization of beef cattle and sheep fertility; growth and wool production; assessment of quality in wool and meat products; a study of local and overseas markets for beef and sheep products.

9311 Animal Production IVA

Level: II.

Points value: 2.

Duration: Semester II.

Assumed knowledge: 6040 Animal Production IIA.

Contact hours: 2 lectures, 1 one-hour tutorial and 1 two-hour practical session per week.

Content: Recent developments in the optimization of beef cattle and sheep fertility; growth and wool production; assessment of quality in wool and meat products; a study of local and overseas markets for beef and sheep products.

4011 Business Law and Tax

Availability: Continuing students only.

Level: II.

Unit value: 3.

Duration: Semester II.

Contact hours: 3 hours per week.

Content: Topics to be covered include: Australian legal system, negligence and nuisance, property, contract, agency, employment, occupational safety, health and welfare, insurance, cheques, consumer law, business structure, law and farming practice, taxation, tax and estate planning, professional consultants and planning.

Assessment: Assignments (35%); classwork (15%); examination (50%).

Text-books: Vermeesch & Lindgren, *Business law of Australia* (Butterworth).

3131 Engineering III

Availability: Continuing students only.

Level: II.

Unit value: 3.

Duration: Full year.

Assumed knowledge: 1103 Engineering II.

Contact hours: 1 lecture and 1 two-hour practical per week.

Content: Topics include: oil hydraulics—pumps, controls and actuators; electronics—components, operation of agricultural monitors; vee belt and chain drives; materials handling equipment.

7226 Engineering IV

Availability: Continuing students only.

Level: II.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: Basic mathematics.

Contact hours: 1 lecture, 1 tutorial and 1 two-hour practical per week.

Content: An introduction to farm building design, fencing, electric circuits and motors and simple water reticulation systems. Students will undertake basic surveying exercises and solve elementary design problems.

8535 Farm Business Finance

Availability: Continuing students only.

Level: II.

Unit value: 6.

Duration: Semester I.

Assumed knowledge: 5399 Farm Planning and Budgeting Techniques
4547 Farm Accounting.

Contact hours: Combination of lectures, tutorials, practicals and workshops as appropriate. 6 hours per week on average.

Content: Investment analysis and management: purpose of financial management, Australian financial system, time preference, financial mathematics, interest rates, break-even analysis and leverage, return and risk, investment planning and management (du Pont model, working capital, long-term capital investment, income and capital gains), securities, debt and equity financing for personal and corporate investment, categories of investment, making application for debt finance, debt management, debt restructuring.
Farm business evaluation: there will be a series of four property visits, with the properties covering a range of types. The property reports will consider: enterprise gross margins, whole farm cash budget, monthly cashflow budget, profit/loss, analysis of key parameters, machinery investment, actual production versus potential production, evaluation of business, viability, cashflow, and profit.

Assessment: By assignment work.

Text-books: To be advised.

5992 Farm Business Finance FM

Level: II.

Points value: 3.

Duration: Semester I.

Assumed knowledge: 5399 Farm Planning and Budgeting Techniques; 4547 Farm Accounting.

Contact hours: Combination of lectures, tutorials, practicals and workshops as appropriate. 6 hours per week on average.

Content: Investment analysis and management: purpose of financial management, Australian financial system, time preference, financial mathematics, interest rates, break-even analysis and leverage, return and risk, investment planning and management (du Pont model, working capital, long-term capital investment, income and capital gains), securities, debt and equity financing for debt finance, debt management, debt restructuring.
Farm business evaluation: there will be a series of four property visits, with the properties covering a range of types. The property reports will consider: enterprise gross margins, whole farm cash budget, monthly cashflow budget, profit/loss, analysis of key parameters, machinery investment, actual production versus potential production, evaluation of business, viability, cashflow, and profit.

Assessment: By assignment work.

Text-books: To be advised.

1119 Farm Business Management

Level: II.

Points value: 2.

Duration: Semester II.

Assumed knowledge: 8284 Resource Management; 4547 Farm Accounting; 5399 Farm Planning and Budgeting Techniques; 8535 Farm Business Finance.

Contact hours: Six hours of lectures, practicals, workshops and seminars per fortnight.

Content: Examines the dryland farm as a complete integrated system. The syllabus includes establishing the current system; criteria for evaluating performance of individual components of the system and of the system as a whole; diagnostic techniques; applied strategic management.
The subject will be based on visits to dryland farming enterprises in a number of farming districts to analyse the system in operation and propose development and management strategies which will improve the performance of the farming system.

Assessment: By assignment.

Text-books: To be advised.

6580 Farm Business Management (DF)

Availability: Continuing students only.

Level: II.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 8284 Resource Management
4547 Farm Accounting
5399 Farm Planning and Budgeting Techniques
8535 Farm Business Finance.

Contact hours: Six hours of lectures, practicals, workshops and seminars per fortnight.

Content: Examines the dryland farm as a complete integrated system. The syllabus includes establishing the current system; criteria for evaluating performance of individual components of the system and of the system as a whole; diagnostic techniques; applied strategic management.
The subject will be based on visits to dryland farming enterprises in a number of farming districts to analyse the system in operation and propose development and management strategies which will improve the performance of the farming system.

Assessment: By assignment.

Text-books: To be advised.

5124 Human Resource Management A

Availability: Continuing students only.

Level: II.

Unit value: 4.

Duration: Semester I.

Contact hours: 2 hours of lectures and 2 hours of tutorials per week.

Content: Organisational structure and objectives, human resource planning, work study, recruitment, selection, induction, training, development, motivation, appraisal, rewards and benefits, safety, health and welfare issues, industrial relations, dismissal, supervision, leadership.

Assessment: Assignments (85%); tutorials (15%).

Text-books: To be advised.

3763 Human Resource Management AD

Level: II.

Points value: 2.

Duration: Semester I.

Contact hours: 2 hours of lectures and 2 hours of tutorials per week.

Content: Organisational structure and objectives, human resource planning, work study, recruitment, selection, induction, training, development, motivation, appraisal, rewards and benefits, safety, health and welfare issues, industrial relations, dismissal, supervision, leadership.

Assessment: Assignments 85%; tutorials 15%.

Text-books: To be advised.

5154 Integrative Farm Studies

Availability: Continuing students only.

Level: II.

Unit value: 6.

Duration: Full year.

Assumed knowledge: 4547 Farm Accounting
5399 Farm Planning and Budgeting Techniques.

Contact hours: 2 hours per week.

Content: This subject is designed to assist students to integrate the various components of the farm management course and to develop a creative, critical and unified approach to farm management and operation. Topics include the principles and practices of strategic management, alternative management systems, ethics, systems thinking, creative and critical thinking.

Assessment: Assignments (20%); case study (65%); tour report (15%).

Text-books: To be advised.

4263 Integrative Farm Studies A

Level: II.

Points value: 3.

Duration: Full year.

Assumed knowledge: 4547 Farm Accounting; 5399 Farm Planning and Budgeting Techniques.

Contact hours: One lecture and two tutorials per week and seminars.

Content: This subject is designed to assist students to integrate the various components of the farm management course and to develop a creative, critical and unified approach to farm management and operation. Topics include the principles and practices of strategic management, alternative management systems, ethics, systems thinking, creative and critical thinking.

Assessment: Major case study, assignments and reports.

Text-books: As advised.

1213 Marketing A

Availability: Continuing students only.

Level: II.

Unit value: 3.

Duration: Semester I.

Contact hours: 3 hours per week.

Content: The marketing concept, management environments, the customer, the marketing mix, strategic marketing, prices and market structure, marketing management, case studies. Presention of a marketing plan.

Assessment: Assignments (30%); case study (40%); written examination (30%).

Text-books: Corkindale, D., Balan, P. & Rowe, C., *Marketing* (Nelson, 1989).

4792 Policy

Availability: Continuing students only.

Level: II.

Unit value: 3.

Duration: Semester II.

Contact hours: 3 hours per week.

Content: The syllabus covers structure of the Australian economy, agriculture in the economy, international trade, comparative advantage, exchange rates, monetary and fiscal economic policies, equity, efficiency, welfare and market failure.

Assessment: Seminar paper (40%); examination (60%).

Text-books: To be advised.

4098 Principles of Marketing, Policy and Commercial Law

Level: II.

Points value: 4.

Duration: Full year.

Contact hours: Two lectures and two tutorials per week.

Content: Marketing: the concept, environments, customers, mixes, strategic marketing.
Policy: structure of the economy and agriculture's place; international trade; comparative advantage; exchange rates; monetary and fiscal policy; equity efficiency welfare and market-failure.
Law: the legal system, negligence and nuisance; property, contract, agency; employment; occupational safety health and welfare; insurance; cheques; consumer law; business structure; law and farming practice.
Tax: taxation; tax and estate planning; professional consultants and planning.

Assessment: Each of the three components will contribute equally to the final grade and will consist of assignments, seminars and a final examination.

Text-books: To be advised.

6998 Seminars

Availability: Continuing students only.

Level: II.

Unit value: 1.

Duration: Full year.

Contact hours: Five two-hour sessions per semester.

Content: Throughout the year agricultural seminars are given on a wide range of topics by a number of people from both off and on Campus. Students and staff who attend the seminars are encouraged to question seminar speakers and discuss points raised by the speakers.

ASSOCIATE DIPLOMA IN APPLIED SCIENCE (HORSE HUSBANDRY AND MANAGEMENT)

SYLLABUSES

7577 Agronomy IE

Level: I.

Unit value: 4.

Duration: Semester II.

Contact hours: 1 lecture, 1 tutorial and 2 practicals per week.

Content: Climatology: air pressure, winds, solar radiation, temperature, clouds and precipitation, seasonal weather patterns, evapotranspiration. Soils: soil texture and structure, soil profiles and classification, soil moisture properties, plant nutrients and their chemistry, erosion and conservation.
Cereals (especially oats): domestication of plants, land preparation, seeding, crop nutrition, crop protection, selecting varieties, hay making, harvest and storage. Other grain crops. Pastures: pastures of South Australia, species and ecology, pasture establishment and management, weed control and nutrition, grazing management, fodder conservation. Crop rotations for sustainable agriculture, disease control, soil conservation.
Practical work: laboratory experiments, plant identification, soil surveying, monitoring crops, running an oat trial, field trips.

7203 Anatomy and Physiology

Level: I.

Unit value: 6.

Duration: Semester I.

Contact hours: 4 hours of lectures and 1 two-hour practical per week.

Content: Anatomical and physiological studies of bones, joints, muscles, nervous system, circulatory system, respiratory system, digestive system, male and female reproductive systems, excretory systems, and studies of growth and development and environmental physiology.

2323 Breeding Management

Level: I.

Unit value: 5.

Duration: Semester II.

Pre-requisite: 1732 Introductory Horse Husbandry.

Contact hours: 2 lectures and 1 three-hour practical per week.

Content: Reproductive biology of the mare: physiology of fertilization, pregnancy, foaling and lactation; obstetrics, infertility, abortion and venereal diseases. Reproductive biology of the stallion: care and management, mating procedures, infertility and semen evaluation. Artificial breeding procedures, foal diseases, disease control on stud farms, stud design.
Practical experience involves teasing practices used on stud farms and demonstrations of handling and control of stallions during mating; care of the mare before, during and after

foaling, management of brood mares and foals, demonstrations of artificial breeding in horses (for example, artificial insemination), fertility testing of stallions and mares, pregnancy diagnosis, use of computers on studs. Visits to breeding establishments will supplement work covered in lectures and practicals.

5186 Computer Applications

Level: I.

Unit value: 2.

Duration: Semester I.

Contact hours: 7 lectures plus a self-directed learning package equivalent to 21 hours of contact.

Content: Information and decision support systems for rural businesses and the role of computers; introduction to the use of word-processing; introduction to the use of spreadsheets; introduction to the use of a database program; communicating with other computers; evaluation of software, evaluation of hardware.

Assessment: Practical examination (60%); term paper (20%); theory examination (20%).

Text-books: To be advised.

4658 Equitation I

Level: I.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 1732 Introductory Horse Husbandry.

Contact hours: 14 lectures, 10 tutorials and 60 hours of practicals.

Content: Topics include work at all paces, transitions, school figures, jumping and rider exercises with and without stirrups. Planning a training programme. Preparation and care of a horse for more strenuous activities, for example, one-day events.

7939 Farm Mechanics

Level: I.

Unit value: 4.

Duration: Semester I.

Contact hours: 1 one-hour lecture, 1 one-hour tutorial and 1 two-hour practical session per week.

Content: This subject provides the student with an introduction to petrol and diesel engines, vehicle service and maintenance, concreting and fencing. All topics are related to a career in the horse industry.

2293 Horse Handling IA

Level: I.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 1732 Introductory Horse Husbandry.

Contact hours: 10 hours of tutorials and 28 hours of practical sessions.

Content: Need for and methods of hoof care; anatomy of the foot in relation to correct trimming and dressing of the hoof. Farriery course—shoeing requirements of the horse in training. Branding of the horse used in all breeds for identification. Clipping styles and the reasons the horse is clipped while in confinement.

1732 Introductory Horse Husbandry

Level: I.

Unit value: 5.

Duration: Semester I.

Contact hours: 2 lectures and 2 hours of practical work per week, plus 2 hours' riding for the first 7 weeks.

Content: Origin of the horse; breeds of horses and their significance; horse organisations; rules for events; identification and registration of horses; dentition and ageing; basic horse health; conformation and predisposition to lameness; natural and artificial gaits; human first aid; safety and the horse; law and the horse; horse behaviour.
Practical sessions include foal handling and leading; yearling handling and leading; restraint and handling techniques; horse gear and its uses; harnessing Clydesdales; clinical examination; hoof care; riding lessons.

8445 Introductory Training and Management

Level: I.

Unit value: 2.

Duration: Semester I.

Contact hours: 1 lecture and 1 two-hour practical per week for 7 weeks.

Content: Introduction to exercise physiology, haematology, blood biochemistry and horse nutrition in the performance horse. Also included will be evaluation of fitness, response to training and effects of stress and fatigue.
Practical experience includes riding techniques used for race-horses and eventers, and driving techniques used for standardbreds.

1541 Stable Management I

Level: I.

Unit value: 5.

Duration: Full year.

Contact hours: 28 hours of tutorials and 112 hours of practical application (for example, daily management of rostered horses).

Content: Responsibilities of the manager; the structure and durability needed for horse confinement; reasons for stabling—safety aspects, accessibility, flexibility, suitability for purpose; types of bedding; facilities to improve management and enhance performance.

1535 Training and Management I

Level: I.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: Basic equitation skills.

Contact hours: 28 hours of lectures, 7 hours of tutorials and 49 hours of practical work with rostered horses (for example, daily exercise).

Content: Exercise physiology; the use of haematology, serum biochemistry and electrocardiography in the performance horse; diseases and conditions such as stress and fatigue which primarily affect the performance of a horse; the use and misuse of drugs administered to performance horses; the thoroughbred and harness racing industries.
Practical experience includes riding techniques used for racehorses and eventers, and driving techniques used for standardbred training.

1524 Commercial Practice

Level: II.

Unit value: 4.

Duration: Semester II.

Contact hours: 3 lectures and 1 one-hour tutorial per week.

Content: Law: Australian legal system, duty of care in tort, law of contract, agency, insurance, cheques, consumer law, business structure, occupational safety, health and welfare.
Marketing: marketing concept, consumer behaviour, the marketing environments, the marketing mix, the marketing plan.
Financial Management: introduction to small business and financial management, managing working capital, managing long lived assets, sources of finance, planning financial structure, analysis and interpretation of financial statements, budgeting, cost/volume/profit analysis, making tactical decisions.

Assessment: Assignments (40%); examination (60%).

Text-books: McMahon, R., *Financial management for small business* (CCH, 1986); Vermeesch, R. B. & Lindgren, K. E., *Business law of Australia*, 5th ed. (Butterworth, 1987) or Latimer, P., *Australian business law*, 1988 edn. (CCH) or Yorston, Fortescue and Turner, *Australian mercantile law*, 17th ed. (Law Book Co., 1985); Hearne, James, *Marketing for managers* (Arnold); November, Peter, *Practical marketing in Australia* (Wiley & Sons).

2975 Equitation II

Level: II.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: 4658 Equitation I.

Contact hours: 10 lectures and 42 hours of practical work.

Content: Preparation required to compete in Dressage, Show-jumping, Eventing and Show competition. Principles of course design. Development of a firmer and more effective seat for flat work and jumping. Training programmes and assessment of horses at various stages of training.

3279 Equitation and Instructional Skills

Level: II.

Unit value: 12.

Duration: Semester II.

Assumed knowledge: 2975 Equitation II.

Contact hours: 18 hours of lectures and 38 hours of practical work.

Content: Execution of schooling exercises within a progressive training programme. Techniques of riding instruction, safety awareness, control of riding classes. Suitability of dress and manner.
An eight-week work experience period in an approved riding centre will be part of this subject to enable the student to practise and improve acquired knowledge and skills.

6999 Horse Handling IB

Level: II.

Unit value: 2.

Duration: Semester I.

Assumed knowledge: 1732 Introductory Horse Husbandry.

Contact hours: 28 hours of practicals.

Content: Preparation of thoroughbred and standardbred yearlings; methods of yearling conditioning; yearling presentation; participation at the annual Thoroughbred and Standardbred Yearling Sales.

6554 Horse Handling II

Level: II.

Unit value: 12.

Duration: Semester II.

Pre-requisite: 1265 Stable Management and Education to Saddle and Harness.

Contact hours: 56 hours of practical work plus 8 weeks' work experience.

Content: Comparisons of handling methods. Horse behaviour and evaluation of the reactions of horses to stimuli. Behavioural problems. Reasons for behavioural problems. Practical modification of behavioural problems. Handling of horses when only the minimum facilities are available. Management and control of stallions with behavioural problems. Methods of loading horses for transportation. Methods of horse transportation including land, sea or air. Horse control in emergency situations. Equipment variations and comparisons. Students will be encouraged to become aware of, and contribute to developments within the industry.
Work experience of 8 weeks' duration is gained off-Campus within the horse industry. The specific work to be undertaken will depend upon the individual student and the opportunities available within the horse industry.

5471 Horse Health

Level: II.

Unit value: 5.

Duration: Semester I.

Assumed knowledge: 7203 Anatomy and Physiology.

Contact hours: 2 lectures and 1 three-hour practical per week.

Content: General pathology, epidemiology, microbiology, immunology, toxicology, parasitology; diseases of respiratory, cardiac, abdominal, musculo-skeletal, integumentary and nervous systems; horse welfare; considerations regarding land use and housing systems; managerial decisions regarding the use of veterinary services.

8199 Horse Nutrition and Genetics

Level: II.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: 1732 Introductory Horse Husbandry.

Contact hours: 2 lectures and 1 two-hour practical per week.

Content: Nutritional requirements of foals, yearlings, stallions, pregnant and lactating mares and horses in work; the ability of crops, pastures and conserved feed to supply these needs; ration formulation for horses used in work and recreation.
Genetic and environmental variation; characters determined by single and many pairs of genes; genetic defects; selection progress associated with heritability, selection differential and generation interval; selection aids; sire lines; Bruce Lowe numbers; pedigrees; progeny; breeding plans, inbreeding, cross breeding and line breeding; compensatory mating.

5124 Human Resource Management A

Level: II.

Unit value: 4.

Duration: Semester I.

Contact hours: 2 hours of lectures and 2 hours of tutorials per week.

Content: Organisational structure and objectives, human resource planning, work study, recruitment, selection, induction, training, development, motivation, appraisal, rewards and benefits, safety, health and welfare issues, industrial relations, dismissal, supervision, leadership.

Assessment: Assignments (85%); tutorials (15%).

Text-books: To be advised.

3670 Project (HM)

Level: II.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 1732 Introductory Horse Husbandry.

Contact hours: One full day a week for six weeks.

Content: This subject will concentrate on the conduct of literature searches, the development of surveys, laboratory techniques, field techniques, seminar preparation and presentation, the preparation and presentation of written reports.

1265 Stable Management and Education to Saddle and Harness

Level: II.

Unit value: 6.

Duration: Semester I.

Assumed knowledge: 1541 Stable Management 1.

Contact hours: 10 hours of tutorials and 74 hours of practicals.

Content: The initial training of young horses prior to riding including leading, lunging and long-reining; the initial saddling, mounting and riding of young horses; the initial training of young horses to harness and driving. The supervision of staff in a horse enterprise; methods of management.
An interstate tour of breeding and training establishments may be included and assessed as part of this subject.

5524 Training and Management II

Level: II.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: 1535 Training and Management I.

Contact hours: 14 hours of lectures and 42 hours of practicals with the student's own or a rostered horse.

Content: Conditioning of the performance horse; race riding and driving; handicapping, stipendary stewards, race starting procedures. Regulations relating to all registered personnel; betting rules and regulations.

ASSOCIATE DIPLOMA IN WINE MARKETING

All subjects in this course are available in the Full-time, Part-time and External modes.

SYLLABUSES

4603 Accounting and Financial Management

Level: I.

Unit value: 4.

Duration: Semester II.

Contact hours: 2 lectures and 2 tutorials per week.

Content: Basic principles and concepts of accounting systems in business and non-profit organisations. Balance sheet and its interpretation; trading statements. Asset structures and depreciation; ratio analysis; funds statements; inventory control; budgets and budgetary controls; cost analysis. Financial mathematics; investment and credit management and controls; methods of financing.

Assessment: Assignments (50%); examinations (50%).

Text-books: Smith & Kelly, *Bookkeeping and commercial practice* (Pitman Publ.); McMahon, R., *Financial management for small business* (CCH).

6972 Advertising, Promotion and Public Relations

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 1 one-hour lecture, 1 one-hour seminar and 1 one-hour tutorial (incorporating industry guest lecturers) per week.

Content: Three topics are combined in the one subject because they are inter-related. Advertising and communications theory and principles, media analysis, development and analysis of mass communicated products, evaluation of media effectiveness are discussed in the advertising segment. Promotion incorporates point of sales, direct mail marketing, telemarketing, training sponsorships and premiums. Public relations considers the evaluation of "public" attitudes, social contexts and mass media relations which influence specific groups and pressure group activities.

Assessment: Examination (40%); seminar (35% — oral 20%, written 15%); tutorial (15% — oral 10%, written 5%); participation/attendance 10%.

Text-books: Nil.

3956 Computing

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 1 lecture and 2 hours of practical work per week.

Content: Setting up spreadsheets with emphasis on those which perform marketing functions. Wordprocessing, including introduction to desktop publishing and office

automation. Database management techniques. Graphics. Communication. Computers in marketing. Generalised computer structure. Types of computers and operating systems. Comparison of programs for database management, spreadsheet and wordprocessing.

Assessment: Practical examination (60%); theory examination (20%); term paper (20%).

Text-books: To be advised.

7110 Consumer Behaviour

Level: I.

Unit value: 4.

Duration: Semester II.

Pre-requisite: 4750 Introductory Marketing.

Contact hours: 2 one-hour lectures, 1 one-hour tutorial and 1 two-hour seminar per week.

Content: The purchasing process and the many variables, both internal and external, which impinge upon an individual or group: market segmentation, models of consumer behaviour, perception, motivation, learning, memory, attitudes, positioning, marketing mix/5C's or the Mars Model, pre and post decisions, brand loyalty, brand switching, corporate influences and trial and retrial characteristics.

Assessment: Two tutorial papers (oral and written presentations), participation and attendance, seminar (oral and written presentation), examination.

Text-books/References: No one text set. The following are recommended: Wilkie, W. L., *Consumer behaviour* (1986); Schiffman, L. G. & Kanuk, L. L., *Consumer behaviour*, 3rd ed. (1987); Berkman, H. W. & Gilson, C., *Consumer behaviour*, 3rd ed. (1986); and Walters, C. G. & Bergeil, B. J., *Consumer behaviour* (1989).

6923 Grape and Wine Production

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 2 lectures per week, plus 1 four-hour trip.

Content: The Australian wine industry—historical development, structure, present status and the future. Grape-growing in Australia and overseas countries. Still table wine, sparkling wine and fortified wine production. Winemaking in France, New Zealand, Italy, Germany, Portugal, the U.S.A. and other overseas countries.

4750 Introductory Marketing

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 2 one-hour lectures and 1 one-hour tutorial (incorporating a seminar presentation) per week.

Content: A basic overview of the role marketing plays in an organisation; line of authority charts; the evolution of marketing; the role of marketing in society and its value to the community; when marketing is valid; the elements of marketing. Each of these aspects of marketing, the corporateness of an organisation (be it, for example, a government, a business, a sporting group or a social group) and the "products" of that organisation are probed and discussed.

Assessment: Announced in the first week of semester.

Text-books: To be advised.

3733 Managerial Economics

Level: I.

Unit value: 3.

Duration: Semester II.

Contact hours: 3 hours per week, consisting of lectures and tutorials as appropriate.

Content: Principles of micro-economics (using the wine industry as the basis). Demand and supply analysis, production relationships, cost analysis. Principles of macro-economics (using the Australian economy as the basis). Contribution of the wine industry to the Australian national economy. Effect of macro-economic variables on the wine industry.

Assessment: By assignment (60%) and examination (40%).

Text-books: To be advised.

2712 Market Experience

Level: I.

Unit value: 4.

Duration: Summer Semester.

Pre-requisite: 4750 Introductory Marketing
7110 Consumer Behaviour.

Contact hours: 240 hours of practical marketing experience.

Content: The student must complete six (6) weeks' experience in at least one of the following areas: cellar door sales in a position necessitating dealing with the attending public; the sales or marketing departments of a wine producer; a retail wine outlet or a wholesaler/agent/distributor; an agreed marketing environment where hands-on experience can be associated with marketing theory.

Assessment: A 3,000 word report.

Text-books: No set text. Wide reading of references and journals relevant to issues raised by the field experience.

4194 Market Research—Quantitative

Level: I.

Unit value: 3.

Duration: Semester II.

Contact hours: 1 one-hour lecture, 1 one-hour seminar and 1 one-hour tutorial each week.

Content: The subject covers all forms of quantitative market research emanating from problem identification. Control of interviews, coding, editing, questionnaire construction and analysis are some of the issues raised in the primary data collection methodology. Syndicated and desk research are also covered as are the means of collecting data. There is some overview of statistical analysis including sampling, hypothesis testing, probability, attitude measurement, population and sample means and the difference between means, analysis of variance, investigation of association and other forms of data analysis.

Assessment: Examination 35%; seminar 40% (oral 20%, written 20%); tutorial 15% (oral 10%, written 5%); participation 10%.

Text-books: Aaker, D. A. & Day, G. S., *Marketing research* (4th ed.) 1990; Zaltman, G. & Burger, P. C., *Marketing research* (1975); Churchill, G. A., *Marketing research* (5th ed.) (1991); Kinnear, T. C. & Taylor, J. R., *Marketing research* (1987); Green, P. E. & Tull, D. S., *Research to marketing decisions*; Tull, D. S. & Hawkins, D. I., *Marketing research* (1976); Runyon, R. P. & Haber, A., *Fundamentals of behavioural statistics* (4th ed.) (1980).

4135 Sales and Communications

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 1 one-hour lecture, 1 one-hour workshop and 1 one-hour tutorial (incorporating a seminar presentation) per week. There is an additional requirement to spend two days in the field with a sales representative.

Content: This subject looks at three functions of the "sales" dimension of wine marketing, namely: the structure and complexities of the sales department in an organisation; the communication process and difficulties; negotiating elements.
The subject defines the significance of the "sales" element in an organisation and analyses the vagaries of a face-to-face selling situation. The many variables which impinge upon the relationship will be probed and discussed so the students apply a more professional analysis to their own, and others' performance.

Assessment: Examination 40%, workshop 20% (total oral contribution 10%, written submission 10%); report from work experience 10%; tutorial 20% (oral 10%, written 10%); participation/attendance 10%.

Text-books/References: Peterson, C. A., Wright, M. D. & Weitz, B. A., *Selling* (8th ed.), (Irwin, 1984); Russell, F., Beach, F. & Buskirk, R., *Selling* (12th ed.) (McGraw-Hill, 1989); Cumming, R., *Contemporary selling* (1989); Kellar, R. E., *Sales negotiation handbook* (Prentice-Hall, 1988); Adam, T., *Secrets of successful selling* (1985); Rackham, N., *Spin selling* (1988); Torquato, J., *Why winners win* (1985); Holmes, G. & Smith, N., *Sales force incentives* (Heinemann, 1986); Burstines, I., *Basic retailing* (Irwin, 1986); Jandt, F. E., *Win-win negotiating* (Wiley, 1987); Fisher, R. & Ury, W., *Getting to yes* (Arrow, 1981); Cohen, H., *You can negotiate anything* (1988); Gardner, G. et al., *Social psychology* (Prentice-Hall, 1981); Tubbs, S. L. & Moss, S., *Human communications* (5th ed.) (1987); Vallence, K. E. & McWilliam, T., *Communication that works* (Nelson, 1987); Adamson, G. & Prentice, J. (eds.), *Communication skills in practice* (Nelson, 1987).

4021 Sensory Evaluation IA

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: Three-hour tasting/tutorial session per week.

Content: Presented mainly via practical tasting/tutorial sessions, this subject covers the following topics: origin of major wine components; senses used in wine evaluation; basic taste sensations; balance and wine flavour; wine types; specification of wine types and styles; language for communication about wine; quality evaluation of wines.

3478 Wine in Society

Level: I.

Unit value: 2.

Duration: Semester II.

Contact hours: 3 hours per week.

Content: The Australian society and its drinking habits and attitudes. Regional and ethnic differences in drinking habits. Implications of alcohol consumption in today's society. Groups in society and their role in influencing human behaviour and attitudes with respect to alcohol consumption. Alcohol, health and alcoholism. Alcohol and the licensing laws. Advertising. Influence of the anti-alcohol lobby. Communication of wine information. Wine and food complementarity. Social responsibility of the wine industry for educating the public on the consumption and use of wine.

Assessment: Internal students: Seminar 30%, essay 30%, report 30%, participation 10%. External students: Two assignments each 35%, report 30%.

Text-books: To be advised.

3451 Wine Marketing in Australia

Level: I.

Unit value: 2.

Duration: Semester II.

Pre-requisite: 4750 Introductory Marketing.

Contact hours: 2 one-hour lectures and 1 one-hour tutorial per week.

Content: The study of the grapegrowing industry's history and future, and the implications for grape supply in the future; the organisations which represent the industry, their structure and function; wine taxation and licensing fees; licensing laws, drinking in moderation campaigns, accreditation schemes, product liability; Pure Food legislation and wine labelling, Australian wine making standards and wine labelling; weights and measures.

Assessment: Tutorial (presentation and written paper) 20%, seminar (including paper) 30%, assignment 30%, participation in tutorials and practical sessions, 20%.

Text-books: No prescribed textbook. Guest speakers provide up-to-date information and examples. Articles and papers are supplied for analysis. The following are recommended for reference: Kotler, P., Chandler, P., Gibbs, R. & McColl, R., *Marketing in Australia* (2nd ed.) (Prentice-Hall, 1989); Corkindale, Balan & Rowe, *Marketing — making the future happen* (Nelson, 1989); *Proceedings: Wine 2000 — Adelaide, S.A. August, 1989* (Wine titles, Adelaide, 1989). Readings from the following publications are recommended: The *Australian and New Zealand wine industry journal,* The *Grapegrower and winemaker, wine and spirit buyers' guide, Liquor world, business review weekly, marketing magazine.*

1141 Business Management

Level: II.

Unit value: 3.

Duration: Semester II.

Pre-requisite: 2712 Market Experience.

Contact hours: 2 lectures and 1 tutorial per week.

Content: Principles and practices of management; management of a marketing and sales force; staffing requirements and managerial structure; the levels of authority and responsibility in an organisation; the relationships between organisational roles and individual behaviour; communication, motivation and leadership; relationships between the processes of planning, organising, directing and controlling; risk management and decision-making.

Assessment: By assignment.

Text-book: Stoner, Collins & Yetton, *Management in Australia* (Prentice-Hall).

1559 Commercial Law

Level: II.

Unit value: 3.

Duration: Semester I.

Contact hours: 2 lectures and 1 tutorial per week.

Content: Introduction to the Australian legal system and sources of law; basic legal principles and applications in areas of torts, property contract, Trade Practices Act, agency, cheques, insurance, business structure, taxation, employment, consumer law, farming.

Assessment: Assignments (50%); examinations (50%).

Text-books: To be advised.

5508 Group Marketing Studies

Level: II.

Unit value: 3.

Duration: Semester II.

Pre-requisite: 4750 Introductory Marketing.

Contact hours: 3 hours per week together with additional hours necessary as dictated by the varying projects.

Content: Students will work in groups to solve specific problems. Industry people will be brought in to provide actual case studies of problems encountered in wine marketing and, using their 18 months' study in marketing as a basis, students will work through the problem in order to find solutions or potential opportunities. The subject utilises many of the skills and concepts learned in the course and attempts to put them into a practical framework.

Assessment: Students have a significant input. A typical format is likely to emerge as self-assessment (25%); group assessment (45%); lecturer assessment (30%).

Text-books: No one textbook. Considerable reference to a wide range of published material.

8923 Individual Project

Level: II.

Unit value: 4.

Duration: Full year.

Assumed knowledge: Completion of the first year of the course.

Co-requisite: It is recommended that students undertake 3345 Strategic Marketing in the same year as undertaking this subject.

Contact hours: Individual consultation with the Subject Co-ordinator by arrangement.

Content: The emphasis of this subject is on the application of marketing theory to a marketing problem. The student must select a topic relevant to the wine market specifically or to an aspect of marketing, subject to the approval of the Subject Co-ordinator. The topic may be an existing marketing situation, a proposed scenario or, with a view to adding to the industry's knowledge, an issue in which research is lacking.
The project will include a literature search and may incorporate data collection methodology. Innovation and lateral thinking in problem solving are the key elements in this subject.

Assessment: Completed project.

Text-books: No one text. Students are required to read widely including industry-produced data and references on marketing.

4154 International Marketing I

Level: II.

Unit value: 3.

Duration: Semester I.

Pre-requisite: 4194 Market Research—Quantitative
4750 Introductory Marketing.

Contact hours: 2 one-hour lectures and 1 one-hour tutorial per week.

Content: This subject provides the student with an overview of the considerations and

contextual variables which confront the international marketer and specifically the wine marketer. Topics include: a review of Australia's major export markets; methods of establishing export markets; Austrade; export and insurance; forward exchange cover; importation and payment of imports; the role played by imported wines in the Australian market. Wine regulatory aspects: role of Government bodies and the Australian Wine and Brandy Corporation.

Assessment: Assignment 1 (30%); assignment 2 (40%); presentation of tutorial and written paper (20%); attendance and participation in lectures and tutorial sessions (10%).

Text-books/References: No prescribed textbooks. The following are recommended: Cuncliff, E. & Hilger, M., *Marketing in the international environment* (2nd ed.) (Prentice-Hall, 1988); Terpstra, V., *International dimensions of marketing* (2nd ed.), (P.W.S., 1988); Terpstra, V., *International marketing* (Dryden Press, 1983); Cateora, P. R., *Strategic international marketing* (Irwin, 1985). Readings will also be used from: *Proceedings: Wine 2000 — Adelaide, S.A., August, 1989;* Winetitles, Adelaide; *The Australian and New Zealand industry journal*, Winetitles, Adelaide; Commonwealth Bank of Australia, *Financing international trade* (2nd ed.); Australian Wine and Brandy Corporation, *The export grid; Marketing* — monthly JMB Publications; *Business Review Weekly*.

1012 Market Research — Qualitative

Level: II.

Unit value: 3.

Duration: Semester I.

Assumed knowledge: 4194 Market Research—Quantitative.

Contact hours: 1 one-hour lecture, 1 one-hour practical and 1 one-hour tutorial per week.

Content: The student is aware of quantitative methodologies and the difficulties of problem identification. This subject considers the "why" of research and is the analysis of human conditions such as attitude formation, perceptions, motivation and how these were formed. Based on psychological and sociological determinants qualitative research probes issues whether in a 1:1 or small group environment, depending on the decision-making unit. It is an exploratory and probing technique of data collection. The student will address issues relating to how and to what consumers relate.

Assessment: Examination (40%); practical (35% — oral 20%, written 15%); tutorial (15% — oral 10%, written 5%), participation and attendance (10%).

Text-books: No one text. The following references provide a variety of perspectives: Robson, R., *Qualitative research in action* (Charles Griffin, 1959); Wood, J. T., Phillips, G. M. & Pederson, D. J., *Group discussion* (2nd ed.), (Harper and Row, 1986); Hirokawa, R. Y. & Pool, M. S., *Communication and group decision making* (Sage, 1956); Cartwright, D. & Zander, A., *Group dynamics: research and theory* (3rd ed.), (Harper and Row, 1968); Fisher, B. A., *Small group decision making* (McGraw-Hill, 1974); Schultz, B., *Communication in small groups: theory and practice* (Harper and Row, 1959); Jones, S. E., Barnland, C. D. & Haiman, F. S., *Communication in small groups* (Harper and Row, 1950).

7614 Sensory Evaluation IIA

Level: II.

Unit value: 6.

Duration: Semester II.

Pre-requisite: 2167 Wine Technology.

Contact hours: 4 hours per week.

Content: This subject advances the student's ability to evaluate critically both Australian and overseas wines by developing the capacity to interpret characteristics in terms of style and quality.
Through practical wine tastings, organoleptic appraisal of both Australian and overseas

wines will be covered with particular emphasis on style and regional characteristics, factors contributing to style and overall assessment and judging of wine for style and quality.

3345 Strategic Marketing

Level: II.

Unit value: 5.

Duration: Semester II.

Pre-requisite: 4750 Introductory Marketing; 7110 Consumer Behaviour.

Contact hours: 1 hour of lectures, 1 one-hour tutorial, 1 one-hour workshop and 1 one-hour seminar per week.

Content: The subject includes elements of strategy/tactics, product evaluation and performance, range extension, brand development, sales forecasting, pricing strategies, methods of control, service, internal and external analysis and formal planning systems. It is the beginning of the process of marketing based on the management criteria of planning, analysis and control, after first having made decisions as to the business the company is in—a major philosophic and directional decision.

Assessment: Examination (35%); seminar (30% — oral 15%, written 15%); workshop (10% — self assessment 5%, group 5%); tutorial (15% — oral 10%, written 5%); participation (10%).

Text-books: No one text. Recommended references include: Baker, M. J., *Marketing strategy and management* (MacMillan, 1985); O'Shanessy, J., *Competitive marketing : a strategic approach* (2nd ed.), (Unwin Hyman, 1988); McKay, E. S., *The marketing mystique* (AMA, 1972); Bradmore, D., Joy, S. & Kimberley, C., *Marketing visions* (Prentice-Hall, 1989); McDonald, M. H. B., *Marketing plans: how to prepare them and how to use them* (Harcourt Brace, 1989); Rapps, S. & Collins, R., *Maxi marketing* (McGraw-Hill, 1987); Ries, A. & Trout, J., *Marketing warfare* (McGraw-Hill, 1986); Sheth, J. N. & Garrett, D. E. (eds.), *Marketing theory* (Thomas Nelson, 1986); Jain, S. C., *Marketing: planning and strategy* (2nd ed.), (Thomas Nelson, 1985); Albert, K. J., *The strategic management handbook* (McGraw-Hill, 1983); Buell, V. P., *Marketing management: a strategic approach* (McGraw-Hill, 1984); Cody, J. F. & Buzzitt, R. D., *Strategic marketing* (Scott Foresman, 1986); Abell, D. & Hammond, J., *Strategic market planning* (Prentice-Hall, 1979); Kevin, R. A. & Peterson, R. A., *Strategic marketing problems* (4th ed.) (Allyn Bacon, 1987); Brown, L., *Competitive marketing strategies* (Thomas Nelson, 1989); Luck & Ferrell, O. C., *Marketing strategy and plans* (3rd ed.), (Prentice-Hall, 1989); Swayne, L. F. & Ginter, P. M., *Cases in strategic marketing* (Prentice-Hall, 1989); Simmons, K., *Strategy and marketing* (2nd ed.) (Phillip Allan); Stapleton, J., *How to prepare a marketing plan* (2nd ed.) (Gower, 1982).

5627 Tour

Level: II.

Unit value: 1.

Duration: Semester II, undertaken in the intra-semester break.

Contact hours: 1 week.

Content: A tour, held in the September mid-semester break, is mandatory for full-time and part-time students and optional for external students. Its purpose is to expose students to decision makers. Contact is made, and discussions are held with the management of wine producers, marketing managers, marketing personnel (Public Relations Managers, Market Research Managers, Sales Managers), specialist marketing and public relations consultants, market research specialists, advertising agencies and direct mail houses.
Visits are also made to resellers at both the wholesale and retail levels.

Assessment: Report.

1142 Viticulture

Level: II.

Unit value: 4.

Duration: Semester I.

Pre-requisite: 6923 Grape and Wine Production.

Contact hours: 1 lecture, 1 one-hour tutorial and 1 three-hour practical session per week.

Content: The study of grapevine morphology, growth, development, pruning, propagation, climate and soil requirements, compositional changes during berry ripening; grapevine fruiting varieties and rootstocks; vintage practices; genetic improvement; vineyard establishment and operation. Practical work includes pruning, propagation, sampling, variety identification.

2167 Wine Technology

Level: II.

Unit value: 5.

Duration: Semester I.

Pre-requisites: 6923 Grape and Wine Production; 4021 Sensory Evaluation IA.

Contact hours: 2 lectures and 1 three-hour practical per week.

Content: Wine production: grape quality and processing; methods of production of table, sparkling and fortified wines; pre-fermentation, fermentation and post-fermentation techniques. Wine distillation: base wine production—brandy and SVR; still types; brandy maturation; Cognac and Armagnac; non-grape spirit production. Introduction to the bottling process; packaging; palletisation and quality control. Practicals will cover exposure to routine cellar operations, especially those relating to the vintage period, including grape sampling and harvesting; grape handling and crushing; draining and pressing; must and juice handling; fermentation procedures and cellar hygiene; basic techniques in wine chemistry and wine microbiology.

DEGREE OF

BACHELOR OF APPLIED SCIENCE (AGRICULTURE)

SYLLABUSES

7658 Agricultural Engineering I

Level: I.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: Year 12 Physics; basic mathematics and trigonometry.

Contact hours: 1 one-hour lecture, 1 one-hour tutorial and 1 two-hour practical per week.

Content: This subject provides a grounding in basic engineering principles with a focus on agricultural implements and machines. Topics studied are: forces and moments; static equilibrium; power and efficiency; engine characteristics; power transmission systems; traction and tractor matching.

8478 Animal Science and Production

Level: I.

Unit value: 4.

Duration: Semester II.

Contact hours: 2 hours of lectures and 1 two-hour practical each week.

Content: The animal science component will study bones and their arrangement in the skeleton of animals, the study of the joints, types of muscles, the structure of the nervous system, and the organs of the circulatory, respiratory, digestive, urinary and reproductive systems.
The production component will cover sheep (wool and meat production), beef and dairy cattle, poultry (egg and broiler production), pigs and horses and will include history and description of breeds, size, distribution and organisation of the animal industry, the animal year or cycle of operations and the measurement of productivity.

6325 Biology IB

Level: I.

Unit value: 4.

Duration: Semester I.

Contact hours: 2 lectures and 1 two-hour practical each week.

Content: This introductory subject covers the following topics: phylogeny and classification; taxonomic principles; cell structure and mitosis and meiosis; characteristics of life—nutrition, growth, reproduction, respiration, excretion, irritability; DNA, RNA and protein synthesis, enzymes; genetics—Mendelian genetics, gene interaction, linkage, sex determination, population genetics, natural selection, evolution; the characteristics of viruses, Monera, Protista, Fungi, Plantae, Animalia. Introduction to Ecology.

1380 Biometry and Experimentation

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 2 lectures and 1 tutorial per week.

Content: Conducting parametric and non-parametric statistical tests, descriptive statistics, diagrams, correlation and regression analysis, sample survey techniques, and the design and analysis of agricultural experiments including those employing completely randomised designs, randomised block, split plot, latin square designs and factorial experiments, design efficiencies, effects of plot and block size, shape and orientation.

8773 Chemistry and Introductory Biochemistry

Level: I.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: Year 12 Mathematics and an attempt at Year 12 Chemistry.

Contact hours: 3 lectures and 1 one-hour tutorial per week.

Content: This subject deals with: the structure of molecules, the application of acids, bases and buffers in natural systems; organic chemistry is developed so that molecules and processes of interest in biochemistry can be satisfactorily understood; redox chemistry theory and its application to biological redox processes including photosynthesis and respiration. Metabolism including glycolysis, fatty acid oxidation and the citric acid cycle. Thermodynamics is developed so that energy flow in ecosystems and in selected biochemical pathways can be studied at an appropriate level. Proteins, their synthesis, chemistry and relationship with DNA and the genetic code are examined. Aspects of inorganic chemistry with application to biological chemistry. For all topics relevant applied problems will be discussed so that problem solving skills are developed.

2686 Communications and Learning

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 3 hours per week.

Content: Communications in theory and practice: why communicate? why study communications? Methods of studying communications, communications models, feedback; report and letter writing; format, style, framework, informal and formal communications, non-verbal communications; writing for the media, speaking, including public speaking, preparation of material for groups and experience in other media such as audio and video tapes, slides, charts, aids and standards required for reports.
The learning process: principles, learning as distinct from being taught, information searching, extracting and recording, general study skills.
Word processors: software characteristics, introduction to usage. Electronic information transfer: systems and packages available, where to go for skills development.

Assessment: Report (15%); essay (25%); seminar (16%); practical (24%); computer practical (20%).

Text-books: To be advised.

6668 Farm Skills I

Level: I.

Unit value: 4.

Duration: Full year.

Pre-requisite: Students should have a South Australian Class 1 Driver's Licence endorsed to Class 2 for on-Campus use.

Contact hours: 26 days' practical work experience, plus 13 three-hour demonstrations.

Content: Practical experience—students are rostered to work on all farm enterprises where basic skills and knowledge in production agriculture are developed.
Farm operations—practical demonstrations on a broad range of farm enterprise operations are presented and involve students in developing their skills.
Enterprise production—production assignments in cropping, dairying and pig and poultry production develop students' knowledge and skills in enterprise production analysis.

2703 Farm Skills IA (On-Campus)

Level: I.

Unit value: 5.

Duration: Summer Semester.

Pre-requisite: Students should have a South Australian Class 1 Driver's Licence endorsed to Class 2 for on-Campus use.

Contact hours: 28 days' practical work experience. Two-day shearer and wool classing practical. Five-day practical work with an agribusiness company.

Content: Practical experience—students are rostered to work on all farm enterprises where skills and knowledge in all areas of production agriculture are further developed.
Wool harvesting programme—demonstrations and practical experience in shearing and wool classing are presented in conjunction with the Australian Wool Corporation.
Agribusiness work experience—students are required to negotiate 5 days' work experience with an agribusiness company which provides a service to the rural industry.

9404 Farming Systems

Level: I.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: Introductory systems theory.

Contact hours: 4 lectures and 2 two-hour tutorials per week for 7 weeks, plus farm visits and a tour as appropriate.

Content: The agribusiness system: its environment, inputs, processes, outputs and feedback mechanisms. Farming systems as subsystems of the agribusiness system, and their evolution in Australia. Characteristics of major farming systems (using case studies where possible): rural social systems; rural commercial/economic systems; farm business management systems; farm production systems: pastoral, mixed farming, livestock, horticulture/viticulture. Principles and practices of the design and management of stable farming systems. The degree course as a system, and the place of the Roseworthy farm in this system.
A tour or mini-tour of agricultural and other land-use systems will be taken as part of this subject.

Assessment: Assignments (30% — one 10%, one 20%); tour report (15%); examination (55%).

Text-books: To be advised.

8466 Introduction to Systems

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 2 lectures per week and 1 two-hour tutorial per fortnight.

Content: This subject covers the theory and application of systems theory to the study and management of environmental systems. It includes the following topics: fundamental principles of systems theory; different types of systems; environmental systems as "thermodynamic" systems; dynamic changes in environmental systems; management of environmental systems.

1776 Microbiology and Entomology

Level: I.

Points value: 2 (Unit value 4).

Duration: Semester II.

Assumed knowledge: 6325 Biology IB or 8057 Biology INR.

Contact hours: 2 hours of lectures and 2 hours of practical work each week.

Content: Microbiology: biology of bacteria, algae, protozoa, fungi, viruses, platyhelmenthes and nematodes. Systems to be studied include source of antibiotics, rhizosphere, fresh and waste water, immune system of animals. Entomology: topics include classification, external and internal anatomy, insect reproduction and life cycles, insect feeding relationships, insect behaviour and predators, parasites, and pathogens.

Assessment: To be advised.

Text-books/Reference books: To be advised.

1947 Plant Science and Production

Level: I.

Unit value: 4.

Duration: Semester II.

Contact hours: 18 hours of lectures, 6 hours of tutorials and 32 hours of practical work.

Content: This subject will concentrate on plant structure, environmental growth factors, plant development, growth regulators, photosynthesis, water movement, plant nutrition, N fixation and yield of annual and perennial plants. Practical work includes seed structure, seedling structure, germination temperature responses, coleoptile growth, stem, root and leaf structure, photosynthetic pigments, osmosis, floral structure and germination in a saline environment.

2636 Soils and Climatology I

Level: I.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: Matriculation Chemistry, Geology *or* Geography.

Contact hours: 2 one-hour lectures, 1 one-hour tutorial and 1 three-hour practical a week.

Content: Climate and weather—effects, energy flows in the atmosphere and the biosphere, solar energy input. Atmospheric pressure systems, moisture transfer and balances in the atmosphere and the biosphere, rainfall influences, rainfall variability, drought and flood, evapo-transpiration. Fire risk. Greenhouse effect.
Soils—profile genesis and nomenclature, major profile characteristics, historical soil classification systems, modern American and Australian nomenclature, methodology of soil preparation and map interpretation. Basic soil physical properties, texture, structure, water movement and storage characteristics. Basic chemical properties, ionic exchange, measure of fertility parameters. Identification of soil properties, texture, structure, pH, carbonate,

colour. Preparation of soil maps, collection and basic analysis of soil samples. Local soils. Soil water movement, hydraulic conductivity, infiltration, capillarity measurement of potential.

3341 Accounting and Budgeting

Level: II.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 9404 Farming Systems.

Contact hours: 4 hours per week of lectures and tutorials.

Content: Principles of management; financial management, accounting information systems; cash; assets and liabilities; profit; reconciliation of a single entry system; interpretation and analysis; double entry systems; gross margin budgets; cash flow budgets; partial and breakeven budgets; other whole farm budgets; development budgeting. Manual and computerised implementation of these tools.

Assessment: Assignments (40%); test (5%); tutorials (5%); two examinations (50%).

Text-books: To be advised.

9848 Agricultural Engineering II

Level: II.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: 7658 Agricultural Engineering I.

Contact hours: 2 lectures and 1 two-hour practical per week.

Content: Topics to be studied are: oil hydraulics—pumps, controls, actuators; water hydraulics—pump and pipe system characteristics; electricity—common motors, supply systems; electronics—components and agricultural monitors; Vee belt and chain drives; structures—components, materials; fencing—tension fencing, electric fencing.

9495 Agricultural Seminars I

Level: II.

Unit value: 2.

Duration: Full year.

Contact hours: 5 two-hour sessions per semester.

Content: Throughout the year agricultural seminars on a wide range of topics are given by a number of off-Campus and on-Campus people. Students and staff who attend the seminars are encouraged to question seminar speakers and discuss points raised by the speakers.

7026 Animal Science I

Level: II.

Unit value: 6.

Duration: Semester I.

Assumed knowledge: 8478 Animal Science and Production; 8773 Chemistry and Introductory Biochemistry.

Contact hours: 6 hours per week.

Content: Animal physiology: the tissues; physiology of bones, joints and muscles; physiology of the major systems including digestive, transport, respiratory, excretory, endocrine,

reproductive and metabolic; environmental physiology. Animal nutrition: methods of investigation: evaluation of feeds—digestibility, energy content, protein; feeding standards for maintenance and growth; minerals and vitamins; voluntary feed intake; properties of common feeds. Animal breeding: genetic and environmental variation; qualitative and quantitative characteristics; correlations; heritability; selection aids; breeding programmes, selection differential and generation interval.

7957 Animal Science II

Level: II.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 8478 Animal Science and Production; 7026 Animal Science I.

Contact hours: 4 lectures and 1 two-hour practical per week.

Content: Animal production-related topics: physiological—control of reproduction in farm animals and control of lactation; physiological factors affecting meat quality and fibre growth. Ruminant digestion: methods of manipulating digestive efficiency in ruminants; processing roughages, effect on digestion and production. Behavioural: introduction and methods of investigation; phylogeny and classification of behaviour; behavioural patterns of particular importance to animal production; stress and its measurement; animal welfare and welfare codes. Animal health: nature of disease, causes of disease and response of body to diseases, manipulation of immunity. Epidemiology. Diseases of importance in grazing animals given as examples.

4004 Animal Science III

Level: II.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 8478 Animal Science and Production; 7026 Animal Science I; 7957 Animal Science II.

Contact hours: 4 lectures and 1 two-hour practical per week.

Content: This subject deals with methods of manipulating reproduction; physiological potential for reproduction; manipulation of meat quality; behavioural patterns in intensive livestock industries; stress/behaviour interrelationships; welfare and welfare codes for intensive animal production; the response of the body to disease, use of chemotherapeutics, including antiseptics, disinfectants, antibiotics, growth promotants and electrolytes and their role in livestock industries.

7280 Basic Irrigation

Level: II.

Unit value: 3.

Duration: Semester I.

Assumed knowledge: 7658 Agricultural Engineering I.

Co-requisite: 9848 Agricultural Engineering II.

Contact hours: 2 lectures and 1 one-hour practical per week.

Content: Topics to be studied include: evapotranspiration and soil moisture budget, crop requirements (peak rate and crop factor), adjustment for salinity (leaching fraction), sprinkler and dripper characteristics, sprinkler and dripper layout, hydraulics of pressure irrigation systems.

9357 Biochemistry and Plant Science

Level: II.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 8773 Chemistry and Introductory Biochemistry; 1947 Plant Science and Production.

Contact hours: 2 lectures and 1 practical per week.

Content: Fermentation, oxidative metabolism, lipid metabolism, ATP formation, energy output from feeds, biochemistry of the rumen, biochemistry of silage, protein metabolism, carbon fixation, plant growth regulators, nitrogen fixation, water stress, post-harvest physiology.

7333 Crops and Pastures I

Level: II.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: 2636 Soils and Climatology I.

Contact hours: 2 lectures per week and 4 hours of practical work per fortnight.

Content: The use of climatic indices in the selection and management of dryland crops and pastures. Pasture establishment, pastures in a cropping rotation, fodder conservation, grass-legume relationships in pastures, pasture management. Production and management of forage in the pastoral zone. The principles and practices of cereal crop production. Tillage practices—conventional, minimum tillage, weed control, crop rotations and reduction in disease carryover. Integration of crop and livestock enterprises. Crop gross margins and the economics of pasture establishment and maintenance.

8237 Crops and Pastures II

Level: II.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 7333 Crops and Pastures I.

Contact hours: 2 lectures per week and 4 hours of practicals per fortnight.

Content: The principles and practices of grain legume, oilseed and summer fodder crop production. Perennial pastures in the higher rainfall areas; crops for the higher rainfall areas of the state; opportunity cropping in perennial pasture areas; fodder trees and shrubs; special-purpose temperate crops as renewable energy sources. The design and maintenance of farming systems with crop and pasture components. Economic evaluation of farming systems which contain crops and pastures. Practicals include conduct of a field trial on production of annual pasture legumes, field visits to assess pasture and crop productivity. Crop monitoring.

8181 Farm Skills II (Stream-specific)

Level: II.

Unit value: 3.

Duration: Full year.

Assumed knowledge: 6668 Farm Skills I.

Contact hours: 13 days' practical work experience including 8 one-hour tutorials with enterprise managers. A minimum of 6 days' work experience undertaken on weekends.

Content: Practical experience: students are rostered to work on all farm enterprises where skills and knowledge in all areas of production agriculture are further developed. Student involvement on weekends includes taking responsibility for the operation of enterprises. Enterprise management: students are involved in management issues affecting their elective enterprise and on behalf of that enterprise are required to produce a production-related report which becomes part of the enterprise manager's regular monthly reports.

6315 Farm Skills IIA (Off-Campus)

Level: II.

Unit value: 5.

Duration: Summer Semester.

Assumed knowledge: 6668 Farm Skills I
2703 Farm Skills IA.

Contact hours: 35 days' practical work experience.

Content: Practical experience: students are required to undertake off-Campus work experience on an approved farm or agribusiness unit. Business operations and management: students are required to prepare a full report on the physical environment and layout of the farm or production unit, annual operation programme and management methods and attitudes.

4472 Horse Husbandry I

Level: II.

Unit value: 3.

Duration: Semester I.

Assumed knowledge: 8478 Animal Science and Production.

Contact hours: 1 lecture and 1 two-hour practical per week.

Content: The subject concentrates on the nutritional, housing, hygiene and exercise requirements of horses kept in confinement; handling the mature boxed horse; horse feeding behaviour; the inheritance of horse traits, pedigree analysis and breeding plans.

1511 Horse Husbandry II

Level: II.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 4472 Horse Husbandry I.

Contact hours: 1 lecture and 1 two-hour practical per week.

Content: This subject will concentrate on the selection of land, pastures and water suitable for horses; horse pasture management—stocking rate, grazing behaviour, digestibility and intake of pasture, supplementary feeding of horses, poisonous plants and weeds, horse fencing. Diseases or abnormal conditions of the musculoskeletal, gastrointestinal tract (which includes internal parasites and their control, colics and digestive disorders), skin, respiratory and nervous systems.

7020 Horticultural Systems

Level: II.

Unit value: 5.

Duration: Semester I.

Contact hours: 42 hours of lectures and 28 hours of practicals.

Content: This subject examines the importance of horticulture to the community, sustainability and economic value, horticultural production areas and environmental factors involved. Fruit crop growth and its control using cultural and chemical methods. Horticultural propagation methods. The basis of production systems which include horticulture, and systems which combine different types of horticulture. The contribution of horticulture to the economy. Profitability of typical horticultural crops, enterprises and systems.

8403 Production Horticulture

Level: II.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 7020 Horticulture Systems.

Contact hours: 2 hours of lectures and 2 hours of practicals per week.

Content: The syllabus includes the study of greenhouse operation, principles of vegetable production; floriculture basics; fruit ripening factors; harvesting and handling fruit; post-harvest; varietal improvement; interrelationships amongst horticultural crops and systems.

2535 Soil Conservation and Management

Level: II.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 2636 Soils and Climatology I or 3283 Soils.

Contact hours: 1 one-hour lecture and 1 one-hour tutorial per week and 1 four-hour practical per fortnight.

Content: Lectures—wind erosion, water erosion, soil structure, soil salinity, land capability, modelling and planning, universal soil loss equation, legislative processes in South Australian soil conservation. Tutorials—computer modelling, land capability exercise, production of case study, solution for salinity and water erosion problems. Practicals—preparation of an erosion management plan for an agricultural situation.

8085 Advanced Marketing

Level: III.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 5068 Economics, Policy and Marketing.

Contact hours: 2 one-hour lectures per week.

Content: The basis of this subject is market research problem analysis to develop an individual project with a data collection system incorporated. The project should be designed to be an innovation in industry, or a topic which has not been covered by industry. Lecture topics include problem solving, survey structure, sampling theory, structure of research scheduling, questionnaire preparation and analysis.

Assessment: To be negotiated with students during the first week of semester.

Text-books: To be advised.

3384 Agricultural Seminars II

Level: III.

Unit value: 2.

Duration: Full year.

Contact hours: 5 two-hour sessions per semester.

Content: Throughout the year agricultural seminars on a wide range of topics are given by a number of off-Campus and on-Campus people. Students and staff who attend the seminars are encouraged to question seminar speakers and discuss points raised by the speakers.

7180 Animal Science IV

Level: III.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: 7957 Animal Science II
4004 Animal Science III.

Contact hours: 2 lectures and 2 hours of tutorial/practical work per week.

Content: Students will study female and male reproduction in avian species, and their control; the influence of the environment on the production of housed animals—social environment, temperature, humidity, ventilation and light; control of environment for production; feed additives, their uses and limitations; processing of feedstuffs and preparation of proprietary feeds—methods, equipment, storage, anti-nutritive factors, moulds and mycotoxins, energy density; regulation of protein and energy metabolism; genetic engineering in animals.

1022 Beef, Sheep and Goat Production IA

Level: III.

Unit value: 3.

Duration: Semester I.

Assumed knowledge: 8478 Animal Science and Production.

Contact hours: 1 lecture and 1 two-hour practical per week.

Content: This subject will concentrate on grazing management of beef, cattle, sheep and goats; management of the oestrous cycle, new techniques in artificial insemination; techniques to promote high levels of fertility, selection techniques including Beefplan, Woolplan and Sheeplan; assessment of beef and sheep using Ausmeat language; assessment of meat and fibre quality; shearing procedures for sheep and goats; animal behaviour considerations in the design and operation of cattle, sheep and goat yards. Local and export markets for, and the marketing of beef, lamb, mutton, goat meat, wool, cashmere and mohair.

2611 Beef, Sheep and Goat Production IB

Level: III.

Unit value: 4.

Duration: Full year.

Assumed knowledge: 8478 Animal Science and Production.

Contact hours: 1 lecture and 1 two-hour practical per week in Semester I and one hour per week of consultancy work in Semester II.

Content: This subject will concentrate on grazing management of beef, cattle, sheep and goats; management of the oestrous cycle, new techniques in artificial insemination; techniques to promote high levels of fertility, selection techniques including Beefplan, Woolplan and Sheeplan; assessment of beef and sheep using Ausmeat language; assessment of meat and fibre quality; shearing procedures for sheep and goats; animal behaviour considerations in the design and operation of cattle, sheep and goat yards. Local and export

markets for, and the marketing of beef, lamb, mutton, goat meat, wool, cashmere and mohair.
In addition, students will undertake self-directed consultancy work. This will involve the identification of a management issue on the Campus enterprise. A contract with the Enterprise Manager will be negotiated and will commit the student to provide an assessable report and recommendations on how to improve the situation.

1534 Business Law and Finance

Level: III.

Unit value: 5.

Duration: Semester II.

Assumed knowledge: 3341 Accounting and Budgeting.

Contact hours: 5 hours per week.

Content: Law: Australian legal system, duty of care in tort, property, contract, consumer law, agency and employment law, insurance, business structure, legal rules of farming practice, taxation, estate planning. Finance: purpose of financial management, Australian financial system, time preference, financial mathematics, interest rates, break-even analysis and leverage, return and risk, decision trees, investment planning and management, debt management. Labour: principles of labour management.

Assessment: Finance component: Assignments (30% — 15%, 5%, 10%); examination (30%). Law component: Assignment (20%); examination (20%).

Text-books: Dobbins, R. & Witts, *Practical financial management* (Blackwell, 1988); Peirson, G., Bird, R. & Brown, *Business finance* (5th ed.) (McGraw-Hill, 1990); Pringle, J. & Harris, R., *Essentials of managerial finance* (Scott Foresman, 1987); Van Horne, J., Nicol, R. & Wright, K., *Financial management and policy in Australia* (3rd ed.) (Prentice-Hall, 1989).

8763 Dairy Production IA

Level: III.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 8478 Animal Science and Production; 7026 Animal Science I; 7957 Animal Science II; 4004 Animal Science III; 7333 Crops and Pastures I.

Contact hours: 2 lectures per week and 2 hours of practical work per fortnight.

Content: Composition of the dairy herd, feeding practices and management of dairy calves, vealers, replacements, dry stock, milking cows and bulls. Selection of replacements, selection of sires, enhancing reproductive performance of the herd, herd health, factors affecting milk production and composition. Herd dynamics. Milking procedure and hygiene, evaluation of alternative dairy designs, milk products, their manufacture and marketing and the marketing of dairy animals. Milk production from, and management of dairy goats and dairy sheep. Integration of dairy enterprises in farming systems. Gross margins of typical dairy enterprises of cattle, goats, and sheep.
(Students enrolled in the Livestock Production stream of the Bachelor of Applied Science (Agriculture) will undertake a tour of livestock enterprises and activities as part of this subject or as part of Pig and Poultry Production IA or IB.)

9237 Dairy Production IB

Level: III.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 8478 Animal Science and Production; 7026 Animal Science I; 7957 Animal Science II; 4004 Animal Science III; 7333 Crops and Pastures I.

Contact hours: 2 lectures per week and 2 hours of practical work per fortnight. 1 hour per fortnight devoted to the consultancy work.

Content: Composition of the dairy herd, feeding practices and management of dairy calves, vealers, replacements, dry stock, milking cows and bulls. Selection of replacements, selection of sires, enhancing reproductive performance of the herd, herd health, factors affecting milk production and composition. Herd dynamics. Milking procedure and hygiene, evaluation of alternative dairy designs, milk products, their manufacture and marketing and the marketing of dairy animals. Milk production from, and management of dairy goats and dairy sheep. Integration of dairy enterprises in farming systems. Gross margins of typical dairy enterprises of cattle, goats, and sheep.
In addition, students will undertake self-directed consultancy work. This will involve the identification of a management issue on the Campus enterprise. A contract with the Enterprise Manager will be negotiated and will commit the student to provide an assessable report and recommendations on how to improve the situation.
(Students enrolled in the Livestock Production stream of the Bachelor of Applied Science (Agriculture) will undertake a tour of livestock enterprises and activities as part of this subject or as part of Pig and Poultry Production IA or IB.)

1505 Dryland Farming Systems IA

Level: III.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 9404 Farming Systems; 8478 Animal Science and Production; 3341 Accounting and Budgeting; 7333 Crops and Pastures I; 8237 Crops and Pastures II; 1022 *or* 2611 Beef, Sheep and Goat Production IA *or* IB; 2535 Soil Conservation and Management; 5068 Economics, Policy and Marketing.

Contact hours: 1 lecture per week and 4 hours of practical work in alternate weeks.

Content: This subject is designed to encourage students to apply a systems management approach to the study of dryland farming in Southern Australia for the purpose of effective management or applied research. Topics include: evaluation of dryland farming systems using criteria of ecological/economical sustainability and flexibility in the context of change and impact on the natural environment; climatic, soil, biological, farm management economics and marketing factors; strategies for improving the management of dryland farming systems within environmental, biological and economic constraints.
Visits will be made to dryland farming enterprises to analyse the systems and propose development and management strategies. This activity will include a tour of a number of farming enterprises and research sites.

6420 Dryland Farming Systems IB

Level: III.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 9404 Farming Systems; 8478 Animal Science and Production; 3341 Accounting and Budgeting; 7333 Crops and Pastures I; 8237 Crops and Pastures II; 1022 *or* 2611 Beef, Sheep and Goat Production IA *or* IB; 2535 Soil Conservation and Management; 5068 Economics, Policy and Marketing.

Contact hours: 1 lecture per week and 4 hours of practical work in alternate weeks.

Content: This subject is designed to encourage students to apply a systems management approach to the study of dryland farming in Southern Australia for the purpose of effective management or applied research. Topics include: evaluation of dryland farming systems

using criteria of ecological/economical sustainability and flexibility in the context of change and impact on the natural environment; climatic, soil, biological, farm management economics and marketing factors; strategies for improving the management of dryland farming systems within environmental, biological and economic constraints.
Visits will be made to dryland farming enterprises to analyse the systems and propose development and management strategies. This activity will include a tour of a number of farming enterprises and research sites.
In addition, students will undertake self-directed consultancy work. This will involve the identification of a management issue on the Campus enterprise. A contract with the Enterprise Manager will be negotiated and will commit the student to provide an assessable report and recommendations on how to improve the situation.

5068 Economics, Policy and Marketing

Level: III.

Unit value: 5.

Duration: Semester I.

Contact hours: Five hours of lectures, tutorials and seminars per week.

Content: Economics: a review of the principles of micro-economics as they apply to optimising agricultural production; input-output, input-input, and product-product production relationships, cost analysis, supply and demand, market equilibrium, market models, agricultural prices. Policy: structure of the Australian economy, the role of agriculture in the Australian economy, international trade, comparative advantage, exchange rates, monetary and fiscal economic policies, equity, efficiency, welfare and market failure. Marketing: the marketing concept, management environments, the customer, the marketing mix, strategic marketing, price hedging, introduction to marketing management, negotiation.

Assessment: By assignment and examination.

Text-books: To be advised.

3958 Extension and Sociology

Level: III.

Unit value: 5.

Duration: Full year.

Assumed knowledge: 2686 Communications and Learning.

Contact hours: 3 hours per week.

Content: Introduction to scientific variables, the political system, agriculture in Australian history, agricultural ecology, agribusiness (national and international), family, community, women in agriculture. The setting, scope, objectives and functions of people and organisations involved in agricultural extension; comparative agricultural extension systems (Australian compared with overseas). Ethics in advising, professional liability, adult education objective setting and evaluation in agricultural extension. Experience in personal communications, presentation of seminars, writing a press release, preparing a radio talk (or videotape).

Assessment: Projects (40%); assignments and seminar (60%).

Text-books: To be advised.

2410 Horse Business and Regulations

Level: III.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 3341 Accounting and Budgeting; 5068 Economics, Policy and Marketing; Earlier Equine Stream subjects.

Contact hours: 3 hours per week lectures and tutorial, plus a tour.

Content: Economic characteristics of the racing industries (thoroughbred and standardbred)—organisation, operation, ownership and operation of venues, syndication, sponsorship, prizes, gate-money, betting, the TAB, financial arrangements with the State and Commonwealth governments.
Laws and regulations which significantly affect the horse industry—quarantine, drugs, income tax and other taxes, environmental control, health, welfare and safety, workers' compensation, industrial agreements and awards.
Financial characteristics of typical full-time horse enterprises—studs, syndicates, racing stables, livery stables, training establishments, riding schools, recreational riding establishments. Characteristics of horse enterprises as components of farms and other businesses, and as part-time activities.

Assessment: To be announced in the first week of semester.

Text-books: To be advised.

2578 Horse Stud Management

Level: III.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 4472 Horse Husbandry I; 1511 Horse Husbandry II; Basic horse handling experience.

Contact hours: 1 lecture and 1 three-hour practical per week.

Content: Lectures: stud designs, reproductive biology of the mare and stallion; infertility in the mare and stallion; abortion; communicable diseases relevant to the congregation of horses of mixed ages, financial considerations in the efficient care and management and welfare of stallions, broodmares and young stock; use of paddocks and pasture; foal diseases; stud book regulations.
Practicals: use of software programs in the storage and retrieval of records and dissemination of accounts to owners of agisted horses; handling of mares during teasing and mating procedures and their day-to-day management; care of the mare prior to, during and after parturition; care of foals. Demonstrations on the evaluation of fertility in the stallion, artificial breeding, for example, artificial insemination, pregnancy diagnosis, basic bacteriology and cytology. Visits to breeding establishments will supplement topics covered in practicals.

9696 Horticultural Crops IA

Level: III.

Unit value: 3.

Duration: Semester I.

Assumed knowledge: 7020 Horticultural Systems; 8403 Production Horticulture.

Contact hours: 28 lectures and 14 practicals.

Content: Industry importance (physical and economic) and organisation for each crop. Production and management of citrus, grape, stone fruit, pome fruit, alternative fruit and nut crops and vegetables. Emphasis on flowering and fruiting, soil and fertilizers, tree management and pruning, yield, pests and disease, varieties and rootstocks, planting, varietal improvement, harvest machinery, quality control, profitability levels and patterns, marketing practices. A tour of horticultural enterprises may be taken as part of this subject.

9586 Horticultural Crops IB

Level: III.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: 7020 Horticultural Systems; 8403 Production Horticulture.

Contact hours: 28 lectures, 14 tutorials and 14 practicals.

Content: Industry importance (physical and economic) and organisation for each crop. Production and management of citrus, grape, stone fruit, pome fruit, alternative fruit and nut crops and vegetables. Emphasis on flowering and fruiting, soil and fertilizers, tree management and pruning, yield, pests and disease, varieties and rootstocks, planting, varietal improvement, harvest machinery, quality control, profitability levels and patterns, marketing practices. A tour of horticultural enterprises may be taken as part of this subject. In addition, students will be involved with the Department of Horticultural Sciences and Oenology in a programme of work and tutorials with the horticulture and viticulture enterprises.

5498 Horticultural Marketing

Level: III.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 7020 Horticultural Systems; 8403 Production Horticulture; 9696 *or* 9586 Horticultural Crops IA *or* IB; 5068 Economics, Policy and Marketing.

Contact hours: 3 hours of lectures and seminars per week.

Content: Appropriate application of general marketing management theory to horticultural commodities and products in the light of the requirements of specific horticultural marketing systems and with an emphasis on international markets. Preparation and class presentation of marketing plans, in both academic case and real world contexts, at the level of the individual firm, horticultural industry and geographic region. Strategic analysis of topical issues as they occur.

Assessment: To be negotiated with students during the first week of semester.

Text-books: To be advised.

6847 Integrated Land Management

Level: III.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: A full study programme to the start of Semester 6.

Contact hours: 2 lectures and 1 tutorial per week.

Content: The legal, functional and ecological definition of land and landscapes. Composition and spatial organisation of land, diversity, stability, landscape processes and associated natural laws relevant to the function of land. Factors which control the use of land, human intervention and impacts associated with land use. Practical ecosystem-based land use and landscape management decision-making procedures to meet needs, including biophysical, social, economic and legal factors.

Assessment: Tutorial assignments, including a land capability assessment, 50%; examination 50%.

References: Naveh, Zev and Leiberman, A. S., *Landscape ecology, theory and application* (Springer Verlag, 1984); Ramade, F., *Ecology of natural resources* (Wiley & Son, 1984); Simmons, I. G., *Ecology and natural resources* (Edward Arnold, 1974); Russell, J. S. & Isbel, R. F. (eds.), *Australian soils, the human impact* (Uni. Q'land Press, 1986); Goude, Andrew,

The human impact on the natural environment (Blackwell, 1986); Gunn, R. H. et al., (eds.), *Australian soil and land survey handbook — guidelines for conducting surveys* (Inkata, 1989); White, I. D., Mottershead, D. N. & Harrison, S. J., *Environmental systems, an introductory text* (Allen & Unwin, 1984).

4637 Integrated Pest Management

Level: III.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: 6325 Biology IB; 1776 Microbiology and Entomology.

Contact hours: 2 lectures per week, 1 tutorial and 3 hours of practicals per fortnight.

Content: General principles of integrated pest management (including pest outbreaks, management strategies and monitoring programmes); modes of action of biological and chemical pesticides.

3513 Irrigated Crops and Pastures

Level: III.

Unit value: 3.

Duration: Semester I.

Assumed knowledge: 8237 Crops and Pastures II.

Contact hours: 3 lectures and 3 hours of practical work per fortnight.

Content: Environmental considerations—soils, climate, water; species and cultivar selection; crop water requirements, including monitoring for moisture stress and salinity effects; use of models for irrigated crop management; integration of irrigation into farming systems; cultural practices; irrigation scheduling, ways in which irrigation can enhance marketing flexibility and profitability.
Economic considerations—capital and operating costs of typical irrigation systems on the farm, profitability of irrigated crops and pastures compared with dryland crops and pastures.

5855 Irrigation Systems Design

Level: III.

Unit value: 6.

Duration: Semester II.

Assumed knowledge: 7280 Basic Irrigation.

Contact hours: 6 hours per week.

Content: This subject includes techniques of irrigation system design further to those studied in Basic Irrigation, particularly including computer-aided design methods. Students will be given a series of design exercises in which they will be provided with appropriate information (soil, climate, crop, topography and water supply characteristics) and given the task of producing a suitable irrigation system design.

4765 Lotfed Animal Production

Level: III.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 8478 Animal Science and Production; 7026 Animal Science I; 7957 Animal Science II.

Contact hours: 3 hours per week.

Content: Aspects of animal production in confined areas and under zero grazing conditions. Core species covered are sheep and beef cattle; other species, for example, deer or dairy cattle, can be included by mutual agreement between staff and students. Topics covered include: lotfeeding under drought conditions; lotfeeding for production, physical facilities required; nutrition, health and behaviour and other aspects of management; location and compatibility with the environment; integration of lotfeeding with a range of farming systems; labour requirements; economics—capital costs, gross margins, margins per unit; growing for specific markets; marketing.

6512 Pig and Poultry Production IA

Level: III.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 7180 Animal Science IV.

Contact hours: 2 lectures and the equivalent of 1 hour practical work per week.

Content: Housing requirements, housing types and equipment; management and nutrition—pigs (young stock, growers and breeders) and poultry (replacement stock, layers, broilers and breeders); least-cost ration formulation; breeding systems and selection methods; methods of handling, treating and disposal of animal wastes; the economics of pig and poultry production—industry-wide and for typical farm-based enterprises; integration of pig and/or poultry enterprises within farming systems; markets available, and the marketing of live animals/birds, meat and products; recent trends in the pig and poultry industries; other forms of meat production.
(Students enrolled in the Livestock Production stream of the Bachelor of Applied Science (Agriculture) will undertake a tour of livestock enterprises and activities as part of this subject or as part of Dairy Production IA or IB.)

9605 Pig and Poultry Production IB

Level: III.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 7180 Animal Science IV.

Contact hours: 2 lectures and the equivalent of 1 hour of practical work per week.

Content: Housing requirements, housing types and equipment; management and nutrition—pigs (young stock, growers and breeders) and poultry (replacement stock, layers, broilers and breeders); least-cost ration formulation; breeding systems and selection methods; methods of handling, treating and disposal of animal wastes; the economics of pig and poultry production—industry-wide and for typical farm-based enterprises; integration of pig and/or poultry enterprises within farming systems; markets available, and the marketing of live animals/birds, meat and products; recent trends in the pig and poultry industries; other forms of meat production.
In addition students will undertake self-directed consultancy work. This will involve the identification of a management issue on the Campus enterprise. A contract with the Enterprise Manager will be negotiated and will commit the student to provide an assessable report and recommendations on how to improve the situation.
(Students enrolled in the Livestock Production stream of the Bachelor of Applied Science (Agriculture) will undertake a tour of livestock enterprises and activities as part of this subject or as part of Dairy Production IA or IB.)

8340 Project/Case Study

Level: III.

Unit value: 4.

Duration: Full year.

Assumed knowledge: Completion of the first and second years of the course.

Contact hours: No formal contact hours. Students work independently with supervisor and/or co-supervisor.

Content: Each student is to undertake an individual project of significant size which exhibits original investigation, analysis and interpretation, and which results in the production of a well-written and well-presented report. The project may comprise a major literature review (of at least 8,400 words), a research project, a case study of a business or related enterprise, or some other approved study.

2631 Project/Case Study (Additional)

Level: III.

Unit value: 2.

Duration: Full year.

Assumed knowledge: Completion of the first and second years of the course.

Contact hours: No formal contact hours. Students work independently with supervisor and/or co-supervisor.

Content: As for 8340 Project/Case Study but with a minimum word limit for a literature review of 12,600.

6407 Seed Production and Plant Breeding

Level: III.

Unit value: 3.

Duration: Semester I.

Assumed knowledge: 7333 Crops and Pastures II; 1380 Biometry and Experimentation; 4637 Integrated Pest Management.

Contact hours: 2 lectures per week and 1 tutorial and 1 three-hour practical every second week.

Content: Small seeds production and harvesting. Seed cleaning and grading. Storage and longevity of seeds. Certification and seed testing aims and procedures. Seeds legislation, including Plant Variety Rights. The seeds industry and marketing. Economic aspects of seed production. Role of seed production enterprises in farm systems. The plant breeding process is followed through from assessment of needs, to setting objectives, creating genetic variability, selecting for qualitative and quantitative characteristics (yield, adaptation, quality, pest and disease resistance), cultivar release, multiplication and recommendation. The effect of Plant Variety Rights on plant breeding is discussed.

1412 The Pleasure and Working Horse Industry IA

Level: III.

Unit value: 3.

Duration: Semester I.

Contact hours: 3 hours per week.

Content: This subject covers the many facets of the pleasure and working horse industry, including the different breeds and types of horses, training methods, facilities and equipment used and organisations involved. Topics include the horse and sport, recreation, tourism, therapy and farm/station use. Commercial horse enterprises in Australia and

overseas. Basic building requirements for specific uses. Use of equipment and facilities. Education and training for particular purposes. Service industries—for example, feed merchants, farriers, saddlers, veterinarians, transporters, stock agents, trailer manufacturers. Careers in the horse industry. Constitutional organisations.
A number of seminars and/or visits to industry-related establishments will be included.

3770 The Pleasure and Working Horse Industry IB

Level: III.

Unit value: 4.

Duration: Semester I.

Contact hours: 4 hours per week.

Content: This subject covers the many facets of the pleasure and working horse industry, including the different breeds and types of horses, training methods, facilities and equipment used and organisations involved. Topics include the horse and sport, recreation, tourism, therapy and farm/station use. Commercial horse enterprises in Australia and overseas. Basic building requirements for specific uses. Use of equipment and facilities. Education and training for particular purposes. Service industries—for example, feed merchants, farriers, saddlers, veterinarians, transporters, stock agents, trailer manufacturers. Careers in the horse industry. Constitutional organisations.
A number of seminars and/or visits to industry-related establishments will be included.
In addition students will undertake a programme of practical work and/or self-directed consultancy work. The latter will involve the identification of a management issue in the Campus Horse Section. A contract with the Horse Section Supervisor will be negotiated and will commit the student to provide an assessable report and recommendations on how to improve the situation.

5265 The Racing Industry IA

Level: III.

Unit value: 3.

Duration: Semester I.

Pre-requisite: 4472 Horse Husbandry I; 1511 Horse Husbandry II.

Contact hours: 21 hours lectures and 21 hours tutorials.

Content: Conditioning and preparation of the thoroughbred or standardbred; handicapping, stewards, officials; starting procedures; riding and driving methods and responsibilities; regulations relating to the registered trainer; race club officials and betting rules and regulations.

9025 The Racing Industry IB

Level: III.

Unit value: 4.

Duration: Semester I.

Pre-requisite: 4472 Horse Husbandry I; 1511 Horse Husbandry II.

Contact hours: 21 hours lectures and 42 hours practical.

Content: Conditioning and preparation of the thoroughbred or standardbred; handicapping, stewards, officials; starting procedures; riding and driving methods and responsibilities; regulations relating to the registered trainer; race club officials and betting rules and regulations.
In addition students will undertake a programme of practical work and/or self-directed consultancy work. The latter will involve the identification of a management issue in the Campus Horse Section. A contract with the Horse Section Supervisor will be negotiated

and will commit the student to provide an assessable report and recommendations on how to improve the situation.

7493 Water Supplies and Irrigation

Level: III.

Unit value: 3.

Duration: Semester II.

Assumed knowledge: 9848 Agricultural Engineering II.

Contact hours: 2 lectures per week, 4 two-hour practical sessions and 1 field trip.

Content: Topics covered will include levelling surveys, flood flow and catchment yield predictions, water storage design, underground water supplies, irrigation systems, irrigation requirements and layout. Integration of water supplies and/or irrigation into farming systems. Capital and operating costs of water supplies and irrigation systems. The subject will be set in the context of a practical design project.

DEGREE OF

BACHELOR OF APPLIED SCIENCE (NATURAL RESOURCES MANAGEMENT)

SYLLABUSES

2247 Agriculture, Environment and Society

Level: I.

Points value: 3.

Duration: Semester I.

Contact hours: 3 lectures and 1 tutorial per week.

Content: Of all human activities, agriculture has had the most profound effect on our physical, biological and social environment. With the continued growth in the world's population, it will be necessary at least to maintain current levels of agricultural production as well as minimise the adverse effects on the environment of any increased productivity. Modern agriculture and its management face changing sets of opportunities and threats which arise in part out of complex mixes of new technologies, economic development, dynamic international policies, increasingly competitive world markets and growing awareness of the importance of natural environments.
This subject is an introduction to the scope of Australian agriculture and its importance to Australian society. It covers topics such as the contribution of Australia to world agriculture, the physical and biological basis of agriculture, the impact of agriculture on the environment, the impact of agricultural chemicals and a description of the major rural industries. Some of the environmental, social, ethical and economic issues faced by Australia's rural industries will be discussed.

Assessment: Essays (3) 30%; tutorial exercises 20% and final examination 50%.

Text-books: List of recommended texts will be provided at first lecture.

6325 Biology IB

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Semester I.

Contact hours: 2 lectures and 1 two-hour practical each week.

Content: This introductory subject covers the following topics: phylogeny and classification; taxonomic principles; cell structure and mitosis and meiosis; characteristics of life—nutrition, growth, reproduction, respiration, excretion, irritability; DNA, RNA and protein synthesis, enzymes; genetics—Mendelian genetics, gene interaction, linkage, sex determination, population genetics, natural selection, evolution; the characteristics of viruses, Monera, Protista, Fungi, Plantae, Animalia.

8057 Biology INR

Level: I.

Points value: 3.

Duration: Semester I.

Pre-requisites: Previous study of biology is not assumed. However, previous or concurrent study of chemistry is necessary.

Contact hours: 3 lectures and 3 hours of practical work a week.

Content: The subject introduces the study of biology and prepares students for later biological studies. Topices include: cell structure and function; biochemical concepts — the flow of energy, enzyme activity and regulation, respiration and photosynthesis and ATP as the common energy currency, membranes and bioenergetics. Genetics — the biology of inheritance; genes, chromosomes, reproduction, and gene mapping; coding and non-coding DNA. Molecular biology — the chemical nature of DNA and replication; transcription and translation, how the genetic code is translated, how proteins are made, manipulating genes. The results of genetic change — micro- and macro-evolution, speciation, the results of speciation, selection pressures and multicellularity, evolution; the multi-kingdom classification system with a brief introduction to each kingdom.

Assessment: Final written examination 75%; laboratory reports 25%.

Text-book: Curtis, H. and Barnes, N. S., *Biology,* 5th edn. (Worth).

References: Raven, P. H. and Johnson, G. B., *Biology,* 2nd edn. (Times Mirror/Mosby College); Arms, K. and Camp, P. S., *Biology,* 3rd edn. (Saunders College).

6976 Biomathematics and Statistics

Level: I.

Points value: 3.

Duration: Semester II.

Assumed knowledge: Year 12 Mathematics IS.

Restriction: 5543 Statistics I; 9786 Mathematics I; 4357 Mathematics IH; 3617 Mathematics IM. Available only to students in B.Ag.Sc. course and B.App.Sc.(N.R.Man't).

Contact hours: 4 lectures and 2 computer lab. sessions per week.

Content: The subject is intended to equip students with basic skills in mathematics and statistics, as an introduction to the use of quantitative methods in agriculture. Where possible, examples and data sets drawn from agricultural and biological sciences will be used. The course will involve the use of modern computing methods.
Topics will include: periodic, exponential and trigonometric functions, matrices and linear equations, integrals, differential equations; data collection and presentation, probability distributions, principles of experimentation (randomization and application), estimation, hypothesis testing, confidence intervals, regression and correlation and elementary analysis of variance.
As part of the course, students will study an extended biomathematical application and complete a group project involving data collection and analysis in a biological context.

Assessment: Formal examination (at least 70%); exercise, practicals and project work (at most 30%).

References: Mead, R. & Curnow,,C. R., *Statistical methods in agriculture and experimental biology* (Chapman & Hall); Arya, J. C. & Lardner, R. W., *Mathematics for the biological sciences* (Prentice-Hall International Inc.).

6191 Botany

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Semester II.

Contact hours: 2 lectures and 1 two-hour practical per week.

Content: Taxonomy—the taxonomic hierarchy applied to plants; floral and fruit structure;

characteristics of selected families; use of dichotomous, computer, diagrammatical and pictorial keys; collection, preservation and presentation of herbarium specimens; the importance of field notes. Physiology—morphology and structure of leaves, roots, stems and flowers; control of water loss and water uptake; fertilisation; natural and artificial growth regulators; carbon fixation in C3, C4 and CAM plants; adaptations to water stress, salinity, and temperature extremes; allelopathy.

7151 Chemistry IHA

Level: I.

Points value: 3.

Duration: Semester I.

Assumed knowledge: Year 12 Chemistry and Physics.

Contact hours: 3 lectures, 1 tutorial and 3 hours of practical work a week.

Content: An introduction to general chemical ideas, the chemical basis of the properties of materials and biological systems, and to the chemistry of the environment. Electronic theories of bonding and the structure of molecules, crystals and metals. Chemical energetics, chemical equilibria, acids and bases, electrochemistry and surface chemistry. Rates of chemical reactions. General organic chemistry. Special topics including: corrosion, water chemistry, energetics of the biosphere, metals in biological systems, applications to soils, biological redox processes biogeochemical cycles.

Assessment: End of semester examination 80%, laboratory work assessed during practical classes 20%. Further details given during the Preliminary Lecture.

Text-books: Chang, R. L., *Chemistry,* 4th edn. Students are required to purchase a pair of safety glasses for use in practical classes; advice on suitable types will be given in the Preliminary Lecture.

8773 Chemistry and Introductory Biochemistry

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: Year 12 Mathematics and an attempt at Year 12 Chemistry.

Contact hours: 3 lectures and 1 one-hour tutorial per week.

Content: This subject deals with: the structure of molecules, the application of acids, bases and buffers in natural systems; organic chemistry is developed so that molecules and processes of interest in biochemistry can be satisfactorily understood; redox chemistry theory and its application to biological redox processes including photosynthesis and respiration. Metabolism including glycolysis, fatty acid oxidation and the citric acid cycle. Thermodynamics is developed so that energy flow in ecosystems and in selected biochemical pathways can be studied at an appropriate level. Proteins, their synthesis, chemistry and relationship with DNA and the genetic code are examined. Aspects of inorganic chemistry with application to biological chemistry. For all topics relevant applied problems will be discussed so that problem solving skills are developed.

3618 Communication, Media and Extension

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Semester I.

Contact hours: 4 hours per week.

Content: Theory—the communication process, communications models and their application, selective perception, attitudes, interpersonal communication, group dynamics. The role, ownership and use of mass media. Information collection, storage and retrieval; writing reports, writing for media, different styles of writing; verbal and non-verbal communication, public speaking and use of the microphone, group dynamics.
Practical—impromptu speaking and presenting a seminar; writing a report; writing a press release; recording and discussion of audio and/or video tapes; exercises in group dynamics, facilitation of learning via groups; using an electronic keyboard for communication.

Assessment: Report (15%); essay (25%); seminar (16%); skills practical (24%); Computer practical (20%).

Text-books: To be advised.

8755 Data Collection and Analysis

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Semester II.

Contact hours: 2 lectures and 2 tutorials per week.

Content: Descriptive statistics, diagrams, correlation and regression analysis, sample survey design including questionnaire design, data verification and validation, surveying wildlife populations, parametric and non-parametric tests of hypothesis for comparing means, variances and association, experimental design and analysis.

8728 Diversity of Australian Higher Plants and Animals

Level: I.

Points value: 4.

Duration: Semester II.

Assumed knowledge: 8057 Biology INR or equivalent.

Contact hours: 4 lectures, 1 tutorial and 4 hours practical per week.

Content: Plants: the taxonomic hierarchy applied to plants, floral and fruit structure, characteristics of selected families, use of dichotomous, computer, diagrammatical and pictorial keys, collection, preservation and presentation of herbarium specimens, the importance of field notes; morphology and structure of leaves, roots, stems and flowers, control of water loss and water uptake, nutrition, plant growth and development, carbon fixation in C3, C4 and CAM plants, adaptations to light, water stress, salinity and temperature extremes. Vertebrate Animals: the taxonomic hierarchy applied to animals, vertebrate anatomy, characteristics of orders present in Australia, descriptions of selected species, identification exercises using skeletal material, whole animals and photographs in conjunction with appropriate keys, environmental adaptations with particular emphasis on osmoregulation and thermoregulation, reproduction, nutrition and digestion.

Assessment: Written theory examination (60%); practical examination (20%); practical work book (10%); tutorial paper (10%).

Text-books: Cogger, H. G., *Reptiles and amphibians of Australia* (4th ed.), (Reed, 1986); Salisbury, F. B. & Ross, C. W., *Plant physiology* (3rd ed.), (Wadsworth, 1985); Simpson, K. & Day, N., *The birds of Australia* (2nd ed.), (Lloyd O'Neil, 1986); Strahan, R. (ed.), *Complete book of Australian mammals* (Angus & Robertson, 1983); Watts, C. H. S. & Aslin, H. J., *The rodents of Australia* (Angus & Robertson, 1981); Weier, T. E., Stocking, C. R., Barbour, M. G. & Rost, T. L., *Botany: an introduction to plant biology* (6th ed.), (John Wiley, 1982).

9404 Farming Systems

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: Introductory systems theory.

Contact hours: 4 lectures and 2 two-hour tutorials per week for 7 weeks, plus farm visits and a tour as appropriate.

Content: The agribusiness system: its environment, inputs, processes, outputs and feedback mechanisms. Farming systems as subsystems of the agribusiness system, and their evolution in Australia. Characteristics of major farming systems (using case studies where possible): rural social systems; rural commercial/economic systems; farm business management systems; farm production systems: pastoral, mixed farming, livestock, horticulture/viticulture. Principles and practices of the design and management of stable farming systems. The degree course as a system, and the place of the Roseworthy farm in this system.
A tour or mini-tour of agricultural and other land-use systems will be taken as part of this subject.

Assessment: Assignments (30% — one 10%, one 20%); four reports (15%); examination (55%).

Text-books: To be advised.

5721 Field Studies I

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Full year.

Contact hours: 1 full day (6 hours) per week.

Content: This subject covers a range of techniques for recording and analysing environmental data: animal capture and measurement; fauna handling and maintenance; radiotelemetry; plant propogation techniques; electronic data management and analysis; soil analysis and mapping; aquatic sampling.

Assessment: Reports, portfolios, seminars and field aptitude.

References: To be advised.

1775 Field Studies IA

Level: I.

Points value: 3.

Duration: Semester I.

Contact hours: 1 full day (6 hours) per week.

Content: This subject covers a range of techniques for recording and analysing environmental data: animal capture and measurement; fauna handling and maintenance; radiotelemetry; plant propagation techniques; electronic data management and analysis; soil analysis and mapping; aquatic sampling.

Assessment: Reports, portfolios, seminars and field aptitude.

Text-books: To be advised.

6526 Geomorphology

Availability: Continuing students only.

Level: I.

Unit value: 2.

Duration: Semester II.

Assumed knowledge: 1955 Hydrology.

Contact hours: 14 hours each of lectures and practicals.

Content: Lectures: endogenetic processes—volcanism and earthquakes; exogenetic processes—aeolian, fluvial, glacial, periglacial and coastal; geological time; weathering. Practicals: characteristics and identification of minerals and igneous, metamorphic and sedimentary rocks; interpretation of geological maps.

1955 Hydrology

Availability: Continuing students only.

Level: I.

Unit value: 2.

Duration: Semester II.

Contact hours: 28 hours including an eight-hour compulsory tour during mid-semester break.

Content: Analysis of drainage basin systems: shapes, forms and processes. The role of water in the drainage basin landscape: surface, intermediate and ground water flow; waterways. Erosion and sedimentation: flow of sediments, processes of stream erosion and the development of river systems from youth to maturity. Human impact: includes agriculture, urbanisation and major engineering structures (dams). Management of the drainage basin: natural hazards and management in the face of changes introduced by humans.

4349 Introduction to Environmental Systems

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Semester I.

Contact hours: 2 lectures per week and 1 two-hour tutorial per fortnight.

Content: This subject covers the theory and application of systems theory to the study and management of environmental systems. It includes the following topics: fundamental principles of systems theory; different types of systems; environmental systems as "thermodynamic" systems; dynamic changes in environmental systems; management of environmental systems.

1776 Microbiology and Entomology

Level: I.

Points value: 2 (unit value 4).

Duration: Semester II.

Assumed knowledge: 6325 Biology IB or 8057 Biology INR.

Contact hours: 2 hours of lectures and 2 hours of practical work each week.

Content: Microbiology: biology of bacteria, algae, protozoa, fungi, viruses, platyhelmenthes and nemotodes. Systems to be studied include source of antibiotics, rhizosphere, fresh and waste water, immune system of animals. Entomology: topics include classification, external

and internal anatomy, insect reproduction and life cycles, insect feeding relationships, insect behaviour and predators, parasites, and pathogens.

Assessment: To be advised.

Text-books/References: To be advised.

3283 Soils

Level: I.

Points value: 3.

Duration: Semester II.

Co-requisites: Other Level I subjects in B.App.Sc. (Nat.Res.Man't.).

Assumed knowledge: Matriculation with Science subjects.

Contact hours: 2 hours lectures, 1 hour tutorial, 3 hour practical.

Content: The aim of the subject is to provide an understanding of the composition, genesis, classification and distribution of soils, the processes important to soil fertility and the principles of soil conservation. Soil structure will be defined as it controls infiltration, storage and movement of water. The importance of vegetation and soils in the hydrologic cycle will be stressed. Salinity in both dryland and irrigated agriculture will be described along with strategies for management of both saline and sodic soils. The chemical and biological properties of soils important to soil fertility will be addressed including concepts of anion and cation exchange and the role of soil organisms in nutrient cycling and structural stabilization. Conservation farming techniques will be outlined.

Assessment: Examination (a) 1 hour (20%); (b) 2 hours (45%); practical work and tutorials (25%); essay (10%).

Text-books/Reference books: No single text prescribed. References advised during lectures.

2636 Soils and Climatology I

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: Matriculation Chemistry, Geology *or* Geography.

Contact hours: 2 one-hour lectures, 1 one-hour tutorial and 1 three-hour practical a week.

Content: Climate and weather—effects, energy flows in the atmosphere and the biosphere, solar energy input. Atmospheric pressure systems, moisture transfer and balances in the atmosphere and the biosphere, rainfall influences, rainfall variability, drought and flood, evapo-transpiration. Fire risk. Greenhouse effect.
Soils—profile genesis and nomenclature, major profile characteristics, historical soil classification systems, modern American and Australian nomenclature, methodology of soil preparation and map interpretation. Basic soil physical properties, texture, structure, water movement and storage characteristics. Basic chemical properties, ionic exchange, measure of fertility parameters. Identification of soil properties, texture, structure, pH, carbonate, colour. Preparation of soil maps, collection and basic analysis of soil samples. Local soils. Soil water movement, hydraulic conductivity, infiltration, capillarity measurement of potential.

4512 Vertebrate Zoology

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Semester II.

Contact hours: 2 hours of lectures and 1 one-hour tutorial per week. 5 three-hour practicals during the semester.

Content: A subject which examines vertebrate animals present in Australia. Included are identification exercises using skeletal material, whole animals and photographs in conjunction with appropriate textbooks; an examination of the adaptations of animals to environmental conditions, covering anatomy, thermoregulation, osmoregulation, diet and reproduction.

Assessment: Theory examination (40%); practical examination (30%); tutorial paper (15%); practical reports (15%).

References: Hildebrand, M., *Analysis of vertebrate structure* (John Wiley & Sons, 1988); Hume, I., *Digestive physiology and nutrition of marsupials* (Cambridge U.P., 1982); Raven, P. & Johnson, G., *Biology* (2nd ed.), (Times Mirror/Mosby College, 1989); Schmidt-Nielsen, K., *Animal physiology* (3rd ed.), (Cambridge U.P., 1983). The most useful journal will be *Australian wildlife research*, CSIRO; another useful journal may be the *Australian Journal of Zoology.*

8349 Environmental Impact Assessment Methodology

Level: II.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: Mathematics to year 12.

Contact hours: 2 lectures and 2 tutorials per week.

Content: The purpose, legal requirements and administrative procedures of Impact Assessment in Australia. The methods of identifying, predicting, measuring, weighting and assessing the impacts of different types of proposals. Checklists, matrix and network techniques and their derivatives. Quantification and ranking systems, social impact assessment and cost benefit analysis. Design of impact studies, sources of data, sampling, monitoring and use of models. Public involvement procedures and decision-making techniques. Case study of a recent impact statement.

Assessment: Tutorial exercises (50%); examination (50%).

References: Thomas, I. G., *Environmental impact assessment — Australian perspectives and practice* (Monash U.P., 1987); Beale, Jack, *The manager and the environment* (Pergamon, 1980).

4565 Ecology of Communities

Level: II.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 6325 Biology IB.

Contact hours: 2 lectures per week, 1 one-hour tutorial per fortnight and 4 half-day practicals.

Content: Examines current major ecological principles applied at community and ecosystem levels and demonstrates these principles with reference to Australian ecosystems. At community level topics are: concepts of community, detection and delineation of communities, community organisation, succession, species diversity measures, response to disturbance, and the stability/diversity controversy. At ecosystem level structural and functional components of ecosystems are analysed, leading to examination of energy transfers, primary and secondary productivities, ecological efficiency, nutrient movements and budgets, and ecosystem dynamics.

Assessment: Practical reports, tutorial paper and examination.

Text-books: To be advised.

6076 Ecology of Populations

Level: II.

Unit value: 4.

Duration: Semester I.

Contact hours: 2 lectures and 1 tutorial per week, plus 4 four-hour practical sessions.

Content: This subject covers the demographic attributes of populations which best illustrate their structural organisation and functional activity (for example, abundance, density, natality, fecundity, fertility, mortality/survivorship, dispersal, age-distribution, sex ratio, dispersion); how these attributes are adaptive (for example, life-history strategies); models of population growth and population regulation; and models of interspecific interactions.

Assessment: Examination, practical reports, tutorial paper.

References: To be advised.

4163 Economics of Resource Management

Level: II.

Unit value: 4.

Duration: Semester II.

Contact hours: 2 hours lectures and 2 hours tutorials/seminars per week.

Content: Principles of micro-economics as they relate to the use and management of natural resources, examination of the causes of market failure in resource allocation and resource use and opportunities for market intervention, introduction to time preference and the economics of resource management over time.

Assessment: Assignments and seminars (40%); written examination (60%).

Text-books: Randall, A., *Resource economics* (Wiley, 1987); Common, M., *Environmental and resource economics* (Longman, 1988); Pearce, D., et al, *Blueprint for a green economy* (Earthscan, 1989).

8411 Environmental Chemistry I

Level: II.

Unit value: 4.

Duration: Semester I.

Pre-requisite: 8773 Chemistry and Introductory Biochemistry or 7151 Chemistry IHA.

Contact hours: 2 lectures and 3 hours of practical work per fortnight.

Content: The environmental properties of water; redox equilibria in natural water; environmental chemical analysis; the nature and composition of the atmosphere; organic chemicals in the atmosphere; environmental biochemistry and toxicology; environmental chemistry of the geosphere and biogeochemical cycles of selected elements.
Practicals include: titrimetric analysis of selected ions in water samples; spectrophotometric analysis of an inorganic constituent in a water sample; effect of metal ions on enzyme activity; chromatography of plant pigments; measurement of reaction rates.

Assessment: Practicals (40%); 2 term papers (60%).

References: A list will be provided with the subject guide.

8220 Fauna Survey and Habitat Assessment

Level: II.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: 6076 Ecology of Populations; 8278 Vegetation Survey; 8755 Data Collection and Analysis.

Contact hours: 2 lectures per week, plus 4 four-hour practical classes.

Content: This subject covers the survey of fauna population and their interaction with the environment: occurrence and movements of individual animals; occurrence and distribution of populations; animal responses to utilization of the environment; determining, mapping, classifying and evaluating fauna habitats; the environment's response to utilization by animals; determination of carrying capacity.

Assessment: Practical reports and theory examination.

1382 Field Studies II

Level: II.

Unit value: 6.

Duration: Full year.

Pre-requisite: 5721 Field Studies I.

Assumed knowledge: 8755 Data Collection and Analysis.

Contact hours: 4 five-day field camps throughout the year.

Content: This subject aims to provide students with an opportunity to gain practical experience and expertise in specific technical skills and procedures concerned with environmental monitoring through their participation in ongoing research programmes. Students are exposed to a problematic situation and then assisted in developing a strategy for problem-solving, which includes problem definition; experimental design; data collection through experimentation; data analysis and interpretation of the data. Detailed syllabus is dependent upon the type of research programme(s) selected.

Assessment: To be advised.

References: A list will be handed out in the first week of semester.

3799 Geographic Information Systems I

Level: II.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 9505 Mapping, Surveying and Remote Sensing.

Contact hours: 1 lecture per week and 4 hours of practical per fortnight.

Content: Types of geographical information systems—vector and raster based; data input, editing and display; spatial modelling including map overlay, geographic registration, buffering and interpretation; concepts, structure and introductory usage of Arc/Info.; digital elevation models; integration of GIS with remote sensing data; case histories of GIS application to natural resource management problems. Students gain experience in the use of both raster and vector GIS on personal computers.

Assessment: Practical assignments, essay and examination.

References: To be advised.

9505 Mapping, Surveying and Remote Sensing

Level: II.

Unit value: 4.

Duration: Semester I.

Contact hours: 21 hours of lectures per semester, a one-hour tutorial per fortnight and a four-hour practical each week. Some practicals are conducted in the field.

Content: Introduces students to a range of mapping, surveying and remote sensing techniques and their application to natural resource surveys, and develops practical skills in map and remote imagery interpretation, basic surveying techniques and preparation of plans and thematic maps. Covers principles of mapping and use of maps for resource surveys; practical application of equipment and techniques used in surveying to exercises involving traversing, siting and contouring; construction of original thematic maps from image interpretation and ground survey; review of the theory and use of vertical air photos and their application in natural resource surveys; an introduction to the sources and nature of remotely-sensed imagery and the principles of earth-electromagnetic radiation interactions.

Assessment: Practical reports, tutorial papers, practical and theory examinations.

References: To be advised.

3394 Personal Communication

Level: II.

Unit value: 2.

Duration: Semester I.

Assumed knowledge: 3618 Communication, Media and Extension.

Contact hours: 2 hours per week.

Content: The basic components of communication: listening, summarising, clarifying, and responding. Theories of personal communication such as transactional analysis. Group dynamics, facilitation, and leadership skills. Negotiation and conflict resolution.

Assessment: Negotiated by contract with each student at the beginning of the semester.

Text-books: To be advised.

1546 Seminar I

Level: II.

Unit value: 2.

Duration: Full year.

Contact hours: 1 two-hour seminar per fortnight for the whole year.

Content: This subject presents a series of seminars from speakers within and outside the Roseworthy Campus, covering a wide range of natural resource management topics and issues. The seminars aim to expose students to current research and environmental management initiatives from institutions and the community. Students are required to present written summaries of seminars attended, and are encouraged to question and respond to speakers.

8278 Vegetation Survey

Level: II.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 6191 Botany.

Co-requisite: 9505 Mapping, Surveying and Remote Sensing.

Contact hours: 1 lecture per week and 1 four-hour practical per fortnight.

Content: Quantification of vegetation, sampling systems and their application to vegetation survey and ecology. Broadscale survey: air photo or LANDSAT based mapping and ground survey; delineation of communities on the basis of inter-specific association and similarity

analysis, application to mapping; temporal survey; assessment of vegetation data for conservation evaluation; vegetation classification and survey in Australia. Methods and scope of surveys conducted by CSIRO, State and Commonwealth Government agencies, consultants and other organisations.

Assessment: Practical reports and examination.

References: To be advised in subject handbook.

8189 Vertebrate Pest Control

Level: II.

Unit value: 4.

Duration: Summer Semester.

Contact hours: 10 days during the summer vacation.

Content: This subject, presented in conjunction with the Animal and Plant Control Commission, strongly emphasises the field application of vertebrate pest control techniques and provides the theoretical bases for these techniques. Topics covered are the biology and ecology of vertebrate pests; the damage caused by pest animals; the legislative and administrative aspects of vertebrate pest control; district organisation; extension; vertebrate pest control practice.

Assessment: Assignments (40%); practical report (30%); theory examination (30%).

Text-books: Kitching, R. L., *The ecology of exotic animals and plants* (John Wiley, 1986).

5561 Aboriginal Land Use and Management

Level: III.

Unit value: 2.

Duration: Semester I.

Contact hours: 2 hours per week.

Content: This subject examines contemporary land use and land management by Aboriginal peoples through exploration of contemporary and traditional land use and management, social systems, land beliefs, and their interdependence; contemporary goals, problems and resources common to land use and management by different Aboriginal peoples, operation of Lands Councils and implications of Land Rights legislation; appropriate ways to approach and work effectively with contemporary Aboriginal organisations, authorities and communities; comparative studies in land science.
The syllabus includes land belief, social systems, diversity of management practices, diversity of economic systems, land use, impacts of European settlement and practice, response to European settlement and practice, Aboriginal achievement, Aboriginal organisations, Land Rights legislation and processes, contemporary land use and management, working with Aboriginal organisations and communities.

8035 Behavioural Ecology

Availability: Not offered in 1992.

Level: III.

Unit value: 2.

Duration: Semester II.

Assumed knowledge: 6325 Biology IB, with particular reference to genetic evolution.

Contact hours: 2 lectures and 1 two-hour tutorial per week.

Content: This subject provides students with an appreciation of the diversity of animal behaviours; understanding of the methods of ethology; the evolutionary approach toward the investigation and interpretation of behaviour; understanding of the theory and

application of cost-benefit analysis and ecological energetics in the investigation of the adaptive functions of specific behaviours including reproduction, feeding, societal behaviours and habitat selection; ability to apply knowledge of the interplay between ecology and behaviour to the controlled manipulation and management of fauna populations.

4426 Crops and Pastures

Level: III.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: 2636 Soils and Climatology I.

Contact hours: 2 lectures per week and 4 hours of practical work per fortnight.

Content: The use of climatic indices in the selection and management of dryland crops and pastures. Pasture establishment, pastures in a cropping rotation, fodder conservation, grass-legume relationships in pastures, pasture management. Production and management of forage in the pastoral zone. The principles and practices of cereal crop production. Tillage practices—conventional, minimum tillage, weed control, crop rotations and reduction in disease carryover. Integration of crop and livestock enterprises. Crop gross margins and the economics of pasture establishment and maintenance.

9929 Ecology and Management of Agricultural Systems

Level: III.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 9404 Farming Systems; 2636 Soils and Climatology I.

Contact hours: 2 lectures per week and 4 hours of practical work per fortnight.

Content: The importance of environmental, social and economic constraints on the development of agricultural systems. Distinction between sustainable and unsustainable agricultural systems. Recent trends including the organic farming movement, degradation of soil through erosion and salinity and means of developing strategies for optimising production at sustainable levels.

6062 Ecology and Management of the Arid Zone

Level: III.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 6076 Ecology of Populations; 4565 Ecology of Communities.

Contact hours: 4 hours per week.

Content: Physical resources: landforms, geology, geomorphology, soil, climate, hydrology. Biological resources: plant and animal communities, changes in distribution as a result of grazing pressure and changed fire regimes, feral animals—their status, distribution and impact. Social aspects: tourism, Aborigines and European inhabitants, land use and alternative concepts of multiple and joint use. Rangeland management, including tools for managers. Management of pastoral leases in South Australia.

Assessment: To be advised in subject outline.

Text-books: To be advised in subject outline. A library of reference material is made available.

1270 Ecology and Management of Forests and Woodlands

Level: III.

Unit value: 4.

Duration: Semester II.

Co-requisite: It will be an advantage to students to have taken, or to take concurrently the subjects
6076 Ecology of Populations
4565 Ecology of Communities.

Contact hours: One lecture and 1 two-hour tutorial per week.

Content: Issues of forest management; processes in forest and woodland ecosystems which influence management; shedding of plant parts; nutrient cycling; forest regeneration; species attributes influencing regeneration; the role of fire; fire protection and management; biotic factors and forest management; birds and forest ecosystems; mammals and forest ecosystems; insects and forest ecosystems; micro flora and bacteria; fragmentation; the viability of remnant stands.

Assessment: Examination (40%); project (30%); seminar (30%).

References: To be advised in subject outline.

8691 Ecology and Management of Freshwater Systems

Level: III.

Unit value: 4.

Duration: Semester II.

Contact hours: 52 hours of lectures, tutorials and practicals.

Content: This subject utilizes an individual or small group problem-solving approach; thus there is no fixed syllabus. Students produce a feasibility study of an approved proposal to establish a fish farming sideline in a Campus pond. The nature of the proposal and study is such that the physical, chemical and biological processes occurring in a pond and its catchment and sampling techniques to enable these processes to be monitored are topics examined by all students in the course of the subject.

Assessment: Project (50%); examination (50%).

7887 Environmental Law

Level: III.

Unit value: 4.

Duration: Semester I.

Contact hours: 2 lectures per week and 1 three-hour workshop per fortnight.

Content: The Australian legal system, sources of law, institutions of law and their roles; Common Law origins and relevance to environmental law; the Australian Constitution; partitioning of State and Commonwealth responsibilities; relative roles in environmental management. The legislative process. Case studies of major areas of environmental legislation: flora, fauna and environmental conservation, land management, heritage, land use planning, coastal management, water resources, mining. Property law and land tenure, the impact of tenure on land management. Environmental protection agencies, charter and effectiveness, operation.

Assessment: Essays, seminar and examination.

References: To be advised.

9920 Fauna Management

Level: III.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 6076 Ecology of Populations; 8755 Data Collection and Analysis.

Contact hours: 2 lectures and 2 tutorials per week.

Content: The subject covers the reasons for management conflicts between man and wildlife; development of ecologically-based management strategies for achieving either of the following goals—conservation, commercial harvesting, pest control; legal and administrative framework.

1564 Field Studies III

Level: III.

Unit value: 6.

Duration: Full year.

Assumed knowledge: 1382 Field Studies II.

Contact hours: 1 four-hour tutorial per fortnight.

Content: Under the supervision of an academic staff member to carry out a research project on a topic approved by the Department. This will involve planning the investigation, preliminary literature surveys, practical experimentation and the preparation of an investigation report. Results will be presented at a seminar.

Assessment: Project report and seminar.

References: As prescribed for individual candidates.

3386 Integrated Catchment Management

Level: III.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: 4349 Introduction to Environmental Systems; 6325 Biology IB; 2636 Soils and Climatology I; 6526 Geomorphology; 1955 Hydrology.

Contact hours: 2 lectures and 2 tutorials per week.

Content: Conflicts in land use; functions of land, definitions and classifications of land; spatial characteristics and processes of land and landscapes; boundary processes in landscapes. Disturbances of components and processes by land use. Land management systems for both single and multiple use. Planning techniques.

Assessment: Tutorial assignments, including a land capability assessment, 50%; examination 50%.

References: Naveh, Zev and Leiberman, A. S., *Landscape ecology, theory and application* (Springer Verlag, 1984); Ramade, F., *Ecology of natural resources* (Wiley & Son, 1984); Simmons, I. G., *Ecology of natural resources* (Edward Arnold, 1974); Russell, J. S. & Isbel, R. F. (eds.), *Australian soils, the human impact* (Uni. Q'land Press, 1986); Goude, Andrew, *The human impact on the natural environment* (Blackwell, 1986); Gunn, R. H. et al. (eds.), *Australian soil and land survey handbook — guidelines for conducting surveys* (Inkata, 1989); White, I. D., Mottershead, D. N. & Harrison, S. J., *Environmental systems, an introductory text* (Allen & Unwin, 1984).

4637 Integrated Pest Management

Level: III.

Unit value: 4.

Duration: Semester I.

Assumed knowledge: 6325 Biology IB
1776 Microbiology and Entomology.

Contact hours: 2 lectures per week, 1 tutorial and 3 hours of practicals per fortnight.

Content: General principles of integrated pest management (including pest outbreaks, management strategies and monitoring programmes); modes of action of biological and chemical pesticides.

4058 Land Rehabilitation and Soil Conservation

Level: III.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 2636 Soils and Climatology I or 3283 Soils.

Contact hours: 1 one-hour lecture and 1 one-hour tutorial each week and 1 four-hour practical each fortnight.

Content: This subject examines the social, physical, chemical and biological processes contributing to land degradation, and develops the theoretical basis for restoring components and processes contributing to ecological instability and land degradation, and the application of appropriate, ecologically-sound techniques for land restoration to land which has been degraded by land abuse.

2776 Pollution and Waste Management

Level: III.

Unit value: 4.

Duration: Semester II.

Pre-requisite: 8411 Environmental Chemistry I.

Contact hours: 2 lectures per week and 4 hours of practical work for 7 weeks.

Content: The types of chemicals and sources of those involved in the pollution of soil, water and air environments. Prediction of the expected environmental reactions and fates of those chemicals, the rate of transport of the chemicals in the water, soil and air environment and the ecosystem effects of the chemicals. Chemodynamics—the movement of chemicals in ecosystems. Principles, practices and problems involved in waste disposal and management. Practicals involve the detection and analysis of trace level contaminents.

Assessment: Practicals (40%); term papers (50%); assignment (10%).

References: A list will be provided with the subject guide.

4638 Recreation Management

Availability: Not offered in 1992.

Level: III.

Unit value: 4.

Duration: Semester II.

Contact hours: 1 lecture per week and 1 tutorial per fortnight. Field work for a project comprises approximately 2 hours per week, to be organised by the student.

Content: Definitions and cultural perspectives: leisure and work, leisure and the community. The environmental context of recreation, outdoor recreation in urban parks, rural areas,

national parks, tourism; the extent and demand for outdoor recreation and tourism; impact of recreation on natural systems, determination and monitoring of impact; management and planning for recreation in natural environments; concepts of ecological and perceptual carrying capacity and their measurement; planning and policy; government role in recreation.

9232 Remote Sensing and Land Capability Assessment

Level: III.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 9505 Mapping, Surveying and Remote Sensing.

Contact hours: 2 lectures and 3 hours of practical work per week, plus 4 days of field work.

Content: Remote Sensing: the interpretation of detailed information about the earth's surface gathered by space and airborne platforms using various scanning systems.
Principles and applications of remote sensing. Principles include the interaction of electromagnetic radiation with the earth's surface; measurement of this radiation by a range of sensors; spectral aspects of earth objects (rocks, soils, vegetation and water) and the way spectral data can be used to identify and characterise those objects and monitor changes over time. Relevance of data base to geological, botanical and soil science inventorization and environmental science. Information extraction using digital image processing including correction, enhancement and classification of the digital data. Applications of remote sensing to atmospheric monitoring, geological mapping and air pollution; applications to land cover mapping and capability assessment, the FAO and USDA systems of capability classification, and use of computer models such as Range Pack and ERAMS for rangeland assessment and management.

1284 Seminar II

Level: III.

Unit value: 2.

Duration: Full year.

Contact hours: 1 two-hour seminar per fortnight.

Content: This subject presents a series of seminars from speakers within and outside the Roseworthy Campus, covering a wide range of natural resource management topics and issues. The seminars aim to expose students to current research and environmental management initiatives from institutions and the community. Students are required to present written summaries of seminars attended, and are encouraged to question and respond to speakers.

2280 Systems Modelling

Level: III.

Unit value: 4.

Duration: Semester II.

Pre-requisite: 4349 Introduction to Environmental Systems.

Assumed knowledge: 8755 Date Collection and Analysis; Year 12 Mathematics.

Contact hours: 2 lectures per week and 7 four-hour practical classes for the semester.

Content: This subject covers the guidelines and steps for model construction, including conceptual model formulation, quantitative specification, model validation, model use. Examples considered include models of populations, communities, ecological processes and ecosystems.

Assessment: By examination.

References: Grant, W. E., *Systems analysis and simulation in wildlife and fisheries sciences* (J. Wiley & Sons, 1986).

DEGREE OF

BACHELOR OF APPLIED SCIENCE (WINE SCIENCE)

SYLLABUSES

3572 Biochemistry

Availability: Continuing students only.

Level: I.

Unit value: 6.

Duration: Semester II.

Pre-requisite: 1576 Chemistry IA.

Contact hours: 3 lectures and 1 practical per week.

Content: Enzyme kinetics; anaerobic and aerobic metabolism of sugars; Pasteur and Crabtree effects; formation of promitochondria; glycerol production; energy efficiency, hetero- and homolactic fermentation; membrane structure and function; formation of ATP; nucleic acid metabolism; inducible and repressible enzymes; lipid metabolism; glyoxylate cycle; sulphur metabolism; secondary plant metabolism—acetate/malonate, acetate-mevalonate shikimic acid pathways.

1127 Biology IC

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Semester I.

Contact hours: 2 lectures and 1 practical per week.

Content: Description of plant cells; cell division; types of plant tissues; leaf structure and function; stem structure and function; root structure and function; flower structure and function; water potential; mineral nutrition; chemical control of growth; environmental control of growth; photosynthesis; fruit development and ripening.

1576 Chemistry IA

Availability: Continuing students only.

Level: I.

Unit value: 8.

Duration: Semester I.

Pre-requisite: Year 12 Chemistry.

Contact hours: 2 hours of lectures and 6 hours of practical and/or tutorial sessions per week.

Content: An introductory subject covering the basic principles and concepts of analytical, physical and organic chemistry. Laboratory safety; volumetric apparatus and techniques, concentration units, approach to chemical calculations, acids, bases, chemical equilibrium, pH buffers, titration curves, distribution diagrams, bonding, properties of solutions, solubility, chemical kinetics, alkanes, alkenes and alkynes, carboxylic acids, alcohols, esters,

carbohydrates, phenolic compounds, nitrogenous compounds, amino acids and proteins, sulphur compounds, oxidation/reduction, reaction mechanisms, identifying reactions of organic compounds, synthesis of organic compounds and isolation and purification steps in the preparation of organic compounds (for example, distillation and crystallisation).

8574 Climatology and Soils

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: Year 12 Chemistry.

Contact hours: 23 hours of lectures, 6 hours of tutorials and 22 hours of practicals/field tour.

Content: A study of soil physical parameters such as texture, structure, porosity and soil water relationships. Soil chemistry including soil fertility evaluation, the macro-nutrients nitrogen, phosphorus and potassium and their availability and replenishment within the soil. Soil management aspects dealing with the principles of soil conservation from salinity, wind and water erosion, and construction of erosion hazard maps. Meteorological factors including solar radiation, cloud formation and rainfall patterns, atmospheric pressure and winds and evapotranspiration. Climatic patterns including variability and climate classification. Weather map and satellite photograph interpretation.

4251 Engineering

Availability: Continuing students only.

Level: I.

Unit value: 4.

Duration: Semester II.

Assumed knowledge: Year 12 Mathematics 1S.

Contact hours: 2 lectures and 1 two-hour practical per week.

Content: Fluids, pressure, flow in fluids, pressure-vessel theory, pipe system characteristics, pump characteristics, suction considerations for pumping, pump types common to irrigation and winery uses, power requirements of pumps, electrical safety, DC and AC power, three phase power, AC motor types and switchgear, maintenance of electric motors.
Practical sessions on the use of the centrifugal pump, mono pump, pumping system performance, motor-generator investigation, single-phase electric motors, autofermenter, mono pump, centrifuge, crusher, bottle filler.
Problem-solving—assignments designed to enhance understanding of the topics presented as well as developing problem-solving skills.

3244 Information Processing

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester I.

Contact hours: 7 lectures plus self-directed learning package for computer use equivalent to 32 hours of contact.

Content: Basic computer concepts, terminology and applications. Information systems for businesses and the role of computers; operating systems. General applications: word processing, spreadsheets, database programs. Specific applications: financial management,

process control; communicating with other computers; evaluation of software and hardware.

Assessment: Practical examination (60%); term paper (20%); theory examination (20%).

Text-books: To be advised.

3800 Introduction to Wine Science

Availability: Continuing students only.

Level: I.

Unit value: 5.

Duration: Semester I.

Contact hours: 2 hours lectures/tutorials and 3 hours of sensory evaluation practical classes per week.

Content: Section 1: The history of the grape and wine industry (world wide, including Australia); grapes for wine and their geographic distribution; micro-organisms and wine; alcoholic fermentation; classification of wine types; introduction to principles and practices of winemaking and distillation. Present position of the Australian wine industry; grapegrowing and wine-producing regions of the world.
Section 2: This section (Sensory Evaluation) is presented mainly via practical tasting/ tutorials, and covers the following topics: origin of major wine components; senses used in wine evaluation; basic taste sensations; balance and wine flavour (introduction); wine types (Australian); specification of wine types and styles; language for communication about wine; introduction to the quality evaluation of wines.

2326 Statistics

Availability: Continuing students only.

Level: I.

Unit value: 3.

Duration: Semester I and Semester II.

Contact hours: 2 lectures and 1 tutorial per week.

Content: Descriptive statistics, diagrams, correlation and regression analysis, index numbers, multivariate techniques, sampling, parametric and non-parametric tests of hypothesis. Experimental design and analysis.

6291 Viticulture I

Availability: Continuing students only.

Level: I.

Unit value: 5.

Duration: Semester II.

Pre-requisite: 1127 Biology IC.

Assumed knowledge: 3800 Introduction to Wine Science.

Contact hours: 2 lectures and 1 three-hour practical per week.

Content: This subject provides the physiological basis necessary for an understanding of grapevine response to environmental and cultural factors. Topics include grapevine anatomy and morphology, growth and development from winter dormancy to fruit set, physiology, pruning, yield components and factors affecting yield and basic propagation. Practical sessions include pruning, planting, grafting, training, physiological measurements and phenology. Students design and perform a simple field experiment which is terminated by harvest measurements in the following season.

6096 Wine Microbiology I

Availability: Continuing students only.

Level: I.

Unit value: 5.

Duration: Semester II.

Assumed knowledge: 1127 Biology IC.

Contact hours: 1 two-hour lecture and 1 three-hour practical per week.

Content: Classification and nomenclature of prokaryotes and eukaryotes; morphological and cultural characteristics of yeasts, bacteria and fungi; ultrastructure and function of prokaryotic and eukaryotic cells; nutrition and cultivation of micro-organisms; microbial growth; methods of measuring growth; factors affecting microbial growth; control of micro-organisms; principles of microbial killing; principles of and methods used in isolating, detecting and identifying micro-organisms; classification of the fungi, yeasts and bacteria; characteristics of major groups and genera of the fungi, yeasts and bacteria; yeast microflora associated with winemaking; evolution and succession of yeasts during vinification; bacteria associated with winemaking; evolution and succession of lactic acid and bacteria during vinification and storage of wine.

7280 Basic Irrigation

Level: II.

Unit value: 3.

Duration: Semester I.

Pre-requisite: 4251 Engineering.

Contact hours: 2 hours of lectures and 1 one-hour practical per week.

Content: Evapotranspiration and soil moisture budget, crop requirements (peak rate and crop factor), adjustment for salinity (leaching fraction), calculation of irrigation depth and period, sprinkler and dripper characteristics, sprinkler and dripper layout, hydraulics of pressure irrigation systems.

3303 Business Finance I

Level: II.

Unit value: 3.

Duration: Semester II.

Contact hours: 2 lectures and 1 tutorial per week.

Content: Circular flow of funds, business risks and the role of management, the financial structure of a business, basic accounting principles, valuation, interpretation of financial accounts, sources of business finance, profit planning and control, business operations and the law, contracts, the law of agency and principle, negotiable instruments.

Assessment: 3 assignments (50% — one 10%, one 15%, one 25%); examination (50%).

Text-books: To be advised.

7454 Grape and Wine Analysis (O)

Level: II.

Unit value: 6.

Duration: Semester I, commencing four weeks prior to the start of the academic year.

Pre-requisite: 1576 Chemistry IA.

Contact hours: 24 hours of lectures/tutorials and 60 hours' practical work and industry

visits. Practical work is concentrated in the four weeks prior to the normal semester commencement date.

Content: This subject deals specifically with basic quality-control principles and analysis methods used in winemaking. It is practically orientated.
Lectures—analytical techniques, errors in analytical methods, laboratory design, laboratory management, laboratory safety, types, structure, amounts, reactions in winemaking process and theory of analysis for the following compounds: sugars, acids, sulphur compounds, ascorbic acid, carbonyl compounds, alcohols, cations, nitrogen compounds, anthocyanins and phenols, flavour compounds. Introductory theory and practice of UV-Vis and Atomic Absorption Spectrophotometry and HPLC methodology.
Practicals—introduction to laboratory techniques, analysis of total soluble solids and reducing sugars, pH and Titratable acidity, sulphur dioxide and ascorbic acid, alcohols, cations (flame photometry and atomic absorption, demonstration of equipment), nitrogen compounds; Paper Chromatography (detection of malo-lactic fermentation); UV-Vis Analysis—Colourimetric analysis of tartaric acid, Enzymatic analyses of malic acid, Anthocyanins and phenolics, Terpene analysis; HPLC (demonstration of equipment).
Project—a comparison of two methods of analysis (accuracy, precision, interfering compounds, speed, cost, suitability).

6565 Grape and Wine Analysis (V)

Level: II.

Unit value: 5.

Duration: Semester I, commencing four weeks prior to the start of the academic year.

Pre-requisite: 1576 Chemistry IA.

Contact hours: 24 hours of lectures/tutorials and 46 hours of practical work and industry visits. Practical work is concentrated in the four weeks prior to the normal semester commencement date.

Content: This subject deals specifically with basic quality-control principles and analysis methods used in winemaking. It is practically orientated.
Lectures—analytical techniques, errors in analytical methods, laboratory design, laboratory management, laboratory safety, types, structure, amounts, reactions in winemaking process and theory of analysis for the following compounds: sugars, acids, sulphur compounds, ascorbic acid, carbonyl compounds, alcohols, cations, nitrogen compounds, anthocyanins and phenols, flavour compounds. Introductory theory and practice of UV-Vis and Atomic Absorption Spectrophotometry and HPLC methodology.
Practicals—introduction to laboratory techniques, analysis of total soluble solids and reducing sugars, pH and Titratable acidity, sulphur dioxide and ascorbic acid, alcohols, cations (flame photometry and atomic absorption, demonstration of equipment), nitrogen compounds; Paper Chromatography (detection of malo-lactic fermentation); UV-Vis Analysis—Colourimetric analysis of tartaric acid, Enzymatic analyses of malic acid, Anthocyanins and phenolics, Terpene analysis; HPLC (demonstration of equipment); comparison of methods of analysis.

2563 Sensory Evaluation I

Level: II.

Unit value: 3.

Duration: Semester I.

Pre-requisite: 3800 Introduction to Wine Science.

Contact hours: Three-hour tasting /practical session per week.

Content: The recognition of varietal characteristics exhibited in grape juices; the influence of fermentation and wood flavours on wine quality; recognising balanced structure in wine; the recognition of spoilage characteristics appearing during the wine production process; the organoleptic ability to recognise quality during the wine-making process. Topics

include: assessment of juices; assessment of wines during winemaking process; characteristics of major varieties (flavour); diversity of wine styles; factors affecting flavour perception; spoilage characteristics; effect of technological practices on wine quality.

2102 Sensory Evaluation II

Level: II.

Unit value: 4.

Duration: Semester II.

Pre-requisite: 3800 Introduction to Wine Science; 2326 Statistics.

Contact hours: 12 hours of lectures and 26 hours of tutorials/practicals.

Content: This subject, presented as a combined lecture/practical tasting programme, will include the following topics: palate evaluation tests; determination of component threshold levels; methods of carrying out screening procedures for wine judge selection; evaluation of wines by scoring; judging procedures; evaluating judge performance; methods of analysis; arrangement and conducting of sensory evaluation panels; quantitative descriptive analysis.

6787 Tour I (O)

4896 Tour I (V)

Level: II.

Unit value: 1.

Duration: Semester II.

Contact hours: Each tour may last up to one week.

Content: This subject will familiarise students with the Australian wine industry by visiting selected grape-growing and wine-producing areas of Australia. Of particular interest will be winery equipment and processes; oenological practices in small and large wineries; grape-growing and vineyard management practices; quality control practices.

4052 Vineyard Operations

Level: II.

Unit value: 5.

Duration: Semester II.

Pre-requisite: 6291 Viticulture I.

Contact hours: Two-hour tutorial/demonstration session and 3 hours of field work per week.

Content: A one-hour tutorial each week at which the students meet with the vineyard manager to prepare a management plan—each student will be required to research and implement or supervise the implementation of one or more vineyard operations, for example, herbicide or fungicide programme. The subject will also include small group demonstrations, such as spray equipment calibration, machinery operation and maintenance, spray application, irrigation system operation and maintenance, trellis construction. Students will be rostered for vineyard work for up to 3 hours each week (not more than 35 hours in total) and will carry out tasks assigned by the vineyard manager, for example, pruning, training, grafting, nursery work, spray application, cultivation, trellis construction and repair, irrigation system operation and maintenance, stock handling.

2826 Viticultural Engineering

Level: II.

Unit value: 5.

Duration: Semester II.

Assumed knowledge: Year 12 Mathematics 1S.

Contact hours: Two hours of lectures and 1 two-hour practical per week.

Content: Lectures—power, torque, shaft power, engine characteristics, traction, weight distribution, tractor performance, properties of materials, fence and trellis load and stress analysis.
Practicals—properties of materials, engine characteristics, tractor engine power, weight distribution, power transmission.

3669 Viticulture II (O)

Level: II.

Unit value: 4.

Duration: Semester I, commencing four weeks prior to the start of the academic year.

Pre-requisite: 6291 Viticulture I.

Contact hours: 2 lectures and 1 three-hour practical per week.

Content: This subject covers the principles and practices of the viticultural operations associated with vintage such as fruit sampling, yield estimation, variety identification, harvesting methods. In addition, berry growth and development, ripening and composition are covered in considerable depth. Other topics include characteristics of fruiting varieties and rootstocks and genetic improvement. Practical sessions relate to lecture topics with most emphasis on sampling techniques, measurement of yield components, variety identification. The pruning project commenced in Viticulture I is completed with yield and compositional measurements.

2312 Viticulture II (V)

Level: II.

Unit value: 5.

Duration: Semester I, commencing four weeks prior to the start of the academic year.

Pre-requisite: 6291 Viticulture I.

Contact hours: 2 lectures and 1 three-hour practical per week, plus a weekend field trip.

Content: This subject covers the principles and practices of the viticultural operations associated with vintage such as fruit sampling, yield estimation, variety identification, harvesting methods and techniques for table and drying grape production. In addition, berry growth and development, ripening and composition are covered in considerable depth. Other topics include characteristics of fruiting varieties and rootstocks and genetic improvement. Practical sessions relate to lecture topics with most emphasis on sampling techniques, measurement of yield components, variety identification. The pruning project commenced in Viticulture I is completed with yield and compositional measurements.

5103 Viticulture III

Level: II.

Unit value: 6.

Duration: Semester II.

Pre-requisite: 2312 Viticulture II (V) or equivalent.

Contact hours: 2 lectures and 1 three-hour practical per week.

Content: Lectures—pruning practices including mechanisation; vineyard site selection, design and establishment, including trellis design and construction; grapevine response to irrigation and salinity effects; techniques for the production of table grapes; growth regulators; advanced propagation including bench grafting, tissue culture.

Practicals—interpretation and analysis of climatic data, propagation, vineyard establishment, trellis design and construction, tablegrape production techniques, rootstock identification. Practical sessions also include field trips to commercial vineyards and project work.

5736 Wine Microbiology II

Level: II.

Unit value: 8.

Duration: Semester II.

Pre-requisite: 6096 Wine Microbiology I.

Assumed knowledge: 3572 Biochemistry.

Contact hours: 2 two-hour lectures and 1 four-hour practical per week. 2 four-hour trips.

Content: Yeast growth and growth kinetics; yeast nutrition and the effect of nutritional status of grape juice/must and wine on yeast growth and fermentation; environmental factors affecting yeast growth and fermentation behaviour. Yeast fermentation by-products—formation and their control. Yeast genetics, strain selection and improvement. Active dry yeasts, immobilised and encapsulated yeasts. Lactic acid bacteria (LAB) of oenological significance—their isolation, detection and identification; selection of malolactic bacteria; propagation of malolactic bacteria and inoculation. Growth requirements and metabolic activities of LAB; physical and chemical factors affecting growth and malolactic fermentation (MLF) in fermenting must and wine, including yeasts and bacteriophages. Management of MLF in red and white wines; acetic acid bacteria—their occurrence and growth in wine; biology and epidemiology of *Botrytis cinerea*—in cultivation in the laboratory and application in winemaking; microbiological quality control in the winery.

4634 Wine Technology I

Level: II.

Unit value: 6.

Duration: Semester I, commencing four weeks prior to the start of the academic year.

Pre-requisite: 3800 Introduction to Wine Science; 3572 Biochemistry; 6096 Wine Microbiology I.

Contact hours: 30 hours of lectures/tutorials and 18 hours of practicals.

Content: Grape quality and harvesting (including use of SO_2 ascorbic acid); grape processing—crushers, drainers, presses, dejuicers, earth/pad filtration and centrifugation, must/juice amelioration, juice handling and storage, wine types (floral/fruity white, full-bodied whites, sweet whites, rose, light dry red, full-bodied dry red).
For each wine type: varieties used, picking criteria, skin contact, juice fractions and treatment, yeast strains, fermentation control (including cap handling and MLF), wine additives (including DAP and Bentonite), post fermentation treatment, analysis, blending and storage.
Sparkling wine styles of the world and their methods of production, including the production of carbonated still wines, wines made from the Charmat and Transfer process and method champenoise; quality considerations to be covered in sparkling wine production procedures.

4575 Wine Technology II

Level: II.

Unit value: 5.

Duration: Semester II.

Pre-requisite: 4634 Wine Technology I.

Assumed knowledge: The production of wine types.

Contact hours: 24 hours of lectures and 36 hours of practicals/tutorials.

Content: Introduction to clarification and stabilisation; fining agents; clarification by natural sedimentation; centrifugation and filtration, tartrate stabilisation; protein stability; metal stability; colour stability; oxidation (types and structure of compounds involved, reaction mechanisms; use of SO_2 and ascorbic acid, oxidative stability); sulphide and methods of removal; use of wood (types, treatment and use for white and red wine styles).
Industry visits—students will visit a large commercial winery to examine laboratory stability checking procedures; and a cooperage to observe cask production and use.

2917 Winery Engineering

Level: II.

Unit value: 4.

Duration: Semester II.

Pre-requisite: 4251 Engineering.

Contact hours: 2 lectures and 1 two-hour practical per week.

Content: Lectures—the first law of thermodynamics, the refrigeration cycle, components of refrigeration systems, heat transfer, fermentation loadings, carbon dioxide properties, nitrogen properties, winery gas systems, steam properties and winery steam systems.
Practicals—specific heat of water, enthalpy of water boiling, solar heating, stratified layers, refrigeration, heat of fusion, saturated steam temperature/pressure relationship, convection and radiation, winery heat exchangers, the pasteurizer, winery refrigeration system, winery steam system.
Problem-solving—students are given weekly assignments designed to enhance their understanding of the topics presented as well as developing their analytic and problem-solving skills.

5459 Winery Operations

Level: II.

Unit value: 5.

Duration: Semester I, commencing four weeks prior to the start of the academic year.

Co-requisite: 4634 Wine Technology I.

Contact hours: 65 hours of practical/tutorial sessions.

Content: Students gain practical experience in routine winery operations, especially those relating to the vintage period, including—preparation for and planning of vintage; grape handling and crushing operations; draining and pressing operations; must and juice handling procedures; routine chemical and microbiological quality control requirements; yeast preparation, propagation and inoculation; fermentation procedures for whites and reds; wine clarification techniques; cellar hygiene/cleaning procedures.
Students receive instruction in the use of inert gases; mixing principles; sampling techniques; juice/wine transfer procedures; winery recording systems; winery safety; machinery operation and maintenance; cooperate use and maintenance (including types of cleaning; sanitising and disinfectant agents).

4420 Business Management I

Level: III.

Unit value: 3.

Duration: Full year.

Assumed knowledge: 3303 Business Finance I.

Co-requisite: 8144 Winery Experience *or* 6079 Vineyard Experience and Case Study.

Contact hours: 1 lecture and 2 tutorial/seminar sessions per week.

Content: Management principles and practices: evolution and current state. Management processes, especially planning and controlling. Decision-making: utility, decision-making under risk and uncertainty. Authority: power, influence, authority, delegation, organisation structure. Behaviour of individuals and groups: communication, motivation, leadership.

Assessment: To be announced in the first week of the semester.

Text-books: To be advised.

9393 Horticultural Technology

Level: III.

Unit value: 2.

Duration: Semester I.

Contact hours: 1 lecture and 1 tutorial per week.

Content: This subject develops an understanding of fruit crops which may be used for alcoholic beverages other than wines. Berry fruit and kiwi fruit are examined in detail. Topics associated with viticulture not covered elsewhere in the course—for example, glass house design; robotics; the application of systems analysis and expert systems to viticulture—are examined.

7463 Marketing I

Level: III.

Unit value: 3.

Duration: Semester II.

Contact hours: 1 one-hour lecture, 1 one-hour tutorial and 1 one-hour seminar per week.

Content: This subject is designed to give winemakers an appreciation of the role, language and techniques of wine marketing. The marketers follow on from the wine production function and in appreciating the many aspects of marketing can be influential in building a synergy, each function working to benefit the other. Topics covered include consumer behaviour, market research, advertising and promotion, public relations and strategic planning.

Assessment: 2 examinations (45% — one 10%, one 35%); seminar (30% — oral 15%, written 15%); tutorials (15% — oral 10%, written 5%); participation (10%).

Text-books: No set text. Good general introductory texts: Kotler, P., Chandler, P., Gibbs, R., & McColl, R., *Marketing in Australia* (2nd ed.), (Prentice Hall, 1989); Stanton, W. J., Miller, K. E. & Layton, R. A., *Fundamentals of marketing* (McGraw-Hill, 1985); Corkindale, D., Balan, P. & Rowe, C., *Marketing — making the future happen* (Nelson, Melbourne, 1989). Useful references include: Allvine, F. C., *Marketing principles and practice* (Harcourt Brace, 1989); Hart, N. A. & Stapleton, J., *Glossary of marketing terms* (Heinemann, 1988); McBurnie, T. & Clutterbuck, D., *The marketing edge* (Penguin, 1988); Shaw, R. J. & Semenik, R. J., *Marketing* (6th ed.), (Thomas Nelson, 1989); Kinnear, T. C. & Bernhardt, I. C. L., *Principles of marketing* (2nd ed.), (Scott Foresman, 1986); Still, R. R. & Cundiff, E. W., *Essentials in marketing* (3rd ed.), (Prentice Hall, 1986); Adler, L., Robinson & Carlson, *Marketing in society: cases and commentaries* (Prentice Hall, 1981); Schwartz, D. J., *Marketing today: a basic approach* (3rd ed.), (Harcourt Brace Jovanovich, 1981).

2709 Sensory Evaluation III

Level: III.

Unit value: 6.

Duration: Full year.

Pre-requisite: 2563 Sensory Evaluation I.

Contact hours: 4 hours per week from week 8, Semester I.

Content: Through practical wine tastings, organoleptic appraisal of both Australian and overseas wines will be covered, with particular emphasis on style and regional characteristics, factors contributing to style and overall assessment and judging of wine for style and quality.

2791 Tour II (O)

6198 Tour II (V)

Level: III.

Unit value: 1.

Duration: Semester II.

Contact hours: Each tour may last up to one week.

Content: This subject will familiarise students with the Australian wine industry by visiting selected grape-growing and wine-producing areas of Australia. Of particular interest will be winery equipment and processes; oenological practices in small and large wineries; grape-growing and vineyard management practices; quality control practices.

3933 Vineyard Business Management

Level: III.

Unit value: 8.

Duration: Semester II.

Pre-requisite: 6079 Vineyard Experience and Case Study.

Co-requisite: 4420 Business Management I.

Contact hours: 3 lectures and 5 tutorials/practicals/seminar sessions/library searches per week, plus vineyard visits.

Content: Evaluation of the place of viticulture in the economy, and of the individual vineyard business. Budgeting: cash flow, profitability, gross margins, investment. Machinery and labour: substitutability, evaluation and use of each. Marketing: introduction to marketing, appropriate marketing methods. Taxation: main effects on the owner of a vineyard business. Communication skills, organisational skills, interpersonal skills, management skills.

Assessment: To be announced in the first week of semester.

Text-books: To be advised.

6079 Vineyard Experience and Case Study

Level: III.

Unit value: 10.

Duration: Semester I.

Pre-requisite: 5103 Viticulture III.

Contact hours: Minimum of 10 weeks' work experience.

Content: Experience in medium to large vineyards by working for a minimum of 10 weeks during the mid-semester breaks, between-semester breaks and summer vacation, from early September in Year 2 to late July in Year 3.
Experience in a range of operations, for example, foliar spraying in Spring, irrigation system management, pre-vintage scheduling of grape delivery to the winery, vintage activities including sampling and assessment of loads, mechanical harvesting.
Detailed description of an approved farm business unit involving documentation of the physical, financial and managerial resources of the business; detailed assessment of the

practices associated with the vineyard (and any other enterprise) to evaluate the efficiency of operations and to prepare a plan and make recommendations to management about the future operations of the farm business.

2426 Viticulture IV

Level: III.

Unit value: 8.

Duration: Semester II.

Pre-requisite: 5103 Viticulture III.

Contact hours: 2 lectures, 1 tutorial and 1 four-hour practical per week.

Content: This subject covers the principles and practices of some commercial vineyard operations concentrating on the design and implementation of a vineyard management plan and knowledge of the means to maximise yield and fruit quality.
Lectures—diseases and pests, plant protection including spray application technology; soil management; nutrition and fertilisers; canopy management; environmental protection; genetic improvement; organic viticulture; vineyard planning.
Practicals—soil moisture determination, irrigation scheduling; disease and pest identification; soil measurements; herbicide effects; spray application technology; petiole analysis; interpretation of soil and petiole analysis data.
The project started in Viticulture III will be completed and each student will be required to present a seminar. Other activities in this subject will include vineyard machinery seminars, vintage experience post-mortems, discussions with practising vineyard managers and visits to vineyards in South Australia and interstate.

2080 Viticulture V

Level: III.

Unit value: 3.

Duration: Semester I.

Pre-requisite: 3669 Viticulture II (O).

Contact hours: 3 lectures per week.

Content: This subject covers the principles and practices of commercial vineyard operations, and the implications of these operations for wine quality. Topics include vineyard site selection, design and establishment; canopy management; pests and diseases; soil management and nutrition; irrigation. Students will be required to prepare a report on the viticultural activities associated with their vintage experience. For example, they will be required to monitor fruit condition and quality and to comment on harvesting and handling.

8144 Winery Experience

Level: III.

Unit value: 8.

Duration: Semester I.

Pre-requisite: 5459 Winery Operations.

Contact hours: 10 weeks' working experience in a commercial winery.

Content: This subject is largely practically orientated in that students must spend 10 weeks working at a commercial winery during vintage. During this time they are expected to gain experience and an understanding of the following operations: grape receival and weighbridge; crushing; draining and pressing; fermentation and post fermentation operations and quality control aspects for that particular winery; laboratory and fermentation cellar for that particular winery.

8372 Winery Management

Level: III.

Unit value: 4.

Duration: Semester II.

Pre-requisite: 8144 Winery Experience.

Co-requisite: 4420 Business Management I.

Contact hours: 2 lectures and 2 hours of tutorials per week, plus winery visits.

Content: The production function: its nature, interaction with other functions, application. Plant location and layout and materials handling: principles and application. Planning, management and control of production: principles, planning, balancing, operations management, quality control inventory management and control. Information: communication on the job, management information systems, information flow, CAD and CAM. Personnel management: principles, management of personnel in large and small wineries. Legislation: industrial, health, welfare and safety, taxation, equal opportunity, other.

6640 Wine Technology III

Level: III.

Unit value: 4.

Duration: Semester II.

Pre-requisite: 4675 Wine Technology II.

Contact hours: 2 lectures per week, plus 3 half-day and 1 full-day field trips.

Content: Bottling and packaging technology and associated quality control procedures, including properties of materials, winery design (case studies), wine laws and regulations, latest research and technological trends. Visits will be made to appropriate commercial plants.

8233 Wine Technology IV

Level: III.

Unit value: 5.

Duration: Semester II.

Pre-requisite: 4634 Wine Technology I.

Contact hours: 2 lectures and 1 three-hour practical session per week.

Content: Wine Distillation: ideal and non-ideal behaviour of liquid mixtures; types of binary systems; multi-component systems; base wine production—brandy and SVR; still types; origins of minor volatile components plus their behaviour during distillation and influence of still type; brandy maturation and its chemistry; Cognac and Armagnac, non-grape spirits and liqueurs; production of neutral spirit from grape marc; winery and distillery wastes; disposal methods; faults in spirits; methanol, toxicity and removal; legal requirements; sensory evaluation of spirits.
Fortified Wine Production: fortified wine styles and their methods of production, including sherry (flor, amontillado, oloroso, Australian non-flor sherry), port (vintage, tawny and ruby), Muscat and Tokay styles; quality considerations in fortified wine production procedures.

DEGREE OF

BACHELOR OF APPLIED SCIENCE (HONOURS)

SYLLABUSES

9438 Honours Agricultural Technology

Level: Honours.

Duration: Full year.

Pre-requisites: At least a credit standard in appropriate Level II and III stream subjects to the value of 9 points offered by the department or special permission of the Head of Department.

Requirements: Candidates are expected to acquire a more detailed knowledge than is required in the ordinary degree. They are required to complete successfully 12 points of course work including 6495 Research Methodology (4 points) and two of the following 4-point Level IV subjects: 6363 Crops & Pastures, 1581 Dryland Farming Systems, 1328 Extensive Livestock, 7602 Intensive Livestock, 8597 Agricultural Engineering. In addition, candidates are expected to study more deeply one branch of Agricultural Technology, by undertaking research to the value of 12 points in this field and to present the results in a written thesis and through the presentation of a seminar.

Assessment: The research thesis and associated seminars comprise 50% of the final grade. The assessment of the remainder of the course will be as presented in the subject descriptions.

Text-books: Individually specified.

1164 Honours Animal Science (B.App.Sc.)

Level: Honours.

Pre-requisites: A Credit or higher standard in at least two Level III subjects approved by the Head of Department.

Requirements: A candidate will be required to undertake a research project (12 points) and take additional course work (12 points) relevant to the research project. The course work will usually consist of four Level III subjects including Animal Physiology B plus at least 1 other subject offered by the Department of Animal Sciences for the B.Ag.Sc. degree. Remaining 2 subjects will be at the discretion of the Head of Department. In the Department of Animal Sciences, candidates can undertake the research work for their honours degree in one of the following areas: Animal Reproduction, Production, Wool Biology, Immunology, Molecular Biology, Rumen Microbiology, Animal Disease, Biotechnology. The candidate will present oral reports and a thesis on research work undertaken during the year under the supervision of one or more members of the academic staff.
Intending candidates should consult the Head of Department and potential supervisors during the final year of the ordinary degree and be prepared to begin studies in the Department at the beginning of February.

Assessment: Average of four Level III subjects (50%); research project (5%) and thesis (45%).

Text-books: In addition to text books recommended for the course work, extra reading relating to the research project may be prescribed by the Head of Department.

5556 Honours Business and Extension

Level: Honours.

Pre-requisites: At least a credit in appropriate Level III subjects offered by the Department of Business and Extension or equivalents acceptable to the Head of Department.

Requirements: This subject comprises a substantial research project of the student's choosing on a topic acceptable to the Department of Business and Extension (equivalent in value to 8 points) and course-work in the department's areas. Students will take 6495 Research Methodology (4 points) as part of this course-work unless specifically exempted.
The course work may be selected from the following Level IV subjects offered by the department, 5796 Agribusiness (2 points), 4826 Marketing G (2 points), 2805 Agricultural Economics & Policy (4 points), 7518 Communications & Agricultural Extension (4 points), 1058 Rural Sociology (4 points), 2793 Social Psychology (4 points), 5979 Natural Resource Economics (4 points) or 1463 Farm & Vineyard Business Management (4 points) and/or from the topic areas listed below:
Advanced Agricultural Marketing (4 points): Qualitative and Quantitative marketing research, Strategic Marketing and the preparation of substantial marketing plans. Emphasis is placed on case studies and small group learning.
Applied Business Management (4 points): Analyse, and identify solutions to the variety of management problems. Organisational theory: history, thought and dimensions of organisation performance. Case-studies will be the main method of teaching and assessment.
Applied Financial & Risk Management (4 points): Identification, assessment and evaluation of business risks, and risk management strategies. Analysis of financial performance of the business. Operation of financial markets.
People & Organisations (4 points): The nature of the individual, group dynamics, the structure and systems of organisations at various stages and sizes. Interactions between individuals and organisations, implications for issues of power, authority, motivation, planning, audit control, delegation, leadership v's administrative management styles during turbulence, ethics, company takeovers and failures.
Project Planning & Management (4 points): Systems approach to the design, analysis and management of agricultural development projects. Project concept and the value of project planning, analytical techniques required in project design, appraisal and evaluation, management and organisational principles for project planning and management. Project case studies set in developing countries.
Small Business Management (4 points): Marketing, production, public relations, finance and banking, accounting, law, and management as they relate to small business.
With the approval of the head of department suitable Level III or IV subjects offered by other departments may be included in the course-work.

Assessment: The research project will be assessed by dissertation and seminar. Course-work subjects will be assessed by assignments, seminars and exams.

Text-books: Individually specified.

1983 Honours Crop Protection (B.App.Sc.)

Level: Honours.

Duration: Full year.

Pre-requisites: A credit or higher standard in at least two Level III subject approved by the Head of Department.

Requirements: A candidate will be required to undertake a research project (12 points) and take additional course work relevant to the research project. The course work will usually consist of four Level III subjects from those listed by the Department in the Schedules for the B.Ag.Sc. degree but, at the discretion of the Head of Department, subjects from another department may be accepted. In the Department of Crop Protection, students can undertake research work for their honours degree in one of the following areas: Entomology, Plant Pathology, or Weed Science. The candidate will present oral reports and a thesis on research work undertaken during the year under the supervision of one or more members of academic staff.

Intending candidates should consult the Head of the Department and potential supervisors during the final year of the ordinary degree and be prepared to begin studies in the Department at the beginning of February.

Assessment: Average of four Level III subjects (50%); research project (5%) and thesis (45%).

Text-books: In addition to text books recommended for the course work, extra reading relating to the research project may be prescribed by the Head of Department.

6513 Honours Environmental Science and Rangeland Management (B.App.Sc.)

Level: Honours.

Duration: Full year.

Pre-requisites: A credit or higher standard, in two Level III subjects approved by the Head of the Department or with special permission of the Head of Department.

Requirements: Candidates are expected to acquire a more detailed knowledge of environmental science and rangeland management than is required for the Ordinary Degree. Candidates are expected to study deeply in one branch of environmental science and rangeland management. Candidates are required carry out research in this field, to present seminars, and to present the results in a written thesis to the value of 12 points. Candidates will be required to undertake approved course work to the value of 12 points, being Level III and IV subjects approved by the Head of Department, offered by Departments in the Faculties of Agricultural and Natural Resource Sciences, Science (especially Botany, P & I Chemistry, Organic Chemistry, Genetics and Zoology) and Arts (especially Geography and the Mawson Graduate Centre for Environmental Studies), or other subjects of equivalent standard.

Assessment: The research thesis and associated seminars comprise 50% of the final grade. The assessment of the remainder of the course will be tailored according to each student's agreed course of work.

Text-books: As specified for individual candidates.

7624 Honours Plant Science (B.App.Sc.)

Level: Honours.

Duration: Full year.

Pre-requisites: A credit or higher standard in at least two Level III subjects approved by the Head of Department.

Requirements: A candidate will be required to undertake a research project (12 points) and take additional course work (12 points) relevant to the research project. The course work will usually consist of four Level III subjects from those listed by the Department in the Schedules for the B.Ag.Sc. degree but at the discretion of the Head of Department subjects from another department may be accepted. In the Department of Plant Science, candidates can undertake the research work for their honours degree in one of the following areas: Crop Physiology and Biochemistry, Plant Molecular Biology, Plant Breeding, Agronomy or Biometry. The candidate will present oral reports and a thesis on research work undertaken during the year under the supervision of one or more members of academic staff.
Intending candidates should consult the Head of the Department and potential supervisors during the final year of the ordinary degree and be prepared to begin studies in the Department at the beginning of February.

Assessment: Average of four Level III subjects (50%); research project/oral presentation (5%) and thesis (45%).

Text-books: In addition to text books recommended for the course work, extra reading relating to the research project may be prescribed by the Head of Department.

6495 Research Methodology

Level: Honours.

Duration: Semester I, commencing in February.

Pre-requisites: Entry to B.App.Sc.(Hons).

Contact hours: Not applicable. This subject is presented as a series of seminars, workshops, and directed reading. A two-week introductory phase will be held just before Semester I. During Semester I there will be two hours of lectures/tutorials per week.

Requirements: Candidates are expected to acquire a detailed knowledge of research methods and techniques appropriate to the needs of their Honours research project. Likely topics include experimental design, data processing and analysis, systems analysis, survey design and administration, presentation of results, etc.

Assessment: Assessment will be based on assignments (50%) and workshop participation (50%).

Text-books: As specified.

GRADUATE DIPLOMA IN AGRICULTURE

SYLLABUSES

5796 Agribusiness

Availability: Internal and External.

Points value: 2.

Duration: Semester I.

Contact hours: 1 lecture and 2 tutorials/seminar sessions/library search exercises per week, plus business visits.

Content: The nature of agribusiness and the difficulty of defining the term. Components of agribusiness: primary industry, input suppliers, distribution and marketing organisations, education extension and research, other. Planning: types of plans and planning methodology. Decision making in the firm. Authority and its effects: organisation structure, delegation, other forms of power. Managing change and dealing with risk and uncertainty. Financial management: sources and uses of finance. Legal constraints on agribusiness activity. Human resources management and industrial relations. Control within the organisation. Optional topics.

Assessment: Assignments (60%); examination (40%).

Text-books: No prescribed texts.

2805 Agricultural Economics and Policy

Availability: Internal and External.

Points value: 4.

Duration: Full year.

Content: Principles of micro-economics using agriculture as the basis. Consumer demands, supply analysis, production relationships, cost analysis. Principles of macro-economics (using the Australian economy as the basis). Role of agriculture in the Australian national economy. Effect of macro-economic policy on the agricultural industry. The framework of agricultural policy formation, the need for government intervention in agriculture. Pricing policy, agricultural policy issues, comparative agricultural policy.

Assessment: 4 assignments each 25%.

Text-books: To be advised.

8597 Agricultural Engineering

Points value: 4.

Duration: Full year.

Contact hours: 4 hours per week.

Content: The subject consists of a project, negotiated between the student and the Department of Agricultural Technology, and assignment and tutorial work as directed by the Department.
Each component is complementary in that the assignment and tutorial work is directed toward the theoretical and analytic basis of the topic in which the project has been selected.

7518 Communications and Agricultural Extension

Availability: Internal only in 1992.

Points value: 4.

Duration: Full year.

Contact hours: 3 hours per week.

Content: Theory and models of communication. Language, meaning, culture, written and oral communications. Report writing. Readability. Style in writing. Application of learning and communications theories to the presentation of information. Role of different extension techniques in the education process. Credibility, empathy and rapport. Communications for various audiences. The scope, purpose, structure and organisation of the agricultural extension services in the different states of Australia. Comparison of the history and underlying philosophy of agricultural extension services in Australia with those of other countries. Organisations and agencies (government and non-government) with a role in agricultural extension. The audience for agricultural extension. Agricultural extension in developing countries. Legal liability in extension. Group process and leadership. The preparation of press articles, tape-recordings, video-tape programmes and micro-teaching presentations are included in practical exercises.

Assessment: Assignments (48%); practical work (52%).

Text-books: To be advised.

6363 Crops and Pastures G

Availability: Internal only in 1992.

Points value: 4.

Duration: Full year.

Assumed knowledge: Degree in Agriculture.

Content: An *advanced* subject providing a detailed knowledge of recent technological developments in the production of crops and pastures in southern Australia with particular reference to dryland farming and promoting the ability to conduct field experiments and interpret the results of agronomic research.
The syllabus includes the technology of cereal, grain legume and oil-seed crop production, with particular emphasis on the effects of crop rotations, tillage systems and fertilizer usage on crop production; the selection and evaluation of herbage plants in relation to physical and biological factors in the environment; methods of pasture establishment, management, conservation and utilisation; recent advances in the control and management of weeds, pests and diseases of crops and pastures.

1581 Dryland Farming Systems

Availability: Internal and External. Attendance at a residential school is compulsory for external students.

Points value: 4.

Duration: Full year.

Assumed knowledge: 7333 Crops and Pastures I (or equivalent)
8237 Crops and Pastures II (or equivalent).

Contact hours: 2 lectures/tutorials per week in Semester I and 4 hours of lectures/practicals per week in Semester II.

Content: The use of a systems approach, within an ecological framework, for the study of dryland farming. The characteristics and operation of various types of dryland farming systems with emphasis on the Australian cereal belt. The principles underlying the integration of crops, pastures and livestock in dryland farming systems. Methods of defining the conditions and practices under which high productivity may be sustained in the major systems of the Australian cereal belt. Methods of evaluating a particular dryland

farming system in order to define major limiting factors, interactions and regulating processes, and to suggest ways of improving productivity and sustainability.

5293 Environmental Systems

Availability: External only in 1992.

Points value: 4.

Duration: Semester II.

Content: The theory and application of Systems Theory to the study and management of environmental systems. The following topics are included: fundamental principles of systems theory; different types of systems; environmental systems as "thermodynamic" systems; dynamic changes in environmental systems; management of environmental systems.

1328 Extensive Livestock

Availability: Internal and External.

Points value: 4.

Duration: Semester I.

Assumed knowledge: 1022 Beef, Sheep and Goat Production IA (or equivalent).

Contact hours: 2 lectures and 1 two-hour practical per week.

Content: This subject presents recent developments in animal science and husbandry relevant to extensive animal production. It examines industry organisation, physiology, breeding, health and nutrition. A degree of specialisation will be allowed in sheep, beef cattle or goat production.

8749 Farm and Vineyard Business Management

Availability: Internal only in 1992.

Points value: 4.

Duration: Full year.

Contact hours: 1 lecture and 2 tutorials/seminar sessions/library search exercises per week. Farm visits.

Content: The basic concepts of management as applied to farm/vineyard business units. The role of accounting and other records in business management. Methods of farm/vineyard management appraisal and analysis—the role and limitations of such methods as input-output analysis, budgets, break-even concepts, gross margins, simplified programming, linear programming. Work studies and their role in efficiency. Systems of network analysis. Decision-making processes, risk and uncertainty. Estate management and appraisal, project evaluation. The role and influence of various forms of legal ownership; investment. Intergeneration transfers of assets; the implications of income tax and other duties and taxes. The role of insurance and assurance.

Assessment: Assignments (70%); test, term paper and final assignment (30%).

Text-books: To be advised.

8338 Horticulture

Availability: External only in 1992.

Points value: 4.

Duration: Full year.

Content: Principles of horticulture and the practices associated with recent innovation in horticulture technology. Students are introduced to a range of topics which represents

innovative technological introductions or new modes of industry structure. Nine topics are presented as independent modules although some naturally follow from others.
Topics are: industry background and structure; horticultural marketing; variety improvement; tissue culture; plant growth regulator use; post-harvest handling; production scheduling; controlling greenhouse environments; hydroponics.

5635 Integrated Land Systems Studies

Availability: Not offered in 1992.

Points value: 4.

Duration: Full year.

Contact hours: 1 three-hour seminar session per week.

Content: Students will prepare individual and group reports and present seminars on a number of problems of resource allocation and land use. Studies include mapping using remote sensing, social and biophysical surveys, static and dynamic budgeting of energy, matter biota and information interrelations, quantification of land use impacts. Evaluation of management practices, planning methodologies and cultural options in optimising land allocation.

7602 Intensive Livestock

Availability: Internal only in 1992.

Points value: 4.

Duration: Full year.

Contact hours: 1 lecture and 2 hours of tutorials or practical work per week.

Content: This subject develops or extends the student's knowledge of the application of the principles and practices of intensive livestock production. The programme will involve an examination of the following topics: accommodation of livestock; nutrition; animal behaviour; reproduction and animal breeding; animal health; animal welfare; industry structure and economics of production; marketing; product evaluation; by-product utilisation; alternative forms of meat production.

9991 Land Use Systems and Planning

Availability: External only in 1992.

Points value: 4.

Duration: Full year.

Co-requisite: It is recommended that students take 5293 Environmental Systems as a co-requisite if they have not already passed that subject.

Assumed knowledge: Basic biology and ecology.

Content: The spectrum of land use systems from wilderness to urban, the factors controlling their distribution, productivity and stability and their static and dynamic interrelationships. The use of this information to appreciate, assess and manage the use of land resources. Each student nominates a particular land system for analysis in depth.

4826 Marketing G

Availability: Internal and External.

Points value: 2.

Duration: Semester II.

Contact hours: 3 hours of lectures/seminars per week.

Content: An introduction to marketing theory with a strategic management emphasis in an international context. Specific areas of application will reflect areas of interest of students

in the class. Preparation and class presentation of marketing plans, in both academic case and real world contexts. Strategic analysis of topical issues as they emerge.

Assessment: To be announced in the first week of the semester.

Text-books: To be advised.

5979 Natural Resources Economics

Availability: External only in 1992.

Points value: 4.

Duration: Semester II.

Content: Principles of micro-economics as they relate to the use and management of natural resources, causes of market failure in resource allocation and resource use and opportunities for market intervention, introduction to time preference and the economics of resource management over time.

Assessment: By assignments.

Text-books: To be advised.

5297 Natural Resources Management

Availability: External only in 1992. Attendance at a residential school is compulsory.

Points value: 4.

Duration: Semester I.

Content: Population pressures and the demand for natural resources are discussed in the historical and current situations; development of a scientific approach to the allocation of resources; the conservation ethic; international, Australian and South Australian organisations; public participation in management decisions. Decision-making processes for local, South Australian and Australian resources are used as case studies. Environmental law, relationship between international, Australian, State and Local Government laws and regulations.

Assessment: To be advised.

References: To be advised in subject handbook.

8130 Natural Resources Methodology

Availability: External only in 1992. Attendance at a residential school is compulsory.

Points value: 4.

Duration: Full year.

Content: Demonstrates a wide range of remote sensing and cartographic techniques and applications for surveying a range of environmental components, field verification and survey techniques; practical application to the design and conduct of surveys of vegetation, fauna and soils. Specific application of remote sensing and aerial images to resource inventory and assessment.

Assessment: To be advised.

References: To be advised in subject handbook.

Projects (Graduate Diploma in Agriculture)

Availability: Internal and External.

Points value: 2762 Project IA 4; 3205 Project IB 4; 8171 Project IC 4; 8512 Project ID 4; 2783 Project IIA 8; 4182 Project IIB 8; 3185 Project III 12.

Duration: Full year.

Assumed knowledge: Students may be required to take certain subjects in preparation for the project.

Contact hours: Formal contact between supervisor and student during the project is by arrangement.

Content: Projects may comprise some or all of literature reviews, field trials, laboratory experiments, seminars and written assignments. Topics for projects may be chosen from any of the subjects included in the course.

1058 Rural Sociology

Availability: Internal and External.

Points value: 4.

Duration: Full year.

Contact hours: 3 hours per week.

Content: This subject provides an introduction to sociology and the sociology of agriculture and natural resources. Topics include classical sociological theories, sociology of agriculture, sociology of natural resources, implications for Australian farmers and research methods—their application and interpretation.

Assessment: By assignment.

Text-books: To be advised.

2793 Social Psychology

Points value: 4.

Duration: Full year.

Contact hours: 3 hours per week.

Content: Introductory social psychology—educational objectives in learning programmes, perception, attitudes, attitude theory and attitude measurement, balanced theories, motivation, needs, wants, goals; groups, group dynamics; principles of education—learning theories, classical conditioning, operant conditioning, Gestalt psychology, cognitive theories, social learning, personality and motivational theories applied to learning, self-concept, defence mechanisms, non-Freudian personality and learning theories, elements of educational psychology, thinking methods and intelligence, adult education, agricultural education; human transactions, conflict resolutions; expectancy, role theory, social psychology of organisations, formal organisations, psychological implications of technological development, application of social psychology to working in developing countries.

Assessment: To be announced in the first week of the semester.

Text-books: To be advised.

3065 Soil Conservation G

Availability: Internal and External. Attendance at a residential school is compulsory for external students.

Points value: 4.

Duration: Full year.

Assumed knowledge: Good basic knowledge of soils.

Content: Historical aspects of human activities on soil erosion, mechanics of wind and water erosion with emphasis on the theoretical aspects of soil structure, rainfall erosivity and wind theoretics. Introduction to aerial photographic interpretation with respect to erosion features, classification and production of erosion maps. The use of remote sensing satellite imagery for broad scale erosion mapping. Laboratory techniques for erosion and structural measurements. Introduction to the sociological and legal constraints involved in conservation procedures.

GRADUATE DIPLOMA IN NATURAL RESOURCES

SYLLABUSES

7518 Communications and Agricultural Extension

Availability: Internal only in 1992.

Points value: 4.

Duration: Full year.

Contact hours: 3 hours per week.

Content: Theory and models of communication. Language, meaning, culture, written and oral communications. Report writing. Readability. Style in writing. Application of learning and communications theories to the presentation of information. Role of different extension techniques in the education process. Credibility, empathy and rapport. Communications for various audiences. The scope, purpose, structure and organisation of the agricultural extension services in the different states of Australia. Comparison of the history and underlying philosophy of agricultural extension services in Australia with those of other countries. Organisations and agencies (government and non-government) with a role in agricultural extension. The audience for agricultural extension. Agricultural extension in developing countries. Legal liability in extension. Group process and leadership. The preparation of press articles, tape-recordings, video-tape programmes and micro-teaching presentations are included in practical exercises.

Assessment: Assignments (48%); practical work (52%).

Text-books: To be advised.

6363 Crops and Pastures G

Availability: Internal only in 1992.

Points value: 4.

Duration: Full year.

Assumed knowledge: Degree in Agriculture.

Content: An *advanced* subject providing a detailed knowledge of recent technological developments in the production of crops and pastures in southern Australia with particular reference to dryland farming and promoting the ability to conduct field experiments and interpret the results of agronomic research.
The syllabus includes the technology of cereal, grain legume and oil-seed crop systems and fertilizer usage on crop production; the selection and evaluation of herbage plants in relation to physical and biological factors in the environment; methods of pasture establishment, management, conservation and utilisation; recent advances in the control and management of weeds, pests and diseases of crops and pastures.

1581 Dryland Farming Systems

Availability: Internal and External. Attendance at a residential school is compulsory for external students.

Points value: 4.

Duration: Full year.

Assumed knowledge: 7333 Crops and Pastures I (or equivalent); 8237 Crops and Pastures II (or equivalent).

Contact hours: 2 lectures/tutorials per week in Semester I and 4 hours of lectures/practicals per week in Semester II.

Content: The use of a systems approach, within an ecological framework, for the study of dryland farming. The characteristics and operation of various types of dryland farming systems with emphasis on the Australian cereal belt. The principles underlying the integration of crops, pastures and livestock in dryland farming systems. Methods of defining the conditions and practices under which high productivity may be sustained in the major systems of the Australian cereal belt. Methods of evaluating a particular dryland farming system in order to define major limiting factors, interactions and regulating processes, and to suggest ways of improving productivity and sustainability.

5293 Environmental Systems

Availability: External only in 1992.

Points value: 4.

Duration: Semester II.

Content: The theory and application of Systems Theory to the study and management of environmental systems. The following topics are included: fundamental principles of systems theory; different types of systems; environmental systems as "thermodynamic" systems; dynamic changes in environmental systems; management of environmental systems.

1328 Extensive Livestock

Availability: Internal and External.

Points value: 4.

Duration: Semester I.

Assumed knowledge: 1022 Beef, Sheep and Goat Production IA (or equivalent).

Contact hours: 2 lectures and 1 two-hour practical per week.

Content: This subject presents recent developments in animal science and husbandry relevant to extensive animal production. It examines industry organisation, physiology, breeding, health and nutrition. A degree of specialisation will be allowed in sheep, beef cattle or goat production.

5635 Integrated Land Systems Studies

Availability: Not offered in 1992.

Points value: 4.

Duration: Full year.

Contact hours: 1 three-hour seminar session per week.

Content: Students will prepare individual and group reports and present seminars on a number of problems of resource allocation and land use. Studies include mapping using remote sensing, social and biophysical surveys, static and dynamic budgeting of energy, matter biota and information interrelations, quantification of land use impacts. Evaluation of management practices, planning methodologies and cultural options in optimising land allocation.

9991 Land Use Systems and Planning

Availability: External only in 1992.

Points value: 4.

Duration: Full year.

Co-requisite: It is recommended that students take 5293 Environmental Systems as a co-requisite if they have not already passed that subject.

Assumed knowledge: Basic biology and ecology.

Content: The spectrum of land use systems from wilderness to urban, the factors controlling their distribution, productivity and stability and their static and dynamic interrelationships. The use of this information to appreciate, assess and manage the use of land resources. Each student nominates a particular land system for analysis in depth.

Assessment: By assignment.

References: To be advised in subject handbook.

5979 Natural Resources Economics

Availability: External only in 1992.

Points value: 4.

Duration: Semester II.

Content: Principles of micro-economics as they relate to the use and management of natural resources, causes of market failure in resource allocation and resource use and opportunities for market intervention, introduction to time preference and the economics of resource management over time.

Assessment: By assignment.

Text-books: To be advised.

5297 Natural Resources Management

Availability: External only in 1992. Attendance at a residential school is compulsory.

Points value: 4.

Duration: Semester I.

Content: Population pressures and the demand for natural resources are discussed in the historical and current situations; development of a scientific approach to the allocation of resources; the conservation ethic; international, Australian and South Australian organisations; public participation in management decisions. Decision-making processes for local, South Australian and Australian resources are used as case studies. Environmental law, relationship between international, Australian, State and Local Government laws and regulations.

Assessment: To be advised.

References: To be advised in subject handbook.

8130 Natural Resources Methodology

Availability: External only in 1992. Attendance at a residential school is compulsory.

Points value: 4.

Duration: Full year.

Content: Demonstrates a wide range of remote sensing and cartographic techniques and applications for surveying a range of environmental components, field verification and survey techniques; practical application to the design and conduct of surveys of vegetation, fauna and soils. Specific application of remote sensing and aerial images to resource inventory and assessment.

Assessment: To be advised.

References: To be advised in subject handbook.

8200 Natural Resources Project I

6846 Natural Resources Project II

Availability: External only in 1992.

Points value: 8200 Natural Resources Project I 4, 6846 Natural Resources Project II 12.

Duration: Full year.

Content: Projects may comprise experiments, surveys, literature reviews, seminars and assignments leading to a written report. Proposals will be individually assessed so that they complement the academic and practical background of each student and his/her course work.

Assessment: To be advised.

Text-books/References: Details will be provided at the first lecture.

1058 Rural Sociology

Availability: Internal and External.

Points value: 4.

Duration: Full year.

Contact hours: 3 hours per week.

Content: This subject provides an introduction to sociology and the sociology of agriculture and natural resources. Topics include classical sociological theories, sociology of agriculture, sociology of natural resources, implications for Australian farmers and research methods—their application and interpretation.

Assessment: By assignment.

Text-books: To be advised.

3065 Soil Conservation G

Availability: Internal and External. Attendance at a residential school is compulsory for external students.

Points value: 4.

Duration: Full year.

Assumed knowledge: Good basic knowledge of soils.

Content: Historical aspects of human activities on soil erosion, mechanics of wind and water erosion with emphasis on the theoretical aspects of soil structure, rainfall erosivity and wind theoretics. Introduction to aerial photographic interpretation with respect to erosion features, classification and production of erosion maps. The use of remote sensing satellite imagery for broad scale erosion mapping. Laboratory techniques for erosion and structural measurements. Introduction to the sociological and legal constraints involved in conservation procedures.

GRADUATE DIPLOMA IN WINE

SYLLABUSES

8749 Farm and Vineyard Business Management

Availability: Internal only in 1992.

Unit value: 6.

Duration: Full year.

Contact hours: 1 lecture and 2 tutorials/seminar sessions/library search exercises per week. Farm visits.

Content: The basic concepts of management as applied to farm/vineyard business units. The role of accounting and other records in business management. Methods of farm/vineyard management appraisal and analysis—the role and limitations of such methods as input-output analysis, budgets, break-even concepts, gross margins, simplified programming, linear programming. Work studies and their role in efficiency. Systems of network analysis. Decision-making processes, risk and uncertainty. Estate management and appraisal, project evaluation. The role and influence of various forms of legal ownership; investment. Intergeneration transfers of assets; the implications of income tax and other duties and taxes. The role of insurance and assurance.

Assessment: Assignments (70%); test, term paper and final assignment (30%).

Text-books: To be advised.

3287 Graduate Project I

9533 Graduate Project II

Unit value: 3287 Graduate Project I 9, 9533 Graduate Project II 6.

Duration: Full year.

Contact hours: By arrangement with the project supervisor.

Content: Each subject consists of a research project of a student's choosing which is acceptable to the appropriate academic department.

6641 Graduate Project III

Unit value: 15.

Duration: Full year.

Contact hours: By arrangement with the project supervisor.

Content: A research project of a student's choosing which is acceptable to the appropriate academic department.

5545 Graduate Sensory Evaluation I

Unit value: 3.

Duration: Semester I.

Contact hours: Three-hour tasting/tutorial session per week.

Content: The subject is presented in the form of compulsory tasting/tutorial sessions, covering the following topics: origin of major wine components, senses used in wine

evaluation, basic taste sensations, balance of tastes and wine flavours, introduction to quality evaluation of wines, vocabulary for the description of wines, introduction to varietal characteristics of wines and Australian wine styles.

7551 Graduate Sensory Evaluation II

Unit value: 3.

Duration: Semester II.

Contact hours: 12 hours of lectures and 24 hours of tutorials/practicals.

Content: The subject, to be presented by a combined lecture/practical tasting programme, will include the following topics: palate evaluation tests; determination of component threshold levels; methods of carrying out screening procedures for wine judge selection; evaluation of wines by scoring; judging procedures; evaluating judge performance; methods of analysis; arrangement and conducting of sensory evaluation panels; quantitative descriptive analysis.

8783 Graduate Sensory Evaluation III

Unit value: 2.

Duration: Full year.

Contact hours: Three-hour tasting/tutorial session per week.

Content: The subject is presented in the form of compulsory tasting/tutorial sessions, covering the following topics: origin of major wine components, senses used in wine evaluation, basic taste sensations, balance of tastes and wine flavours, introduction to quality evaluation of wines, vocabulary for the description of wines, introduction to varietal characteristics of wines and Australian and overseas wine styles.

8879 Graduate Sensory Evaluation IV

Unit value: 2.

Duration: Full year.

Co-requisite: 5545 Graduate Sensory Evaluation I.

Contact hours: Three-hour tasting/tutorial session per week.

Content: Assessment of juices, wines during the winemaking process, characteristics of major varieties, diversity of wine styles, effect of technological practices on wine quality, appraisal of both Australian and overseas wines with emphasis on variety, style and regional characteristics. The students will be expected to give their assessments of wines at any time during the practical session.

7388 Graduate Viticultural Engineering

Unit value: 8.

Duration: Full year.

Assumed knowledge: Basic mathematics and trigonometry, and Year 12 Physics.

Contact hours: 5 hours per week.

Content: Evapotranspiration and soil moisture budget, crop requirements (peak rate and crop factor), adjustment for salinity (leaching fraction), calculation of irrigation depth and period, sprinkler and dripper characteristics, sprinkler and dripper layout, hydraulics of pressure irrigation systems.
Power, torque, shaft power, engine characteristics, traction weight distribution, tractor performance, properties of materials, fence and trellis load and stress analysis, levelling and chain surveying, spraying machinery, grape harvesting machinery, pruning machinery, tillage and horticultural tillage machinery.

Properties of materials, engine characteristics, tractor engine power, weight distribution, power transmission, trellis loadings.
Project on irrigation system design, machinery assessment or a similar topic.

1124 Graduate Viticulture I

Unit value: 7.

Duration: Semester I, commencing three weeks prior to the start of the academic year.

Contact hours: 52 hours of lectures/tutorials and 88 hours of practical work and industry visits. Practical work covers analytical laboratory work and viticulture exercises.

Content: Lecture topics—berry growth and development, ripening, composition, effect of environmental and endogenous factors on these processes; vineyard sampling and yield estimation; harvesting and handling wine-, table- and drying grapes; ampelography; genetics; characteristics of fruit varieties and rootstocks. Analytical techniques, errors in analytical methods. Laboratory design, management, safety. Reactions in winemaking process and theory of analysis for the following compounds—sugars, acids, sulphur compounds, ascorbic acid, carbonyl compounds, alcohols, cations, nitrogen compounds, anthocyanins and phenols, flavour compounds. Introductory theory and practice of UV-Vis and Atomic Absorption Spectrophotometry and HPLC methodology.
Practicals—sampling, yield estimation; harvesting, ampelography; canopy measurements and vineyard scoring, summer training. Introduction to laboratory techniques, analysis of total soluble solids and reducing sugars, pH and titratable acidity, sulphur dioxide and ascorbic acid, alcohols, cations (flame photometry and atomic absorption, demonstration of equipment), nitrogen compounds; paper chromatography (detection of malo-lactic fermentation); UV-Vis Analysis—colourimetric analysis of tartaric acid, enzymatic analyses of malic acid, anthocyanins and phenolics, terpene analysis; HPLC (demonstration of equipment), comparison of methods of analysis.

6830 Graduate Viticulture II

Unit value: 13.

Duration: Semester II.

Pre-requisite: 1124 Graduate Viticulture I; *or* 3669 Viticulture II (O) *and* 7574 Grape and Wine Analysis (O).

Contact hours: 4 lectures, 1 tutorial and 2 three-hour practicals per week.

Content: This subject covers the principles and practices of commercial vineyard operations including: pruning practices, site selection, vineyard design and establishment, irrigation, soil management, nutrition, canopy management; disease and pest control, vine improvement, propagation, growth regulators. Field trips examine various aspects of vineyard management. There is also a major experimental project.

6153 Graduate Wine Microbiology I

Unit value: 8.

Duration: Semester I.

Assumed knowledge: 6096 Wine Microbiology I (or equivalent); 3572 Biochemistry (or equivalent).

Contact hours: 2 two-hour lectures and 1 four-hour practical per week. 2 four-hour trips.

Content: Yeast growth and growth kinetics; yeast nutrition and the effect of nutritional status of grape juice/must and wine on yeast growth and fermentation; environmental factors affecting yeast growth and fermentation behaviour. Yeast fermentation by-products—formation and their control. Yeast genetics, strain selection and improvement. Active dry yeasts, immobilised and encapsulated yeasts. Lactic acid bacteria (LAB) of oenological significance—their isolation, detection and identification; selection of malolactic bacteria; propagation of malolactic bacteria and inoculation. Growth require-

ments and metabolic activities of LAB; physical and chemical factors affecting growth and malolactic fermentation (MLF) in fermenting must and wine, including yeasts and bacteriophages. Management of MLF in red and white wines; acetic acid bacteria—their occurrence and growth in wine; biology and epidemiology of *Botrytis cinerea*—cultivation in the laboratory and application in winemaking; microbiological quality control in the winery.

2739 Graduate Wine Microbiology II

Unit value: 4.

Duration: Semester II.

Assumed knowledge: 6096 Wine Microbiology I (or equivalent), 3572 Biochemistry (or equivalent).

Contact hours: Two-hour lecture and two-hour practical per week.

Content: Microbiology of winemaking, yeast morphology, taxonomy and classification, evolution and succession of yeasts in naturally fermenting musts. Lactic acid bacteria (LAB) of oenological significance—classification, morphological and cultural characteristics, evolution and succession in fermenting must and wine. Methods and media for detecting, isolating and identifying lactic acid bacteria and yeasts; yeast growth and growth kinetics; yeast nutrition and the effect of nutritional status of grape juice/must and wine on yeast growth and fermentation; environmental factors affecting yeast growth and fermentation behaviour in fermenting must/juice; characteristics of wine yeasts; selecting and improving yeast strains. Physical and chemical factors affecting growth of LAB in fermenting must and wine, including yeast/bacteria interaction and bacteriophages; metabolic activities of LAB; management and conduct of malolactic fermentation in red and white wines; acetic acid bacteria—occurrence and growth in wine; biology and epidemiology of *Botrytis cinerea*—cultivation in the laboratory and application in winemaking; microbiological quality control in the winery.

9427 Graduate Wine Technology I

Unit value: 10.

Duration: Full year.

Contact hours: 60 hours of lectures, tutorials and industry visits.

Content: Students will study: must composition, fermentation and fermentation variables, commercial yeast propagation, production and procedures for white table wine (sweet and dry), red table wine, sparkling, rose and maceration carbonique wines. Post fermentation procedures, including clarification by settling, fining, filtering and centrifugation. Wine stabilisation practices to ensure protein, tartrate, metal, colour and oxidative stability. Wine maturation, tank and cooperage use.

A research paper, to be conducted over two semesters, together with a seminar presentation will be incorporated into this subject.

4568 Graduate Wine Technology II

Unit value: 5.

Duration: Semester II.

Contact hours: 40 hours lectures, tutorials and visits.

Content: Developments in grape juice processing and conservation, fermentation control, quality control procedures for wine and other materials, bottling and packaging, including bag-in-box, and winery design. Fortified wine styles of the world and their methods of production, including sherry, port, muscat and tokay styles. Visits will be made to appropriate commercial plants.

8697 Graduate Wine Technology III

Unit value: 5.

Duration: Semester II.

Assumed knowledge: The production of wine types.

Contact hours: 24 hours of lectures and 36 hours of practicals/tutorials.

Content: Introduction to clarification and stabilisation; fining agents; clarification by natural sedimentation; centrifugation and filtration, tartrate stabilisation; protein stability; metal stability; colour stability; oxidation (types and structure of compounds involved, reaction mechanisms; use of SO_2 and ascorbic acid, oxidative stability); sulphide and methods of removal; use of wood (types, treatment and use for white and red wine styles).
Industry visits—students will visit a large commercial winery to examine laboratory stability checking procedures; and a cooperage to observe cask production and use.

3479 Graduate Wine Technology IV

Unit value: 3.

Duration: Semester I, commencing three weeks prior to the start of the academic year.

Contact hours: 24 hours of lectures/tutorials, 60 hours of practical work concentrated in the first three weeks of the subject, and industry visits.

Content: Lectures—analytical techniques, errors in analytical methods, laboratory design, laboratory management, laboratory safety, types, structure, amounts, reactions in winemaking process and theory of analysis for the following compounds (sugars, acids, sulphur compounds, ascorbic acid, carbonyl compounds, alcohols, cations, nitrogen compounds, anthocyanins and phenols, flavour compounds). Introductory theory and practice of UV-Vis and Atomic Absorption Spectrophotometry and HPLC methodology.
Practicals—introduction to laboratory techniques, analysis of total soluble solids and reducing sugars, pH and Titratable acidity, sulphur dioxide and ascorbic acid, alcohols, cations (flame photometry and atomic absorption, demonstration of equipment), nitrogen compounds; Paper Chromatography (detection of malo-lactic fermentation); UV-Vis Analysis—Colourimetric analysis of tartaric acid; Enzymatic analyses of malic acid, Anthocyanins and phenolics, Terpene analysis; HPLC (demonstration of equipment).
Project—practical plus written report. A comparison of two methods of analysis (accuracy, precision, interfering compounds, speed, cost suitability).

DEGREES OF

MASTER OF APPLIED SCIENCE (AGRICULTURE)
MASTER OF APPLIED SCIENCE (NATURAL RESOURCES)
MASTER OF APPLIED SCIENCE (OENOLOGY)
MASTER OF APPLIED SCIENCE (VITICULTURE)

REGULATIONS

1. There shall be the undermentioned degrees:
Master of Applied Science (Agriculture)
Master of Applied Science (Natural Resources)
Master of Applied Science (Oenology)
Master of Applied Science (Viticulture)

2. Subject to Regulation 4 the Faculty of Agricultural and Natural Resource Sciences may accept as a candidate for one of the degrees abovementioned an applicant who:
(a) Has qualified for *either*

(i) An Honours degree of the University of Adelaide, *or*

(ii) An equivalent award of another institution in a relevant field; or

(b) Being qualified for an Ordinary degree of the University of Adelaide, or an equivalent award of another institution in a relevant field, has *either*

(i) Qualified for a Graduate Diploma of the University of Adelaide, *or*

(ii) Had relevant professional experience.

3. (a) Subject to Regulation 4 and the approval of the Board of Graduate Studies the Faculty may, in special cases and subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for one of the degrees abovementioned an applicant who, although not satisfying the requirements of Regulation 2, has given evidence satisfactory to the Faculty of fitness to undertake work for the degree.
(b) Before deciding such applicant's fitness the Faculty may require the applicant to complete prescribed preliminary work (which may include practical experience) and thereafter, or alternatively, to complete a prescribed course of study and pass a qualifying examination of Honours standard.

4. In addition to satisfying the requirements of Regulation 2 and 3 an applicant shall:
(a) Indicate in general terms the subject of the research work or investigation on which the applicant proposes to submit a thesis; and
(b) Provide certification from the Head of the Department of the intended supervisor that:

(i) The applicant has shown evidence of ability to undertake work for a research Master's degree;

(ii) The proposed research project or investigation is appropriate;

(iii) There are available members of staff qualified and able to provide supervision of the proposed candidacy throughout its likely duration; and

(iv) Suitable resources and facilities are available (either in the University or, by

arrangement acceptable to the Faculty, elsewhere) for the proposed project or investigation to be undertaken.

5. If the applicant is accepted as a candidate for the degree concerned the Faculty shall appoint a supervisor and at least one associate supervisor to guide the candidate in the candidate's work.

6. To qualify for the degree concerned a candidate must submit a satisfactory thesis upon a subject approved by the Faculty and shall adduce evidence acceptable to the Faculty that the thesis is the candidate's own work. The thesis shall give the results of original research or of an investigation on which the candidate has been engaged.

7. A candidate may proceed to the degree concerned on a full-time or a part-time basis. Except by special permission of the Faculty, the work for the degree shall be completed and the thesis submitted:
(a) In the case of a full-time candidate, not less than one year nor more than three years from the date of commencement of candidature; or
(b) In the case of a part-time candidate, not less than two years nor more than six years from the date of commencement of candidature.

8. If in the opinion of the Faculty a candidate is not making satisfactory progress the Faculty may, with the consent of the Council, terminate the candidature.

9. The Faculty shall appoint two examiners, at least one of whom shall be external to the University, to report upon the thesis.

10. On completion of the work for the degree concerned the candidate shall inform the Head of Department concerned and lodge with the Registrar three copies of the thesis prepared in accordance with directions given to candidates from time to time.

11. The examiners may recommend that the thesis:
(a) Be accepted, with or without conditions, or
(b) Be accepted, with or without conditions and subject to satisfactory performance in an examination, either written or oral or both, in the field of study immediately relevant to the subject of the thesis, or
(c) Be not accepted, but that the candidate be allowed to resubmit it after revision, or
(d) Be rejected.
The examiners of a thesis resubmitted following recommendation (c) may recommend only (a), (b) or (d) above.

12. Having considered the reports of the examiners the Faculty shall determine whether the thesis is satisfactory.

13. A candidate who fulfils the requirements of these Regulations shall, on the recommendation of the Faculty, be admitted to the degree concerned.

Regulations allowed 21 February 1991.

FACULTY OF ARCHITECTURE AND PLANNING

REGULATIONS, SCHEDULES AND SYLLABUSES

DEGREE OF

BACHELOR OF ARCHITECTURAL STUDIES

REGULATIONS

1. There shall be an Ordinary and an Honours degree of Bachelor of Architectural Studies. A candidate may obtain either degree or both.

2. The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(a) the subjects of study for the degree; and

(b) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

3. The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus or syllabuses.

4. Except by the permission of the Faculty, a candidate shall not enrol in any subject for which the prerequisite studies as prescribed in the syllabus for that subject have not been satisfactorily completed.

5. A candidate shall not be eligible to attend for examination unless the prescribed work has been completed to the satisfaction of the Head of the Department concerned.

6. In determining a candidate's final result in a subject (or part of a subject) the examiners may take into account oral, written, practical and examination work, provided that the candidate has been given adequate notice at the commencement of the teaching of the subject of the way in which work will be taken into account and of its relative importance in the final result.

7. There shall be three classifications of pass in the final assessment of any subject for the Ordinary degree, as follows: Pass with Distinction, Pass with Credit, Pass. If the Pass classification be in two divisions a pass in the higher division may be prescribed in the syllabuses as a prerequisite for admission to further studies in that subject or to other subjects. There shall also be a classification of Conceded Pass. A candidate may present for the Ordinary degree only a limited number of subjects for which a Conceded Pass has been obtained, as specified in the relevant schedule made under these regulations.

8. There shall be three classifications of Pass in the final assessment of the subject for the Honours degree as follows: First Class, Second Class and Third Class. The Second Class classification shall be divided into two divisions as follows: Division A and Division B.

9. A candidate will be permitted to take a supplementary examination in a subject only in circumstances approved by the department administering such subject and consistent with any expressed Council policy.

10. A candidate who fails a subject or who obtains a lower division pass and who desires to take that subject again shall, unless exempted wholly or partially therefrom by the Head of the Department concerned, again complete the required work in that subject to the satisfaction of the teaching staff concerned.

11. If a candidate is unable to complete the course for the Honours degree within the time allowed, or if the candidate's work is unsatisfactory at any stage of the course, or if the candidate withdraws from the course such fact shall be reported to the Faculty. The Faculty may permit the candidate to re-enrol for an Honours degree under such conditions (if any) as it may determine.

12. No candidate will be permitted to count for the degree any subject, together with any

other subject, which, in the opinion of the Faculty, contains a substantial amount of the same material; and no subject or portion of subject may be counted twice towards the degree.

13. A candidate who has twice failed the examination in any elective subject for the Ordinary degree may not enrol for that subject again or for any other elective subject which in the opinion of the Faculty contains a substantial amount of the same material, except by special permission of the Faculty and then only under such conditions as Faculty may prescribe.

14. (a) A candidate who has passed subjects in other faculties of the University or in other educational institutions, may, on written application to the Registrar, be granted such exemption from the requirements of the schedules made under these regulations as the Faculty may determine.

(b) A graduate of the University or of another educational institution who wishes to proceed to the degree of Bachelor of Architectural Studies may do so under the requirements of the schedules made under these regulations.

15. If in any year/semester the student enrolment for a particular subject offered by the Faculty is less than the minimum specified by the Faculty, that subject may not be offered.

16. All previous regulations concerning the degree of Bachelor of Architectural Studies are hereby repealed, provided that a candidate who has completed subjects under the repealed regulations shall have status in equivalent subjects under schedules made under these regulations.

Regulations allowed 31 January, 1980.
Amended: 4 Feb. 1982: 6, 12: 24 Feb. 1983: 3, 17 Jan. 1985: 7, 14.
Regulations repealed, substituted and allowed 20 July, 1989. Awaiting allowance: 3, 14.

DEGREE OF

BACHELOR OF ARCHITECTURAL STUDIES

SCHEDULES

(Made by the Council under Regulation 2)

NOTE: Syllabuses of subjects for the degree of B.Arch.St. are published below, immediately after these schedules. For syllabuses of subjects taught for other degrees and diplomas see the table of subjects at the end of the volume.

Notwithstanding the Schedules and Syllabuses published in this volume, the availability of some of the elective subjects listed in the course leading to the degree of Bachelor of Architectural Studies will be conditional upon the availability of staff and facilities.

SCHEDULE I: THE ORDINARY DEGREE

1. *Course of Study*

(a) The course of study for the Ordinary degree shall extend over three years of full-time study or the equivalent. Students shall pass subjects to the value of at least 24 points at each of the three levels. The point values of the subjects are contained in Schedule II and the Syllabuses.

(b) To qualify for the Ordinary degree a candidate shall pass subjects from Schedule II to the value of at least 72 points, as follows:

Compulsory Subjects

8006 Australian Urban Development III
7006 Building Construction I
4168 Built Environments I
4348 Design and Form I
2719 Design, Ideologies and Institutions III
7358 Economics in Building Design and Development III
4321 Energy, Environment and Buildings III
8169 Image, Text, Architecture I
4696 Representation, Knowledge, Architecture II
3006 Science in Building Design II
3596 The Design of Houses II

Elective subjects

(i) Subjects from Schedule II to the value of at least 12 points at Level I other than the compulsory subjects listed above, at least six points of which must be other than an Architectural Studies subject, and

(ii) Subjects to the value of at least 12 points each at Level II and Level III other than the compulsory subjects listed above.

(c) Candidates must enrol in either 4168 Building Environments I *or* 4348 Design and Form I *or* 8169 Image, Text, Architecture I *or* 7006 Building Construction I in the first year of enrolment.

(d) A graduate in another faculty or other educational institution who wishes to qualify for the Ordinary degree of Bachelor of Architectural Studies in the Faculty of Architecture and Planning and to count towards that degree subjects which have already been presented for another degree may do so providing such a candidate presents a range of subjects which fulfils the requirements of the clauses (a), (b) and (c) above, including subjects to the value of 36 points which must include compulsory and elective Level III subjects to the value of at least 24 points which have not been presented for any other degree.

(e) No candidate will be permitted to count for the degree any subject together with any other subject which, in the opinion of the Faculty, contains a substantial amount of the same material; and no subject or portion of a subject may be counted twice towards the

degree. No candidate may present the same section of a subject in more than one subject for the degree.

(f) Courses of study must be approved by the Dean of the Faculty of Architecture and Planning (or nominee) at enrolment each year.

2. *Conceded Passes*

A candidate may count toward the degree subjects at Level II or Level III with a grade of Conceded Pass, provided that such subjects are not worth more than three points each and that the total value of subjects with Conceded Passes which may be counted toward the degree shall not exceed six points.*

3. *Unacceptable Combinations of Subjects***

No candidate may present for the degree any of the following combinations of subjects:

5468 Art History and Theories IA and 9888 Art History and Theories IIA

8361 Art History and Theories IB and 9853 Art History and Theories IIB

3700 Asian Architecture I and 5094 Asian Architecture II

2006 Australian Architecture I and 2891 Australian Architecture II

8807 Australian Planning II and 9303 Australian Planning III

1098 Building Science II and 2151 Building Science IIIS

1530 Computer-Aided Design II and 3148 Computer-Aided Design IIIS

1530 Computer Methods in Architecture II and 3148 Computer-Aided Design IIIS

1530 Computer Methods in Architecture II and 3148 Computer Methods in Architecture IIIS

8651 Landscape Design Studies II or 8651 Landscape Design II and 9149 Landscape Design Studies III or 9149 Landscape Design III

3073 Modernity in Architecture II and 2726 Modernity in Architecture III

7774 Planning Processes in Urban and Landscape Design II and 9767 Planning Processes in Urban and Landscape Design III

8814 Urban Design Studies II or 8814 Urban Design II and 9295 Urban Design Studies III or 9295 Urban Design III

or any other unacceptable combination of subjects, details of which are available from the Assistant Registrar of the Faculty involved.

4. *Students Enrolled before 1989*

(a) No candidate will be disadvantaged because of changes in subjects resulting from semesterization of the academic year.

(b) Candidates who passed subjects in the course for the degree of B.Arch.St. and/or who have been granted status on account of studies passed at another tertiary institution before 1989 will be given credit for those subjects in the 72-point degree structure introduced in 1989. The point values of subjects in Schedule I of the degree of B.Arch.St. before 1989 shall be:

First-year subjects	6 points at Level I
First-year half-subjects	3 points at Level I
Second-year subjects	8 points at Level II
Second-year half-subjects	4 points at Level II
Third-year subjects	12 points at Level III
Third-year half-subjects	6 points at Level III

(c) (i) If as a result of course changes in 1989 a candidate undertakes a subject which contains elements satisfactorily completed in subjects undertaken before 1989, the candidate may apply to the Faculty for exemption from any portion of a subject previously passed.

* Conceded Passes are not awarded in those subjects listed in Schedule II under the heading Architectural Studies subjects.

** The restrictions contained within clauses of the degree of Bachelor of Arts (see Contents) shall apply to candidates enrolled for the degree of Bachelor of Architectural Studies.

(ii) A candidate who has previously passed a portion of a subject which is equivalent to a semester-length subject introduced in 1989 may apply to the Faculty for status in the semester-length subject.

(d) When in the opinion of the Faculty special circumstances exist the Council on the recommendation of the Faculty in each case may vary any of the provisions of this Clause.

SCHEDULE II: SUBJECTS OF STUDY

The following subjects have been approved by the Faculty of Architecture and Planning as subjects of study for the Ordinary degree.

Subjects offered by other faculties but not listed below may possibly be available on application and subject to the recommendation of the Head of the Department of Architecture, the department concerned, and the approval of the Faculty of Architecture and Planning.

LEVEL I

Architectural Studies subjects

5468	Art History and Theories IA*	3	8169	Image, Text, Architecture I	3
8361	Art History and Theories IB*	3	2006	Australian Architecture I	3
7006	Building Construction I	3	3700	Asian Architecture I	3
4168	Built Environments I	3	1629	Classicism and Architecture****	3

Arts subjects

Level I subjects listed in Schedule I of the degree of Bachelor of Arts.

Economics subjects

9073	Economic History I	3	7263	Mathematics for Economists I	3
2148	Economic Institutions and Policy I	3	7626	Economic Statistics I	3
8461	Economics I	6	7322	Economic Statistics IA	3
7626	Mathematical Economics I	3			

Engineering subjects

9167	Design Graphics	1.5	2853	Engineering Planning and Design	1.5
2391	Dynamics	1.5	6866	Materials I	1.5
6714	Electrical Systems	1.5	3018	Process Systems	1.5
5729	Engineering Computing I	1.5	6581	Statics	1.5

Mathematical and Computer Sciences subjects

Level I subjects listed in Schedule II of the degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences.

Science subjects

Level I subjects listed in Schedule III of the degree of Bachelor of Science in the Faculty of Science.

LEVEL II

Architectural Studies subjects

9888	Art History and Theories IIA*	4	9104	Christianity and Architecture****	4
9853	Art History and Theories IIB*	4	5094	Asian Architecture II	4
3006	Science in Building Design II	4	3073	Modernity and Architecture II	4
4696	Representation, Knowledge, Architecture II	4	2891	Australian Architecture II	4
1530	Computer-Aided Design II*	4	8651	Landscape Design II**	4
8221	Special Topic in Architectural Studies II	4	3596	The Design of Houses II	4
8084	Design Theories II****	4	8814	Urban Design II	4

* A quota may apply to this subject in 1992.

** Available in odd years only.

**** Not available in 1992.

Arts subjects

Level II subjects listed in Schedule I of the degree of Bachelor of Arts.

Economics subjects

9467	East Asian Economies	4	8457	Economic Statistics IIA(S)	4
1682	Economic History A	4	9893	Macroeconomics II	4
7350	Economic History C	4	8620	Mathematical Economics II/III	4
7579	Economic Statistics II(S)	4	8870	Microeconomics II	4
5426	Industrial Relations II/III	4	5920	Economics of Resources and the Environment	4

Law subjects

1826	Australian Legal System	6	3731	Contract	6

Mathematical and Computer Sciences subjects

Level II subjects listed in Schedule II of the degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences.

Science subjects

Level II subjects listed in Schedule III of the degree of Bachelor of Science in the Faculty of Science.

LEVEL III

Architectural Studies subjects

7358	Economics in Building Design and Development III	3	2784	Special Topic in Architectural Studies III	6
4321	Energy, Environment and Buildings III	3	8006	Australian Urban Development III	3
2719	Design, Ideologies and Institutions III	3	2726	Modernity and Architecture III	6
2258	Computer-Aided Design IIIA*****	6	3547	Critiques, Theories and Architectural History III****	6
4903	Computer-Aided Design IIIB*****	6	9149	Landscape Design III*	6
3148	Computer-Aided Design IIIS*****	6	9295	Urban Design III**	6

Arts subjects

Level III subjects listed in Schedule I of the degree of Bachelor of Arts.

Economics subjects

9467	East Asian Economies	4	7350	Economic History C	4
1682	Economic History A	4	8620	Mathematical Economics II/III	4
5426	Industrial Relations II/III	4	5920	Economics of Resources and the Environment	4
2100	Economic Theory III	8	8518	Economics of Labour III	4
4883	Applied Econometrics III	4	3751	Economic Development IIIA	4
5284	Business and Govt II	4	7981	Public Finance III	4
7739	Econometrics III	4			
5942	Economic Development IIIB	4			

Law subjects

8433	Constitutional Law	6	7730	Land Use Planning Law**	3
7272	Environmental Planning and Protection Law***	3	8821	Property	6
9844	Conservation and Heritage Law*	3	9365	Torts	6

* Available odd years only.

** Available even years only.

*** A quota of five B.Arch.St. students will apply.

**** Not available in 1992.

***** A quota may apply in this subject in 1992.

Mathematical and Computer Sciences subjects

Level III subjects listed in Schedule II of the degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences.

Science subjects

Level III subjects listed in Schedule III of the degree of Bachelor of Science in the Faculty of Science.

SUBJECTS FROM OTHER INSTITUTIONS

Such subjects provided by other institutions as may be approved from time to time by the Council on the recommendation of the Faculty of Architecture and Planning.

In 1992 these are:

Social Ecology I and II (University of South Australia)
Visual Arts I (Flinders University)
The Museum (Flinders University)
Archaeology: an introduction to its history, techniques and methodology. (Flinders University)
Italian IS (Flinders University)
Italian IBS (Flinders University)
Italian Language II (Flinders University)
Society and Literature in Italy II (Flinders University)
Italian Language IIB (Flinders University)
Italian Language IIIS (Flinders University)
Italian Language IIIBS (Flinders University)
Society and Literature in Italy IIIS (Flinders University)

Information about the point values of the above subjects is available from the Assistant Registrar of the Faculty

NOTE: (not forming part of the schedules):

LAW: Studies in Law within the degree of B.Arch.St.

1. Candidates who have successfully completed subjects to the value of 24 points at Level I of the B.Arch.St. degree are eligible to apply for admission to Law studies. If admitted, candidates may count certain Law subjects toward both the degree of B.Arch.St. and the degree of LL.B. Candidates may apply for admission to Law studies through the South Australian Tertiary Admission Centre by mid-October of their first year in the B.Arch.St. course.

2. For candidates who wish to seek admission to Law studies, the following programme of study is recommended:

First Year:
Subjects listed in Schedule II at Level I of the degree of B.Arch.St. to the value of at least 24 points

Second Year:

4696 Representation, Knowledge, Architecture II
3006 Science in Building Design II
3596 The Design of Houses II
1826 Australian Legal System
3731 Contract

Third Year:

8006 Australian Urban Development III
7358 Economics in Building Design and Development III
4321 Energy, Environment and Buildings III
2719 Design, Ideologies and Institutions III
9844 Conservation and Heritage Law*
7730 Land Use Planning Law**
8433 Constitutional Law
8821 Property
9365 Torts
7272 Environmental Planning and Protection Law

(Any two of the subjects 8433 Constitutional Law, 8821 Property, and 9365 Torts are the equivalent of 12 points at Level III for the degree of B.Arch.St. To complete the LL.B. degree in minimum time students would need to take all these subjects although this involves an overload and is not a requirement of the B.Arch.St. degree.) Before enrolment in the Level III subjects of the above scheme, students should consult the Law Course Adviser.

3. See also the Schedules of the LL.B. degree and see, in particular, the Introductory Notes to the LL.B. Syllabuses.

* Available odd years only.

** Available even years only.

SCHEDULE III: THE HONOURS DEGREE

A candidate who wishes to proceed to the Honours degree must obtain the approval of the Head of the Department of Architecture, normally by 15 December of the year preceding enrolment.

A candidate for the Honours degree shall attend classes regularly and pass examinations in the subject 2493 Honours Architectural Studies* which shall consist of either one topic to the value of 24 points or two topics to the value of up to 12 points each of an Honours subject.

A candidate may, subject to the approval of the Faculty of Architecture and Planning in each case, include in the subject 2493 Honours Architectural Studies a subject to the value of 12 points taught in a department in another faculty; such candidates must consult the head of the department concerned and must apply in writing to the Registrar by 15 December of the year preceding the proposed Honours year, seeking the approval of the Head of the Department of Architecture.

The work of the Honours year may not be commenced before a candidate is qualified for the Ordinary degree, or has qualified for a degree regarded by the Faculty of Architecture and Planning as equivalent and has completed such pre-requisite subjects (if any) as may be prescribed in the syllabuses. The work of the Honours year must be completed in one year of full-time study, save that on the recommendation of the Head of the Department, the Faculty may permit a candidate to spread the work over two years but not more, under such conditions as the Faculty may determine.

No exemption from any component of the requirements of this schedule is permitted.

*Information on the approved subjects from which the prescribed combination may be chosen shall be advised in the preceding year by the Department of Architecture.

The subjects to be offered in a particular year will depend upon the availability of staff.

DEGREE OF

BACHELOR OF ARCHITECTURAL STUDIES

INTRODUCTION AND OBJECTIVES

The Bachelor of Architectural Studies (B.Arch.St.) is a first undergraduate degree in architecture and the built environment open to applicants with matriculation qualifications or mature students who apply for Special Entry. It is intended for two groups of students:

(1) People wishing to develop the intellectual skills and knowledge involved in combining critical thinking with creative activity and have an interest in the design of the built environment as a context within which to develop these skills. In this respect, the degree serves a similar purpose to other first degrees but is unique in that the selected context of the built environment involves aspects of the arts and the sciences, writing and graphics, design and analysis, and management and engineering.

(2) People wishing to work in the field of architecture and the built environment, particularly those wishing to become professional architects, who are attracted to a programme which emphasises the development of skills in combining critical thinking with creative activity. A second degree, the Bachelor of Architecture, leads after necessary practical experience and examinations to registration as an architect.

The work of the degree will engage the synthesis of critical thought and creative action manifested in architecture. Graduates of the degree should:

- Be able to form and express deep criticism of architectural objects from a broad perspective,
- Be able to generate and present relevant proposals for intervention in situations in the built environment, and
- Be able to combine criticism and proposal generation into a working process of design.

Half of the course comprises core subjects in each year. The remainder are chosen by each student from subjects in the Department of Architecture and certain other Departments in the University. The ordinary degree may be completed in three years and students can also apply for entry to an additional Honours years. (*see attached diagram*)

Students who have completed at least one year of the degree may apply for admission to law studies in their second year. Such students, if accepted, can complete both their B.Arch.St. and LL.B. degrees in a total of five years of full time study by taking some overload.

Educational Objectives

The curriculum and teaching of the degree have both substantive and instrumental objectives. Substantive objectives pertain to knowledge of the *nature of* creative action and critical thinking and to the discipline of architecture. Instrumental objectives pertain to *skills and techniques* relevant to critical thinking, creative action and to work within architecture.

Substantive Objectives

Critical thinking

To present coherent intellectual structures within which observation, analysis, understanding and judgement of situations, texts and objects can be made. To demonstrate the relevance of these structures.

Creative action

To present current knowledge of the act of designing, from both theoretical and practical perspectives. To demonstrate its application to the management of design processes.

Architecture

To present accounts of the built environment, the processes of its production, and the positions, values and preferences that influence its form. To demonstrate the relevance of these accounts.

Instrumental Objectives

Finding, ordering, sifting, filtering, organising information.

Intelligent use of library resources and research of library material. Information acquisition, collation and management from libraries and other sources.

Visualising, representing and manipulating spatial objects.

Perceiving 3D objects.
Drawing and model making using hand and computer techniques.

Writing.

Designing, outlining, organising, and refining thought expressed with the written word, using hand and computer techniques.

Speaking.

Designing, outlining, organising, and refining thought expressed with the spoken word.

Computing

Computational techniques using algorithms and data relationships.

Experimenting

Experimentation using a variety of media.

Working in groups

Acting as both a leader and a member of a group of individuals.

SYLLABUSES

Text-books

Students are expected to have their own copies of text-books; but they are advised to await advice from the lecturer concerned before buying any particular book. Only the prescribed edition of any text-book should be bought. Books marked * are available in paperback editions.

Reference books:

Although lists of books and journals for reference purposes are regarded as important, details have not been included in this Volume. These will however be issued from time to time by the Department of Architecture. It is hoped that all books and journals set for reference will be available to be consulted in the Barr Smith Library.

Communication competence:

In the course of essay, tutorial and project work, students are expected to increase their competence in the use of oral, written and visual communication.

Examinations:

For each subject students may obtain from the department concerned details of the examination in that subject including the relative weights given to the components (e.g. such of the following as are relevant: assessments, semester tests, essays or other written or practical work, final written examinations, *viva voce* examinations).

Bachelor of Architectural Studies 1992

SEMESTER I

Level I

Compulsory Subjects		Elective Subjects¶
4168 Built Environments I (3 points)	4348 Design and Form I (3 points)	Elective(s)§ (total 6 points)

5468 Art History & Theories IA (3 points)
2006 Australian Architecture I (3 points)

Level II

3006 Science in Building Design II (4 points)	3596 The Design of Houses II (4 points)	Elective (4 points)

9888 Art History & Theories IIA (6 points)
2891 Australian Architecture II (4 points)
3073 Modernity & Architecture II (4 points)
8221 Special Topic in Architectural Studies II (4 points)

Level III

8006 Australian Urban Development III (3 points)	7358 Economics in Building Design and Development III (3 points)	Elective (6 points)

2258 Computer-Aided Design IIIA (6 points)
2726 Modernity & Architecture III (6 points)
2784 Special Topic in Architectural Studies III (6 points)

SEMESTER II

Level I

Compulsory Subjects		Elective Subjects¶
7006 Building Construction I (3 points)	8169 Image, Text, Architecture I (3 points)	Elective(s)§ (total 6 points)

8361 Art History & Theories IB (3 points)
3700 Asian Architecture I (3 points)

Level II	4696 Representation, Knowledge, Architecture II (4 points)	Elective (4 points)	Elective (4 points)

9853 Art History & Theories IIB (4 points)
5094 Asian Architecture II (4 points)
1530 Computer-Aided Design II (4 points)
8651 Landscape Design II (4 points)

Level III	4321 Energy, Environment & Buildings III (3 points)	2719 Design, Ideologies & Institutions (3 points)	Elective (6 points)

4903 Computer-Aided Design IIIB (6 points)
3148 Computer-Aided Design IIIS (6 points)
9149 Landscape Design III (6 points)

¶ Students may also select elective subjects outside the Faculty of Architecture and Planning.

§ All students must take at least one Level I subject, or two Level I half-subjects (total 6 points) outside the Faculty of Architecture and Planning.

LEVEL I

5468 Art History and Theories IA

Level: I.

Points value: 3.

Duration: Semester I.

Restriction: 2090 Art History and Theories or 9888 Art History and Theories IIA.

Contact hours: 2 lectures and 1 tutorial a week plus occasional excursions.

Content: Impressionism and after: a critical view of European art from the time of Manet to the First World War. This subject introduces students to the most influential ideas and theories in the art of the latter part of the 19th century, a time of renegotiation of the relationship between artists and the social context within which they work. Included in the study are the major artists and ideas contributing to the development of impressionism, post-impressionism, symbolism, fauvism, cubism, futurism, constructivism, posters and political art, expressionism and dada. The subject aims to stimulate an awareness that familiarity with the history of ideas can aid each person in the expansion, structuring and enrichment of his or her own life. Development of the following skills will be brought into focus: clear-thinking, verbal communication, written communication, interpretation of written and visual material, and ability to work with historical research methods. Guest lecturers and excursions are incorporated in the subject where appropriate. Use is made of a broad range of visual material.

Assessment: Slide test 40%, essays 35% and tutorial work 25%.

Text-books: Selz, Peter *Art in our times: A pictorial history 1890 — 1980* (Thames and Hudson, 1982) or Arnason, H.H., *A history of modern art* (Thames and Hudson, 1969); Chipp, Herschel B., *Theories of modern art* (Uni. of California Press, 1968); Hamilton, G.H., *Painting and sculpture in Europe 1880 — 1940* (Pelican History of Art, Penguin, 1967); Stangos, Nikos (ed.) *Concepts of modern art* 2nd ed. (Holt Rinehart, 1981).

8361 Art History and Theories IB

Level: I.

Points value: 3.

Duration: Semester II.

Restriction: 9853 Art History and Theories IIB.

Contact hours: 2 lectures and 1 tutorial hour a week.

Content: Art history and theories after World War I: modernism and beyond. The subject introduces students to some of the leading ideas and manifestations of visual art from about 1920 to the present day. The term "visual art" is broadly understood to include film, photography, graphics, posters, performance and the arts of process and idea, as well as painting, sculpture and architecture (although architecture is chiefly dealt with in other subjects). Modernism, abstract expressionism, op, pop and minimalism, art and technology, environments, happenings, performance, body art, conceptual art, process art, video, women's art, murals and photorealism are studied. Guest lecturers and excursions are incorporated in the subject where appropriate. Use is made of a broad range of visual material.

Assessment: Slide test 40%, essays 40% and tutorial work 20%.

Text-books: Selz, Peter *Art in our times: A pictorial history 1890 — 1980* (Thames and Hudson, 1982) or Arnason, H.H., *A history of modern art* (Thames and Hudson, 1969); Chipp, Herschel B., *Theories of modern art* (Uni. of California Press, 1968); Hamilton, G.H., *Painting and sculpture in Europe 1880 — 1940* (Pelican History of Art, Penguin, 1967); Stangos, Nikos (ed.) *Concepts of modern art* 2nd ed. (Holt Rinehart, 1981).

3700 Asian Architecture I

Level: I.

Points value: 3.

Duration: Semester II.

Restriction: 5094 History and Theories of Architecture IIC and 5094 Asian Architecture II.

Contact hours: 2 lectures and 1 tutorial a week.

Content: A topic in Asian architectural history and landscape studies will be offered as the vehicle for a study of the problems of inter-cultural understanding. The nature of built objects, the modes and means of transmitting architectural knowledge, the relation of architecture to myths, rituals, cosmologies will be discussed in detail. Primary sources in translation will be introduced whenever possible.

Topic for 1991: The domestic architecture and gardens of imperial China.

Assessment: Tutorial papers 40%, final essay 60%.

Text-book: Hay, J., *Kernels of energy, bones of earth: The rock in Chinese art* (China Institute in America, 1985); Hall, D. L. and Ames, R. T., *Thinking through Confucius* (State Univ. of New York Press, 1987); Stein, R.A., *The world in miniature: Container gardens and dwellings in Far Eastern religious thought* (Stanford University Press, 1990).

2006 Australian Architecture I

Level: I.

Points value: 3.

Duration: Semester I.

Restriction: 8329 History and Theories of Architecture I or 2006 History and Theories of Architecture IB or 2891 Australian Architecture II.

Contact hours: 2 lectures and 1 tutorial a week.

Content: A general introduction to the study of Australian architecture since 1788, with special attention to conceptual issues concerned with the characterization of "Australian" architecture. The limitations of the formal analysis of built objects, periodization and stylistic taxonomy will be discussed with reference to selected buildings in Adelaide and elsewhere, both professionally designed and otherwise. Australian architectural discourse will be analysed in relation to wider patterns of cultural value. Reference to the wider international context will be made as appropriate.

Assessment: Tutorial papers 40%, final essay 60%

Text-books: Fiske, J., Hodge, B, & Turner, G., *Myths of Oz: Reading Australian popular culture* (Allen & Unwin, 1987); Apperly, R., Irving, R., & Reynolds, P., *Identifying Australian architecture* (Angus & Robertson, 1989); Kahn, A., Drawing/Building/Text: *Essays in Architectural theory* (Princeton Architectural Press, 1990); Gianni, B. and Shiles, B., *Dice thrown* (Princeton Architectural Press, 1989).

7006 Building Construction I

Level: I.

Points value: 3.

Subject quota: 80.

Duration: Semester II.

Assumed knowledge: None.

Restriction: 8334 Building Studies IA.

Contact hours: 2 lectures and 2 tutorial hours a week.

Content: An introduction to the vocabulary of the methods, materials and forms of construction in the built environment. The elements of building construction produced by both on-site and industrialised techniques will be discussed and examples investigated. Through simple design examples technical performance requirements will be introduced and assessed.

Assessment: Assignments 100%.

Reference books: Wilkie, G. and Arden, S. (1988), *Building your own house* (Lansdowne Press, Sydney); International Council for the Building Research Studies and Documentation (1981), *Working with the performance approach in building* CIB Report, Pub. 64, Rotterdam; Others to be advised.

4168 Built Environments I

Level: I.

Points value: 3.

Subject quota: 80.

Duration: Semester I.

Assumed knowledge: None.

Restriction: None.

Contact hours: 2 lectures and up to 2 tutorial hours a week.

Content: An introduction to the study of built environments, their history and relationship to culture and the natural environment, and to a transdisciplinary, problem-focused approach to built environment decision-making. The subject examines how the processes by which built environments are created and changed influence the products at the levels of

global issues, cities, buildings and artifacts. Exemplars in the forms of problems, products and processes are considered in the light of models of built environment decision-making. Products cover a range of scales and contexts, including local cases and cases remote in space and time. Emphasis is given to problems and processes of current relevance in Australia. The roles of all main decision-makers are considered, with emphasis on those of architects and related professions. Ethical issues and human requirements of built environments are considered in relation to the limitations imposed by environmental constraints.

Assessment: Examination 50%, Assignments 50%.

Reference books: Beach, C.R. (1990) *Image theory: decision making in personal and organizational contexts*, John Wiley, Chichester Cooper Hewitt Museum (1982) Cities: *The forces that shape them*, Rizzoli, New York, Lang, J. (1987) *Creating architectural theory*, Van Nostrand Reinhold, New York.

1629 Classicism and Architecture

Availability: Not offered in 1992.

Level: I.

Points value: 3.

Duration: Semester II.

Restriction: 8329 History and Theories of Architecture I or 9951 History and Theories of Architecture IIB or 1629 History and Theories of Architecture IC.

Contact hours: 2 lectures and 1 tutorial a week.

Content: A study of Classicism and architecture from antiquity to the present with particular emphasis on the Renaissance and 19th-century classicism. The characteristics of classical and classicist architecture will be analysed in relation to conventional rules of composition against an outline of major shifts in Western architectural history. Special attention will be devoted to the changing natures of architectural practice and the built object, and to changing conceptions of time and the past in Western societies since the Renaissance.

Assessment: Tutorial papers 40%, final essay 60%.

Text-books: Tzonis, A., and Lefaivre, L., *Classical architecture: The poetics of order* (MIT Press, 1986); Wittkower, R., *Architectural principles in the age of humanism*, 4th ed. (Academy Editions, 1973); Colquhoun, A., *Modernity and the classical tradition: Architectural essays*, 1980-1987 (MIT Press, 1988) or Hersey, G.L., *The lost meaning of classical architecture: Speculations on ornament from Vitruvius to Venturi* (MIT Press, 1988).

4348 Design and Form I

Level: I.

Points value: 3.

Duration: Semester I.

Assumed knowledge: None.

Restriction: 8897 Design Studies IA.

Contact hours: 2 lectures and 2 tutorial hours a week.

Content: An introduction to architectural design, discussed and demonstrated as an iterative activity involving both creative action and critical thought. The primary emphasis of the subject is developing concepts and skills for creative action: designing spatial forms as both visual compositions and as a potential setting for human activities, including the concepts of derivation, geometric construction and grammatical rules as well as skills in drawing, model making, writing, group work and computing. The secondary emphasis is critical thought: designs are examined from multiple and often conflicting positions and

values. The subject matter is situated within the history of architecture through the use of examples.

Assessment: Assignments 100%.

Reference books: Ching, F.D.K. (1979) *Architecture: form, space and order,* Van Nostrand Reinhold, New York; Lassau, P. (1980) *Graphics thinking for architects and designers* (Van Nostrand Reinhold, New York).

8169 Image/Text/Architecture I

Level: I.

Points value: 3.

Duration: Semester II.

Assumed knowledge: None.

Restriction: 2713 Design Studies IB.

Contact hours: 2 lectures and 2 tutorial hours a week.

Content: An introduction to the cultural and historical study of 20th-century architecture which addresses drawn, built, and written modes of architectural production. The incorporation of modern aesthetics into processes of industrial production, advertising theory and cultural consumption will be discussed as part of a general introduction that seeks to situate current architectural developments in late capitalism. In a number of practical projects, students will be encouraged to cultivate their ability to handle written texts and images.

Assessment: Assignments 100%.

Reference books: Barthes, R. (1983) *The fashion system* (Hill and Wang); Ewen, S. (1988) *All consuming images: The politics of style in contemporary culture* (Basic Books); Foster, H. (1985) *Recodings: Art, spectacle, cultural politics* (Bay Press); Hays, K.M. & Burns, C. eds. (1990) *Thinking the present: Recent American architecture* (Princeton Architectural Press); Kahn, A. (1990) *Drawing/Building/Text: Essays in architectural theory* (Princeton Architectural Press); Colomina, B. ed. (1988) *Architecture production* (Princeton Architectural Press); Foucault, M. (1983) *This is not a pipe* (University of California Press); W.J.T. Mitchell (1986), *Iconology: Image, text, ideology* (The University of Chicago Press); Jameson, F. (1991), *Postmodernism, or the cultural logic of late capitalism* (Duke University Press).

LEVEL II

9888 Art History and Theories IIA

Level: II.

Points value: 4.

Duration: Semester I.

Restriction: 2090 Art History and Theories or 5468 Art History and Theories IA.

Contact hours: 2 lectures and 1 tutorial a week plus occasional excursions.

Content: Impressionism and after: a critical view of European art from the time of Manet to the First World War. This subject introduces students to the most influential ideas and theories in the art of the latter part of the 19th century, a time of renegotiation of the relationship between artists and the social context within which they work. Included in the study are the major artists and ideas contributing to the development of impressionism, post-impressionism, symbolism, fauvism, cubism, futurism, constructivism, posters and political art, expressionism and dada. The subject aims to stimulate an awareness that familiarity with the history of ideas can aid each person in the expansion, structuring and enrichment of his or her own life. Development of the following skills will be brought into

focus: clear thinking, verbal communication, written communications, interpretation of written and visual material, and ability to work with historical research methods. Guest lecturers and excursions are incorporated in the subject where appropriate. Use is made of a broad range of visual material.

Assessment: Slide test 40%, essays 35% and tutorial work 25%.

Text-books: Selz, Peter *Art in our times: A pictorial history 1890 — 1980* (Thames and Hudson, 1982) or Arnason, H.H., *A history of modern art* (Thames and Hudson, 1969); Chipp, Herschel B., *Theories of modern art* (Uni. of California Press, 1968); Hamilton, G.H., *Painting and sculpture in Europe 1880 — 1940* (Pelican History of Art, Penguin, 1967); Stangos, Nikos (ed.) *Concepts of modern art* 2nd ed. (Holt Rinehart, 1981).

9853 Art History and Theories IIB

Level: II.

Points value: 4.

Duration: Semester II.

Restriction: 2090 Art History and Theories or 8361 Art History and Theories IB.

Contact hours: 2 lectures and 1 tutorial hour a week.

Content: Art history and theories after World War I: modernism and beyond. The subject introduces students to some of the leading ideas and manifestations of visual art from about 1920 to the present day. The term "visual art" is broadly understood to include film, photography, graphics, posters, performance and the arts of process and idea, as well as painting, sculpture and architecture (although architecture is chiefly dealt with in other subjects). Modernism, abstract expressionism, op, pop and minimalism, art, video, women's art, murals and photorealism are studied. Guest lecturers and excursions are incorporated in the subject where appropriate. Use is made of a broad range of visual material.

Assessment: Slide test 40%, essays 40%, and tutorial work 20%.

Text-books: Selz, Peter *Art in our times: A pictorial history 1890 — 1980* (Thames and Hudson, 1982) or Arnason, H.H., *A history of modern art* (Thames and Hudson, 1969); Chipp, Herschel B., *Theories of modern art* (Uni. of California Press, 1968); Hamilton, G.H., *Painting and sculpture in Europe 1880 — 1940* (Pelican History of Art, Penguin, 1967); Stangos, Nikos (ed.) *Concepts of modern art* 2nd ed. (Holt Rinehart, 1981).

5094 Asian Architecture II

Level: II.

Points value: 4.

Duration: Semester II.

Restriction: 5094 History and Theories of Architecture IIC.

Contact hours: 2 lectures and 1 tutorial a week.

Content: A topic in Asian architectural history and landscape studies will be offered as the vehicle for a study of the problems of inter-cultural understanding. The nature of built objects, the modes and means of transmitting architectural knowledge, the relation of architecture to myths, rituals, cosmologies will be discussed in detail. Primary sources in translation will be introduced whenever possible.

Topic for 1992: The domestic architecture and gardens of imperial China.

Assessment: Tutorial papers 40%, final essay 60%.

Text-book: Hay, J., *Kernels of energy, bones of earth: The rock in Chinese art* (China Institute in America, 1985); Hall, D. L. and Ames, R. T., *Thinking through Confucius* (State Univ. of New York Press, 1987); Stein, R. A., *The world in miniature: Container gardens and dwellings in Far Eastern religious thought* (Stanford University Press, 1990).

2891 Australian Architecture II

Level: II.

Points value: 4.

Duration: Semester I.

Restriction: 8329 History and Theories of Architecture I *or* 2006 History and Theories of Architecture IB *or* 2006 Australian Architecture I *or* 9951 History and Theories of Architecture IIB.

Contact hours: 2 lectures and 1 tutorial a week.

Content: A general introduction to the study of Australian architecture since 1788, with special attention to conceptual issues concerned with the characterization of "Australian" architecture. The limitations of the formal analysis of built objects, periodization and stylistic taxonomy will be discussed with reference to selected buildings in Adelaide and elsewhere, both professionally designed and otherwise. Australian architectural discourse will be analysed in relation to wider patterns of cultural value. Reference to the wider international context will be made as appropriate.

Assessment: Tutorial papers 40%, final essay 60%.

Text-books: Fiske, J., Hodge, B., and Turner, G., *Myths of Oz: reading Australian popular culture* (Allen & Unwin, 1987); Apperly, R., Irving, R., and Reynolds, P., *Identifying Australian architecture* (Angus & Robertson, 1989); Kahn, A., Drawing/Building/Text: *Essays in architectural theory* (Princeton Architectural Press, 1990; Gianni, B. and Shiles, B., *Dice thrown* (Princeton Architectural Press, 1989).

9104 Christianity and Architecture

Availability: Not offered in 1992.

Level: II.

Points value: 4.

Restriction: 8378 History and Theories of Architecture II and 9104 History and Theories of Architecture IIA.

Contact hours: 2 lectures and 1 tutorial a week.

Content: A study of the architecture of the Judaeo-Christian tradition with particular emphasis on the Gothic cathedrals and on 19th-century Gothic Revival. Concepts of iconography, symbolism and sacred space will be introduced as part of a detailed study of selected Gothic monuments. The activities of major architects and advocates of the Gothic Revival will be discussed in relation to the general development of historicism and historical studies in 19th-century Europe. The subject will conclude by considering the differences in the problematics of sacred architecture in these areas.

Assessment: Tutorial papers 40%, final essay 60%.

Text-books: James, J., *Chartres: the masons who built a legend* (Routledge & Kegan Paul, 1982); von Simson O., *The Gothic cathedral: origins of Gothic architecture and the medieval concept of order*, 2nd ed. (Princeton University Press, 1974); Hersey, G. L., *High Victorian Gothic* (Johns Hopkins University Press, 1972).

1530 Computer-Aided Design II

Level: II.

Points value: 4.

Duration: Semester II.

Restriction: 1530 Computer Methods in Architecture II *or* IIH *or* 3148 Computer Methods in Architecture IIIS *or* 2258 Computer Methods in Architecture IIIA *or* 4903 Computer Methods in Architecture IIIB *or* 3148 Computer-Aided Design IIIS.

Assumed knowledge: Mathematics equivalent to Year 12 Mathematics I & II.

Contact hours: 2 lectures and 2 tutorial hours a week.

Content: The subject examines the nature, assumptions and characteristics of current computer-aided design (CAD) graphics systems, their relationship to computation, abstraction and representation in design, and ways of looking at designs and designing from a CAD viewpoint. The human and management issues involved in the use of CAD systems in design offices will be discussed with examples.

Assessment: 2 hour examination 30% and assignments 70%.

8084 Design Theories II

Availability: Not offered in 1992.

Level: II.

Points value: 4.

Duration: Semester I.

Restriction: 6895 Design Studies IIH.

Contact hours: 2 lectures and 3 seminar hours a week.

Content: An investigation of a number of philosophical, cultural, social, political and ideological constructs informing theories of design, its practice(s) and its reception; the economic, political and environmental relevance of design as both intellectual and pragmatic activity within the wider social context.

Assessment: Tutorials and workshops 50%, and essays 50%.

8651 Landscape Design II

Availability: Even years only.

Level: II.

Points value: 4.

Duration: Semester II.

Restriction: 3138 Urban and Landscape Design Studies II or 8651 Landscape Design Studies II or 9149 Landscape Design Studies III or 9149 Landscape Design III.

Contact hours: 1 lecture and up to 3 hours of tutorial/practical work a week plus occasional site visits.

Content: The history of landscape design is reviewed and contemporary issues in landscape design are examined — the concepts, theories, materials and people involved.

Assessment: Project work 40%, tutorial assignments 30%, 2-hour examination 30%.

3073 Modernity and Architecture II

Level: II.

Points value: 4.

Duration: Semester I.

Restriction: 2726 Modernity and Architecture III.

Contact hours: 2 lectures and 1 tutorial a week.

Content: Modernity and architecture. An exploration of the transformation of the traditional practices of Western architecture in the aftermath of the Scientific Revolution and the French Enlightenment. Issues discussed will include concepts of rationality and functionalism, the technologies and mythologies of industrialisation and mass production, and the ideologies of the avant-gardes, considered in relation to selected architectural projects from the 18th century to recent decades. The implications of structuralist and post-structuralist positions for a methodological critique of conventional accounts of 20th-century architecture will be explored.

Assessment: Tutorial papers 40%, final essay 60%.

Text-books: Rykwert, J., *The first moderns: the architects of the eighteenth century* (MIT Press, 1980); Perez-Gomez, P., *Architecture and the crisis of modern science* (MIT Press, 1983); Tafuri, M., *The sphere and the labyrinth: Avant-gardes and architecture from Piranesi to the 1970s* (MIT Press, 1987); Vidler, A., *The writing of the walls: architectural theory in the late enlightenment* (Princeton Architectural Press, 1987); Harvey, D., *The condition of postmodernity: An enquiry into the origins of cultural change* (Basil Blackwell, 1989); Kolb, D., *Postmodern sophistications: Philosophy, architecture and tradition* (University of Chicago Press, 1990).

4696 Representation, Knowledge, Architecture II

Level: II.

Points value: 4.

Duration: Semester II.

Assumed knowledge: 4348 Design and Form I or its equivalent.

Restriction: 6344 Design Studies IIA and 7090 Design Studies IIB.

Contact hours: 2 lectures and up to 3 tutorial hours a week.

Content: The intersection of theory and practice in two areas: Representation, including issues of cultural representation, the reading and interpretation of images, the production of images, and techniques of representation in architectural practice and discourse: and Knowledge, including the cultural construction of knowledge, its historical and philosophical context, and models of knowledge and design. Students will develop skills in various media.

Assessment: Assignments 100%.

Reference books: To be advised.

3006 Science in Building Design II

Level: II.

Points value: 4.

Duration: Semester I.

Assumed knowledge: 4168 Built Environments I and 7006 Building Construction I or their equivalents.

Restriction: 9423 Building Studies IIS.

Contact hours: 2 lectures and up to 4 tutorial hours a week.

Content: Building on knowledge gained in previous subjects, the applicability of building science techniques in relation to the design of built environments will be examined. Three key topics which introduce experimental methods and mathematical modelling will be addressed to represent each of building structural design, materials science and environmental science. Examples of such topics are movement of building materials, colour and light and structural design in deformation.

Assessment: Assignments 50%, Examination 50%.

Reference books: Ward-Harvey, K. (1985), *Fundamental building materials* (Sakoya, Sydney); Cowan, H.J. (1987), *Science and building* (John Wiley & Sons, New York); Pritchard, D.C., *Lighting (environmental physics)*, 2nd edn. (Longman); Schaeffer, R.E., *Building structures* (New York, Prentice-Hall).

8221 Special Topic in Architectural Studies II

Level: II.

Points value: 4.

Duration: To be advised.

Assumed knowledge: To be advised.

Restriction: None.

Contact hours: 2 lectures and up to 3 tutorial hours a week.

Content: To be advised.

Assessment: To be advised.

Reference books: To be advised.

3596 The Design of Houses II

Level: II.

Points value: 4.

Duration: Semester I.

Assumed knowledge: 4348 Design and Form I, 4168 Built Environments I.

Restriction: 6344 Design Studies IIA.

Contact hours: 2 lectures and up to 3 tutorial hours a week.

Content: The relationship of human needs to the design of houses and other forms of dwellings, the expression of architecture in houses, the history of the development of the form of houses and the work of architects, and the relationship of house form to cultural, social and economic factors. Making and evaluating designs for houses.

Assessment: Assignments 100%.

Reference books: To be advised.

8814 Urban Design II

Availability: Odd years only.

Level: II.

Points value: 4.

Duration: Semester II.

Restriction: 3138 Urban and Landscape Design Studies II or 8814 Urban Design Studies II or 9295 Urban Design Studies III or 9295 Urban Design III or 5020 Design and Building Studies IIIA.

Contact hours: 1 lecture and 3 hours of tutorial/practical work a week plus occasional site visits.

Content: This subject is concerned with urban areas and urban design. Emphasis is placed on examining how the built environment becomes what it is — the theoretical concepts, practices, policies and participants that interact to create this environment.

Assessment: Project work 40%, tutorial assignments 30%, 2-hour examination 30%.

LEVEL III

8006 Australian Urban Development III

Level: III.

Points value: 3.

Duration: Semester I.

Assumed knowledge: 4168 Built Environments I or equivalent.

Restriction: 6229 Design and Building Studies IIIB.

Contact hours: 2 lectures and 2 tutorial hours a week.

Content: Aspects of the history and theory of Australian urban development. This subject examines Australian cities within a global context and explores the social and environmental parameters that generate their form. Current environmental engineering and development practices are examined.

Assessment: Assignments 100%.

Reference books: To be advised.

2258 Computer-Aided Design IIIA

Level: III.

Points value: 6.

Duration: Semester I.

Restriction: 2258 Computer Methods in Architecture IIIA.

Assumed knowledge: 1530 Computer Methods in Architecture II *or* IIH *or* 1530 Computer-Aided Design II or equivalent.

Contact hours: 2 lectures and 3 tutorials a week.

Content: The construction of mathematical models in design and their representation and implementation as computer algorithms, with architecture and urban design as context. The subject includes a critical examination of computer hardware, software and operating systems as they relate to design offices.

Assessment: Assignments 100%.

4903 Computer-Aided Design IIIB

Level: III.

Points value: 6.

Duration: Semester II.

Restriction: 4903 Computer Methods in Architecture IIIB.

Assumed knowledge: 1530 Computer Methods in Architecture II *or* IIH *or* 1530 Computer-Aided Design II or equivalent.

Contact hours: 2 lectures and 3 tutorials a week.

Content: Advanced theories and models of computer-aided design (CAD), with architecture and urban design as context. CAD paradigms for design description, generation and evaluation are examined, with selected topics from parametric design, computational design, expert systems, knowledge engineering, simulation and optimization.

Assessment: Assignments 100%.

3148 Computer-Aided Design IIIS

Level: III.

Points value: 6.

Duration: Semester II.

Restriction: 1530 Computer Methods in Architecture II or IIH *or* 1530 Computer-Aided Design II *or* 3148 Computer Methods in Architecture IIIS.

Assumed knowledge: Mathematics equivalent to Mathematics I or II at Year 12.

Contact hours: 2 lectures and 3 tutorials a week.

Content: The subject examines the nature, assumptions and characteristics of current computer-aided design (CAD) graphics systems, their relationship to computation, abstraction and representation in design, and ways of looking at designs and designing from a CAD viewpoint. The human and management issues involved in the use of CAD systems in design offices are discussed, with examples.

Assessment: 2 hour examination 20% and assignments 80%.

3547 Critiques, Theories and Architectural History III

Availability: Not offered in 1992.

Level: III.

Points value: 6.

Duration: Semester II.

Restriction: 6528 History and Theories of Architecture III *or* 3547 History and Theories of Architecture IIIB.

Contact hours: 2 lectures and 3 seminar hours a week.

Content: A topic will be offered of a specialised nature concerning architectural history. Drawing on the works of prominent writers in modern cultural studies such as Walter Benjamin and Michel Foucault, this subject will focus on developing techniques of historical study and for examining various historical methodologies.

Topic for 1991: Australian architectural discourse since 1880.

Assessment: Tutorial papers 40%, final essay 60%.

Text-books: Colomina, B., ed. *Architecture production* (Princeton Architectural Press, 1988); Ockman, J., ed. *Architecture, criticism, ideology* (Princeton Architectural Press, 1985); Merod, J., *The political responsibility of the critic* (Cornell University Press, 1981); Ghirardo, D., ed., *Out of site: A social criticism of architecture* (Bay Press, 1991); Bauman, Z., *Legislators and interpreters: On modernity, post-modernity and intellectuals* (Cornell University Press, 1987).

2719 Design, Ideologies and Institutions III

Level: III.

Points value: 3.

Duration: Semester II.

Assumed knowledge: 4696 Representation, Knowledge, Architecture II.

Restriction: None.

Contact hours: 1 lecture and up to 3 tutorial hours a week.

Content: The activity of designing and the influence of institutions, politics and ethical issues on the status of designers and the making and evaluation of designs. The primary emphasis of the subject is on ways that architecture, its process of making and its practice are treated within organised society. A second theme in the subject is the reasoned development of ethical positions and proposals for action on architectural issues.

Assessment: Assignments 100%.

7358 Economics in Building Design and Development III

Level: III.

Points value: 3.

Duration: Semester I.

Assumed knowledge: None.

Restriction: 2920 Building and Development Economics III.

Contact hours: 1 lecture and 2 tutorial hours a week.

Content: Aspects of economic criteria related to building design and development implementation. The topics to be covered include: the building industry in Australia, its role in the national economy, housing affordability, building initial and recurring costs,

estimating, life-cycle costing, investment and yield, feasibility studies, and cost/benefit analysis.

Assessment: Examination 50%, Assignments 50%.

Reference books: Ferry, D.J. and Brandon, P.S., *Cost planning of buildings*, Granada, London; Stone, P.A., *Building design evaluation — costs in use*, Methuen, London.

4321 Energy, Environment and Buildings III

Level: III.

Points value: 3.

Duration: Semester II.

Assumed knowledge: 3006 Science in Building Design II or equivalent.

Restriction: None.

Contact hours: 1 lecture and 2 tutorial hours a week.

Content: A problem-focused approach in which energy and climate-related issues in building design are examined in relation to human requirements and resources availability and distribution. Design problems amenable to quantification will be emphasised. Topics which will be addressed include choice of appropriate building materials and built forms, and elementary equipment selection.

Assessment: Assignments 100%.

Reference books: Coldicutt, A.B. et al *Solar control design aids*, Department of Architecture, University of Melbourne; Szokolay, S.V., *Thermal design of buildings*, RAIA, Canberra; Coldicutt, A.B. et al, *Thermal properties of construction elements*, Department of Architecture, University of Adelaide, Experimental Building Station (to be advised).

9149 Landscape Design III

Availability: Even years only.

Level: III.

Points value: 6.

Duration: Semester II.

Restriction: 8651 Landscape Design Studies II or 8651 Landscape Design II or 6425 Urban and Landscape Design Studies IIIA or 9149 Landscape Design Studies III.

Contact hours: 1 lecture and up to 4 hours of tutorial/practical work a week plus occasional site visits.

Content: This subject is concerned with landscape design. The history of landscape design is reviewed and contemporary issues in landscape design are examined — the concepts, theories, materials and people involved.

Assessment: Project work 30%, tutorial assignments 40%, 2-hour examination 30%.

2726 Modernity and Architecture III

Level: III.

Points value: 6.

Duration: Semester I.

Restriction: 6528 History and Theories of Architecture III *or* 3073 Modernity and Architecture II *or* 2726 History and Theories of Architecture IIIA.

Contact hours: 2 lectures and 3 seminar hours a week.

Content: Modernity and architecture. An exploration of the transformations of the traditional practices of Western architecture in the aftermath of the Scientific Revolution and the French Enlightenment. Issues discussed will include concepts of rationality and

functionalism, the technologies and mythologies of industrialisation and mass production, and the ideologies of the avant-gardes, considered in relation to selected architectural projects from the 18th century to recent decades. The implications of structuralist and post-structuralist positions for a methodological critique of conventional accounts of 20th-century architecture will be explored.

Assessment: Tutorial papers 40%, final essay 60%.

Text-books: Rykwert, J., *The first moderns: The architects of the eighteenth century* (MIT Press, 1980); Perez-Gomez, P., *Architecture and the crisis of modern science* (MIT Press, 1983); Tafuri, M., *The sphere and the labyrinth: Avant-gardes and architecture from Piranesi to the 1970s* (MIT Press, 1987); Vidler, A., *The writing of the walls: Architectural theory in the late Enlightenment* (Princeton Architectural Press, 1987); Harvey, D., *The condition of postmodernity: An enquiry into the origins of cultural change* (Basil Blackwell, 1989); Kolb, D., *Postmodern sophistications: Philosophy, architecture and tradition* (University of Chicago Press, 1990).

2784 Special Topic in Architectural Studies III

Level: III.

Points value: 6.

Duration: To be advised.

Assumed knowledge: To be advised.

Restriction: To be advised.

Contact hours: 2 lectures and up to 3 tutorial hours a week.

Content: To be advised.

Assessment: To be advised.

Reference books: To be advised.

9295 Urban Design III

Availability: Odd years only.

Level: III.

Points value: 6.

Duration: Semester II.

Restriction: 8814 Urban Design Studies II or 8814 Urban Design II or 6425 Urban and Landscape Design Studies IIIA or 9295 Urban Design Studies III.

Contact hours: 1 lecture and 4 hours of tutorial/practical work a week plus occasional site visits.

Content: This subject is concerned with urban areas and urban design. Emphasis is placed on examining how the built environment becomes what it is — the concepts, practices, policies and participants that interact to create this environment.

Assessment: Project work 30%, tutorial assignments 40%, 2-hour examination 30%.

2493 Honours Architectural Studies

Level: IV.

Points value: 24.

Duration: Full year.

Pre-requisite: See Schedule III.

Contact hours: Discussion with supervisor, occasional seminars, laboratory sessions as appropriate.

Content: Students will be required to undertake supervised research in one or two advanced

topics, thereby developing a thorough understanding of appropriate research techniques. The outcome of this research will be submitted in the form of a substantial essay or research report including a survey of the literature relevant to the topic(s) chosen. The range of topics to be offered in any year will depend on staff availability. Topics which can be expected to be offered from time to time include:

Architectural History
Architectural Theories in Modern Architecture
Australian Architectural History
*Building Acoustics and Noise
*Building Materials Behaviour
Computer-Aided Design
Computer Applications in Architecture
Criticism and Architecture
Conservation in the Built Environment
*Daylight Studies
*Energy Control in Buildings
Ergonomics
Housing
Rainfall and Buildings
Solar Access
Urban Design
Wind and Buildings

Those with asterisk require experimental work in the Building Science Laboratory

Subject to the approval of the Head, Department of Architecture and with the agreement of the other Department concerned, a subject equivalent to 12 points at Level IV taught in another department may be taken as part of this subject.

Assessment: Progress 30% and final presentation 70%.

DEGREE OF

BACHELOR OF ARCHITECTURE

REGULATIONS

1. There shall be an Ordinary and an Honours degree of Bachelor of Architecture. A candidate may obtain either the Ordinary degree or the Honours degree but not both.

2. The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(a) the subjects of study for the degree; and

(b) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

3. The syllabuses of the subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of the Department or Centre may approve minor changes to any previously approved syllabus or syllabuses.

4. Except by the permission of the Faculty, a candidate shall not enrol in any subject for which the prerequisite studies as prescribed in the syllabus for that subject have not been satisfactorily completed.

5. A candidate shall not be eligible to attend for examination unless the prescribed work has been completed to the satisfaction of the teaching staff concerned.

6. In determining a candidate's final result in a subject (or part of a subject) the examiners may take into account oral, written, practical and examination work, provided that the candidate has been given adequate notice at the commencement of the teaching of the subject of the way in which work will be taken into account and of its relative importance in the final result.

7. There shall normally be three classifications of pass in the final assessment of any subject for the Ordinary degree, as follows: Pass with Distinction, Pass with Credit, Pass. If the Pass classification be in two divisions a pass in the higher division may be prescribed in the syllabuses as a prerequisite for admission to further studies in that subject or to other subjects. Results in certain subjects as specified in the Schedules, will not be classified.

8. There shall be three classifications for the Honours degree as follows: First Class, Second Class and Third Class. The Second Class classification shall be divided into two divisions as follows: Division A and Division B. A candidate who fails to obtain Honours shall be awarded an Ordinary degree provided all requirements for the Ordinary degree are satisfactorily completed.

9. A candidate will be permitted to take a supplementary examination in a subject only in circumstances approved by the department administering such subject and consistent with any expressed Council policy.

10. A candidate who fails a subject or who obtains a lower division pass and who desires to take that subject again shall, unless exempted wholly or partially therefrom by the Head of the department concerned, again complete the required work in that subject to the satisfaction of the teaching staff concerned.

11. A candidate who has passed subjects in the Faculty of Architecture and Planning or in other faculties of the University or in other educational institutions may on written application to the Registrar be granted such exemption from these regulations and from

schedules made under them as the Faculty may determine, save that a candidate shall always be required to satisfy the examiners in all subjects of the final year of the course.

12. All previous regulations concerning the degree of Bachelor of Architecture are hereby repealed, provided that:

(a) a candidate who has completed subjects under the repealed regulations shall have status in equivalent subjects under schedules made under these regulations; and

(b) a candidate who first enrolled in the course for the degree of Bachelor of Architecture before 1987 shall satisfy the examiners in all of the Group A, Group B and Group C practice subjects, or the equivalent, listed in Schedule III of the degree which is contained in the University Calendar for 1987, Volume 2, p. 492.

Regulations allowed 31 January, 1980.
Amended 4 Feb. 1982: 8, 11; 24 Feb. 1983: 5, 8; 17 Jan. 1985: 8(b), 13; 29 May 1986: 3(a).
Regulations repealed and substituted 20 July, 1989; 21 Feb. 1991: 7. Awaiting allowance: 3.

DEGREE OF

BACHELOR OF ARCHITECTURE

SCHEDULES

(Made by the Council under Regulation 2.)

SCHEDULE I: ADMISSION

Subject to quotas and selection procedures currently operating in the Faculty, and subject to the approval of the Faculty of Architecture and Planning (and the Council) where required, an applicant may be *considered* for admission if one or more of the following pre-requisites are satisfied:

(a) Completion of the degree of Bachelor of Architectural Studies.

(b) Completion in The University of Adelaide or another university of a degree which is approved by the Faculty as equivalent for the purpose to the degree of Bachelor of Architectural Studies.

(c) Completion in another institution of the first three years of an approved Architecture course.

(d) The holding of qualifications which satisfy the Faculty and the Council of the candidate's fitness to undertake work for the degree after the completion of qualifying studies as prescribed in Schedule II.

SCHEDULE II: QUALIFYING STUDIES

An applicant may be selected for admission under Schedule I(b) or (d) subject to satisfactory completion of such qualifying studies as determined by the Faculty after consideration of advice from the Head of the Department of Architecture.

Qualifying studies will normally be undertaken on a half-time basis extending over a full year preceding the candidate's entry to the B.Arch. course.

Qualifying studies will normally be selected from the preparatory subjects; in unusual cases the Faculty may approve different studies, after consideration of advice from the Head of the Department of Architecture.

The preparatory subjects are:

1620 Qualifying Studies in Building	6
5347 Qualifying Studies in Design	6

Candidates undertaking qualifying studies must successfully complete those studies before they may undertake subjects of the B.Arch. course.

On the recommendation of the Head of the Department of Architecture a supplementary examination may be offered to a candidate undertaking qualifying studies.

A candidate who fails all or part of the qualifying studies may repeat them in another year only with permission of the Faculty after it has considered advice from the Head of the Department of Architecture.

SCHEDULE III: THE ORDINARY DEGREE

1. Course of Study

(a) The course of study for the Ordinary degree shall normally extend over three years of full-time study. Students shall pass subjects to the value of at least 24 points at each of the three levels. The point values of the subjects are contained in this Schedule and in the Syllabuses.

(b) To qualify for the degree a candidate shall undertake the requirements of and satisfy the examiners in the following subjects:

Level I

6907	Architectural Construction I(P)	4	9861	Architectural Science I(P)	4
2220	Architectural Design IS	12	9700	Architectural Structures I(P)	4

Level II

8332	Architectural Design IIS	6	7441	Architectural Management and Practice IIB	2
3330	Architectural Design and Practice II	10	1493	Architectural Science II(P)	2
7372	Architectural Management and Practice IIA	2	8498	Architectural Structures II(P)	2

Level III

8585	Architectural Construction III	2	7943	Architectural Science III	2
4624	Architectural Design IIIA	6	1539	Architectural Structures III	2
8297	Architectural Design IIIB	12			

2. Order of Subjects

Entry to Level II

A candidate may not enrol in Level II subjects unless he or she has passed 2220 Architectural Design IS and at least two of 6907 Architectural Construction I(P), 9861 Architectural Science I(P) and 9700 Architectural Structures I(P).

Entry to Level III

A candidate may not enrol in Level III subjects unless:

(a) he or she has passed all of the Level I subjects.

(b) he or she has passed 8332 Architectural Design IIS and at least 1493 Architectural Science II(P) or 8498 Architectural Structures II(P).

3. Approval of Course

Courses of study must be approved by the Dean of the Faculty (or nominee) at enrolment each year.

4. Assessment

In the case of the subject 3330 Architectural Design and Practice II no supplementary examinations are granted except in exceptional circumstances as determined by the Head of the Department of Architecture.

The results in the subject 3330 Architectural Design and Practice II will not be classified.

5. Exemptions

Exemption or status will not be granted in any Level III subject undertaken for the first time.

6. Students Enrolled before 1989

(a) No candidate will be disadvantaged because of changes in subjects resulting from semesterization of the academic year.

(b) Candidates who passed subjects in the course for the degree of B.Arch. and/or who have been granted status on account of studies passed at another tertiary institution before 1989 will be given credit for those subjects in the 72-point degree structure introduced in 1989. The point values of subjects in Schedule III of the degree of B.Arch. before 1989 shall be:

1987-88:	First Year	Points
6907	Architectural Construction I(P)	4
9204	Architectural Design I(P)	10
9861	Architectural Science I(P)	4
9700	Architectural Structures I(P)	4
	4 Group A Practice Subjects (.5 points each)	2
		24
1988:	**Second Year**	
9763	Architectural Construction II(P)	2
6109	Architectural Design II(P)	7
1493	Architectural Science II(P)	2
8498	Architectural Structures II(P)	2
7605	Practical Experience	8
	4 Group A Practice Subjects (.5 points each)	2
	2 Group B Practice Subjects (.5 points each)	1
		24
1982-86:	**First Year**	
4131	Architectural Construction I	3
9792	Architectural Design I	7
1686	Architectural Science I	3
9841	Architectural Structures I	3
	6 Practice Subjects (.5 points each)	2
	Practical Experience	5
		24
1982-87:	Second Year	
8383	Architectural Construction II	3
9042	Architectural Design II	12
3142	Architectural Science II	3
1072	Architectural Structures II	3
	6 Practice Subjects (.5 points each)	2
		24
1982-88:	**Third Year**	
8585	Architectural Construction III	2
7187	Architectural Design III	18
7943	Architectural Science III	2
1539	Architectural Structures III	2
		24

(c) If as a result of course changes in 1989 a candidate undertakes a subject which contains elements satisfactorily completed in subjects undertaken before 1989, the candidate may apply to the Faculty to be exempted from attendance in any portion of a subject previously passed.

(d) When in the opinion of the Faculty special circumstances exist, the Council on the recommendation of the Faculty in each case may vary any of the provisions of this Clause.

SCHEDULE IV: THE HONOURS DEGREE

A candidate who wishes to proceed to the Honours degree must obtain the approval of the Head of the Department of Architecture, normally by 15 December of the year preceding enrolment.

A candidate for the Honours degree in addition to completing the full course prescribed for the Ordinary degree shall also attend classes regularly and pass examinations in an additional advanced subject 3918 Honours Architecture. This additional subject will normally be undertaken concurrently with Level III subjects, but may, on the recommendation of the Head of the Department of Architecture, be undertaken with Level II subjects.

In order to qualify for the award of Honours, a candidate must, in addition to satisfying the examiners in the advanced subject 3918 Honours Architecture, also achieve a high classification of pass in the Level III subjects for the Ordinary degree.

A document setting out guidelines approved by the Faculty which contains requirements for admission and the criteria for the award of the Honours degree is available from the Department of Architecture.

DEGREE OF

BACHELOR OF ARCHITECTURE

INTRODUCTION AND OBJECTIVES

The Bachelor of Architecture (B.Arch.) is a second degree, open only to graduates, in the practice of architecture. Studio-based, it is project-oriented and concerned with the technical and practical matters of practice within a philosophical and theoretical context of professional ethics, aesthetics and style, performance specification and management, and the many other issues that concern practitioners. Entrants to the degree are graduates who have demonstrated abilities to link critical thought and creative action. Graduates of the degree should:

- Have acquired knowledge and skills sufficient for early stages of directed activity in an existing architectural practice.
- Have developed intellectual and creative approaches and adaptability to form a basis for continued learning and development throughout professional life.

Entrants to the degree come from two main groups:
Graduates of the B.Arch.St. of the University of Adelaide, or an equivalent degree;
Other graduates who have demonstrated capabilities to enter the degree, generally through completing some qualifying studies.

Educational Objectives

The curriculum and teaching of the degree will have both substantive and instrumental objectives. Substantive objectives pertain to knowledge of the nature of architectural practice. Instrumental objectives pertain to skills and techniques relevant to operating as an architect.

Substantive Objectives
The profession of architecture

Ethics and the environmental, social and legal responsibilities of the profession of architecture.

Architectural services

The recognition of situations where an architect can contribute, the formulation of appropriate strategies, and appropriate pre-design, design, project management and post construction services.
Processes in developing designs, including the development of a brief, and the outline, assessment, detailed design and costing of proposals in conformity with codes and other requirements.
The organisation, management and documentation associated with building construction and the administration of building contracts.
The marketing of architectural services.

The technology of architecture

Building planning, construction, structure and services as they relate to new buildings and alterations to existing buildings.

The architect in relation to other professions, organisations and the building industry

The relationship of architects to builders, structural and building services engineers, landscape architects, interior designers, urban designers, planners, and others involved in the creation of the built environment.
The relationship of the profession of architecture to statutory authorities and to the building industry.

Instrumental mental Objectives
Designing

The practice of architectural design, emphasising the pervasion of design from planning to detailing and the interrelationship of aesthetic, economic, environmental, legal, societal and individual reactions, and technical factors, and the nature of design as a group activity.

Surveying

Land and building surveying.

Communicating

The communication and documentation of designs as a part of the individual and group design process and for clients, construction, public presentation and statutory authorities. The preparation of professional reports.

Managing

The management and operation of an architectural practice and the activities of an architectural practice.

SYLLABUSES

Text-books:

Students are expected to have their own copies of text-books; but they are advised to await advice from the lecturer concerned before buying any particular book. Only the prescribed edition of any text-book should be bought.

Reference books:

Although lists of books and journals for reference purposes are regarded as important, details have not been included in this Volume. These will however be issued from time to time by the Department of Architecture. It is hoped that all books and journals set for reference will be available to be consulted in the Barr Smith Library, or in the case of standard professional references and trade literature, in the Department of Architecture.

Examinations:

For each subject students may obtain from the department concerned details of the examination in that subject including the relative weights given to the components (e.g. such of the following as are relevant: assessments, semester tests, essays or other written or practical work, final written examinations, *viva voce* examinations).

Bachelor of Architecture 1992

Semester I

Level I	6907 Architectural Construction I(P) (4 points)	9861 Architectural Science I(P) (4 points)	9700 Architectural Structures I(P) (4 points)	2220 Architectural Design IS (12 points)
Level II	7372 Architectural Management & Practice IIA (2 points)	1493 Architectural Science II(P) (2 points)	8498 Architectural Structures II(P) (2 points)	8332 Architectural Design IIS (6 points)

Level III	8585 Architectural Construction III (2 points)	7943 Architectural Science III (2 points)	1539 Architectural Structures III (2 points)	4624 Architectural Design IIIA (6 points)
	Semester II			
Level I	6907 Architectural Construction I(P) (4 points)	9861 Architectural Science I(P) (4 points)	9700 Architectural Structures I(P) (4 points)	2220 Architectural Design IS (Continued)
Level II	7441 Architectural Management and Practice IIB (2 points)	3330 Architectural Design and Practice II (10 points)		
Level III	8297 Architectural Design IIIB (12 points)			

1620 Qualifying Studies in Building

Level: 0.

Points value: 6.

Duration: Full Year.

Contact hours: An average of 3 contact hours a week. Students who have passed equivalent studies may be exempted from undertaking portions of this subject.

Content: This is a preparatory subject for students entering the B.Arch. course without the kind of knowledge of building construction, science and structures provided in 4168 Built Environments I and 7006 Building Construction I and 3006 Science in Building Design II and 4321 Energy, Environment and Buildings III and 7358 Economics in Building Design and Development III and 8006 Australian Urban Development III. Topics from those subjects will be selected for study during the year.

Assessment: Details provided at commencement.

5347 Qualifying Studies in,Design

Level: 0.

Points value: 6.

Duration: Full year.

Contact hours: An average of 3 contact hours a week. Students who have passed equivalent studies may be exempted from undertaking portions of this subject.

Content: This is a preparatory subject for students entering the B.Arch. course without the kind of knowledge about design provided in 4348 Design and Form I and 8169 Image, Text, Architecture I and 4696 Representation, Knowledge, Architecture II and 3596 The Design of Houses II and 8006 Australian Urban Development III and 2719 Design, Ideologies and Institutions III. Topics from those subjects will be selected for study during the year.

Assessment: Details provided at commencement.

LEVEL I SUBJECTS

6907 Architectural Construction I(P)

Level: I.

Points value: 4.

Duration: Full year.

Contact hours: Up to 4 hours a week.

Content: This subject introduces the common construction techniques for domestic and larger scale buildings. Construction practices are examined with an emphasis on design aspects. Topics include site preparation, footing systems, light timber-frame construction, masonry construction, water-proofing and damp-proofing, windows and doors, steel frame construction, in-situ and pre-cast concrete, load bearing construction, performance evaluation of building components and elements, design of gutters and downpipes, construction planning, organisation of sites and sequence of work, network schedules, materials handling, site safety.

Assessment: 2 three-hour examinations 50% and assignments 50%.

2220 Architectural Design IS

Level: I.

Points value: 12.

Duration: Full year.

Contact hours: Up to 14 hours a week, plus a field trip (Semester II).

Content: Architectural Design (26L+260 hrs Studio). This subject aims to develop the various techniques used in the creation of architecture — graphic analysis and simulation, model-making, drafting and computer applications in architecture. Initially, simple design tasks will introduce the student to elementary architectural design and planning, to dimensional aspects or architectural form and to evaluation of architectural design proposals. Later more complex design problems will be undertaken to develop skills required by an architect; developing a brief, surveying existing work, site planning and designing. Design projects at this stage will typically be moderately complex buildings, particularly those with an obvious social agenda, and will explore the relationship of the building proposed to a varied set of urban and non-urban contexts.

Appropriate integration of concepts and information from 6907 Architectural Construction I(P), 9861 Architectural Science I(P) and 9700 Architectural Structures I(P) will influence assessment, and staff from these subjects will be available for scheduled consultation, as will professional consultants for specific projects.

Lectures given in this subject will complement the design projects and will include the following topics: architectural representation and documentation, the use of computers in architectural design, architectural briefs, measured drawing, surveying, planning and design methodology.

Architectural Surveying (9L+27 hrs field work, drawing and levelling calculations). Surveying equipment. Survey techniques for site boundaries levels and contours, and for setting out buildings.

Building Surveys (4L+12 hrs measured work and drawing). Surveying and measuring existing buildings. Measured drawings. Techniques for alteration of projects, for dilapidations reports, and for the recording of historic buildings and sites.

Assessment: Assignments 100%.

9861 Architectural Science I(P)

Level: I.

Points value: 4.

Duration: Full year.

Contact hours: Up to 4 hours a week.

Content: The following topics are developed with emphasis on application in design. Ergonomics: principles applied to furniture and spaces; functional analysis of architectural planning. Sunlight: sun penetration and shading. Daylight: application of daylighting design aids. Electric lighting: lumen method, light sources and fittings. Colour and lighting. Thermal performance: selection of materials; building shape and orientation; infiltration and ventilation. Mechanical services: heating, ventilation and air-conditioning; lifts and escalators; other mechanical services; electrical services. Building materials. Fire in buildings: origin; fire resistance and behaviour of materials and buildings in fire; fire-fighting installations. Architectural planning in relation to fire.

Assessment: Coursework 100%.

Text-books: Coldicutt, A.B., et al., *Solar control design aids* (Dept. of Architecture, University of Melbourne); Coldicutt, S. and Williamson, T.J., *Design guide for energy efficient housing — Adelaide* (Energy Information Centre, Adelaide); Pritchard, D.C., *Lighting* 2nd edn. (Environmental physics) (Longman); Experimental Building Station, *Bulletins Nos 6, 7 and 8* (E.B.S., Sydney); Hassall, D., *Reflective insulation and the control of thermal environments* (St. Regis A.C.I., Sydney) or Szokolay, S.V., *Thermal design of buildings* (RAIA, Canberra).

9700 Architectural Structures I(P)

Level: I.

Points value: 4.

Duration: Full year.

Contact hours: 2 lectures and 2 other hours a week.

Content: Structural Design. The role of the engineer in the design team. Objectives and criteria of structural design; strength, serviceability and economy. The process of project planning, conceptual design, preliminary design, proportioning and detailing. Codes and building regulations. Design loads, design data, methodology. Structural form, structural materials, structural action and building function. Typical structural forms for buildings in concrete, steel, timber and masonry. Procedures and design aids for preliminary design. Floor systems-selection and design.

Structural Analysis. Elastic models of flexural behaviour, deformations and deflections. Introduction to the analysis of indeterminate structures. Concept of instability. Overload behaviour of structures; elastic-plastic models; collapse load analysis and design.

Geotechnical Engineering. Soil properties and particle size; phase relations for soil; site investigation and in-situ testing; stress in soils, the principle of effective stress; geotechnical aspects of design procedures for footings on expansive soils; soil strength, shear failure, triaxial testing; footing design, elastic settlements, bearing capacity; soil compaction; soil retaining structures, earth pressure coefficients; soil slope stability, angle of repose, undrained loading of a non-vertical slope.

Assessment: 2 three-hour examinations 70% and assignments 30%.

LEVEL II SUBJECTS

8332 Architectural Design IIS

Level: II.

Points value: 6.

Duration: Semester I.

Pre-requisite: See clause II of Schedule III of this degree.

Contact hours: Up to 14 hours a week.

Content: The subject aims to develop the ability to incorporate technical aspects into architectural designing. Design projects will typically emphasise construction, services, cost restrictions, and take account of building, planning and other regulations. The integration of concepts and information from architectural science, architectural structures and Architectural Management and Practice will also be important.
Lectures and tutorials will be given on construction and building services:
Construction (13L and 26T). Topics include: understanding working drawings, dimensional and modular coordination, jointing of materials and components, principles and practice of modern joinery, architectural hardware, and the design and evaluation of construction details.
Building services and equipment (plumbing and sanitation) (13L and 13T). Water supply, drainage and sewerage. Plumbing fittings for domestic and commercial use. Garbage disposal in buildings. Special problems of high-rise buildings.

Assessment: Coursework 100%.

3330 Architectural Design and Practice II

Level: II.

Points value: 10.

Duration: Semester I or II.

Pre-requisite: 9792 Architectural Design I or 9204 Architectural Design I(P) or 2220 Architectural Design IS.

Contact hours: Over 20 weeks, 30 hours a week office work (or the equivalent part-time). 2 hours of seminars a week during Semester I or II.

Content: Approved engagement with an architectural office or elsewhere in the building industry or if such work is not available a practical or supervised project related to the practice of architecture.

Assessment: Report and associated documents 100% submitted by the end of the third week of January in the year following enrolment in this subject.

7372 Architectural Management and Practice IIA

Level: II.

Points value: 2.

Duration: Semester I.

Pre-requisite: None.

Contact hours: 2 (sometimes 3) hours of lectures/tutorials a week.

Content: Topics include organisational theory; principles of law; the general organisation of architectural practice including the management of an office's human, physical and financial resources, the relationship between architects and their clients; consultants and contractors; contract administration; specifications.

Assessment: Examination 100%.

Reference books: To be advised.

7441 Architectural Management and Practice IIB

Level: II.

Points value: 2.

Duration: Semester II.

Pre-requisite: None.

Contact hours: 2 (sometimes 3) hours of lectures/tutorials a week.

Content: Topics include the legal qualifications of an architect; professional organisations;

ethics; risk management and professional liability; planning and building law and regulations; problems facing the architect today; estimating and cost control; bills of quantities; the role of the quantity surveyor; project management; the range of services offered by architects.

A student is expected to be in possession of a current copy of the Building Code of Australia and its associated commentary, as a requirement of this subject.

Assessment: Examination 100%.

Reference books: To be advised.

1493 Architectural Science II(P)

Level: II.

Points value: 2.

Duration: Semester I.

Pre-requisite: See Clause 2 of Schedule III of this degree.

Contact hours: Up to 3 hours a week.

Content: The following topics are developed with emphasis on application in design: architectural acoustics and noise control; the visual environment (daylighting, artificial lighting and colour considered in design); building materials.

Assessment: Course work 67% and 2-hour examination 33%.

Text-books: CIBS, *Code for interior lighting* (UK), (CIBS, 1984); Parkin, P.H., Humphreys, H.R., and Cowell, J.R., *Acoustics, noise and buildings* (Faber) *or* Moore, J.E., *Design for good acoustics and noise control* (Macmillan).

8498 Architectural Structures II(P)

Level: II.

Points value: 2.

Duration: Semester I.

Pre-requisite: See Clause 2 of Schedule III of this degree.

Contact hours: 1 lecture and 2 other hours a week.

Content: Sizing of structural components; proportioning and detailing of components in steel, concrete, timber and masonry. Principles of pre-stressed concrete. Advanced structural forms.

Assessment: Tutorial assignments 34% and 3-hour examination 66%.

LEVEL III SUBJECTS

8585 Architectural Construction III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisite: See Clause 2 of Schedule III of this degree.

Contact hours: Up to 3 hours a week.

Content: Lectures will examine advanced building construction techniques with an emphasis on design and economic aspects. Topics will include choice of construction forms and systems; industrialised construction; large span and multi-storey buildings; below-ground construction, underpinning, shoring. Students will prepare a construction report and present a seminar on a chosen topic.

Assessment: Tutorial assignment 10%, seminar presentation 20% and report 70%.

4624 Architectural Design IIIA

Level: III.

Points value: 6.

Duration: Semester I.

Pre-requisite: See Clause 2 of Schedule III of this degree. 9042 Architectural Design II or 6109 Architectural Design II(P) or 8332 Architectural Design IIS.

Contact hours: Up to 12 hours a week.

Content: This subject aims to develop design skills in the formal aspects of architecture, also exploring its cultural roles. Projects will typically be those which encourage imaginative conjectures and design responses will be expected to show familiarity with current architectural issues.

Assessment: Project assignments 90% and 2-hour examination 10%.

8297 Architectural Design IIIB

Level: III.

Points value: 12.

Duration: Semester II.

Assumed knowledge: See Clause 2 of Schedule III of this degree. 4624 Architectural Design IIIA.

Contact hours: Up to 20 hours a week studio work, with specialist lectures irregularly spaced.

Content: A single project, from a limited selection, which will be of moderate complexity. Responses should demonstrate all phases of architectural designing; sketch plans, technical development including one specialised topic, and a final presentation which should show a thorough integration of all major aspects of the course.

Assessment: Final project 100%.

7943 Architectural Science III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisite: See Clause 2 of Schedule III of this degree.

Contact hours: Up to 3 hours a week.

Content: The following topics will be developed with an emphasis on application in design: architectural acoustics and noise control; the visual environment (daylighting, artificial lighting and colour); building materials. Selected laboratory/experimental work will be undertaken by the student.

Assessment: Course work 34% and 3-hour examination 66%.

1539 Architectural Structures III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisite: See Clause 2 of Schedule III of this degree.

Contact hours: 2 hours (lectures/tutorials/seminars) a week.

Content: Students prepare a project report on a selected topic under the guidance of the lecturer concerned. This report forms the basis of a seminar given by the student.

Assessment: Final report and seminar presentation 100%.

3918 Honours Architecture

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisite: Admission will be selective, based on prior results. Selection guidelines available in the Department of Architecture.

Contact hours: 1 two-hour tutorial/seminar weekly.

Content: Students will be required to undertake supervised research into a particular topic, leading to the presentation of a seminar paper and submission of a final essay or report of the order of 4000 words.

Topics offered for this subject will depend upon staff availability. Examples of topics which can be expected from time to time are:
Architectural History
Architectural Theories in Modern Architecture
Australian Architectural History
*Building Acoustics and Noise
*Building Materials Behaviour
Computer-Aided Design
Computer Applications in Architecture
Criticism and Architecture
Conservation in the Built Environment
*Daylight Studies
*Energy in Buildings
Ergonomics
Housing
Rainfall and Buildings
Solar Access
Urban Design
Wind and Buildings.

Those with asterisk require experimental work in the Building Science Laboratory

DEGREE OF

MASTER OF ARCHITECTURE

REGULATIONS

1. There shall be a degree of Master of Architecture.

2. To qualify for the degree a candidate shall prepare a thesis, embodying the results of original research or investigation made into a field of study on an aspect or aspects of architectural design, building practice and/or the architectural profession. The field of study shall be approved in advance by the Faculty and prepared under the guidance of and in regular consultation with a supervisor or supervisors appointed by the Faculty.

3. (a) The Faculty of Architecture and Planning may accept as a candidate for the degree of Master of Architecture any person who:

(i) has become entitled to receive the Honours degree of Bachelor of Architecture of the University of Adelaide; or

(ii) has obtained in another university or tertiary institution qualifications which in the opinion of the Faculty of Architecture and Planning are at least equivalent to those of the Honours degree of Bachelor of Architecture.

(b) Subject to the approval of the Board of Graduate Studies acting with the authority wittingly devolved to it by Council the Faculty may in special cases and subject to such conditions as it may see fit to impose in each case, accept as a candidate for the degree a person who does not meet the requirements specified in regulation 3(a) if it is satisfied that he or she is likely to be able satisfactorily to undertake work for the degree.

(c) (i) Subject to the approval of the Council, Faculty may accept as a probationary candidate for the degree an applicant with an unusual background or whose academic record does not clearly indicate fitness to undertake the degree. The Faculty may impose special conditions on a probationary candidature.

(ii) The performance of each probationary candidate shall be reviewed by the Faculty after such period as the Faculty prescribes or allows (not exceeding twelve months) and, subject to the approval of the Council, the candidature shall be either confirmed or terminated.

4. The Head of the Department of Architecture shall advise the Faculty whether suitable facilities and staff are available to assist and supervise the research of the applicant before the candidature and proposed topic of research are approved by the Faculty.

5. In cases where the proposed research calls for skills or qualifications not yet possessed by the candidate, the Faculty may on the recommendation of the Head of the Department of Architecture require the candidate to spend a period of time, the length of which shall be prescribed by the Faculty on the recommendation of the Head of the Department, either on supervised study or on research under a supervisor or supervisors appointed by the Faculty, and/or to undertake and pass at an acceptable standard examinations in courses related to the research topic.

6. There shall in each case be adequate and regular contact between the candidate and internal supervisor(s). The candidate may, with prior permission of Faculty and subject to such conditions as may be determined in each case, conduct research in an organisation other than the University provided (i) that such research is closely related to the thesis, (ii) that the supervisor has access to all the candidate's external research work, and (iii) that the publication of results will not thereby be prejudiced. Any candidate given such permission shall be available for seminars and other discussions as required by the supervisor(s) or the Head of the Department of Architecture.

7. (a) Unless the Faculty approves in advance an extension of time in a particular case, the thesis shall be submitted:

(i) in the case of a full-time candidate, not earlier than one year and not later than three years from the date at which the candidature was accepted by the Faculty; or

(ii) in the case of a part-time candidate, not earlier than two years and not later than five years from the date at which the candidature was accepted by the Faculty.

(b) Three months before the intended date of submission the candidate shall notify the Faculty in writing of the candidate's intention to submit the thesis, and shall at the same time submit the proposed title and a one-page summary of the thesis.

8. The candidate shall lodge with the Registrar three copies of the thesis prepared in accordance with directions given to candidates from time to time.*

9. (a) The Faculty shall appoint at least two examiners of the thesis of whom at least one shall be external. The examiners may recommend to the Faculty that the thesis:

(i) be accepted; or

(ii) be accepted subject to minor corrections; or

(iii) be accepted subject to the candidate's passing such examination(s) as determined by the Faculty in the field of study immediately relevant to the subject of the thesis; or

(iv) be returned to the candidate for revision and resubmission (within such period of time as the Faculty may allow); or

(v) be rejected.

(b) The examiners of a thesis resubmitted following recommendation (iv) may recommend only (i), (ii) or (v).

10. (a) If in the opinion of the Faculty a candidate for the degree is not making satisfactory progress, the Faculty may, with the consent of the Council, withdraw its approval of the candidature and the candidate shall cease to be enrolled for the degree.

(b) Before making a recommendation for termination of candidature to the Council the Faculty shall notify the candidate of its intention so to do and shall permit the candidate to offer within one month written explanation for the lack of satisfactory progress. If notwithstanding any submission made by the candidate, the Faculty decides to recommend termination of the candidature, the candidate shall be informed accordingly and shall have the right to appeal within one month to the Council, and any such appeal shall be considered by the Council at the same time as it considers the Faculty's recommendation.

11. A candidate for the degree of Doctor of Philosophy whose work is considered by the Faculty, after report by the examiners appointed to make recommendations on it, to be not of sufficient merit to qualify for that degree but of sufficient merit to qualify for the degree of Master of Architecture, may be admitted to the degree of Master of Architecture' provided that the candidate is otherwise qualified to become a candidate for the degree.

12. When the Faculty is satisfied that a candidate has complied with the requirements and conditions of the Regulations and that the thesis is acceptable, the Faculty shall recommend to the Council that the candidate be admitted to the degree of Master of Architecture.

Regulations allowed 21 December, 1967.

Amended: 28 Feb. 1974: 3; 15 Jan. 1976: 2,8; 2 Feb. 1978: 2; 4 Feb. 1982: 8; 17 Jan. 1985: 1-11, 12; 21 Feb. 1991: 3.

*Published in "Guidelines on Higher Degrees by Research and Specifications for Thesis": *see* Contents.

DEGREE OF

MASTER OF ARCHITECTURAL STUDIES

REGULATIONS

1. There shall be a degree of Master of Architectural Studies.

2. To qualify for the degree the candidate shall prepare a thesis, embodying the results of original research or investigation made into a field of study relating to the built environment in general and/or design or architecture in particular. The field of study shall be concerned with a cultural, historical, philosophical and/or theoretical aspect or aspects of the built environment, and shall be approved in advance by the Faculty and prepared under the guidance of and in regular consultation with a supervisor or supervisors appointed by the Faculty.

3. (a) The Faculty of Architecture and Planning may accept as a candidate for the degree of Master of Architectural Studies any person who:

(i) has become entitled to receive the Honours degree of Bachelor of Architectural Studies or the Honours degree of Bachelor of Architecture of the University of Adelaide; or

(ii) has obtained in another university or tertiary institution qualifications which in the opinion of the Faculty of Architecture and Planning are at least equivalent to those of the Honours degree of Bachelor of Architectural Studies.

(b) Subject to the approval of the Board of Graduate Studies acting with the authority wittingly devolved to it by Council the Faculty may in special cases and subject to such conditions as it may see fit to impose in each case, accept as a candidate for the degree a person who does not meet the requirements specified in regulation 3(a) if it is satisfied that he or she is likely to be able satisfactorily to undertake work for the degree.

(c) (i) Subject to the approval of the Council, Faculty may accept as a probationary candidate for the degree an applicant with an unusual background or whose academic record does not clearly indicate fitness to undertake the degree. The Faculty may impose special conditions on a probationary candidature.

(ii) The performance of each probationary candidate shall be reviewed by the Faculty after such period as the Faculty prescribes or allows (not exceeding twelve months) and, subject to the approval of the Council, the candidature shall be either confirmed or terminated.

4. The Head of the Department of Architecture shall advise the Faculty whether suitable facilities and staff are available to assist and supervise the research of the applicant before the candidature and proposed topic of research are approved by the Faculty.

5. In cases where the proposed research calls for skills or qualifications not yet possessed by the candidate, the Faculty may on the recommendation of the Head of the Department of Architecture require the candidate to spend a period of time, the length of which shall be prescribed by the Faculty on the recommendation of the Head of the Department, either on supervised study or on research under a supervisor or supervisors appointed by the Faculty, and/or to undertake and pass at an acceptable standard examinations in courses related to the research topic.

6. There shall in each case be adequate and regular contact between the candidate and internal supervisor(s). The candidate may, with prior permission of Faculty and subject to such conditions as may be determined in each case, conduct research in an organisation other than the University provided (i) that such research is closely related to the thesis, (ii) that the supervisor has access to all the candidate's external research work, and (iii) that the publication of results will not thereby be prejudiced. Any candidate given such

permission shall be available for seminars and other discussions as required by the supervisor(s) or the Head of the Department of Architecture.

7. (a) Unless the Faculty approves in advance an extension of time in a particular case, the thesis shall be submitted:

(i) in the case of a full-time candidate, not earlier than one year and not later than three years from the date at which the candidature was accepted by the Faculty; or

(ii) in the case of a part-time candidate, not earlier than two years and not later than five years from the date at which the candidature was accepted by the Faculty.

(b) Three months before the intended date of submission the candidate shall notify the Faculty in writing of the candidate's intention to submit the thesis, and shall at the same time submit the proposed title and a one-page summary of the thesis.

8. The candidate shall lodge with the Registrar three copies of the thesis prepared in accordance with directions given to candidates from time to time.*

9. (a) The Faculty shall appoint at least two examiners of the thesis of whom at least one shall be external. The examiners may recommend to the Faculty that the thesis:

(i) be accepted; or

(ii) be accepted subject to minor corrections; or

(iii) be accepted subject to the candidate's passing such examination(s) as determined by the Faculty in the field of study immediately relevant to the subject of the thesis; or

(iv) be returned to the candidate for revision and resubmission (within such period of time as the Faculty may allow); or

(v) be rejected.

(b) The examiners of a thesis resubmitted following recommendation (iv) may recommend only (i), (ii) or (v).

10. (a) If in the opinion of the Faculty a candidate for the degree is not making satisfactory progress, the Faculty may, with the consent of the Council, withdraw its approval of the candidature and the candidate shall cease to be enrolled for the degree.

(b) Before making a recommendation for termination of candidature to the Council the Faculty shall notify the candidate of its intention so to do and shall permit the candidate to offer within one month written explanation for the lack of satisfactory progress. If notwithstanding any submission made by the candidate, the Faculty decides to recommend termination of the candidature, the candidate shall be informed accordingly and shall have the right to appeal within one month to the Council, and any such appeal shall be considered by the Council at the same time as it considers the Faculty's recommendation.

11. A candidate for the degree of Doctor of Philosophy whose work is considered by the Faculty, after report by the examiners appointed to make recommendations on it, to be not of sufficient merit to qualify for that degree but of sufficient merit to qualify for the degree of Master of Architectural Studies, may be admitted to the degree of Master of Architectural Studies provided that the candidate is otherwise qualified to become a candidate for the degree.

12. When the Faculty is satisfied that a candidate has complied with the requirements and conditions of the Regulations and that the thesis is acceptable, the Faculty shall recommend to the Council that the candidate be admitted to the degree of Master of Architectural Studies.

Regulations allowed 29 May, 1986.

21 Feb. 1991: 3.

*Published in "Guidelines on Higher Degrees by Research and Specifications for Thesis": *see* Contents.

DEGREE OF

MASTER OF BUILDING SCIENCE

REGULATIONS

1. There shall be a degree of Master of Building Science.

2. To qualify for the degree the candidate shall prepare a thesis, embodying the results of original research or investigation made into a field of study relating to the built environment in general or architecture in particular. The field of study shall be concerned with scientific and/or technical aspects of the built environment, and shall be approved in advance by the Faculty and prepared under the guidance of and in regular consultation with a supervisor or supervisors appointed by the Faculty.

3. (a) The Faculty of Architecture and Planning may accept as a candidate for the degree of Master of Building Science any person who:

(i) has become entitled to receive the Honours degree of Bachelor of Architectural Studies or the Honours degree of Bachelor of Architecture of the University of Adelaide; or

(ii) has obtained in another university or tertiary institution qualifications which in the opinion of the Faculty of Architecture and Planning are at least equivalent to those of the Honours degree of Bachelor of Architectural Studies.

(b) Subject to the approval of the Board of Graduate Studies acting with the authority wittingly devolved to it by Council the Faculty may in special cases and subject to such conditions as it may see fit to impose in each case, accept as a candidate for the degree a person who does not meet the requirements specified in regulation 3(a) if it is satisfied that he or she is likely to be able satisfactorily to undertake work for the degree.

(c) (i) Subject to the approval of the Council, Faculty may accept as a probationary candidate for the degree an applicant with an unusual background or whose academic record does not clearly indicate fitness to undertake the degree. The Faculty may impose special conditions on a probationary candidature.

(ii) The performance of each probationary candidate shall be reviewed by the Faculty after such period as the Faculty prescribes or allows (not exceeding twelve months) and, subject to the approval of the Council, the candidature shall be either confirmed or terminated.

4. The Head of the Department of Architecture shall advise the Faculty whether suitable facilities and staff are available to assist and supervise the research of the applicant before the candidature and proposed topic of research are approved by the Faculty.

5. In cases where the proposed research calls for skills or qualifications not yet possessed by the candidate, the Faculty may on the recommendation of the Head of the Department of Architecture require the candidate to spend a period of time, the length of which shall be prescribed by the Faculty on the recommendation of the Head of the Department, either on supervised study or on research under a supervisor or supervisors appointed by the Faculty, and/or to undertake and pass at an acceptable standard examinations in courses related to the research topic.

6. There shall in each case be adequate and regular contact between the candidate and internal supervisor(s). The candidate may, with prior permission of Faculty and subject to such conditions as may be determined in each case, conduct research in an organisation other than the University provided (i) that such research is closely related to the thesis, (ii) that the supervisor has access to all the candidate's external research work, and (iii) that the publication of results will not thereby be prejudiced. Any candidate given such permission shall be available for seminars and other discussions as required by the supervisor(s) or the Head of the Department of Architecture.

7. (a) Unless the Faculty approves in advance an extension of time in a particular case, the thesis shall be submitted:

(i) in the case of a full-time candidate, not earlier than one year and not later than three years from the date at which the candidature was accepted by the Faculty; or

(ii) in the case of a part-time candidate, not earlier than two years and not later than five years from the date at which the candidature was accepted by the Faculty.

(b) Three months before the intended date of submission the candidate shall notify the Faculty in writing of the candidate's intention to submit the thesis, and shall at the same time submit the proposed title and a one-page summary of the thesis.

8. The candidate shall lodge with the Registrar three copies of the thesis prepared in accordance with directions given to candidates from time to time.*

9. (a) The Faculty shall appoint at least two examiners of the thesis of whom at least one shall be external. The examiners may recommend to the Faculty that the thesis:

(i) be accepted; or

(ii) be accepted subject to minor corrections; or

(iii) be accepted subject to the candidate's passing such examination(s) as determined by the Faculty in the field of study immediately relevant to the subject of the thesis; or

(iv) be returned to the candidate for revision and resubmission (within such period of time as the Faculty may allow); or

(v) be rejected.

(b) The examiners of a thesis resubmitted following recommendation (iv) may recommend only (i), (ii) or (v).

10. (a) If in the opinion of the Faculty a candidate for the degree is not making satisfactory progress, the Faculty may, with the consent of the Council, withdraw its approval of the candidature and the candidate shall cease to be enrolled for the degree.

(b) Before making a recommendation for termination of candidature to the Council the Faculty shall notify the candidate of its intention so to do and shall permit the candidate to offer within one month written explanation for the lack of satisfactory progress. If notwithstanding any submission made by the candidate, the Faculty decides to recommend termination of the candidature, the candidate shall be informed accordingly and shall have the right to appeal within one month to the Council, and any such appeal shall be considered by the Council at the same time as it considers the Faculty's recommendation.

11. A candidate for the degree of Doctor of Philosophy whose work is considered by the Faculty, after report by the examiners appointed to make recommendations on it, to be not of sufficient merit to qualify for that degree but of sufficient merit to qualify for the degree of Master of Building Science, may be admitted to the degree of Master of Building Science provided that the candidate is otherwise qualified to become a candidate for the degree.

12. When the Faculty is satisfied that a candidate has complied with the requirements and conditions of the Regulations and that the thesis is acceptable, the Faculty shall recommend to the Council that the candidate be admitted to the degree of Master of Building Science.

Regulation allowed 29 May, 1986.

21 Feb. 1991: 3.

*Published in "Guidelines on Higher Degrees by Research and Specifications for Thesis": *see* Contents.

DEGREE OF

MASTER OF PLANNING

REGULATIONS

1. There shall be a degree of Master of Planning.

2. To qualify for the degree a candidate shall prepare a thesis, embodying the results of original research or investigation made into a field of study which has been approved in advance by the Faculty and prepared under the guidance of and in regular consultation with a supervisor or supervisors appointed by the Faculty.

3. (a) The Faculty of Architecture and Planning may accept as a candidate for the degree of Master of Planning any person who has become entitled to receive an Honours degree of the University of Adelaide or other qualifications accepted by the University as equivalent to an Honours degree.

(b) Subject to the approval of the Board of Graduate Studies acting with the authority wittingly devolved to it by Council the Faculty may in special cases and subject to such conditions as it may see fit to impose in each case, accept as a candidate for the degree a person who does not meet the requirements specified in regulation 3(a) if it is satisfied that he or she is likely to be able satisfactorily to undertake work for the degree.

(c) (i) Subject to the approval of the Council, Faculty may accept as a probationary candidate for the degree an applicant with an unusual background or whose academic record does not clearly indicate fitness to undertake the degree. The Faculty may impose special conditions on a probationary candidate.

(ii) The performance of each probationary candidate shall be reviewed by the Faculty after such period as the Faculty prescribes or allows (not exceeding twelve months) and, subject to the approval of the Council, the candidate shall be either confirmed or terminated.

4. The Head of the Department of Architecture shall advise the Faculty whether suitable facilities and staff are available to assist and supervise the research of the applicant before the candidature and proposed topic of research are approved by the Faculty.

5. In cases where the proposed research calls for skills or qualifications not yet possessed by the candidate, the Faculty may on the recommendation of the Head of the Department of Architecture require the candidate to spend a period of time, the length of which shall be prescribed by the Faculty on the recommendation of the Head of the Department, either on supervised study or on research under a supervisor or supervisors appointed by the Faculty, and/or to undertake and pass at an acceptable standard examinations in courses related to the research topic.

6. There shall in each case be adequate and regular contact between the candidate and internal supervisor(s). The candidate may, with prior permission of Faculty and subject to such conditions as may be determined in each case, conduct research in an organisation other than the University provided (i) that such research is closely related to the thesis, (ii) that the supervisor has access to all the candidate's external research work, and (iii) that the publication of results will not thereby be prejudiced. Any candidate given such permission shall be available for seminars and other discussions as required by the supervisor(s) or the Head of the Department of Architecture.

7. (a) Unless the Faculty approves in advance an extension of time in a particular case, the thesis shall be submitted:

(i) in the case of a full-time candidate, not earlier than one year and not later than three years from the date at which the candidatures was accepted by the Faculty; or

(ii) in the case of a part-time candidate, not earlier than two years and not later than five years from the date at which the candidatures was accepted by the Faculty.

(b) Three months before the intended date of submission the candidate shall notify the Faculty in writing of the candidate's intention to submit the thesis, and shall at the same time submit the proposed title and a one-page summary of the thesis.

8. The candidate shall lodge with the Registrar three copies of the thesis prepared in accordance with directions given to candidates from time to time.*

9. (a) The Faculty shall appoint at least two examiners of the thesis of whom at least one shall be external. The examiners may recommend to the Faculty that the thesis:

(i) be accepted; or

(ii) be accepted subject to minor corrections; or

(iii) be accepted subject to the candidate's passing such examination(s) as determined by the Faculty in the field of study immediately relevant to the subject of the thesis; or

(iv) be returned to the candidate for revision and resubmission (within such period of time as the Faculty may allow); or

(v) be rejected.

(b) The examiners of a thesis resubmitted following recommendation (iv) may recommend only (i), (ii) or (v).

10. (a) If in the opinion of the Faculty a candidate for the degree is not making satisfactory progress, the Faculty may, with the consent of the Council, withdraw its approval of the candidature and the candidate shall cease to be enrolled for the degree.

(b) Before making a recommendation for termination of candidature to the Council the Faculty shall notify the candidate of its intentions so to do and shall permit the candidate to offer within one month written explanation for the lack of satisfactory progress. If, notwithstanding any submission made by the candidate, the Faculty decides to recommend termination of the candidature, the candidate shall be informed accordingly and shall have the right to appeal within one month to the Council, and any such appeal shall be considered by the Council at the same time as it considers the Faculty's recommendation.

11. A candidate for the degree of Doctor of Philosophy whose work is considered by the Faculty, after report by the examiners appointed to make recommendations on it, to be not of sufficient merit to qualify for that degree but of sufficient merit to qualify for the degree of Master of Planning, may be admitted to the degree of Master of Planning provided that the candidate is otherwise qualified to become a candidate for the degree.

12. When the Faculty is satisfied that a candidate has complied with the requirements and conditions of the Regulations and that the thesis is acceptable, the Faculty shall recommend to the Council that the candidate be admitted to the degree of Master of Planning.

Regulations allowed 24 February, 1983.

Amended: 17 Jan. 1985: 3. 21 Feb. 1991: 3.

Published in "Guidelines on Higher Degrees by Research and Specifications for Thesis": *see* Contents.

FACULTY OF DENTISTRY

REGULATIONS, SCHEDULES AND SYLLABUSES OF DEGREES

DIPLOMA IN

DENTAL THERAPY

REGULATIONS

1. There shall be a Diploma in Dental Therapy.

2. To qualify for the Diploma a candidate shall satisfactorily complete a course of full-time study extending over two years.

3. The Council after receipt of advice from the Faculty of Dentistry, shall from time to time prescribe schedules defining:

(a) the requirements for admission to the course for the Diploma;

(b) the subjects of study for the Diploma; and

(c) the range of subjects to be satisfactorily completed and the examinations to be passed by students.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

4. There shall be a Course Advisory Committee which shall advise the Faculty of Dentistry concerning the course of study, syllabuses, assessment, admission and other matters related to the teaching of the Diploma. The composition of the Committee shall be defined from time to time by the Faculty.

5. The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre and the Principal of the School of Dental Therapy of the South Australian Dental Service may approve minor changes to any previously approved syllabus.

6. Except by the permission of the Faculty of Dentistry a student shall not enrol in any subject for which the pre-requisite studies as prescribed in the syllabus for that subject have not been satisfactorily completed.

7. A student shall not be eligible to attend for examination unless the prescribed work has been completed to the satisfaction of the Principal of the School of Dental Therapy.

8. There shall be three classifications of pass in the final assessment of any subject of the Diploma, as follows: Pass with Distinction, Pass with Credit, Pass.

9. A student shall be permitted to take a supplementary examination in a subject only in circumstances approved by the Faculty of Dentistry and consistent with any expressed Council policy.

10. A candidate who fails a subject, shall, unless exempted wholly or partially therefrom by the Principal of the School of Dental Therapy, again complete the required work in that subject to the satisfaction of the teaching staff concerned. Such a candidate may be required to attend such lectures, clinical laboratory and other practical work as the Faculty of Dentistry may prescribe, in other subjects of annual examination.

11. A candidate who has twice failed the examination in any subject for the Diploma may not enrol for that subject again or for any other subject which in the opinion of the Faculty of Dentistry contains a substantial amount of the same material, except by the special permission of the Faculty and then only under such conditions as the Faculty may prescribe.

12. A student who passed subjects in other Faculties of the University or in other educational institutions accepted by the University, may on written application to the Registrar be granted such status and/or exemption from the requirements of the schedules made under these regulations as the Faculty may determine.

13. The Diploma in Dental Therapy shall be awarded for the first time in 1993.

Regulations allowed 21st February 1991.
Awaiting allowance: 5.

DIPLOMA IN

DENTAL THERAPY

SCHEDULES

(Made by the Council under Regulation 3)

1. Applicants shall, unless exempted by the Faculty, have qualified for Matriculation. In addition to academic merit, the Course Selection Committee appointed by Faculty may assess the suitability of applicants for employment as Dental Therapists by the South Australian Dental Service, or other public health authorities.

2. (a) To qualify for the Diploma a candidate shall regularly attend lectures, tutorials and clinical practice, do written and laboratory or other practical work to the satisfaction of the Principal of the School of Dental Therapy and pass the prescribed examinations.

(b) In the First Year every candidate shall study the following subjects:

3896 First Annual Therapy Examination
2895 Dental Sciences IT
3284 Clinical Dentistry IT
1352 Applied Clinical Practice IT
4399 Social and Preventive Dentistry IT

(c) In the Second Year every candidate shall study the following subjects:

9209 Second Annual Therapy Examination
8442 Dental Sciences IIT
7964 Clinical Dentistry IIT
3005 Applied Clinical Practice IIT
7228 Social and Preventive Dentistry IIT

3. A candidate shall pass the examination in every subject prescribed for the First Annual Examination before entering upon the work of the Second Year. A candidate who fails to complete successfully any subject in the First Annual Examination may, with the approval of the Faculty and under such conditions as it may prescribe, be permitted to take a supplementary examination.

4. If a candidate's performance in the required clinical work for the Second Annual Examination is considered unsatisfactory by the Board of Examiners, it may defer the candidate's result and require the candidate satisfactorily to complete additional work.

5. If in the opinion of the Faculty a candidate is not making satisfactory progress, the Faculty may, after inviting the candidate to show cause why he or she should be permitted to continue with the course, either

(i) permit the candidate to continue;
(ii) permit the candidate to enrol only in such topics as it may approve during the current or subsequent year;
(iii) recommend to Council that the student be precluded from further enrolment in the course.

6. Candidates shall at all times be under the direction and supervision of the teaching staff, duly appointed by the Principal of the School of Dental Therapy, and shall carry out such work as shall be allotted.

DIPLOMA IN

DENTAL THERAPY

SYLLABUSES

Text-books:
The lists of the text-books were correct at the time that this Volume went to press. It is possible however that amendments to these lists will be made before the start of lectures, and, if so, students attending classes will be notified appropriately by the lecturer concerned.

In general, students are expected to have their own copies of text-books; but they are advised to await advice from the lecturer concerned before buying any particular book. Only the prescribed edition of any text-book should be bought.

Reference books:
Although lists of books and journals for reference purposes are regarded as important, details have not been included in this Volume. These will however be issued from time to time by the departments concerned. It is hoped that all books and journals set for reference will be available to be consulted in the Barr Smith Library.

Examinations:
For each subject students may obtain from the department concerned details of the examination in that subject including the relative weights given to the components (e.g. such of the following as are relevant: assessments, term or mid-year tests, essays or other written or practical work, final written examinations, *viva voce* examinations).

Proficiency in English
Experience has shown that students who do not have a good ability to communicate in spoken and written English have difficulties with this course.

FIRST YEAR

1352 Applied Clinical Practice IT

Level: I.

Points value: 12.

Duration: Full year.

Pre-requisites: None.

Co-requisite: 3284 Clinical Dentistry IT

Assumed knowledge: Proficiency in English.

Restriction: None.

Contact hours: 23 lecture hours, 25 clinical hours, 515 practical hours.

Content: Applied Clinical Practice contains three components: Clinical Practice I, Operative Techniques and First Aid, and provides the opportunity to integrate theoretical practice and practical skills with a rationale and philosophy for effective contemporary dental practice.

Assessment: Clinical Practice I represents 20% of this subject and is assessed by written and practical assignments. Operative Dentistry represents 80% of this subject and is assessed by the summation of a continuing assessment of practical work throughout the entire year. The First Aid programme will be assessed by the St. John Ambulance Association and a

pass in their examination is considered essential. Students will be required to pass all three components to gain a pass in this Clinical Practice I.

Text-books/Reference Books: Horsted-Bindslev, P. & Mjor, I., *Modern concepts in operative dentistry* (Munksgaard, 1988); Kidd, E. A. M. & Smith, B. G. N., (eds), *Pickard's manual of operative dentistry*, 6th edn (Oxford Medical Publications, 1990); O'Brien, W. J., *Dental materials: properties and selection* (Quintessence, 1989); Wilson, H., McLean, J. & Brown, D., *Dental materials and their clinical applications* (British Dental Association, 1988); South Australian Dental Service, Policy on examinations and dental therapists' duties; South Australian Dental Service, Personalized dental care programme; St. John Ambulance Association in Australia, *First aid*.

3284 Clinical Dentistry IT

Level: I.

Points value: 6.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Proficiency in English.

Restriction: None.

Contact hours: 127 lecture hours, 30 tutorial hours, 116 practical hours.

Content: Clinical Dentistry IT contains three components: Dental Anatomy, Operative Dentistry and Dental Radiography and provides the theory and background information essential to the development of knowledge, practices and attitudes which enable effective practice of restorative dentistry for children and adolescents.

Assessment: Assessment will be in the form of assignments, examinations, and radiography practical as set out in the subject information handout. Assessment will reflect the contribution to the subject of each component: Dental Anatomy 10%, Dental Radiography 30%, and Operative Dentistry 60%. Students will be required to pass all components to pass the subject.

Text-books/Reference Books: Wheeler, R. C., *An atlas of tooth form* (W. B. Saunders Co., 1969); Frommer, H. H., *Radiology for dental auxiliaries*, 3rd edn. (The C. V. Mosby Company, St. Louis, 1983); Horsted-Bindslev, P. & Mjor, I., *Modern concepts in operative dentistry* (Munksgaard, 1988); Kidd, E. A. M. & Smith, B. G. N., (eds), *Pickard's manual of operative dentistry*, 6th edn (Oxford Medical Publications, 1990); O'Brien, W. J., *Dental materials: properties and selection* (Quintessence, 1989); Wilson, H., McLean, J. & Brown, D., *Dental materials and their clinical applications* (British Dental Association, 1988).

2895 Dental Sciences IT

Level: I.

Points value: 3.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Proficiency in English.

Restriction: None.

Contact hours: 127 lecture hours, 20 tutorial hours.

Content: Dental Sciences contains components of Histology, Anatomy, Physiology, Pathology and Microbiology, and provides the biological grounding upon which the practice of dentistry rests. It is an introduction to the anatomy and physiology of the human body and in particular the teeth and oro-facial regions, and involves the study of diseases of the teeth and their supporting tissues.

Assessment: Assessment will be in the form of assignments and examinations (Semester I

and II). The overall subject assessment reflects the assessment of the components of the subject is as follows: Histology 10%, Anatomy and Physiology 45% and Pathology and Microbiology 45%. Students are required to meet the assessment requirements for each of the components of this subject to gain a passing grade.

Text-books/Reference Books: Reed, G. M. & Sheppard, V. F. *Basic structures of the head and neck* (W. B. Saunders Co., Philadelphia 1976); Spence, A. P. & Mason, E. B., *Human anatomy and physiology* (The Banjamin/Cummings Publishing Company, California 1983); Junqueira, L. C., *Basic histology* (6th edn, 1989 Appleton & Lange); *Ishikawa's colour atlas of oral pathology* (Ishiyaku Euro America Inc. 1987); Shafer, W. G. et al, *A textbook of oral pathology* (W. B. Saunders Company, Philadelphia, 4th ed., 1983); MacFarlane, T. W. & Samaranayake, L. P., *Clinical oral microbiology* (Butterworth & Co., 1989).

4399 Social and Preventive Dentistry IT

Level: I.

Points value: 3.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Proficiency in English.

Restriction: None.

Contact hours: 96 lecture hours, 20 tutorial hours, 23 seminar hours, 49 practical hours.

Content: Social and Preventive Dentistry contains the components of Community Health and Awareness, Dental Disease, Prevention of Dental Disease, Dental Health Education: Theory and Practice, and Study Skills. This subject provides an introduction to the complex interrelationships of attitudes, behaviours and requirements which impact on the health professional, client and the community in the maintenance of general and dental health. The types and etiologies of dental disease are introduced in this subject with a strong focus on the methods of prevention and control of these diseases. The study skills component increases student awareness of personal study needs and fosters the identification and development of skills. Dental Health Education: Theory and Practice is designed to develop knowledge and skills in the practice of teaching and the use of audiovisual aids.

Assessment: Assessment will be in the form of assignments and examinations (Semester I and II). The assessment for this subject reflects the assessment requirements of the components of the subject. The percentage contribution of each component to this subject is as follows: Community Health and Awareness 25%, Dental Disease 15%, Prevention of Dental Disease 25%, and Dental Health Education: Theory and Practice 35%. Students are required to meet the assessment requirements for each of the components of this subject to gain a passing grade.

Text-books/Reference Books: Elderton, R. J., *Positive Dental Prevention* (Heinemann Medical Books, 1989); Harris, N. O. & Christen, A. G., *Primary preventive dentistry* (Prentice-Hall, 1987); Nikiforuk, G., *Understanding dental caries Vol. 1 — Etiology and mechanisms* (S. Karger, A. G., Switzerland); Nikiforuk, G., *Understanding dental caries Vol. 2 — Prevention* (S. Karger AG Switzerland, 1985); 6 Study Skills Series Modules.

SECOND YEAR

3005 Applied Clinical Practice IIT

Level: II.

Points value: 12.

Duration: Full year.

Pre-requisites: 1352 Applied Clinical Practice IT and 3284 Clinical Dentistry IT.

Assumed knowledge: Proficiency in English.

Restriction: None.

Contact hours: 15 lecture hours, 20 tutorial hours, 684 clinical hours.

Content: Applied Clinical Practice IIT contains components of Clinical Practice II, Clinical Radiography and Clinical Dentistry for Children (practical). It provides formalisation of knowledge and skills gained in Applied Clinical Practice IT, incorporates clinical statistics and field experience, and makes provision for students to align this knowledge and skill within the policies of the S.A. Dental Service.

Assessment: Assessment will be in the form of assignments, tutorials, patient presentations and continuous clinical assessment. Assessment will reflect the contribution to the subject of each component: Clinical Practice II 25%, Clinical Radiography 10%, Clinical Dentistry for Children 65%. Students will be required to pass all components of this subject to pass the subject.

Text-books/Reference Books: As for 3284 Clinical Dentistry IT and 1352 Applied Clinical Practice IT; South Australian Dental Service, *General information circulars, policy documents, professional bulletins, standardization document, dental therapists' duties*; South Australian Dental Service, *Policy on examinations and dental therapists' duties*; South Australian Dental Service, *Standardization document* (1988).

8442 Dental Sciences IIT

Level: II.

Points value: 3.

Duration: Full year.

Pre-requisite: 2895 Dental Sciences IT.

Assumed knowledge: Proficiency in English.

Restriction: None.

Contact hours: 66 lecture hours, 20 seminar hours, 4 practical hours.

Content: Dental Sciences IIT contains components of Applied Oral Pathology, Medicine and Pharmacology and Applied Oral Anatomy, and instructs students in aspects of diagnosis and management of pathological conditions, medicine, pharmacology and anatomy which relate to the delivery of dental care.

Assessment: Assessment will be in the form of case presentations (10%), Tests (10%), mid year examination (30%) and end of year examination (50%). Students will be required to pass all components of this subject to pass the subject.

Text-book/Reference Book: Little, J. W. & Fallace, D. A., *Dental management of the medically compromised patient*, 2nd edn. (The C. V. Mosby Company, St. Louis, 1984); Malamed, S. F., *A handbook of local anaesthesia* (W. B. Saunders Company, Philadelphia, 1986); Paff, G. J., *Anatomy of the head and neck* (W. B. Saunders Company, 1973); Shafer, W. G., Hine, M. K. & Levy, B. M., *A textbook of oral pathology*, 4th edn. (W. B. Saunders Company, Philadelphia, 1983).

7964 Clinical Dentistry IIT

Level: II.

Points value: 3.

Duration: Full year.

Pre-requisites: 3284 Clinical Dentistry IT and 1352 Applied Clinical Practice IT.

Assumed knowledge: Proficiency in English.

Restriction: None.

Contact hours: 86 lecture hours, 36 tutorial hours, 10 practical hours.

Content: Clinical Dentistry IIT contains components Clinical Dentistry for Children, Orthodontics and Periodontology and develops and applies the principles of restorative dentistry, periodontal disease and orthodontics gained in Clinical Dentistry IT.

Assessment: Assessment will be in the form of assignments, case presentations, and examinations as set out in the subject information. Assessment will reflect the contribution to the subject of each component: Clinical Dentistry for Children 60%, Orthodontics 20%, Periodontology 20%. Students will be required to pass all components of this subject to pass the subject.

Text-books/Reference Books: Horsted-Bindslev, P. & Mjor, I., *Modern concepts in operative dentistry* (Munksgaard, 1988); Mathewson, R. J. et al (1987), *Fundamentals of dentistry for children* 2nd edn. (Quintessence Publishing Company Inc., Chicago, 1982); O'Brien, W. J. (1989) *Dental materials: properties and selection* (Quintessence, 1989); Thilander, B. and Herbel, J. R., *Introduction to orthodontics* (Tandlarkaforlaget, Stockholm, 1985); Wilson, H., McLean, J. & Brown, D. (1988) *Dental materials and their clinical applications* (British Dental Association, 1988); Grant, D. A., Stern, I. B. & Listgarten, M. A., *Periodontics* (Mosby).

7228 Social and Preventive Dentistry IIT

Level: II.

Points value: 6.

Duration: Full year.

Pre-requisites: Social and Preventive Dentistry IT.

Assumed knowledge: Proficiency in English.

Restriction: None.

Contact hours: 91 lecture hours, 12 tutorial hours, 17 seminar hours, 6 practical hours.

Content: Social and Preventive Dentistry contains the components of Developmental Psychology, Epidemiology and Biostatistics, Applied Community Dentistry and Sociology. The subjects focus on specific areas which are designed to promote personal and professional awareness and development, complementing and enhancing clinical experience and future professional dental therapy practice. Students are introduced to health analysis and assessment, concentrating on dental public health principles and philosophies. The social and behavioural sciences components have been designed to develop awareness and understanding of the knowledge associated with the various psychological and sociological influences implicated in human behaviour. Emphasis is placed on the provision of care in an interpersonal setting, and the requirement for developing effective interpersonal skills.

Assessment: Assessment will be in the form of assignments and examinations (Semester I and II). The assessment for this subject reflects the assessment requirements of the components of the subject. The percentage contribution of each component to this subject is as follows: Developmental Psychology 30%, Epidemiology and Biostatistics 30%, Sociology 30%, and Applied Community Dentistry 10%. Students are required to meet the assessment requirements for each of the components of this subject to gain a passing grade.

Text-books/Reference Books: Lupton, G. M. & Najman, J. M., *Sociology of health and illness* (Macmillan Australia, 1989); Peţerson, C. C., *Looking forward through the lifespan* (Globe Press, 1989); Ryan, P., *A short course in elementary biostatistics* (Department of Community Medicine, University of Adelaide, 1990).

DEGREE OF

BACHELOR OF DENTAL SURGERY

REGULATIONS

1. There shall be an Ordinary degree of Bachelor of Dental Surgery.

2. The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(a) the subjects of study for the degree; and

(b) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by Council or such other dates as the Council may determine.

3. The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

4. Except by the permission of the Faculty, a candidate shall not enrol in any subject for which the pre-requisite studies as prescribed in the syllabus for that subject have not been satisfactorily completed.

5. A candidate shall not be eligible to attend for examination unless the prescribed work has been completed to the satisfaction of the academic staff concerned.

6. In determining a candidate's final result in a subject (or part of a subject) the examiners may take into account oral, written, clinical, practical and examination work, provided that the candidate has been given adequate notice at the commencement of the teaching of the subject of the way in which work will be taken into account and of its relative importance in the final result.

7. There shall be three classifications of pass in the final assessment of any subject for the Ordinary degree, as follows: Pass with Distinction, Pass with Credit, Pass.

8. A candidate will be permitted to take a supplementary examination only in circumstances approved by the Faculty and consistent with any expressed Council policy.

9. (a) A candidate who fails a subject shall, unless exempted wholly or partially therefrom by the Head of the Department concerned, again complete the required work in that subject to the satisfaction of the teaching staff concerned. Such a candidate may be required to attend concurrently, such lectures, clinical practice, laboratory and other practical work as the Faculty may prescribe, in other subjects of annual examination.

(b) Except in the case of the First Annual Examination, a candidate who is exempted from part of any subject shall not be granted a classified pass in that subject.

10. A candidate who has twice failed the examination in any subject for the Ordinary degree may not enrol for that subject again or for any other subject which in the opinion of the Faculty contains a substantial amount of the same material, except by special permission of the Faculty and then only under such conditions as Faculty may prescribe.

11. A candidate who has passed subjects in other Faculties of the University or in other educational institutions, may on written application to the Registrar be granted such exemption from the requirements of the schedules made under these regulations as the Faculty may determine.

Regulations allowed 16 March, 1961.

Amended: 17 Dec. 1970: 9, 10, 11, 12; 21 Dec. 1972: 13; 28 Feb. 1974: 1, 8, 9, 12; 15 Jan. 1976: 2; 2 Feb. 1978: 6, 7; 4 Feb. 1982: 3, 11, 13; 24 Feb. 1983: 2; 17 Jan. 1985: 12(a).

Regulations repealed and substituted 20 July, 1989; Awaiting allowance: 3.

NOTE (not forming part of the regulations): A candidate who is eligible to re-enrol in the dental course and who fails to do so without faculty permission will be required to apply for re-admission to the course and will be able to re-enrol only if selected for re-admission.

DEGREE OF

BACHELOR OF DENTAL SURGERY

SCHEDULES

(Made by the Council under Regulation 2)

SCHEDULE I: COURSES OF STUDY

1. Approval of Enrolment

The following students must have their courses approved by the Dean or nominee at the time of enrolment in the year concerned:

(a) students who have been granted or are seeking status or exemption from these schedules under Regulation 11.

(b) students who are repeating a subject or subjects; such students may be required to resume at such a point in the course and/or undertake such additional or special programme of study as the Dean of Faculty deems appropriate.

(c) students who have obtained permission from the Faculty to intermit their course, either to proceed to the Honours degree of Bachelor of Science in Dentistry, or for other reasons approved in each case.

2. Lectures, Practical Work, Clinical Instruction

The course for the degree of Bachelor of Dental Surgery shall extend over five years. To qualify for the degree a candidate shall regularly attend lectures, tutorials and clinical practice, do written and laboratory or other practical work to the satisfaction of the academic staff concerned, and pass the prescribed examinations. Students shall attend at clinics of the South Australian Dental Service and other teaching hospitals and health centres as required for their clinical instruction.

First Year

During the first year every student shall attend courses of instruction in: (a) Behavioural Science, (b) Biology, (c) Organic Chemistry, (d) Genetics, (e) Anatomy and Histology, (f) Medical Physics, (g) Dental Science.

Second Year

During the second year every student shall attend courses of instruction in: (a) Regional Anatomy, (b) Systematic Histology and Embryology, (c) Biochemistry, (d) Human Physiology, (e) Dental Science, (f) Conservative Dentistry and (g) Dental Care.

Third Year

During the third year every student shall attend courses of instruction in: (a) Human Physiology, (b) Pharmacology and Therapeutics, (c) General Pathology, (d) Microbiology and Immunology, (e) Oral Pathology, (f) Removable Prosthodontics, (g) Conservative Dentistry, (h) Dental Materials Science, (i) Orthodontics, (j) Pain Control, (k) Oral Diagnosis, (l) Dental Radiology, (m) Periodontology, (n) Biology of Occlusion.

Fourth Year

During the fourth year every student shall attend courses of instruction in: (a) General Medicine, (b) General Surgery, (c) Children's Dentistry, (d) Orthodontics, (e) Periodontology, (f) Endodontics, (g) Oral Pathology, (h) Oral Diagnosis, (i) Dental Radiology, (j) Oral Surgery, (k) Removable Prosthodontics, (l) Conservative Dentistry and (m) Crown and Bridge Prosthodontics.

Fifth Year

During the fifth year every student will continue instruction in: (a) Oral Diagnosis and Dental Radiology, (b) Crown and Bridge Prosthodontics, (c) Removable Prosthodontics, (d) Endodontics, (e) Children's Dentistry, (f) Oral Surgery, (g) Pain Control, (h) Oral Medicine and Applied Oral Pathology, (i) General Dental Practice and (j) undertake theoretical, clinical and research electives to broaden their experience in preferred areas.

SCHEDULE II: EXAMINATIONS

1. 5770 First Annual Examination

At the First Annual Examination the candidate shall satisfy the examiners in each of the following subjects:

8715 Behavioural Science ID
7393 Biology ID
6424 Genetics ID
9931 Anatomy and Histology ID
3117 Medical Physics I
9089 Organic Chemistry ID
3311 Dental Science I

2. 6626 Second Annual Examination

At the Second Annual Examination the candidate shall satisfy the examiners in each of the following subjects:

5065 Biochemistry IID
2812 Dental Care II
3860 Human Physiology IID
3188 Dental Science II
2237 Regional Anatomy II
3187 Conservative Dentistry II
5764 Systematic Histology and Embryology II

3. 9494 Third Annual Examination

At the Third Annual Examination the candidate shall satisfy the examiners in each of the following subjects:

1583 General Pathology IIID
3606 Human Physiology and Occlusion IIID
7094 Oral Pathology III
3164 Pharmacology and Therapeutics III
6704 Dental Materials Science III
4554 Conservative Dentistry III
3937 Removable Prosthodontics III
3485 Periodontology III
2583 Oral Diagnosis and Dental Radiology III
9958 Pain Control III
9412 Orthodontics III
2490 Microbiology and Immunology IIID

4. 9097 Fourth Annual Examination

At the Fourth Annual Examination the candidate shall satisfy the examiners in each of the following subjects:

7133 General Medicine IV
3717 General Surgery IV
9389 Oral Pathology IV
6982 Periodontology IV
6541 Conservative Dentistry IV
5376 Removable Prosthodontics IV
5586 Orthodontics IV

9697 Oral Diagnosis and Dental Radiology IV
6274 Children's Dentistry IV
5462 Oral Surgery IV

5. 6753 Fifth Annual (Final) Examination

At the Fifth Annual Examination the candidate shall satisfy the examiners in each of the following subjects:

7629 Oral Medicine and Applied Oral Pathology V
9391 Oral Surgery V
9776 Oral Diagnosis and Dental Radiology V
1422 Children's Dentistry and Orthodontics V
7647 Pain Control V
5472 Community Dentistry V
5263 Removable Prosthodontics V
4110 General Dental Practice V
2548 Electives V

6. General

A candidate shall complete each annual examination before entering upon the work of the following year's course of study provided that:

(a) A candidate who has not completed or been granted status for all subjects in any year of the course shall enrol for all incomplete or mandatory subjects of that year. Except by permission of Faculty the candidate may not enrol concurrently for any additional subjects from the following year.

(b) A candidate may begin the first semester's work in the following year's course of study pending the result of any supplementary examination for which the candidate has been permitted to present.

(c) A candidate shall not be re-examined at a supplementary examination in any subject previously passed at the annual examination. A supplementary examination shall not be awarded on academic grounds in any subject where the student obtained an aggregate score of 35% or less.

(d) The annual examination at the end of the fifth year shall be known as the Final Examination. In exceptional circumstances a candidate's results in the Final Examination may be with-held if the candidate's performance in the required clinical work is considered unsatisfactory by the Board of Examiners. In such a case, the candidate will be required to complete satisfactorily such additional work as the Head of the Department may recommend to the Board of Examiners.

RULES FOR THE ADMISSION OF DENTAL STUDENTS TO THE PRACTICE OF THE SOUTH AUSTRALIAN DENTAL SERVICE AND OTHER TEACHING HOSPITALS AND HEALTH CENTRES.

1. Each dental student of the University of Adelaide shall attend clinics of the South Australian Dental Service, or other teaching hospitals or health centres, as directed by the Dean of the Faculty of Dentistry; and each student shall be admitted to the practice of the South Australian Dental Service or other teaching hospitals or health centres under the disciplinary control of the Chief Executive Officer, in the case of the former, or the Medical Superintendent or Director, in the case of the latter, whilst in attendance.

2. No student may introduce visitors into any of the said clinics, hospitals or health centres without permission of the above designated officers.

3. Students shall conduct themselves with propriety and discharge the duties assigned, and pay for or replace any article damaged, lost or destroyed by them together; and make good any loss sustained by their negligence.

4. Each student shall at all times be under the direction and supervision of a duly appointed member of the teaching staff of the University of Adelaide, or a person who has been granted appropriate University status, and shall carry out such work as shall be allotted.

5. No student shall administer treatment to any patient without the approval of an appointed teacher.

6. Except in the performance of the associated clinical duties, no student may disclose any information whatsoever concerning a patient without the permission of both the patient and the Senior Dental or Medical Officer in charge.

7. No student shall publish a report on any case without the written permission of the Chief Executive Officer in the case of the South Australian Dental Service, or the Medical Superintendent or Director in the case of teaching hospitals or health centres, and the Senior Dental or Medical Officer under whose care the patient is or has been.

8. No student shall communicate directly to the press, radio or television any matter concerning the clinical practice of the institution to which that student is attached.

9. Students shall pay such fees as are laid down by the South Australian Dental Service in consultation with the Dean, Faculty of Dentistry; no student shall be admitted to clinics until such fees are paid.

10. Misconduct or infringement of any of these rules, may lead to temporary suspension by the Chief Executive Officer, South Australian Dental Service, or the Medical Superintendent or Director, other teaching hospitals or health centres. In the case of such temporary suspension, written notice shall immediately be given to the Dean of the Faculty of Dentistry.

DEGREE OF

BACHELOR OF DENTAL SURGERY

SYLLABUSES

Text-books:

The lists of the text-books were correct at the time that this Volume went to press. It is possible however that amendments to these lists will be made before the start of lectures; and, if so, students attending classes will be notified appropriately by the lecturer concerned.

In general, students are expected to have their own copies of text-books; but they are advised to await advice from the lecturer concerned before buying any particular book. Only the prescribed edition of any text-book should be bought.

Reference books:

Although lists of books and journals for reference purposes are regarded as important, details have not been included in this Volume. These will however be issued from time to time by the departments concerned. It is hoped that all books and journals set for reference will be available to be consulted in the Barr Smith Library.

Examinations:

For each subject students may obtain from the department concerned details of the examination in that subject including the relative weights given to the components (e.g. such of the following as are relevant: assessments, term or mid-year tests, essays or other written or practical work, final written examinations, *viva voce* examinations).

Proficiency in English

Experience has shown that students who do not have a good ability to communicate in spoken and written English have difficulties with this course.

5770 FIRST ANNUAL EXAMINATION

8715 Behavioural Science ID

Level: I.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Proficiency in English.

Contact hours: 3 lectures, 1 tutorial and 3 hours of practicals a week.

Content: The subject deals with scientific approaches to the understanding of human behaviour in health and disease. With this objective, contributions from general and developmental psychology, psychophysiology, social psychology, sociology, and anthropology are studied.

Assessment: Semester examinations, 32.5% each, 3 practical reports during year, 10% each and 5% for tutorial participation. Pass mark is an aggregate of 50% with the proviso that any student who has failed both examinations will be deemed to have failed the subject.

Students may be precluded from sitting for examinations if practical work has not been completed to the satisfaction of the examiners.

Text-book: Winefield, H. R., and Peay, M. Y., *Behavioural science in medicine* (second edition, 1991). Copies available from Dept. Psychiatry.

6424 Genetics ID

Level: I.

Duration: Semester II.

Pre-requisites: None.

Assumed knowledge: It will be assumed that students are taking or have completed 7393 Biology ID.

Contact hours: 3 lectures, 1 tutorial and 2 hours practice/tutorial work a week.

Content: This course aims to provide dental students with a basic knowledge of classical and molecular genetics and to indicate where this knowledge is applicable to dentistry. Heredity and variation; Genes and chromosomes; Linkage; Chromosomes and evolution; Properties of the genetic material and molecular organisation of chromosomes; Genetics of bacteria and viruses; Gene manipulation; Population genetics and evolution; Quantitative inheritance; Human diseases; Dental applications of genetics.

Assessment: 3-hour final examination 80%, assignments 20%.

Text-book: Hartl, D. L., *Basic genetics*, 2nd edn. 1991 (Jones and Bartlett).

3117 Medical Physics I

Level: I.

Duration: Semester II.

Pre-requisites: None.

Assumed knowledge: Year 12 PES Physics and Mathematics IS (or Mathematics I and II).

Contact hours: 2 lectures and 2 hours of practicals (or equivalent) a week plus 1 tutorial a fortnight.

Content: The aim of this course is to teach Medical Physics as a relevant course in the medical and dental curriculum. It concentrates therefore on concepts and principles and their applications, not on mathematics or formal derivations. It aims to look at some social issues in a scientific context, such as the after-effects of Chernobyl. It provides a useful background to physiology, anatomy, radiology and anaesthetics. It is taught with the assistance of the Department of Medical Physics of the Royal Adelaide Hospital. The main topics are: biomechanics, fluids, solids, diffusion, electricity with applications, waves, sound, optics and radiation. The course aims to bridge the gap between matriculation physics and the applications needed in medical and dental subjects. Therefore, students who have not taken matriculation physics will need to do extra work to cope with the lectures. These students are advised to consult the lecturer as early as possible and obtain a copy of Kane and Sternheim.

Assessment: Written examination, plus assignments and practical or project work.

Text-book: Cameron, J. R., and Skofronick, J. G. *Medical physics* (Wiley).

Reference: Kane, J. W. and Sternheim, M. M., *Physics* (Wiley).

7393 Biology ID

Level: I.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Proficiency in English.

Contact hours: 2 lectures, 1 tutorial and 3 hour practical work a week.

Content: An introduction to major biological fields providing the basis on which later specialized biological and dental studies build. Topics include: cell structure and function; biochemical concepts—respiration, photosynthesis, enzymes; energy flow; membranes; DNA, RNA, protein synthesis; an introduction to bacteria, fungi, autotrophs and chordates; the nature of evolution, natural selection, the ancestry of man; the structure and physiology of vertebrates. The subject is similar to 5847 Biology IM, but omits the sections dealing with invertebrates and ecology.

Assessment: Semester I examination 45%, Semester II examination 30%, laboratory practical work 20%, essay 5%.

Text-book: Curtis, H. and Barnes, N.S. *Biology* 5th edn. (Worth).

9089 Organic Chemistry ID

Level: I.

Duration: Semester I.

Pre-requisites: None.

Assumed knowledge: Year 12 PES Chemistry and proficiency in English.

Contact hours: 3 lectures, 1 tutorial a week and 12 hours of practicals.

Content: An introduction to the structure, bonding, stereochemistry, spectroscopy, properties and reactions of the following major organic chemistry functional groups: alkyl halides, alcohols, thiols, alkenes, carbonyls, carboxylic acids (and their derivatives), amines. An introduction to the concepts of mechanism, nucleophiles, electrophiles, nucleophilicity versus basicity. A brief discussion of polyfunctional, biologically important compounds such as carbohydrates, nucleic acids and amino acids.

Assessment: 2½ hour written examination at the end of the Semester. Satisfactory attendance and performance is required for each of the practicals.

Text-book: Bailey, P. S. and Bailey, C. A., *Organic chemistry*, 4th ed. (Allyn and Bacon).

9931 Anatomy and Histology ID

Level: I.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Proficiency in English.

Contact hours: 2 lectures (3 for first 2 weeks) and up to 2 hours of practicals a week.

Content: An introduction to general body form, methods of anatomical study, an outline of the anatomy of body systems, general cytology and tissue histology, the histology of the skeletal, muscular, nervous, cardiovascular, lymphatic and respiratory systems, structure of the skull, an introduction to early embryology.

Assessment: Short examination at the end of Semester I, with the main examination at the end of Semester II.

Text-books: Junqueira, L. C., Carneiro J., and Kelley, R. O., *Basic histology* 6th edn. (Lange) *or* Cormack, D.H., *Ham's Histology* 9th edn. (Harper & Row).

3311 Dental Science I

Level: I.

Duration: Full year — Semester 1, Dental Care; Semester II, Oral Anatomy.

Pre-requisites: None.

Assumed knowledge: Proficiency in English.

Co-requisites: 8715 Behavioural Science ID, 9931 Anatomy and Histology I, 7393 Biology ID, 1497 Genetics ID.

Contact hours: 1 lecture and 2 hours of practicals a week plus tutorials and fieldwork in Semester I.

Content: Concepts of health and disease; the mouth in health; dental plaque and its control; plaque disclosing systems; the nature and aetiology of periodontal disease; introduction to the nature of dental caries—aetiology and prevention—oral hygiene, diet, fluoride; utilization of fluoride prevention of dental caries, including its effectiveness and safety; Introduction to dental epidemiology including—evaluation of dental health at individual and community level, dental health status of Australians, Attitudes to dental health and dental care, prevention and treatment programmes in public health dentistry; prevention and emergency treatment of traumatic injury of teeth; oral surface features, morphology of the deciduous and permanent teeth; pulpal anatomy; tooth emergence and calcification; evolutionary changes in skull form; comparative anatomy of the masticatory system; genetics and dental morphology.

Assessment: A 2 hour written examination at the end of each semester, plus continuous assessment of clinical and practical work and assignments.

Text-books: Dental Science I, Practical Assignment Book; Harris, N. O. and Christen, A. G., *Primary preventative dentistry*, 2nd ed., (Appleton and Lange); Dental Science 1. *Manual*, *Oral anatomy*.

6626 SECOND ANNUAL EXAMINATION

5065 Biochemistry IID

Level: II.

Duration: Full year.

Contact hours: 3 lectures a week, 1 tutorial per fortnight during Semester I and 4 two-hour practicals during Semester II.

Content: Biochemistry component: Introduction to Chemical Reactions of the Cell, Membranes, Food, Digestion and Absorption, Storage, Transport and Utilization of Ingested Foodstuffs, Metabolic Pathways, Integration of Metabolism, Structure and Function of Proteins. Nucleic Acid Synthesis, Protein Synthesis Control of Gene Expression, Biochemistry of Cancer, and Growth Factors.

Dental component: Microbial biochemistry and basic microbiology. Areas to be dealt with are microbial cytology, physiology and metabolism, ecology and genetics; principles of disinfection and sterilization; principles of applied antibiotic therapy; host-parasite relationships including mechanisms of microbial pathogenicity; intracellular parasitism; virology.

Assessment: Biochemistry component: Final written examinations on lecture content 45%, a written examination on tutorials and projects 15%. Dental component: Final written examination 40%. Students are required to pass both components.

Text-books: Stryer L., *Biochemistry*, 3rd edn (Freeman); Schuster, G. S. (ed.), *Oral microbiology and infectious disease, Student edition* (Williams and Wilkins); Marsh, P. D., and Martin, M., *Oral microbiology* (American Soc. for Microbiology). Newman and Nisengard, *Oral microbiology and immunology* (Saunders).

2237 Regional Anatomy II

Level: II.

Duration: Full year.

Pre-requisites: 9931 Anatomy and Histology I.

Contact hours: 2 lectures and 2 hours of practicals a week.

Content: The gross topographic anatomy of the head and neck emphasizing aspects of functional and clinical importance; the functional anatomy of the central nervous system.

Assessment: End of semester examinations.

Text-books: Scott, J. H. and Dixon, A. D., *Anatomy for students of dentistry* (Livingstone); Romanes, G. J., *Cunningham's Manual of practical anatomy vol. 3* (O.U.P.) 15th edn; Noback, C. R., Strominger, N. L., and Demarest, R. J., *The nervous system, introduction and review*, 4th ed., *or* Gilman, S., and Winans, S. S., *Essentials of clinical neuroanatomy and neurophysiology* (F. A. Davis and Co.).

5764 Systematic Histology and Embryology II

Level: II.

Duration: Full year.

Pre-requisites: 9931 Anatomy and Histology ID.

Contact hours: 1 lecture a week in Semester I, 2 in Semester II, plus 2 hours of practicals a week.

Content: The functional histology of the alimentary, renal and endocrine systems and special sense organs; the detailed histology of the teeth and adjacent structures; a brief course in oro-facial embryology.

Assessment: End of semester examinations.

Text-books: Junqueira, L. C., Carneiro, J., and Kelley, R. O., *Basic Histology* 6th edn (Lange); *or* Cormack, D. H., *Ham's histology*, 9th ed. (Harper and Row); Ten Cate, A. R., *Oral Histology* 3rd edn (Mosby).

3860 Human Physiology IID

Level: II.

Duration: Full year.

Pre-requisites: 5770 First Annual Examination.

Contact hours: 3 lectures a week, 1 tutorial a fortnight and 3 hours of practicals per week in Semester II.

Content: General physiology including introductory cellular physiology and the physiology of the circulatory, respiratory, endocrine, gastrointestinal, nervous and renal systems. The department conducts a project based practical course. The project in second semester consists of a literature review, experimental work, written report and a poster presentation.

Assessment: Examinations at the end of each Semester (40%) and practical assessments (20%). Multiple choice questions for self-assessment may also be provided.

Text-books: Guyton, A., *Textbook of medical physiology* (current edition) (Saunders); *or* Sherwood, L., *Human physiology — from cells to systems* (West Publishing Co.). The practical session content in terms of experimental design is covered in *Physiology and the Scientific Method* by Scott and Waterhouse. The recommended statistical reference is *Understanding statistics in the behavioural sciences*, 3rd edn., R. R. Pagano (West, 1990).

2812 Dental Care II

Level: II.

Duration: Full year.

Pre-requisites: 3311 Dental Science I, 9089 Organic Chemistry ID.

Contact hours: 2 lectures, 3 hours of tutorials and practicals a week.

Content: This subject builds on the Dental Care segment of Dental Science I, providing a more in-depth consideration of the nature, aetiology, mechanism of action, and treatment of gingivitis and dental caries. Courses on introductory dental radiography, nutrition, introductory patient diagnostic and management skills, and behavioural aspects of clinical dentistry will also be given. Practical and clinical sessions will provide opportunities for students to build their clinical diagnostic skills, prior to working with selected patients of the Adelaide Dental Hospital.

Assessment: End of Semester written examinations, continuous assessment of clinical and practical work, and assignments.

Text-book: Harris, N. O. and Christen, A. G., *Primary preventative dentistry*, 2nd ed. (Appleton and Lange).

3187 Conservative Dentistry II

Level: II.

Duration: Full year.

Co-requisites: 2812 Dental Care II.

Contact hours: 1 lecture and 3 hours of practicals a week.

Content: Topics include: operative instruments, effects of operative procedures on pulpal tissue, pulp protection, moisture control, operative hazards, periodontal and other considerations, use of plastic restorative materials, conservative restorative treatments, assessment of restorative work and failures.

Assessment: End of Semester I examination (2 hours), end of Semester II examinations (2 hours written, 2 hours practical) plus continuous practical assessment.

Text-books: Hörsted-Bindslev, P., and Mjör, I.A., *Modern concepts in operative dentistry* (Munksgaard); Mount, J., *An atlas of glass-ionomer cements: the clinicians guide* (Martin Dunitz, London); Wilson, A.D., and McLean, J.W., *Glass ionomer cement (Quintessence).*

3188 Dental Science II

Level: II.

Duration: Full year.

Pre-requisites: 9931 Anatomy and Histology ID, 3311 Dental Science I.

Co-requisites: 2237 Regional Anatomy II, 3860 Human Physiology IID.

Contact hours: 1 lecture (except 2nd half Semester II) and 2 hours of practicals (3 hours in 2nd half Semester II) a week.

Content: This course follows on from the second Semester of Dental Science I. It is divided into four parts:

Part I (first half of Semester I) — Skeletal biology. Topics discussed include functional anatomy of the skull, radiographic anatomy and forensic odontology.

Part 2 (second half of Semester I) — Human growth and development. Topics discussed include general aspects of growth and development, growth curves, factors influencing growth, indices of maturation, craniofacial growth, application of growth knowledge in dentistry, statistics in human biology.

Part 3 (first half of Semester II) — Biology of dental occlusion. Topics include morphology of dental arches, concepts of occlusion, occlusal curvatures and axial alignment, opposing tooth contacts, mandibular movements and positions, functions of the masticatory system.

Part 4 (second half of Semester II) — Functional dental occlusion. A series of clinical and practical sessions related to the examination and analysis of dental occlusion and masticatory function.

Assessment: Continuous assessment of laboratory and clinical performance, including assignments. A 2-hour written examination at the end of each semester.

Text-books: Dental Science II manual; Tanner, J.M., *Foetus into man: physical growth from conception to maturity* (Castlemead); Hill, I.R. et al., *Forensic odontology: it's scope and history* (IOFOS).

9494 THIRD ANNUAL EXAMINATION

1583 General Pathology IIID

Level: III.

Duration: Semester I.

Pre-requisites: 6626 Second Annual Examination.

Contact hours: 3 lectures and 3 hours of practicals a week plus 3 tutorials.

Content: The nature and causes of disease are first considered, and then follows a full consideration of the inflammatory reaction, including tissue regeneration and repair. Other topics are thrombosis, embolism and infarction, cellular changes and degenerations, the biological effects of radiant energy, the fundamentals of the neoplastic process, haemorrhage, shock and oedema.

Assessment: Written and practical examinations.

Text-books: Rubin, E. and Farber, J.L. *Pathology* (Lippincott); Wheater, P. R., Burkitt, H. G., Stevens, A. and Lowe, J. S., *Basic histopathology* (Churchill Livingstone).

2490 Microbiology and Immunology IIID

Level: III.

Duration: Semester I.

Pre-requisite: 5065 Biochemistry IID.

Co-requisites: 1583 General Pathology IIID.

Contact hours: 2 lectures a week and 18 hours of practicals.

Content: Microbial pathogens of significance in dental practice. This presents the relationship of the oral microbiota to mucosal infections and oral manifestations of systemic infections. In addition, the relationship of the oral microbiota to the major dental diseases, caries and periodontal disease, is discussed.

Assessment: End of Semester 3 hour written examination.

Text-books: Schuster, G. S. (ed.), *Oral microbiology and infectious disease,* 3rd (Student) edn., 1990 (Williams and Wilkins); Marsh, P. D., and Martin, M., *Oral microbiology* (American Soc. for Microbiology). Newman and Nisengard, *Oral microbiology and immunology* (Saunders).

3606 Human Physiology and Occlusion IIID

Level: III.

Duration: Semester I.

Contact hours: 3 lectures and 3 hours of practicals/tutorials a week.

Pre-requisites: 3860 Human Physiology IID or equivalent.

Content: This subject is a continuation of 3860 Human Physiology IID, but with increased emphasis on applied aspects of physiology which are of particular interest to dentistry students. Lectures and practicals are included on the physiology of mastication which are integrated with material on other aspects of occlusion given by other departments.

Assessment: Final 1-hour written examination on all material covered, plus assessment of laboratory and clinical performance.

Text-books: As for 3860 Human Physiology IID. Other recommended readings will be given.

3164 Pharmacology and Therapeutics III

Level: III.

Duration: Semester II.

Pre-requisites: 3860 Human Physiology IID, 5065 Biochemistry IID.

Co-requisites: 1583 General Pathology IIID, 2490 Microbiology and Immunology IIID, 3606 Human Physiology and Occlusion IIID, 9958 Pain Control III.

Contact hours: 3 lectures, 3 hours of practicals a week and tutorials by arrangement.

Content: Instruction in the basic principles of drug action; properties and uses of drugs; the design and clinical evaluation of pharmaceutical products and factors influencing the usage of drugs in dental practice. Particular emphasis will be placed on drugs acting on autonomic, central nervous and cardiovascular systems; local and general anaesthetic agents; muscle relaxants; analgesics; anti-inflammatory agents; antibiotics; anti-allergenic drugs; and drugs acting in the oral cavity.

Assessment: Final 3 hour written examination of a mixed essay and multiple choice format.

Text-books: Gilman, A. G., Goodman, L. S. and Gilman, A., *The pharmacological basis of therapeutics,* current edition (Macmillan); Speight, T. M., *Avery's Drug treatment,* current edition (ADIS); Neidle, E. A., Kroeger, D. C. and Yagiela, J. A., *Pharmacology and therapeutics for dentistry,* current edition (Mosby).

7094 Oral Pathology III

Level: III.

Duration: Semester II.

Assumed knowledge: 5764 Systematic Histology and Embryology II.

Co-requisites: 1583 General Pathology IIID, 2490 Microbiology and Immunology IIID.

Contact hours: 2 lectures a week and 27 hours of practicals.

Content: The pathology of enamel, dentine, cementum, pulp and periapical tissues; dental caries; periodontal disease; cysts of the jaws; healing of oral wounds; developmental mucoral lesions.

Assessment: 3 hour written examination including questions on histopathology.

Text-book: Regezi, J. A. and Sczubba, J. J., *Oral pathology, clinical-pathological correlations* (W. B. Saunders, 1989).

4554 Conservative Dentistry III

Level: III.

Duration: Full year.

Pre-requisites: 3187 Conservative Dentistry II, 2812 Dental Care II.

Co-requisites: 6704 Dental Materials Science III.

Contact hours: 1 weekly lecture and approximately 7 hours of practicals.

Content: Topics include: preventive aspects and cariology; pulpal injuries and therapy; principles of indirect goldwork and ceramic work; intra and extra-coronal preparations;

temporary restorations; luting cements; veneers; post-core systems; clinical assessments, and seminar topics.

Assessment: Two 2 hour written examinations on theory and clinical and laboratory assessments given each semester, including a preclinical component.

Text-books: As for 3187 Conservative Dentistry II. In addition, Rosenstiel, Land, Lord and Fujimoto, *Contemporary fixed prosthodontics*.

3937 Removable Prosthodontics III

Level: III.

Duration: Full year.

Contact hours: 1 weekly lecture and approximately 140 hours of practicals and 36 hours of clinical work.

Content: The principles and practice of the management of partly edentulous patients. Topics covered include: diagnosis and treatment planning; the principles of denture design including retention, support, stability and tissue preservation; removable partial denture design and construction. During the first Semester students will complete a pre-clinical exercise in partial denture design and construction. In the second Semester students will provide treatment for selected patients.

Assessment: Final written examination 40%, continuous assessment of practical work 30% and an assessment of the clinical component 30%. Students must pass each component.

Text-books: To be advised.

6704 Dental Materials Science III

Level: III.

Duration: Full year.

Pre-requisites: 3187 Conservative Dentistry II.

Assumed knowledge: 3971 Medical Physics, 9089 Organic Chemistry ID.

Co-requisites: 4554 Conservative Dentistry III, 3937 Removable Prosthodontics III.

Contact hours: 1 weekly lecture (2 in Semester II), 1 weekly tutorial in Semester II and 1 weekly practical in Semester II.

Content: The Materials Science section includes the mechanical properties of materials, deformation, rheological properties, crystal structure and dislocations, the concept of phases in materials and the application of these concepts to particular materials used in dentistry.

The Dental Materials section examines a series of specific materials and their properties and manipulation for clinical and laboratory application. A series of tutorials and practical assignments relate theory to the practical use of these materials. Written assignments are required.

Assessment: Written papers, assessment of tutorials and practical assignment reports may be included. A pass is required in both sections.

Text-books: Phillips, R. W., *Skinner's science of dental materials* (Saunders); *Practical guide for successful dentistry* (Aust. Dent. Assoc. Inc.); Coombe, E. C., *Notes on dental materials* (Churchill Livingstone).

3485 Periodontology III

Level: III.

Duration: Full year.

Contact hours: 1 lecture, 1 tutorial and 2 hours of practicals a week.

Content: Topics include: instrumentation, biology of the periodontium, treatment planning, treatment philosophy.

Assessment: Weekly tutorial tests 10%, Clinical assessment 40%, Semester I examination 10%, Semester II examination 20%, essay 20%.

Text-book: Grant, D.A., Stern, I.B. and Listgarten, M.A., *Periodontics* (Mosby).

2583 Oral Diagnosis and Dental Radiology III

Level: III.

Duration: First four weeks of Semester I.

Pre-requisites: 6626 Second Annual Examination.

Contact hours: 2 lectures and 4 hours of practicals a week.

Content: Oral Diagnosis: Students attend the Oral Diagnosis clinic for an introduction to the principles of history taking, diagnosis, the provision of primary oral care and treatment planning.

Dental Radiology: Revision and extension of material covered in the first two years of the course and an introduction to orthopantomography and simple extra-oral procedures.

Assessment: Written examination at the completion of the clinical programme. A radiology logbook is introduced to allow recording and assessment of work completed. This record is maintained throughout course.

Text-books: To be advised at the commencement of the course.

9958 Pain Control III

Level: III.

Duration: First four weeks of Semester I.

Contact hours: 10 lectures and 5 two-hour clinical sessions.

Content: Theoretical and practical tuition to cover the introductory psychology, physiology and pharmacology of pain control with detailed instruction in local anaesthesia.

Assessment: 1 hour written examination and assessment of clinical procedures.

Text-books: Teaching Manual: *Local anaesthesia in dentistry*; Malamed, S. F., *Handbook of local anaesthesia*, 2nd ed. (C. V. Mosby).

9412 Orthodontics III

Level: III.

Duration: Semester II.

Assumed knowledge: 2237 Regional Anatomy II, 5764 Systematic Histology and Embryology II.

Contact hours: 1 lecture a week.

Content: Principles of dento-facial growth are re-evaluated with orthodontic relevance. Concepts of facial aesthetics, orthodontic terminology, and initial diagnosis and treatment planning are introduced.

Assessment: 1 hour written examination.

Text-book: Moyers, R. E., *Handbook of Orthodontics*, 4th ed., Year Book Medical Publishers.

9097 FOURTH ANNUAL EXAMINATION

7133 General Medicine IV

Level: IV.

Duration: Semester I.

Pre-requisites: 5065 Biochemistry IID, 1583 General Pathology IIID, 2490 Microbiology and Immunology IIID, 3164 Pharmacology and Therapeutics III, 3606 Human Physiology IIID and Occlusion.

Contact hours: 1 lecture a week.

Content: Topics include: An introduction to clinical medicine; disorders of the blood cells and bone marrow; treatment of bleeding after dental surgery; calcium and bones; nutrition obesity and diabetes; dental aspects of endocrine disorders; disorders of the alimentary tract; jaundice; hepatitis and other disorders of the liver and bilary tract; atheroma and ischemic heart disease; rheumatic heart disease and bacterial endocarditis; cardiac failure, arrhythmias and arrest; disease of the lungs; disease of the kidneys; the immune system and anaphylaxis; the mouth and sexually transmitted disease; cerebrovascular disease, fainting and epilepsy; diseases of the joints and muscles of the head and neck.

Assessment: Final 2 hour written examination comprising long (essay-type) and short questions.

Text-books: Kennedy, A. C. and Blumgart, L. H., *Essentials of medicine and surgery for dental students* (Churchill Livingstone), or Little, J. W. and Falace, D. A., *Dental management of the medically compromised patient* (Mosby).

3717 General Surgery IV

Level: IV.

Duration: Semester II.

Contact hours: 1 lecture a week and 6 tutorials.

Content: An overview of surgery including core knowledge such as bleeding and transfusion; metabolic response to injury and shock; deep vein thrombosis etc. as well as specific areas such as plastic surgery, neuro surgery etc.

Assessment: 1 hour multiple-choice final examination consisting of 60 questions.

Text-book: Elmslie, R. G. and Ludbrook, J., *An introduction to surgery: 100 topics* (Heinemann).

9389 Oral Pathology IV

Level: IV.

Duration: Semester I.

Pre-requisites: 7094 Oral Pathology III.

Assumed knowledge: 6002 General Pathology IIID, 2490 Microbiology and Immunology IIID.

Contact hours: 3 hours per week.

Content: This subject deals with the systematic pathology of the oral mucosa, the jawbones, the salivary glands, the temporomandibular joint, the maxillary sinus, facial pain, the spread of oral infections, cancer of the oral region and odontogenic tumours.

Assessment: 1 written examination of 3 hours duration.

Text-books: As for 7094 Oral Pathology III.

6982 Periodontology IV

Level: IV.

Duration: Semester I.

Pre-requisites: 3485 Periodontology III.

Contact hours: 9 lectures, 9 tutorials and 3 hours of practicals a week.

Content: The academic and clinical concepts introduced during the 3485 Periodontology III course are further developed. More advanced topics are examined in periodontal theory and includes material from the recent literature. Wherever possible, patients with more complicated periodontal treatment will be treated. Students will be encouraged to manage patients according to the needs of the individual within the broader context of general health and the impact of systemic conditions on periodontal health.

Assessment: Continuous clinical assessment, tutorial tests and a final 2 hour written examination. A pass in each component is required.

Text-book: As for 3485 Periodontology III.

6541 Conservative Dentistry IV

Level: IV.

Duration: Full year.

Pre-requisites: 4554 Conservative Dentistry III.

Contact hours: 1 lecture and 11 hours of practicals a week.

Content: Pre-clinical programmes consisting of lectures, tutorials and laboratory exercises designed to introduce students to the principles and practice of endodontics and complex conservative dentistry are followed by laboratory exercises in bridgework techniques. A lecture course covers the diagnosis and management of occlusion-related problems. Students then proceed with clinical practice to further their experience in simple conservative procedures in addition to developing skills in the areas of diagnosis, integrated treatment planning, preventive management and providing treatment for patients in the areas of endodontics, gold and ceramic crowns and simple bridgework.

Assessment: Two final written examinations (2 and 3 hours) and continuous assessment of clinical and practical work. Remedial written and clinical assignments and final clinical examinations may be required for some students at the discretion of the course co-ordinator.

Text-books: As for 4554 Conservative Dentistry III. In addition, Andreasen, J., *Traumatic injuries of the teeth*, (Munksgaard). Cohen and Burns R. *Pathways of the pulp* 4th edn. (Mosby, 1987).

5376 Removable Prosthodontics IV

Level: IV.

Duration: Full year.

Pre-requisites: 3937 Removable Prosthodontics III.

Contact hours: 1 lecture and 6 hours of practicals a week.

Content: The principles and practice of the management of edentulous patients. Topics covered include: diagnosis and treatment planning; the principles of complete denture design including retention, support, stability and tissue preservation; complete denture construction; the planning and construction of immediate dentures. During the first Semester students will complete a pre-clinical exercise in complete denture design and construction and continue the management of patients requiring removable partial dentures. In the second Semester students will provide treatment for selected patients requiring complete dentures. Toward the end of Semester II students will complete a pre-clinical exercise in immediate denture construction.

Assessment: Final 3 hour written examination 40%, continuous assessment of laboratory work 10% and assessment of clinical work 50%. Students must pass each component.

Text-books: To be advised.

5586 Orthodontics IV

Level: IV.

Duration: Full year.

Pre-requisites: 9412 Orthodontics III.

Contact hours: 1 lecture and 3 hours of practicals a week.

Content: Orthodontic diagnosis and treatment planning, including cephalometrics, growth prediction, dental arch analysis, management of specific malocclusion types, theory of tooth movement and its consequences and mechanism of tooth movement both removable and fixed.

Assessment: 3 hour written examination, 1 hour viva at the end of course, and continuous clinical and laboratory assessment.

Text-book: Proffit, W. R., *Contemporary orthodontics* (Mosby).

9697 Oral Diagnosis and Dental Radiology IV

Level: IV.

Duration: Full year.

Contact hours: 3½ hours of seminars/practicals a week.

Content: Oral Diagnosis: Emphasis is placed on the further development skills in history taking, examination, and diagnosis. The dental needs of patients are carefully considered, and alternative forms of treatment evaluated. During these sessions students provide primary oral care in the clinic and attend specialist clinics within the discipline.

Dental Radiology: Continuation of the practical and clinical tuition from the third year, with increasing emphasis on radiographic interpretation.

Assessment: Continuing assessment of clinical work. Case presentation and other assignments may be required and assessed. A final examination consisting of written, practical, or viva voce examinations may be held. Maintenance of the radiology log-book continues.

Text-books: To be advised at the commencement of each year.

6274 Children's Dentistry IV

Level: IV.

Duration: Semester II.

Pre-requisites: 4554 Conservative Dentistry III.

Co-requisites: 5586 Orthodontics IV.

Contact hours: 1 lecture and 3.25 hours of practicals a week, plus 3 hours of tutorials and fieldwork.

Content: Children's Dentistry continues in Semester I in fifth year. Lectures during fourth year will cover the topics of child development including anxiety, fears and phobias, cavity preparation and pulp treatment of primary teeth, rubber dam, training children to be good dental patients, management of behavioural deviations, diagnosis and treatment planning for children, rampant caries, bottle caries, diet and nutrition. Operative techniques in cavity preparation and pulp treatment in primary teeth will be completed before commencement of clinical practice. Dental care will be provided to preschool and primary school children including an orthodontic consultation and presentation.

Assessment: Consists of field trip report and multi-choice examinations 15%, operative techniques 15% and continuous assessment of clinical practice 70%.

Text-book: McDonald, R. E. and Avery, D. R., *Dentistry for the child and adolescent,* 4th edn (Mosby); Moyers, R. E., *Handbook of orthodontics,* 4th edn, Year Book Medical Publishers; *Dietary counselling manual for dentistry,* Elizabeth Fanning and Barbara Smith (eds.).

5462 Oral Surgery IV

Level: IV.

Duration: Semester II.

Pre-requisites: 7094 Oral Pathology III.

Co-requisites: 9389 Oral Pathology IV, 7133 General Medicine IV, 3717 General Surgery IV.

Contact hours: 24 hours of lectures and 3 hours of practicals.

Content: A series of lectures on the principles and practice of oral surgery with the emphasis on general assessment and dento-alveolar surgery. This is to prepare students for their clinical practice in final year.

Assessment: To be advised.

Text-book: Moore, J. R., *Principles of oral surgery,* 3rd edn. (Manchester U.P.).

6753 FIFTH ANNUAL EXAMINATION

9391 Oral Surgery V

Level: V.

Duration: Full year.

Pre-requisites: 9097 Fourth Annual Examination.

Contact hours: 30 lectures and 60 hours of practicals.

Content: The fourth year lecture series is followed and expanded in lecture and clinical tuition. Major aspects of oral surgery including dento-alveolar surgery, maxillo-facial injuries, preprosthetic surgery, orthognathic surgery, temporomandibular joint surgery and aspects of cleft surgery and head and neck oncology are covered.

Clinical practice includes patient assessment, diagnosis, selection of appropriate analgesia/anaesthesia, routine exodontia, minor oral surgery and elective oral surgery on outpatients at the Royal Adelaide Hospital.

Assessment: Written examination at the end of Semester I, continuous clinical assessment and final assessment of the clinical component at the completion of the course.

Text-book: Moore, J. R., *Principles of oral surgery,* 3rd edn (Manchester U.P.).

7629 Oral Medicine and Applied Oral Pathology V

Level: V.

Duration: Semester I.

Co-requisites: 9391 Oral Surgery V.

Contact hours: 18 lectures and practicals during Oral Surgery clinics.

Content: Clinical application of oral pathology is covered including the principles of diagnosis of systemic and local diseases affecting the oral cavity. Instruction is given in the use of clinical and laboratory diagnostic procedures. Methods of treatment of oral disease are considered and emphasis is placed on interactions between dental treatment and medical conditions.

Assessment: Final written examination.

Text-books: As for 7094 Oral Pathology III plus Little, J. W. and Falance, D. A., *Dental management of the medically compromised patient* (Mosby).

9776 Oral Diagnosis and Dental Radiology V

Level: V.

Duration: Full year.

Contact hours: 1 one-hour weekly seminar (Semester II) in Oral Diagnosis and 12 hours of seminars in Dental Radiology. 3½ hours of practicals per week in Oral Diagnosis plus 12 hours of practicals per year in Dental Radiology.

Content: Oral Diagnosis: This component continues from the fourth year with increasing emphasis on the development of treatment planning and communication skills. Students will be encouraged to consider the prognosis for their treatment management decisions.

Dental Radiology: Students attend the Dental Radiology unit for a series of sessions gaining expertise in extra-oral radiography. Material from the previous years is reinforced.

Assessment: Continuing clinical assessment with final examination consisting of written, practical, or viva voce examinations. Case presentation or essay assignments may be required. The radiology log book is continued and may be recalled for assessment.

Text-books: A list of the texts required will be made available at the commencement of the year.

1422 Children's Dentistry and Orthodontics V

Level: V.

Duration: Semester I.

Pre-requisites: 6274 Children's Dentistry IV, 5586 Orthodontics IV.

Contact hours: 1 lecture, 3¼ hours of practicals a week, plus 7 hours of tutorials and 10 hours of fieldwork.

Content: Lectures cover the topics of soft tissue anomalies in children, anomalies of tooth formation and developmental defects in teeth, occlusal sealants, topical fluorides, relative analgesia and general anaesthesia for children, stainless steel crowns, space-maintainers, handicapped children, child abuse, recall systems, referring of patients, growth and development of the cranio-facial complex, and the recognition, diagnosis and treatment of malocclusion and associated anomalies of the jaws. Also diagnosis and orthodontic treatment planing seminars and student debates are presented. Operative techniques in stainless steel crowns, fixed and removable space maintainers and removable orthodontic appliances will be completed before commencement of clinical practice. Dental care will be provided to preschool and primary school children including orthodontic consultations, a case presentation and the fabrication and insertion of simple orthodontic appliances.

Assessment: Continuous clinical assessment 55%, written examination 15%, reports on field trips 10%, orthodontic presentation and assessment 15% and operative and orthodontic technique exercises 5%.

Text-books: As for 6274 Children's Dentistry IV and 5586 Orthodontics IV.

5472 Community Dentistry V

Level: V.

Duration: Semester I.

Contact hours: 1 weekly lecture plus 1 weekly seminar (two-hours) or workshop (three-hours).

Content: Lectures, seminars and workshops cover demography and dental epidemiology; prevention of dental diseases; social impact of dental disease; delivery of dental services;

planning and evaluating dental services; financing dental care; dental services for special groups; and future practice of dentistry.

Assessment: Continuous assessment, written assignment and 1½ hour final written examination.

Text-book: Striffler, D. F., *et al., Dentistry, dental practice and the community* 3rd edn (W. B. Saunders).

5263 Removable Prosthodontics V

Level: V.

Duration: Semester I.

Pre-requisites: 5376 Removable Prosthodontics IV.

Contact hours: 1 one-hour seminar and 1 three-hour practical a week.

Content: A series of seminars on selected topics and continuation of clinical practice in removable prosthodontics.

Assessment: 3 hour written paper 40%, seminars 10% and continuous clinical assessment 50%.

Text-books: To be advised.

4110 General Dental Practice V

Level: V.

Duration: Full year.

Contact hours: 1 weekly seminar in Semester II and 14 hours of practicals a week.

Content: Clinical experience of the comprehensive management of patients, based on the co-ordination of skills from individual disciplines. Seminars and clinical tutorials explore a wide range of topics relating to general practice. Emphasis is placed on treatment planning, reviews of completed treatments and prognosis.

Assessment: Continuing clinical assessment and final examination consisting of clinical presentation and viva voce examination. An endodontics essay and other assignments may be required.

Text-books: To be advised.

7647 Pain Control V

Level: V.

Duration: Semester I.

Pre-requisites: 9097 Fourth Annual Examination.

Co-requisites: 9391 Oral Surgery V.

Contact hours: 16 hours of lectures and seminars and practical experience during the Oral Surgery roster.

Content: A fully integrated course encompassing the theoretical and practical tuition necessary for the student to become competent in the essential aspects of the management of apprehension and pain in all dental procedures.

Assessment: Written examination at end of semester.

Text-books: Malamed, S. F., *Sedation: a guide to patient management*, 2nd ed. (C. V. Mosby); Malamed, S. F., *Handbook of local anaesthesia*, 2nd ed. (C. V. Mosby).

2548 Electives V

Level: V.

Duration: Semester II.

Contact hours: Approximately 9 hours per week.

Content: The elective programme is designed to give students the opportunity to take part in one or more activities not included in other parts of the course. This might include coursework from other appropriate courses, supervised research projects, additional experience in advanced aspects of a clinical specialty or exchange visits to other dental schools.

Students are strongly advised to discuss their proposed elective programme with the co-ordinator as soon as possible.

Assessment: Final assessment will be based on the assessment provided by supervisors and on a presentation of work carried out during the elective programme held during November.

HONOURS DEGREE OF

BACHELOR OF SCIENCE IN DENTISTRY

REGULATIONS

1. There shall be an Honours degree of Bachelor of Science in Dentistry.

2. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the degree; and

(ii) the range of subjects to be satisfactorily completed and the examinations, lectures, clinical practice, laboratory and other practical work to be satisfactorily undertaken; and

(iii) the pre-requisite work for any subject.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

3. Before entering upon the course of study for the degree a candidate must:

(a) have completed the pre-requisite work, or work accepted by the Faculty of Dentistry as appropriate for the proposed course of study; and

(b) be deemed by the Head of the Department concerned to be a suitable candidate for advanced work.

4. To qualify for the degree a candidate shall undertake advanced study extending over one academic year as a full-time candidate, or with the approval of the Faculty of Dentistry, over a period of not more than two academic years as a half-time candidate and satisfy the examiners at the first attempt.

5. A candidate shall not be eligible to attend for examination unless the prescribed work has been completed to the satisfaction of the teaching staff concerned.

6. The names of the candidates who qualify for the degree shall be published within the following classes and divisions in each subject:

First Class

Second Class
- Division A
- Division B

Third Class.

Regulations repealed and substituted: 1 March 1989.
Awaiting allowance: 2(b).

HONOURS DEGREE OF

BACHELOR OF SCIENCE IN DENTISTRY

SCHEDULES

(Made by the Council under Regulation 2.)

SCHEDULE I: COURSES OF WORK

1. A course of study for the degree may be undertaken in one of the following:

2190 Honours Dentistry
1739 Honours Anatomy and Histology
1790 Honours Biochemistry
7751 Honours Materials Science
1551 Honours Pathology
3950 Honours Pharmacology
6740 Honours Physiology
7599 Honours Genetics

Assumed knowledge: All courses of study assume a pass in the Third Annual Examination for the degree of Bachelor of Dental Surgery; or an Ordinary degree in another field of study that the Faculty deems equivalent.

Honours Genetics specifically assumes a pass in the subject Genetics II as prescribed for the degree of Bachelor of Science.

2. A course of study will consist of such of the following as may be required:

(a) reading in selected fields and submissions of essays;

(b) attendance at lectures;

(c) practical work; and

(d) the undertaking of a research investigation on a topic assigned early in the course.

3. The examination for the degree may consist of such written, oral and practical examinations as may be required. Assessments of any essays submitted by the candidate, practical work completed during the course, and the report on a research investigation may be taken into account.

HONOURS DEGREE OF

BACHELOR OF SCIENCE IN DENTISTRY

SYLLABUSES

Intending candidates should consult the Head of the appropriate Department prior to commencement of the programme for details of required reading and of assessment.

HONOURS DEGREE OF BACHELOR OF SCIENCE IN DENTISTRY

The following subjects are available:

2190 Honours Dentistry

Candidates may, with the approval of the Head of the Department, enrol in the Honours Dentistry programme after they have successfully completed the third year of the Ordinary degree of Bachelor of Dental Surgery, or after they have obtained the Ordinary degree of Bachelor of Dental Surgery or equivalent. Under certain circumstances, candidates who have obtained an ordinary degree in another Faculty may be admitted to an Honours programme in Dentistry.

Candidates may choose as their principal area of study one of the disciplines of the current research thrust of the Department of Dentistry. Candidates will be required to undertake on a full time basis for one year (unless in half-time if approved by the Head of the Department and Faculty), a course of study which may include essays, seminars, laboratory work, clinical work and a research project under the supervision of a member of the Department. A candidate may be required to undertake such formal courses of study in related subjects as are deemed desirable. Prospective candidates are advised to consult the Head of the Department and staff members in the year preceding the honours year to discuss the area of proposed study.

6777 Honours Biochemistry

1739 Honours Anatomy and Histology

1551 Honours Pathology

7751 Honours Materials Science

7599 Honours Genetics

3950 Honours Pharmacology

6740 Honours Physiology

GRADUATE DIPLOMA IN CLINICAL DENTISTRY

Note: Postgraduate tuition fees may apply to this course.

REGULATIONS

1. There shall be a Graduate Diploma in Clinical Dentistry.

2. The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining the course of study. Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

3. (a) The Faculty of Dentistry may accept as a candidate for the Graduate Diploma any person who:

(i) has qualified in the University of Adelaide for the degree of Bachelor of Dental Surgery;

(ii) has qualified in another university for a degree or degrees in dentistry which the Faculty regards as equivalent for the purpose to the qualification specified in sub-section (i) hereof.

(b) With the approval of Council, the Faculty may accept as a candidate for the Graduate Diploma a person who does not hold a degree of a University but holds a dental qualification which involved a course of study acceptable to the Faculty and whom Faculty considers to be a suitable candidate for advanced work in clinical dentistry.

4. To qualify for the Graduate Diploma, a candidate shall:

(a) complete satisfactorily an approved course of study extending over at least one year as a full-time student, or with approval of Faculty, over a period of not more than three years as a part-time candidate; and

(b) pass such written, oral, clinical and practical examinations, and submit such reports as may be required by the Faculty.

5. The programme of study, examination, reports and such other work as may be required and the period of study for each candidate shall be specified by the Head of Department and approved by the Faculty.

6. Unless the Faculty, on the advice of the Head of the Department, approve an extension of time in a particular case, the work for the Graduate Diploma shall be completed within the period of study approved for the particular candidate under Regulation 4.

7. A candidate shall not be eligible to present for examination unless the required course of study has been completed to the satisfaction of the Head of the Department.

8. A candidate's progress may be reviewed at any time by the Head of Department. If, in the opinion of the Department a candidate is not making satisfactory progress the Faculty may, with the consent of Council, terminate the candidature.

9. The Faculty shall appoint examiners for written, oral, clinical and other assessments.

10. A candidate who complies with the foregoing conditions and satisfies the examiners and the Faculty shall be awarded the Graduate Diploma of Clinical Dentistry.

Regulations allowed 17 January, 1985.
1 March 1990: diploma to graduate diploma.

GRADUATE DIPLOMA IN CLINICAL DENTISTRY

SCHEDULES

(Made by the Council under Regulation 2.)

A. The course of study shall be in four sections:

1. Coursework.

The formal course will consist of lectures, guided reading and tutorials concerned with specified clinical disciplines and related subjects, and supervised clinical and/or laboratory practice.

2. Major Clinical Subject.

Lectures/tutorials, clinical and laboratory work in one of the subjects taken at an advanced level.

3. Critical Survey of Research Literature (related to a specific subject).

4. Introduction to Research Methodology (scientific method, basic statistics, etc.).

B. Course work may be in one of the following clinical disciplines:

8016 Conservative Dentistry.

3882 Removable Prosthodontics.

7712 Endodontics.

7700 Community and Preventive Dentistry.

9648 General Dental Practice.

Other clinical subjects may be considered from time to time.

DEGREE OF

GRADUATE DIPLOMA IN FORENSIC ODONTOLOGY

Note: Postgraduate tuition fees may apply to this course.

REGULATIONS

1. There shall be a Graduate Diploma in Forensic Odontology.

2. An applicant for admission to the course of study for the Graduate Diploma shall have qualified for the degree of Bachelor of Dental Surgery in the University of Adelaide, or hold qualifications in Dentistry from another institution accepted for the purpose by the University.

3. Subject to the approval of the Council, the Faculty may accept as a candidate an applicant who does not satisfy the requirements of Regulation 2 above but who have given evidence satisfactory to the Faculty of fitness to undertake advanced work in clinical dentistry.

4. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining the subjects of study and the forms of assessment to be undertaken by candidates. Such schedules shall become effective from the date of prescription by Council or such other date as Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

5. To qualify for the Diploma a candidate shall satisfactorily complete a course of full-time study extending over one year, or of part-time study extending over at least two years.

Except with special permission of the Faculty, the course for the Graduate Diploma shall be completed in not more than three years.

6. The Faculty may appoint a Board of Examiners to carry out or supervise the examination of candidates for the Graduate Diploma in accordance with the schedules and syllabuses.

7. A candidate shall not be eligible to attend for examination unless the prescribed course of study has been completed to the satisfaction of the Head of the Department.

8. If in the opinion of the Faculty a candidate is not making satisfactory progress, the Faculty may, with the consent of Council, terminate the candidature.

Regulations allowed 21st February 1991.
Awaiting allowance: 4(b).

GRADUATE DIPLOMA IN FORENSIC ODONTOLOGY

SCHEDULES

(Made by the Council under Regulation 4)

1. A candidate for the diploma shall regularly attend lectures and tutorials, do such written, clinical and other practical work, and pass such examinations, as may be required by the Head of the Department of Dentistry.

2. To qualify for the diploma a candidate shall pass the following subjects:
   3914 Anatomy and Forensic Anthropology
   9472 Oral and Forensic Pathology
   8843 Principles and Methods of Forensic Odontology
   9868 Postgraduate Core Course in Dentistry
   6760 Casework in Forensic Odontology

3. Students shall at all times be under the direction and supervision of a member of the teaching staff, duly appointed by the Chairman or the Director of the Forensic Odontology Unit, and shall carry out such work as shall be allocated.

GRADUATE DIPLOMA IN FORENSIC ODONTOLOGY

SYLLABUSES

3914 Anatomy and Forensic Anthropology

Level: Postgraduate.

Points value: 4.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Proficiency in English.

Restriction: None.

Contact hours: 2 hour seminar per week.

Content: The scope and history of physical anthropology generally and in South Australia. Osteology of the skull. Comparative anatomy and evolution of head form and the masticatory system. Principles and methodology for study of human growth and development. Craniofacial growth and development and normal age changes. Human and dental genetics. Craniofacial malformations and paleopathology. Somatometry, craniometry and cephalometry with emphasis on new imaging techniques. Osteology of race. Disaster victim identification including cultural factors, management and international protocol.

Assessment: Students will be advised of the combination of assessment modes at the beginning of the course.

Text-books/Reference Books: Krogman, W. M. & Isaac, M. Y., *The human skeleton in forensic medicine* (C. C. Thomas, 1986); *Biological anthropology manual* (Department of Dentistry).

9472 Oral and Forensic Pathology

Level: Postgraduate.

Points value: 4.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Proficiency in English.

Restriction: None.

Contact hours: 2 hour seminar per week.

Content: This subject introduces general principles of forensic pathology. Emphasis is given to diagnosis and time of death, rigor mortis, time since death, age at death. Methods of forensic pathology examinations and identification of the dead are introduced including medical identification, injuries, serology and DNA identification. Age determination by dental methods and dental histopathology.

Assessment: Students will be advised of the combination of assessment modes at the beginning of the course.

Text-books: Students will be advised of texts at the beginning of the course.

8843 Principles and Methods of Forensic Odontology

Level: Postgraduate.

Points value: 4.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Proficiency in English.

Restriction: None.

Contact hours: 2 hour seminar per week.

Content: History and role of forensic odontology in community dentistry. Legal systems and role and jurisdiction of courts of law. The coronial system and practice of the Coroner's Office. Expert evidence. Methods of investigation of civil and criminal matters. Relationship of police to forensic odontology. Preservation and recovery of dental evidence from scene. Forensic dental photography. Principles and techniques of video and computer imaging in cranio facial superimposition. Procedures for investigation of bitemarks.

Assessment: Students will be advised of the combination of assessment modes at the beginning of the year.

Text-books: Students will be advised of texts at the beginning of the course.

9868 Postgraduate Core Course in Dentistry

Level: Postgraduate.

Points value: 4.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Proficiency in English.

Restriction: None.

Contact hours: 2 hour seminar per week.

Content: Compulsory modules in biostatistics, ethics in research and research methodology. A series of elective modules undertaken in consultation with the co-ordinator taken from: microbiology and immunology, restorative dentistry—dental materials, dental caries, orthodontics, oral pathology and oral medicine, endodontics, radiology, periodontology, forensic odontology and community dentistry and dental public health.

Assessment: Assessment for each module will be arranged in consultation with the co-ordinator.

Text-books: Students will be notified at the commencement of the course of the relevant texts.

6760 Casework in Forensic Odontology

Level: Postgraduate.

Points value: 8.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Proficiency in English.

Restriction: None.

Contact hours: Students will receive supervision as required.

Content: The subject will require students to participate in routine casework undertaken by the Forensic Odontology Unit including attendance at Coroner's mortuary and Courts of Law. Students will undertake a small research project in an approved topic.

Assessment: Students will be advised of the combination of assessment modes at the beginning of the year.

Text-books/Reference Books: To be advised.

DEGREE OF

MASTER OF DENTAL SURGERY

Note: Postgraduate tuition fees may apply to this course.

REGULATIONS

1. There shall be a degree of Master of Dental Surgery.

2. (a) The Faculty of Dentistry may accept as a candidate for the degree any person who:

(i) has qualified in the University of Adelaide for the degree of Bachelor of Dental Surgery and who has acquired at least one year of relevant practical experience since qualifying for that degree or who has qualified for an appropriate higher degree or diploma.

(ii) has qualified in another university for a degree or degrees in dentistry which the Faculty regards as equivalent to the qualifications specified in sub-section (i) hereof.

(b) With the approval of the Board of Graduate Studies, acting with authority wittingly devolved to it by Council, the Faculty may accept as a candidate for the degree a person who does not hold a degree of a university but holds a dental qualification which involved a course of study acceptable to the Faculty and whom Faculty considers to be a suitable candidate for advanced work.

(c) A candidate shall not be admitted to the degree before the expiration of two calendar years from the date of his admission to candidature.

3. To qualify for the degree a candidate shall satisfactorily complete a course of study and a research project on a subject approved by the Faculty of Dentistry.

4. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe the schedules defining:

(i) the subjects of study for the degree; and

(ii) the range of subjects to be satisfactorily completed and the written, oral, clinical and practical examinations to be passed.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

5. (a) A person who wishes to become a candidate for the degree shall apply to the Registrar indicating in general terms the subject and outline of the proposed course of study for examination and of the proposed research project.

(b) For each candidate, the Faculty shall appoint a supervisor or supervisors for guidance.

6. Unless the Faculty expressly approve an extension of time in a particular case, the work for the degree shall be completed and the research report submitted:

(a) in the case of a full-time candidate, in not less than two and not more than three calendar years from the date of admission to candidature; or

(b) in the case of a half-time candidate, who is able to devote at least half of the time to the approved programme of work for the degree as prescribed in regulation 2, in not less than four and not more than six calendar years from the date of admission to candidature.

7. A candidate's progress shall be reviewed by the Master's Examination Committee at the end of the first year of the course or after two years in the case of a half-time candidate. If,

in the opinion of the Committee, a candidate is not making satisfactory progress the Faculty may, with the consent of the Council, terminate the candidature.

8. (a) On completion of his work the candidate shall lodge with the Registrar three copies of the research report which shall be prepared in accordance with directions given from time to time.*

(b) The Faculty shall appoint examiners of the research report at least one of whom shall be an external examiner.

(c) The examiners may recommend that a candidate be examined orally or otherwise on the subject of the research report and the general field of knowledge in which it falls.

9. (a) For each candidate the Faculty shall appoint a Master's Examination Committee which shall:

(i) recommend the appointment of examiners under regulation 8(b);

(ii) consider the reports of the examiners of the research report and the results of any examination; and

(iii) recommend the appointment of examiners—

a. to examine a candidate under regulation 4(a)(ii); and

b. to examine a candidate under regulation 8(c) if it concurs with a recommendation by the examiners under that regulation.

(b) The Master's Examination Committee may recommend to Faculty through the Higher Degrees and Scholarships Committee that the candidate:

(i) be awarded the degree;

(ii) be awarded the degree subject to such minor amendments of the research report as the examiners may have suggested;

(iii) be not awarded the degree but be allowed to revise and resubmit the research report within such period as the Faculty may allow; or

(iv) be not awarded the degree.

10. A candidate who complies with the following conditions and satisfies the Examination Committee shall, on the recommendation of the Faculty, be awarded the degree of Master of Dental Surgery.

11. All regulations hitherto in force concerning the degree of Master of Dental Surgery are hereby repealed. Candidates enrolled for the degree under the regulations hereby repealed may be granted such status under these regulations as the Council, on the recommendation of the Faculty of Dentistry, shall decide.

Regulations allowed 16 December, 1971.

Amended: 28 Feb. 1974: 1; 2 Feb. 1978: 4; 8 Feb. 1979: 2; 31 Jan. 1980: 4; 29 Jan. 1981: 7; 4 Feb. 1982: 3, 6; 24 Feb. 1983: 1-9. 21 Feb. 1991: 1. Awaiting allowance: 2, 1, 3, 4, 5, 6, 7, 8, 9 renumbered 4(b), 6(a), 6(b).

* Published in "Guidelines on Higher Degrees by Research and Specifications for Thesis": *see* Contents.

DEGREE OF

MASTER OF DENTAL SURGERY

SCHEDULES

(Made by the Council under Regulation 4).

SCHEDULE I: Subjects of Study and Research Projects

Candidates shall satisfactorily complete

(a) 5305 Research Methods and Ethics 2 points
4660 Biological and Applied Oral Sciences 2 points

(b) two of the following subjects, both in the same field of study unless the Faculty specially approves otherwise:

8881 Advanced Dentistry VI	12 points
9323 Advanced Dentistry VII	16 points
3813 Combined Prosthodontics VI	12 points
4685 Combined Prosthodontics VII	16 points
4870 Community and Preventive Dentistry VI	12 points
8786 Community and Preventive Dentistry VII	16 points
8652 Conservative Dentistry VI	12 points
6212 Conservative Dentistry VII	16 points
3804 Dental Radiology VI	12 points
2961 Dental Radiology VII	16 points
9642 Endodontics VI	12 points
9130 Endodontics VII	16 points
6699 Forensic Odontology VI	12 points
5299 Forensic Odontology VII	16 points
3992 General Dental Practice VI	12 points
8003 General Dental Practice VII	16 points
4759 Gerodontics VI	12 points
8813 Gerodontics VII	16 points
1597 Oral and Maxillofacial Surgery VI	12 points
1449 Oral and Maxillofacial Surgery VII	16 points
1055 Oral Pathology VI	12 points
4133 Oral Pathology VII	16 points
1764 Orthodontics VI	12 points
6708 Orthodontics VII	16 points
4871 Paedodontics VI	12 points
6968 Paedodontics VII	16 points
4989 Periodontics VI	12 points
3123 Periodontics VII	16 points
1924 Prosthodontics VI	12 points
5321 Prosthodontics VII	16 points
7749 Tropical Oral Pathology VI	12 points
8547 Tropical Oral Pathology VII	16 points

(c) a supervised research project (16 points) which shall normally be undertaken over at least two years.

DEGREE OF

MASTER OF DENTAL SURGERY

SYLLABUSES

5305 Research Methods and Ethics

Points value: 2.

Duration: Semester I.

Contact hours: 2 hours per week.

Content: The subject provides an in depth consideration of scientific method, ethics in research, research methodology and biostatistics. The material presented aims to meet the specific needs of the students enrolled and will contain examples relevant to the individual backgrounds of the students.

Assessment: Students will be notified of assessment procedures at the commencement of the course.

Text-books/References: Students will be notified of texts and references at the commencement of the course.

4660 Biological and Applied Oral Sciences

Points value: 2.

Duration: Semester II.

Pre-requisites: 5305 Research Methods and Ethics.

Contact hours: 2 hours per week.

Content: The course aims to provide a high level of grounding to postgraduate dental students in the area of biological and applied oral sciences.

Assessment: Assessment for each module will be arranged in consultation with the co-ordinator.

Text-books/References: Students will be notified at the commencement of the course of the relevant texts.

8881 Advanced Dentistry VI

Points value: 12.

Duration: Full year.

Co-requisites: 5305 Research Methods and Ethics, 4660 Biological and Applied Oral Sciences.

Contact hours: 10 hours per week.

Content: Advanced Dentistry serves as a mechanism for students to enrol in postgraduate dentistry courses for which there are not yet prescribed courses.

Assessment: Assessment for each module will be arranged in consultation with the co-ordinator.

Text-books/References: Students will be notified at the commencement of the course of the relevant texts.

9323 Advanced Dentistry VII

Availability: Not offered in 1992.

Points value: 16.

Duration: Full year.

Pre-requisites: 8881 Advanced Dentistry VI

Contact hours: 10 hours per week.

Content: As for 8881 Advanced Dentistry VI.

Assessment: As for 8881 Advanced Dentistry VI.

Text-books/References: As for 8881 Advanced Dentistry VI.

3813 Combined Prosthodontics VI

Availability: Not offered in 1992.

Points value: 12.

Duration: Full year.

Co-requisites: 5305 Research Methods and Ethics, 4660 Biological and Applied Oral Sciences.

Contact hours: 10 hours per week.

Content: Combined Prosthodontics aims to bring together at an advanced level the principles and practices if the disciplines of prosthodontics and conservative dentistry.

Assessment: Assessment for each module will be arranged in consultation with the co-ordinator.

Text-books/References: Students will be notified at the commencement of the course of the relevant texts.

4685 Combined Prosthodontics VII

Availability: Not offered in 1992.

Points value: 16.

Duration: Full year.

Pre-requisites: 3813 Combined Prosthodontics VI.

Contact hours: 10 hours per week.

Content: As for 3813 Combined Prosthodontics VI.

Assessment: As for 3813 Combined Prosthodontics VI.

Text-books/References: As for 3813 Combined Prosthodontics VI.

4870 Community and Preventive Dentistry VI

Availability: Not offered in 1992.

Points value: 12.

Duration: Full year.

Co-requisites: 5305 Research Methods and Ethics, 4660 Biological and Applied Oral Sciences.

Contact hours: 12 hours per week.

Content: Lectures, seminars and practicals covering the nature and distribution of oral diseases and related problems, their aetiology and prognosis, and clinical interventions that may prevent or control them at an individual or population level.

Assessment: Continuous assessment, assignments and final "open book" examination.

Text-books/References: Students will be notified at the commencement of the course of the relevant texts.

8786 Community and Preventive Dentistry VII

Availability: Not offered in 1992.

Points value: 16.

Duration: Full year.

Pre-requisites: 4870 Community and Preventive Dentistry VI.

Contact hours: 16 hours per week.

Content: Lectures, seminars and practicals covering the assessment of oral disease and related problems, identification of prevention and control measures, selection and implementation of appropriate measures and evaluation of the results.

Assessment: Continuous assessment, assignments and final "open book" examination.

Text-books/References: Students will be notified at the commencement of the course of the relevant texts.

8652 Conservative Dentistry VI

Points value: 12.

Duration: Full year.

Co-requisites: 5305 Research Methods and Ethics, 4660 Biological and Applied Oral Sciences.

Contact hours: 10 hours per week.

Content: The course is designed to meet the special needs of individual students in achieving advanced knowledge in research and clinical skills in selected branches of Conservative Dentistry.

Assessment: Assessment is based upon seminar performance, essays, research and clinical work.

Text-books/References: All current texts and relevant journals.

6212 Conservative Dentistry VII

Availability: Not offered in 1992.

Points value: 16.

Duration: Full year.

Pre-requisites: 8652 Conservative Dentistry VI.

Contact hours: As for 8652 Conservative Dentistry VI.

Content: As for 8652 Conservative Dentistry VI.

Assessment: As for 8652 Conservative Dentistry VI.

Text-books/References: All current texts and relevant journals.

3804 Dental Radiology VI

Points value: 12.

Duration: Full year.

Co-requisites: 5305 Research Methods and Ethics, 4660 Biological and Applied Oral Sciences.

Contact hours: 10 hours per week.

Content: The subject comprises advanced aspects of dental radiology, including biological

sciences, radiological sciences, radiography and radiology with advanced work being undertaken in the related disciplines of oral pathology, oral diagnosis and oral medicine. Students will attend radiology clinics in the Adelaide Dental Hospital, Royal Adelaide Hospital, Flinders Medical Centre as well as private clinics.

Assessment: Assessment for each module will be arranged in consultation with the co-ordinator.

Text-books/References: Students will be notified at the commencement of the course of the relevant texts.

2961 Dental Radiology VII

Availability: Not offered in 1992.

Points value: 16.

Duration: Full year.

Pre-requisites: 3804 Dental Radiology VI.

Contact hours: 10 hours per week.

Content: As for 3084 Dental Radiology VI.

Assessment: As for 3084 Dental Radiology VI.

Text-books/References: As for 3804 Dental Radiology VI.

9642 Endodontics VI

Availability: Not offered in 1992.

Points value: 12.

Duration: Full year.

Pre-requisites: Successful completion of the primary examinations of the Royal Australasian College of Dental Surgeons (or equivalent).

Co-requisites: 5305 Research Methods and Ethics, 4660 Biological and Applied Oral Sciences.

Contact hours: 12 hours per week.

Content: The programme aims at fulfilling the requirements for graduate education as laid down in guidelines published by the Australian Society of Endodontology. The coursework component consists of lectures and seminars in the following areas: endodontology, oral and general pathology, oral microbiology, immunology, lecturing and public speaking, oral surgery, restorative dentistry, periodontology and radiology.

The clinical component provides experience within the discipline of endodontology in the form of technique work on the human skull, clinical practice, observations in private endodontic and oral surgery practices.

Assessment: Assessment for each module will be arranged in consultation with the co-ordinator.

Text-books/References: Students will be notified at the commencement of the course of the relevant texts.

9130 Endodontics VII

Points value: 16.

Duration: Full year.

Pre-requisites: 9642 Endodontics VI.

Contact hours: 12 hours per week.

Content: As for 9642 Endodontics VI.

Assessment: As for 9642 Endodontics VI.

Text-books/References: As for 9642 Endodontics VI.

6699 Forensic Odontology VI

Points value: 12.

Duration: Full year.

Co-requisites: 5305 Research Methods and Ethics, 4660 Biological and Applied Oral Sciences.

Contact hours: 10 hours per week.

Content: This subject covers similar material to that covered in the Graduate Diploma in Forensic Odontology but in greater depth. The student will be required to undertake extra work in one or more of the specialised areas within the field of Forensic Odontology. Details will be determined in consultation with staff.

Assessment: Assessment will be arranged in consultation with the co-ordinator.

Text-books/References: Students will be notified at the commencement of the course of the relevant texts.

5299 Forensic Odontology VII

Availability: Not offered in 1992.

Points value: 16.

Duration: Full year.

Pre-requisites: 6699 Forensic Odontology VI.

Contact hours: 10 hours per week.

Content: As for 6699 Forensic Odontology VI.

Assessment: As for 6699 Forensic Odontology VI.

Text-books/References: As for 6699 Forensic Odontology VI.

3992 General Dental Practice VI

Points value: 12.

Duration: Full year.

Co-requisites: 5305 Research Methods and Ethics, 4660 Biological and Applied Oral Sciences.

Contact hours: 12 hours per week.

Content: Advanced clinical experience of the comprehensive management of patients, based upon the co-ordination of skills from individual disciplines. Seminars and clinical tutorials explore a wide range of topics relating to general practice at the Masters level. Emphasis is placed on treatment planning, reviews of completed treatments and prognosis.

Assessment: Assessment will be arranged in consultation with the co-ordinator.

Text-books/References: Students will be notified at the commencement of the course of the relevant texts.

8003 General Dental Practice VII

Availability: Not offered in 1992.

Points value: 16.

Duration: Full year.

Pre-requisites: 3992 General Dental Practice VI.

Contact hours: 12 hours per week.

Content: As for 3992 General Dental Practice VI.

Assessment: As for 3992 General Dental Practice VI.

Text-books/References: As for 3992 General Dental Practice VI.

4759 Gerodontics VI

Points value: 12.

Duration: Full year.

Co-requisites: 5305 Research Methods and Ethics, 4660 Biological and Applied Oral Sciences.

Contact hours: 10 hours per week.

Content: The subject aims to comprehensively cover all aspects of treatment of the ageing population. This comprises the clinical aspects of managing the aged patient, with emphasis on conservative and prosthetic dentistry. Aspects which affect the aged patient such as medical, sociological, epidemiological factors will also be covered.

Assessment: Assessment will be arranged in consultation with the co-ordinator.

Text-books/References: Students will be notified at the commencement of the course of the relevant texts.

8813 Gerodontics VII

Availability: Not offered in 1992.

Points value: 16.

Duration: Full year.

Pre-requisites: 4759 Gerodontics VI.

Contact hours: 10 hours per week.

Content: As for 4759 Gerodontics VI.

Assessment: As for 4759 Gerodontics VI.

Text-books/References: As for 4759 Gerodontics VI.

1055 Oral Pathology VI

Points value: 12.

Duration: Full year.

Co-requisites: 5305 Research Methods and Ethics, 4660 Biological and Applied Oral Sciences.

Contact hours: 10 hours per week.

Content: This subject deals with the systematic pathology and histopathology of the oral mucosa, the jawbones, the salivary glands, the temporomandibular joint, the maxillary sinus, the teeth, cancer of the oral region and odontogenic tumours at the postgraduate level. During the two year programme candidates are involved in both theoretical and practical aspects of general pathology and all facets of diagnostic oral histopathology. A minor research project is undertaken as part of the programme. At the completion of the course the student will be a competent diagnostician with comprehensive knowledge of all aspects of diagnostic oral histopathology.

Assessment: Assessment will be arranged in consultation with the co-ordinator.

Text-books/References: Students are notified during the course of the relevant texts.

4133 Oral Pathology VII

Availability: Not offered in 1992.

Points value: 16.

Duration: Full year.

Pre-requisites: 1055 Oral Pathology VI.

Contact hours: 10 hours per week.

Content: As for 1055 Oral Pathology VI.

Assessment: As for 1055 Oral Pathology VI.

Text-books/References: As for 1055 Oral Pathology VI.

1597 Oral and Maxillofacial Surgery VI

Points value: 12.

Duration: Full year.

Pre-requisites: Successful completion of the Primary Examinations of the Royal Australian College of Dental Surgeons and satisfactory progress with employment at the Royal Adelaide Hospital.

Contact hours: Part time course with concurrent appointment as Junior Registrar with the Royal Adelaide Hospital.

Content: The course covers all academic and clinical aspects of modern Oral and Maxillofacial Surgery. This includes dento alveolar surgery, maxillofacial injuries, preprosthetic surgery including implants, orthognathic surgery, temporomandibular joint surgery and aspects of cleft surgery and head and neck oncology.

Assessment: Students will be advised of assessment format during the course.

Text-books/References: All current texts and relevant journals.

1449 Oral and Maxillofacial Surgery VII

Points value: 16.

Duration: Full year.

Pre-requisites: 1597 Oral and Maxillofacial Surgery VI.

Co-requisites: Selected subjects from second and third years of M.B.B.S. programme.

Contact hours: As for 1597 Oral and Maxillofacial Surgery VI.

Content: As for 1597 Oral and Maxillofacial Surgery VI.

Assessment: As for 1597 Oral and Maxillofacial Surgery VI.

Text-books/References: As for 1597 Oral and Maxillofacial Surgery VI.

1764 Orthodontics VI

Points value: 12.

Duration: Full year.

Co-requisites: 5305 Research Methods and Ethics, 4660 Biological and Applied Oral Sciences.

Contact hours: 30 hours per week.

Content: Normal growth changes of the body in general, and of the craniofacial complex in particular, with reference to growth of the jaws, eruption of the teeth and development of normal occlusion.
Applied anatomy of the head and neck with special reference to the temporomandibular joint and to the muscles that attach directly and indirectly to the mandible.
The physiology of the stomatognathic system, and in particular the physiology of sucking,

mastication, deglutition, respiration and phonation, and the effect that soft tissues have on the developing occlusion.
A study of growth and development, encompassing embryology, histology, genetics, anthropology and oral pathology.
The principles of examination and orthodontic diagnosis on patients, which involves cephalometrics and radiology.
A detailed study of the periodontium and its reaction to orthodontic tooth movement.
The properties and uses of orthodontic materials.
Cleft palate and other dento-facial deformities and their surgical management.
Clinical orthodontic treatment with fixed appliances, including Begg and Edgewise techniques is a major component.

Assessment: Assessment will be arranged in consultation with the co-ordinator.

Text-books/References: Students will be notified at the commencement of the course of the relevant texts.

6708 Orthodontics VII

Points value: 16.

Duration: Full year.

Pre-requisites: 1764 Orthodontics VI.

Contact hours: 10 hours per week.

Content: As for 1764 Orthodontics VI.

Assessment: As for 1764 Orthodontics VI.

Text-books/References: As for 1764 Orthodontics VI.

4871 Paedodontics VI

Points value: 12.

Duration: Full year.

Co-requisites: 5305 Research Methods and Ethics, 4660 Biological and Applied Oral Sciences.

Contact hours: 10 hours per week.

Content: Specialised treatment of the Paediatric Dental patient requires increased knowledge, understanding and expertise in many of the areas of dentistry, particularly in behaviour modification. Individual preventative programmes for all types of child and adolescent patients including the medically compromised patient are a prerequisite for comprehensive dental care of the child and adolescent. Areas of increased expertise would include preventive dentistry, community dentistry, infant oral health care, aesthetic considerations, minor oral surgery procedures, growth and development of the teeth and jaws, interceptive orthodontics including the use of removable appliances, spacemaintaining and minor fixed appliances, the treatment of severe dental trauma and endodontics in children.
Seminars and clinical tutorials on patients with severe dental and medical problems will be undertaken. The student will also gain experience and improve their skills in teaching and producing audiovisual aids. Selected topics for review are required in addition to the research project. Clinical experience will be provided in The Adelaide Dental Hospital, The Adelaide Medical Centre for Women and Children and The Somerton Park School of Dental Therapy.

Assessment: Students will be advised of assessment format during the course.

Text-books/References: All current texts and relevant journals.

6968 Paedodontics VII

Availability: Not offered in 1992.

Points value: 16.

Duration: Full year.

Pre-requisites: 4871 Paedodontics VI.

Contact hours: 10 hours per week.

Content: As for 4871 Paedodontics VI.

Assessment: As for 4871 Paedodontics VI.

Text-books/References: As for 4871 Paedodontics VI.

4989 Periodontics VI

Points value: 12.

Duration: Full year.

Pre-requisites: Two years' clinical experience.

Co-requisites: 5305 Research Methods and Ethics, 4660 Biological and Applied Oral Sciences.

Contact hours: 10 hours per week.

Content: The course covers: (1) the macro and micro anatomical aspects of the alveolus that influence the pathogeneisis of alveolar disease. (2) Fundamental biological properties of indigenous bacteria and their role in the etiology of human disease. (3) The epidemiology of the periodontal diseases. (4) The prevalence of physiological and pathological changes in the alveolus of dry skulls (anthropological aspects of periodontal tissues). (5) Concepts of human chronic disease and their relevance to periodontics. (6) Behavioural component of periodontal disease. (7) Environmental component of periodontal disease. (8) Clinical studies and management of periodontal pathoses.

Assessment: Assessment is based upon seminar performance, essays, research and clinical work.

Text-books/References: All current texts and relevant journals.

3123 Periodontics VII

Availability: Not offered in 1992.

Points value: 16.

Duration: Full year.

Pre-requisites: 4989 Periodontics VI.

Contact hours: 10 hours per week.

Content: As for 4989 Periodontology VI.

Assessment: Assessment is based upon seminar performance, essays, research and clinical work.

Text-books/References: All current texts and relevant journals.

1924 Prosthodontics VI

Points value: 12.

Duration: Full year.

Co-requisites: 5305 Research Methods and Ethics, 4660 Biological and Applied Oral Sciences.

Contact hours: 10 hours per week.

Content: The subject considers at an advanced level the management of edentulous

patients. Areas covered include diagnosis and treatment planning, principles of complete denture design including retention, support, stability and tissue preservation, complete denture construction and the planning and construction of immediate dentures.

Assessment: Assessment is based upon seminar performance, essays, research and clinical work.

Text-books/References: All current texts and relevant journals.

5321 Prosthodontics VII

Availability: Not offered in 1992.

Points value: 16.

Duration: Full year.

Pre-requisites: 1924 Prosthodontics VI.

Contact hours: 10 hours per week.

Content: As for 1924 Prosthodontics VI.

Assessment: As for 1924 Prosthodontics VI.

Text-books/References: As for 1924 Prosthodontics VI.

7749 Tropical Oral Pathology VI

Points value: 12.

Duration: Full year.

Co-requisites: 5305 Research Methods and Ethics, 4660 Biological and Applied Oral Sciences.

Contact hours: 10 hours per week.

Content: This subject covers all aspects of oral pathology as described for 1055 Oral Pathology VI and 4133 Oral Pathology VII but with major emphasis on those diseases relevant to tropical regions. The course also includes work related to consideration of climatic, geographical, environmental and social factors impinging on minor research project which has relevance to the tropics is also undertaken.

Assessment: Assessment is based upon seminar performance, essays, research and diagnostic histopathology work.

Text-books/References: All current texts and relevant journals.

8547 Tropical Oral Pathology VII

Availability: Not offered in 1992.

Points value: 16.

Duration: Full year.

Pre-requisites: 7749 Tropical Oral Pathology VI.

Contact hours: As for 7749 Tropical Oral Pathology VI.

Content: As for 7749 Tropical Oral Pathology VI.

Assessment: As for 7749 Tropical Oral Pathology VI.

Text-books/References: As for 7749 Tropical Oral Pathology VI.

DEGREE OF

MASTER OF SCIENCE IN DENTISTRY

REGULATIONS

1. (a) The Faculty of Dentistry may accept as a candidate for the degree any person who:

(i) has qualified in the University of Adelaide for the degree of Bachelor of Dental Surgery and for the Honours Degree of Bachelor of Science in Dentistry with First or Second Class Honours;

(ii) has qualified for a degree in dentistry and whose qualifications are regarded by the Faculty as equivalent to those specified in sub-section (i) hereof; or

(iii) has qualified for a degree or degrees other than in Dentistry which the Faculty regards as equivalent to the qualifications specified in sub-section (i) hereof.

(b) In exceptional cases and with the approval of the Board of Graduate Studies, acting with authority wittingly devolved to it by Council, Faculty may accept as a candidate for the degree a person who does not hold a degree of a university but who possesses qualifications and experience, in a relevant area, which satisfies Faculty that the person is a suitable candidate for advanced work.

(c) A candidate shall not be admitted to the degree before the expiration of two calendar years from the date of admission to candidature.

2. To qualify for the degree, a candidate shall:

(a) complete satisfactorily, in the University of Adelaide or at an institution approved for the purpose by the Faculty, an approved course of study and research of a minimum duration of two calendar years and a maximum of three calendar years. In the cases of half-time candidates, the requirements will be a minimum of four calendar years and a maximum of six calendar years;

(b) perform satisfactorily an original research project which shall comprise the whole or at least the great majority of the course in sub-section (a) hereof;

(c) submit a satisfactory thesis on the subject of the research project which contributes to the knowledge of that subject; and

(d) pass such examinations as the Master's Examination Committee may determine.

3. (a) A person who wishes to become a candidate for the degree shall apply to the Registrar indicating in general terms the subject and outline of the proposed research project and where applicable the proposed course of study for examination.

(b) For each candidate, the Faculty shall appoint a supervisor or supervisors for guidance.

4. Unless the Faculty expressly approve an extension of time in a particular case, the thesis shall be submitted and the other work for the degree (if any) completed:

(a) in the case of a full-time candidate, within three calendar years from the date of admission to candidature; or

(b) in the case of a half-time candidate, who is able to devote at least half of the time to the approved programme of work for the degree as prescribed in regulation 2, within six calendar years from the date of admission to candidature.

5. A candidate's progress shall be reviewed by the Master's Examination Committee at the end of the first year of the course or the second year in the case of half-time candidates. If, in the opinion of the Committee, a candidate is not making satisfactory progress the Faculty may, with the consent of the Council, terminate the candidature.

6. (a) On completion of his work the candidate shall lodge with the Registrar three copies of the thesis which shall be prepared in accordance with directions given from time to time.

(b) The Faculty shall appoint examiners of the thesis at least one of whom shall be an external examiner.

(c) The examiners may recommend that a candidate be examined orally or otherwise on the subject of the thesis and the general field of knowledge in which it falls.

7. (a) For each candidate the Faculty shall appoint a Master's Examination Committee which shall:

(i) recommend the appointment of examiners under regulation 6(b);

(ii) consider the reports of the examiners of the research report and the results of any examination; and

(iii) recommend the appointment of examiners—

a. to examine a candidate under regulation 2(d); and

b. to examine a candidate under regulation 6(c) if it concurs with a recommendation by the examiners under the regulation.

(b) The Master's Examination Committee may recommend to Faculty through the Higher Degrees and Scholarships Committee that the candidate:

(i) be awarded the degree;

(ii) be awarded the degree subject to such minor amendments of the thesis as the examiners may have suggested;

(iii) be not awarded the degree but be allowed to revise and resubmit the thesis within such period as the Faculty may allow; or

(iv) be not awarded the degree.

8. A candidate who complies with the foregoing conditions and satisfies the Examination Committee shall, on the recommendation of the Faculty, be awarded the degree of Master of Science in Dentistry.

Regulations allowed 24 February, 1983; 21 Feb, 1991: 1.

DEGREE OF

DOCTOR OF DENTAL SCIENCE

REGULATIONS

1. A person shall not be accepted as a candidate for the degree of Doctor of Dental Science until the expiration of at least four years from admission to the degree of Bachelor of Dental Surgery in The University of Adelaide. Provided that, in the case of a graduate in dentistry of another university who has been admitted *ad eundem gradum* in the University of Adelaide, the period of four years shall be reckoned from the date of the first graduation in dentistry.

2. Except in special cases approved by the Board of Graduate Studies, acting with authority wittingly devolved to it by Council only persons who have been admitted to the degree of Master of Dental Surgery or Master of Science in Dentistry or Doctor of Philosophy may become candidates for the degree of Doctor of Dental Science.

3. (a) A person who desires to become a candidate for the degree shall give notice of the intended candidature in writing to the Registrar. At the same time, and in a separate statement, the applicant shall furnish particulars of personal achievements and a summary of the progress of knowledge relevant to the work proposed for the degree, and indicate where it is considered that the work advances dental knowledge or practice.

(b) The Faculty of Dentistry shall appoint a committee to investigate the information submitted, including the nature and scope of the work to be submitted, and to advise the Faculty as to whether Faculty should (i) allow the applicant to proceed, and approve the subject or subjects of the work to be submitted; or (ii) advise the applicant not to submit the work; and the Faculty's decision shall be conveyed to the applicant.

(c) If the candidature is accepted and the candidate proceeds with the submission, Faculty shall approve at least two examiners recommended by the committee of whom at least one shall be external to the University.

(d) The thesis may be written specially for the degree, or may be an already published work, or may be a series of papers. It shall not be a compilation from books, nor a mere compendium of cases, nor merely observational. On the recommendation of an examiner, a candidate may be required to undergo examination in the subject matter of, or in subjects cognate to, the thesis.

(e) In submitting published works, the candidate shall state generally in a preface and specifically in notes, the main sources from which the information was derived and the extent to which the work of others has been included, especially where joint publications are concerned. The candidate may also signify in general terms those parts of the work that are claimed as original. The candidate is also required to indicate what part, if any, of the work has been submitted for a degree in this or any other university.

4. To qualify for the degree, the candidate must satisfy the examiners that the thesis makes an original contribution of distinguished merit and advances knowledge in some branch of dental science.

5. The candidate shall lodge with the Registrar three copies of the work prepared in accordance with the directions given in sub-paragraph (b) of clause 2B of Chapter XXV of the Statutes. If the work is accepted for the degree the Registrar will transmit two of the copies to the University Library.

6. On receipt of the reports of the examiners appointed to adjudicate upon the thesis the Faculty of Dentistry will recommend whether the degree be granted or withheld or delayed.

7. Notwithstanding anything contained in the preceding regulations, the Faculty may in exceptional circumstances recommend the award of the degree to any person who is not a member of the staff of the University. Any such recommendation must be accompanied by

evidence that the person for whom the award is proposed has made an original and substantial contribution of distinguished merit to some branch of dental science.

Regulations allowed 10 December, 1942.
Amended: 16 Mar. 1961: 5; 15 Jan. 1976: 7; 4 Feb. 1982: 5; 1 Mar. 1984: 2, 7.
Regulations repealed and substituted 1 Mar. 1989; 21 Feb, 1991: 2.

FACULTY OF ENGINEERING

REGULATIONS, SCHEDULES AND SYLLABUSES

Bachelor of Engineering (B.E.)

Graduate Diploma in Computer Systems Engineering (Grad.Dip.Comp.Sys.Eng.)

Master of Engineering (M.E.)

Master of Engineering Science (M.Eng.Sc.)

Master of Applied Science (M.App.Sc.)

Doctor of Philosophy (Ph.D.)

Regulations and Schedules under "Board of Graduate Studies"—*see* Contents

Doctor of Engineering (D.E.)

NOTE:

Graduate Certificate in Telecommunications (Grad.Cert. Telecommunications): — This course is jointly managed with the Faculty of Mathematical and Computer Sciences.

DEGREE OF

BACHELOR OF ENGINEERING

REGULATIONS

1. (a) There shall be a degree of Bachelor of Engineering which may be awarded in the Pass or Honours grade.

(b) The award of the Honours grade shall be made for meritorious performance in the course with greatest weight given to performance in the later years.

(c) The Honours grade may be awarded in one of the following classifications: First Class, Second Class Division A, Second Class Division B.

2. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the degree; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approved by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

3. Except by permission of the Faculty a candidate shall not be admitted to the class in any subject for which the candidate has not completed the pre-requisite work prescribed in the syllabus for that subject.

4. (a) To qualify for the degree a candidate shall regularly attend lectures and do written, laboratory, and other practical work (where such is required), and pass examinations in the subjects prescribed for one of the following Engineering courses:

(i) Chemical Engineering;

(ii) Civil Engineering.

(iii) Computer Systems Engineering

(iv) Electrical and Electronic Engineering;

(v) Mechanical Engineering;

(b) Before being admitted to the degree a candidate shall also submit satisfactory evidence of completion of a period of practical experience in work approved by the Faculty of Engineering as appropriate to the course which the candidate has followed.

5. (a) Examinations in any subject or part of a subject shall be held in accordance with the provisions of the relevant schedule made under these regulations.

(b) A candidate shall not be eligible to attend for examination unless the prescribed work has been completed to the satisfaction of the teaching staff concerned. A candidate who is not eligible to attend for examination shall be deemed to have failed the examination.

(c) In determining a candidate's final result in a subject (or part of a subject) the examiners may take into account oral, written, practical and examination work, provided that the candidate has been given adequate notice of the way in which work will be taken into account and of its relative importance in the final result.

(d) There shall be three classifications of pass at an annual examination in any subject for the degree, as follows: Pass with Distinction, Pass with Credit, Pass. If the pass list be published in two divisions, a pass in the higher division may be prescribed in the syllabuses as pre-requisite for admission either to further courses in that subject or to other subjects.

There shall also be a classification of Conceded Pass. A candidate may present for the degree only a limited number of subjects for which a Conceded Pass has been awarded, as specified in the relevant schedule made under these regulations.

(e) A candidate who fails to pass in any subject shall again attend lectures and do practical work in that subject, to the satisfaction of the professors and lecturers, unless exempted by the Faculty of Engineering. Any such exemption shall hold for one academic year only.

(f) Supplementary examinations in any subject will be held only in special circumstances approved by the department administering such subject, and consistent with any expressed Council policy, after consideration of individual cases.

6. Except in case of illness or other sufficient cause allowed by the Council, no candidate shall be credited in any year with attendance at lectures or laboratory work in a subject unless the candidate has attended at least three-fourths of the lectures and laboratory work respectively in that subject.

7. No candidate shall be granted exemption from attendance at lectures or practical work in any subject, except upon grounds approved by the Council.

8. A candidate who has twice failed to pass the examination in any subject or division of a subject may not present again for instruction or examination therein unless the candidate's plan of study is approved by the Dean. If the candidate fails a third time the candidate may not proceed with the subject again except by special permission of the Faculty, and under such conditions as the Faculty may prescribe.

For the purpose of this regulation a candidate who is refused permission to sit for examination in any subject or division of a subject shall be deemed to have failed to pass the examination.

9. A student who has passed examinations *in pari materia* in another faculty or otherwise, or who desires that work at other universities or technical schools should be counted *pro tanto* for the degree of Bachelor of Engineering, may on application be granted such exemption from the requirements of these regulations as the Council shall determine.

Regulations allowed 11 December, 1947.

Amended: 8 Dec. 1949: 4; 11 Nov. 1954: 10, 11; 22 Dec. 1955: 5; 20 Dec. 1956: 5, 9; Jan. 1958: 3, 11; 15 Jan. 1959: 4: 4 Oct. 1962: 11; 4 Apr. 1963: 4, 10; 28 Jan. 1965: 4, 10, 11; 4 Nov. 1965: 11; 21 Dec. 1967: 4, 11; 24 Dec. 1969: 11, 15 Jan. 1976: 2; 23 Dec. 1976: 11; 2 Feb. 1978: 5; 4 Feb. 1982: 5; 24 Feb. 1983: 2, 4, 10; 17 Jan. 1985: 5(d), 11(d). 1 Mar. 1990: 1, 4, 5, 10, 11. 21 Feb. 1991: 5. Awaiting allowance: 2(b), 4(a), 5(b), 6, 8, 9.

DEGREE OF

BACHELOR OF ENGINEERING

SCHEDULES

(Prescribed by the Council under Regulation 2.)

NOTE: Syllabuses of subjects for the degree of B.E. are published below, immediately after these schedules. For syllabuses of subjects taught for other degrees and diplomas see the table of subjects at the end of the volume.
The availability of all subjects and options is subject to the availability of staff and facilities.

SCHEDULE I: ARRANGEMENT OF COURSES

The courses shall occupy four years of full-time study. Details of these courses are set out in schedules IV, V, VI, VII and VIII.

SCHEDULE II: COMPLETION OF SUBJECTS

It is not necessary for a candidate to take all the subjects of any one level simultaneously or to complete all the subjects set out for one level before enrolling for any subject of the following level provided that the pre-requisite subjects have been passed. However a candidate who desires to take a Level III subject before completing all Level I subjects, or a Level IV subject before completing all Level II subjects, must obtain the permission of the Faculty.

Note: (Not forming part of the Schedule):
Under the terms of Clause 4C of Chapter XXV of the Statutes, the Faculty of Engineering may review the academic progress of any candidate in circumstances where the following conditions apply:

(a) **Candidates NOT previously enrolled in a different course**
Candidates who, on account of failure and/or Division II passes (where Division I passes are required) in subjects prescribed for an engineering course, have not completed or will not complete all the subjects prescribed for the first two years of their course for the degree of Bachelor of Engineering by the end of their third year of full-time study for the course (or, in the case of part-time candidates, by the end of an equivalent period).

(b) **Candidates previously enrolled in a different course**
A candidate who transferred from another Faculty will be subject to the same conditions as candidates enrolled in the Faculty for the first time. Any previous studies which are to be counted towards the Engineering degree will be treated as part of the candidate's study for the Engineering course for Clause 4C purposes.

Depending on the circumstances, the Faculty may recommend to the Council that a candidate be refused permission to enrol in the next ensuing academic year or be precluded from taking further studies in the course.

SCHEDULE III: APPROVAL OF SUBJECTS

During the enrolment period before the beginning of each academic year each candidate must obtain the approval of the Dean or nominee of the Faculty of Engineering to enrol for the subjects he/she wishes to study. The Dean or nominee, in exceptional circum-

stances, may approve minor variations to the subject completion requirements of individual candidates.

SCHEDULE IV: CHEMICAL ENGINEERING

Candidates are required to satisfactorily complete subjects to the value of 24 points at each of Levels I, II, III and IV.

(Note: The points value of subjects is indicated after each subject title.)

LEVEL I

9786	Mathematics I	6.0	5729	Engineering Computing I	1.5
6878	Chemistry I	6.0	2853	Engineering Planning and Design	1.5
9167	Design Graphics	1.5	6866	Materials I	1.5
2391	Dynamics	1.5	3018	Process Systems	1.5
6714	Electrical Systems	1.5	6581	Statics	1.5

LEVEL II

1016	Differential Equations and Fourier Series E	2.0	7543	Process Heat Transfer	1.5
2187	Vector Analysis and Complex Analysis	2.0	5022	Stress Analysis A	1.5
4569	Laplace Transforms and Probability and Statistical Methods	2.0	8601	Introductory Process Fluid Mechanics	2.0
9653	Chemistry IIE	8.0	8845	Chemical Engineering Projects II(N)	2.0
6283	Chemical Process Principles II	3.0	3798	Chemical Engineering Thermodynamics***	2.0

Law Subjects***

1826	Australian Legal System	6.0
3731	Contract	6.0

Note: A candidate who has completed Level II of the Chemical Engineering course and who wishes to qualify for the B.Sc. and B.E. degrees concurrently is recommended to undertake one year of full-time study within the Faculty of Science to qualify for the degree of Bachelor of Science, before proceeding to further studies within the Faculty of Engineering. A student who wishes to do this is required to submit an application for admission to the Science degree course through the South Australian Tertiary Admissions Centre.

LEVEL III

9816	Fluid and Particle Mechanics	3.0	8310	Process Control and Instrumentation	2.5
7738	Materials III(C)	1.5	5909	Transport Phenomena	2.0
1345	Mechanism Design	1.5	5815	Electrical Circuits and Machines	1.5
5578	Separation Processes	2.0	8083	Process Design	1.0
3824	Chemical Engineering Projects III	4.0	6758	Level III Elective	1.5
8415	Seminar	1.0			
8462	Kinetics and Reactor Design	2.5			

Law Subjects***

9365	Torts	6.0
8433	Constitutional Law	6.0

*** These subjects are only available to students who have been admitted to the LL.B. course.

LEVEL IV

2932	Advanced Separation Techniques & Thermal Processes 2.0	4459	Chemical Engineering Laboratory Projects IV 2.0
1488	Process Dynamics and Control 2.0	7348	Industrial Economics and Management 2.0
8014	Chemical Engineering Research Project 2.0	5058	Plant Design Project 6.0

Law Subject***

8821 Property 6.0

Electives: 4 electives to be selected from the following list*. With the approval of the Head of the Department of Chemical Engineering, subjects offered by other departments within the University may be included in the selection of electives.

3324	Reaction Engineering 2.0	9949	Industrial Rheology 2.0
6238	Advanced Materials Engineering 2.0	1532	Minerals Processing 2.0
2098	AI Applications in Engineering Design 2.0	6856	Particulate Technology 2.0
2532	Biochemical Engineering 2.0	9871	Plant and Safety Engineering 2.0
4668	Biomedical Engineering 2.0	2088	Special Management Studies 2.0
8723	Combustion Processes 2.0	1872	Thermal Process Synthesis and Integration 2.0
9988	Environmental Engineering 2.0	1172	Special Studies in Chemical Engineering 2.0
5734	Hydrocarbon Reservoirs 2.0		

Note (not forming part of the Schedules):
Law: Studies within the B.E.(Chem) course.
1. Candidates who have successfully completed subjects to the value of 24 points at Level I of the B.E.(Chem) course are eligible to apply for admission to the course for the degree of LL.B. If admitted, candidates may count certain Law subjects towards both the degree of B.E.(Chem) and the degree of LL.B. Candidates may apply for admission to the course for the degree of LL.B. through the South Australian Tertiary Admissions Centre by mid October of their first year in the B.E.(Chem) course.
2. For candidates who wish to qualify both for the award of the degree of B.E.(Chem) and the award of the degree of LL.B., the following programme of study is recommended:

First Year

All Level I subjects in the B.E.(Chem) course. (Total points: 24)

Second Year (The points value of subjects is indicated after each subject title)

1826	Australian Legal System 6.0	3731	Contract 6.0
1016	Differential Equations & Fourier Series E 2.0	4569	Laplace Transforms and Probability and Statistical Methods 2.0
2187	Vector Analysis and Complex Analysis 2.0	8845	Chemical Engineering Projects II(N) 2.0
6283	Chemical Process Principles II 3.0	3789	Chemical Engineering Thermodynamics 2.0
8601	Introductory Process Fluid Mechanics 2.0	7543	Process Heat Transfer 1.5

Third Year

9365	Torts 6.0	8433	Constitutional Law 6.0
3824	Chemical Engineering Projects III 4.0	9816	Fluid and Particle Mechanics 3.0
8462	Kinetics & Reactor Design 2.5	7738	Materials III(C) 1.5
8310	Process Control & Instrumentation 2.5	5578	Separation Processes 2.0
6758	Level III Elective 1.5		

* Not all subjects are offered each year. Information as to which subjects are to be offered in a given year will be available from the Department at the time of enrolment.

*** These subjects are only available to students who have been admitted to the LL.B. course.

Fourth Year

8821 Property 6.0
4459 Chemical Engineering Laboratory Projects IV 2.0
9988 Environmental Engineering 2.0
5058 Plant Design Project 6.0
2932 Advanced Separation Techniques & Thermal Processes 2.0
8014 Chemical Engineering Research Project 2.0
7348 Industrial Economics & Management 2.0

Either:
1488 Process Dynamics & Control 2.0
or
6238 Advanced Materials Engineering 2.0

Note: to complete the B.E.(Chem) and LL.B. degree courses in minimum time, candidates are required to take all these subjects even though it involves an overload in Second and Third Year.

Fifth and Six Years

In accordance with LL.B. Schedules.

3. See also the Schedules of the LL.B. degree and see, in particular, the Introductory Notes in the LL.B. Syllabuses.

SCHEDULE V: CIVIL ENGINEERING

Candidates are required to satisfactorily complete subjects to the value of 24 points at each of Levels I, II, III and IV.

(Note: The points value of subjects is indicated after each subject title.)

LEVEL I

9786 Mathematics I 6.0
5599 Physics IHE* 3.0
7422 Chemistry IHE* 3.0
9167 Design Graphics 1.5
2391 Dynamics 1.5
6714 Electrical Systems 1.5
5729 Engineering Computing I 1.5
2853 Engineering Planning and Design 1.5
6866 Materials I 1.5
3018 Process Systems 1.5
6581 Statics 1.5

LEVEL II

1016 Differential Equations and Fourier Series E 2.0
2187 Vector Analysis and Complex Analysis 2.0
4569 Laplace Transforms and Probability and Statistical Methods 2.0
3732 Geology IHE* 3.0
5484 Strength of Materials II 2.5
9290 Design of Structures II 4.0
4100 Water Engineering II 1.5
3290 Geotechnical Engineering II 2.0
3107 Surveying 1.5
8795 Civil Engineering Construction 1.5
4760 Numerical and Computing Methods in Engineering II 2.0

LEVEL III

8128 Structural Mechanics III 2.5
6859 Structural Design III (Steel) 3.0
4967 Structural Design III (Concrete) 3.0
8227 Water Engineering and Design III 4.0
9245 Geotechnical Engineering III 2.0
9566 Management and Planning 2.0
4611 Environmental Engineering III 2.0
7455 Numerical and Computing Methods in Engineering III 2.0

* with the approval of the Faculty a student may undertake the corresponding first-year science subject in place of this subject.

and either the two subjects

3967 Environmental Design III 0.5
8260 Environmental Chemistry 3.0

or the two subjects

4919 Heat Transfer and Design 2.0
5815 Electrical Circuits and Machines 1.5

LEVEL IV

8046 Water Engineering IV 1.5
9978 Geotechnical Engineering IV 1.5
6944 Instrumentation and Computing IV 2.0
6026 Management, The Profession and Society 2.0
6211 Civil Engineering Design Project 4.0
5880 Civil Engineering Research Project 4.0

either

2872 Structural Mechanics IV 3.0

or

6908 Environmental Engineering IV* 3.0

Specialisation Subjects: 3 subjects to be chosen from the following list**. Other suitable subjects offered by other departments within the University may be chosen, with the approval of the Head of the Department of Civil Engineering, in lieu of one or more specialisation subjects.

4174 Specialisation Steel Structures 2.0
8595 Reinforced Concrete Structures Specialisation 2.0
7357 Prestressed Concrete Structures Specialisation 2.0
5076 Structural Dynamics Specialisation 2.0
9785 Steel — Concrete Composite Structures Specialisation 2.0
5252 Structural Engineering Specialisation 2.0
1825 Coastal Engineering Specialisation 2.0
7157 Hydraulics Specialisation 2.0
6719 Hydrology and Water Resources Specialisation 2.0
5865 Water Engineering Specialisation 2.0
2937 Rock Mechanics Specialisation 2.0
9190 Soils Engineering Specialisation 2.0
7040 Geotechnical Engineering Specialisation 2.0
3535 Engineering Systems Planning Specialisation 2.0
4325 Engineering Management Specialisation 2.0
9123 Resource and Infrastructure Management Specialisation 2.0
1963 Earthquake Engineering Specialisation 2.0
5575 Environmental Engineering Specialisation 2.0
8851 Special Studies in Civil Engineering 2.0

SCHEDULE VI: COMPUTER SYSTEMS ENGINEERING

Candidates are required to satisfactorily complete subjects to the value of 24 points at each of Levels I, II, III and IV.

(Note: The points value of subjects is indicated after each subject title.)

LEVEL I

9786 Mathematics I 6.0
3643 Physics I 6.0
9167 Design Graphics 1.5
2391 Dynamics 1.5
6714 Electrical Systems 1.5
5729 Engineering Computing I 1.5
2853 Engineering Planning and Design 1.5
6866 Materials I 1.5
3018 Process Systems 1.5
6581 Statics 1.5

* Not offered in 1992.

** A maximum of six subjects will be offered each year. Information as to which subjects are to be offered in a given year will be available from the Department at the time of enrolment.

LEVEL II

9635	Circuit Analysis E	2.0	2187	Vector Analysis and Complex Analysis	2.0
2772	Electronics IIE	2.0	4569	Laplace Transforms and Probability and Statistical Methods	2.0
2753	Fields and Energy Conversion E	2.0	6733	Concepts of Computer Science	2.0
8969	Experimental Electrical Engineering II	2.0	5132	Programming and Data Structures A	2.0
9289	Physics IIE	4.0	1006	Programming and Data Structures B	2.0
1016	Differential Equations and Fourier Series E	2.0			

LEVEL III

3085	Electronics IIIE	2.0	9753	Digital Systems	2.0
9133	Energy Conversion E	2.0	3655	Numerical Methods	2.0
7091	Fields Lines and Guides E	2.0	*One of*		
9623	Control IIIE	2.0	5022	Stress Analysis A	1.5
8366	Electrical Project	1.0	*or*		
8056	Experimental Electrical Engineering IIIC	2.5	1211	Machine Design*	1.5
1062	Engineering Skills	1.0	*or*		
			1345	Mechanism Design	1.5

Candidates are also required to select Level III subjects offered by the Department of Computer Science to the value of 6 points. In combination with the Level IV requirements below, these should be chosen in such a way that by the completion of Level IV the following eight points of Computer Science subjects will have been passed:

2328	Computer Networks	2.0	7343	Programming Language Concepts	2.0
4468	Operating Systems	2.0	6987	Software Engineering	2.0

LEVEL IV

Candidates are required to select subjects from groups A-F** listed below to the value of at least 18 points. The compulsory subjects have a total value of 16 points, therefore electives to the value of 2 points must be chosen.

A: Communications and Signal Processing

Compulsory Subject:			1008	Advanced Signal Processing	1.0
4907	Communications & Signals	3.0	3471	Circuit Analysis & Synthesis	1.0
Elective Subjects:			7673	Analogue Techniques	1.0
9334	Advanced Communication Theory	1.0			

B: Digital Systems Engineering

Compulsory Subjects:			*Elective Subjects:*		
5072	Digital Electronics & Systems	3.0	6281	Advanced Microprocessors	1.0
5497	Digital Computer Hardware Design	1.0	4526	VLSI Laboratory	1.0
9416	Real Time Systems	1.0	4312	Advanced VLSI	1.0

* Not offered in 1992.

** Not all subjects are offered each year. Information as to which subjects are to be offered in a given year will be available from the department at the time of enrolment. Timetables for Level III Computer Science subjects will be available at enrolment time.

C: Electromagnetic Engineering

Elective Subjects:

3846 Electromagnetic Engineering 2.0
5650 Advanced Electromagnetic Engineering 1.0
1290 Optical Communications 1.0

D: Industrial Power & Control

Elective Subjects:

7027 Control IV 1.0
2283 Power Electronics 1.0
9288 Power Systems & Machine Dynamics A 2.0
1560 Advanced Control 1.0
8323 Power Systems & Machine Dynamics B 1.0

E: Project Work

Compulsory Subjects:

2356 Project A 2.0
7345 Project B 3.0

F: Professional Practice

Compulsory Subjects:

4053 Management (see note below) 2.0
6341 Essays and Specialist Lectures 1.0

In addition, the subject 7286 Special Studies in Electrical Engineering (1 point) may be taken as an elective.

Candidates are also required to pass Level III subjects offered by the Department of Computer Science to the value of at least 6 points. In combination with the Level III requirements above, the six points of Level III Computer Science subjects should be chosen so that by the completion of Level IV the following eight points of Computer Science subjects will have been passed:

2328 Computer Networks 2.0
4468 Operating Systems 2.0
7343 Programming Language Concepts 2.0
6987 Software Engineering 2.0

Note: with the permission of the Head of Department the subject 3635 Entrepreneurship and Innovation may be offered in place of 4053 Management.

Note: A student who has completed Level III of the Computer Systems Engineering course, and who wishes concurrently to qualify for the degrees of B.E. and B.Sc. (in either the Faculty of Science or the Faculty of Mathematical and Computer Sciences), may undertake one year of full-time study in one of those Faculties at this stage before proceeding to further studies within the Faculty of Engineering. A student who wishes to do this is required to submit an application for admission to the Science or Mathematical Sciences degree course through the South Australian Tertiary Admissions Centre.

Level III and Level IV subjects previously counted towards a degree of Bachelor of Science in the Faculties of Science or Mathematical and Computer Sciences may not be counted towards the degree of B.E. in Computer Systems Engineering. This may affect the subject choice for the B.Sc. degree.

SCHEDULE VII: ELECTRICAL & ELECTRONIC ENGINEERING

Candidates are required to satisfactorily complete subjects to the value of 24 points at each of Levels I, II, III and IV.

(Note: The points value of subjects is indicated after each subject title.)

LEVEL I

9786 Mathematics I 6.0
3643 Physics I 6.0
9167 Design Graphics 1.5
2391 Dynamics 1.5
6714 Electrical Systems 1.5
5729 Engineering Computing I 1.5
2853 Engineering Planning and Design 1.5
6866 Materials I 1.5
3018 Process Systems 1.5
6581 Statics 1.5

LEVEL II

9635	Circuit Analysis E	2.0	
2772	Electronics IIE	2.0	
2733	Fields and Energy Conversion E	2.0	
8969	Experimental Electrical Engineering II	2.0	
2653	Physics II	8.0	
1016	Differential Equations and Fourier Series E	2.0	
2187	Vector Analysis and Complex Analysis	2.0	
4569	Laplace Transforms and Probability and Statistical Methods	2.0	
1642	Linear Programming and Numerical Analysis	2.0	

LEVEL III

3085	Electronics IIIE	2.0	
9133	Energy Conversion E	2.0	
7091	Fields Lines and Guides E	2.0	
9623	Control IIIE	2.0	
8366	Electrical Project	1.0	
8528	Experimental Electrical Engineering III	3.0	
1062	Engineering Skills	1.0	
6733	Concepts of Computer Science	2.0	
5132	Programming and Data Structures A	2.0	
1006	Programming and Data Structures B	2.0	
9753	Digital Systems	2.0	
5022	Stress Analysis A	1.5	
either			
1211	Machine Design*	1.5	
or			
1345	Mechanism Design	1.5	

Note: A student who has completed Level III of the Electrical & Electronic course, and who wishes concurrently to qualify for the degrees of B.E. and B.Sc. (in either the Faculty of Science or the Faculty of Mathematical and Computer Sciences), may undertake one year of full-time study in one of those Faculties at this stage before proceeding to further studies within the Faculty of Engineering. A student who wishes to do this is required to submit an application for admission to the Science or Mathematical Sciences degree course through the South Australian Tertiary Admissions Centre.

LEVEL IV

Candidates are required to pass the compulsory subjects in all groups A-F** listed below and a minimum of 4 points of electives.

A: Communications and Signal Processing

Compulsory Subject:			
4907	Communications & Signals	3.0	
Elective Subjects:			
9334	Advanced Communication Theory	1.0	
1008	Advanced Signal Processing	1.0	
3471	Circuit Analysis & Synthesis	1.0	
7673	Analogue Techniques	1.0	

B: Digital Systems Engineering

Compulsory Subject:			
5072	Digital Electronics and Systems	3.0	
Elective Subjects:			
5497	Digital Computer Hardware Design	1.0	
6281	Advanced Microprocessors	1.0	
4526	VLSI Laboratory	1.0	
4312	Advanced VLSI	1.0	
9416	Real Time Systems	1.0	

C: Electromagnetic Engineering

Compulsory Subject:			
3846	Electromagnetic Engineering	2.0	
Elective Subjects:			
5650	Advanced Electromagnetic Engineering	1.0	
1290	Optical Communications	1.0	

* Not offered in 1992.

** Not all subjects are offered each year. Information as to which subjects are to be offered in a given year will be available from the Department at the time of enrolment.

D: Industrial Power & Control

Compulsory Subject:

7027	Control IV	1.0
2283	Power Electronics	1.0
9288	Power Systems & Machine Dynamics A	2.0

Elective Subjects:

1560	Advanced Control	1.0
8323	Power Systems & Machine Dynamics B	1.0

E: Project Work

Compulsory Subjects:

2356	Project A	2.0
7345	Project B	3.0

F: Professional Practice

Compulsory Subjects:

4053	Management (see note below)	2.0
6341	Essays and Specialist Lectures	1.0

In addition, the subjects 4668 Biomedical Engineering (2 points) or 7286 Special Studies in Electrical Engineering (1 point) may be taken as electives.

Note: with the permission of the Head of Department the subject 3635 Entrepreneurship and Innovation may be offered in place of 4053 Management.

SCHEDULE VIII: MECHANICAL ENGINEERING

Candidates are required to satisfactorily complete subjects to the value of 24 points at each of Levels I, II, III and IV.

(Note: The points value of subjects is indicated after each subject title.)

LEVEL I

9786	Mathematics I	6.0
5599	Physics IHE*	3.0
7422	Chemistry IHE*	3.0
9167	Design Graphics	1.5
2391	Dynamics	1.5
6714	Electrical Systems	1.5
5729	Engineering Computing I	1.5
2853	Engineering Planning and Design	1.5
6866	Materials I	1.5
3018	Process Systems	1.5
6581	Statics	1.5

LEVEL II

1016	Differential Equations and Fourier Series E	2.0
2187	Vector Analysis and Complex Analysis	2.0
4569	Laplace Transforms and Probability and Statistical Methods	2.0
1642	Linear Programming and Numerical Analysis	2.0
1376	Thermodynamics 1	1.5
8781	Fluid Mechanics 1	1.5
4103	Machine Dynamics	1.5
6953	Stress Analysis	1.5
2810	Materials II	1.5
7872	Design for Function	1.5
4766	Design for Strength	1.5
5533	Design Project (Level II)	1.0
6231	Manufacturing Engineering 1	1.5
5815	Electrical Circuits and Machines	1.5
1360	Computational and Experimental Techniques 1	1.5
6710	Workshop Practice (Mechanical)	0.0

* With the approval of the faculty a student may undertake the coresponding first-year Science subject in place of this subject.

LEVEL III

5424	Engineering Mathematics III	2.0	
9813	Thermodynamics 2	1.5	
9900	Heat Transfer	1.5	
5526	Fluid Mechanics 2	1.5	
4109	Solid Mechanics	1.5	
6602	Vibrations	1.5	
5893	Automatic Control	1.5	
2079	Materials III(M)	1.5	
3536	System Design	1.5	
4958	Structural Design Analysis****	1.5	
2046	Design for Manufacture	1.5	
8432	Design Project (Level III)	1.5	
7915	Manufacturing Engineering 2	1.5	
5815	Electrical Circuits and Machines***	1.5	
7980	Electronics	1.5	
6375	Communication and Seminar	1.0	
4066	Computational and Experimental Techniques 2	1.5	

LEVEL IV

4153	Mechanical Engineering Project (Level IV)	10.0	
5802	Management 1A and 1B	1.0	
6393	Engineering Management	2.0	
1483	Computational and Experimental Techniques 3	1.0	

* Electives: a minimum of 5 selected from the following list. With the approval of the Head of the Department of Mechanical Engineering, subjects offered by other departments within the University may be included in the selection of electives. Of the five electives selected not less than three must be those offered by the Department of Mechanical Engineering.

5962	Advanced Automatic Control	2.0	
9463	Advanced Heat and Mass Transfer	2.0	
9274	Advanced Vibrations	2.0	
6804	Airconditioning and Refrigeration	2.0	
4668	Biomedical Engineering**	2.0	
3539	Boundary Layers	2.0	
5769	Gas Dynamics and Compressible Flow Machines	2.0	
3312	Engineering Acoustics	2.0	
1322	Computational Mathematics**	2.0	
2368	Elasticity**	2.0	
3701	Design Automation	2.0	
3635	Entrepreneurship and Innovation**	2.0	
5758	Heat Recovery and Process Integration	2.0	
2742	Mechanical Engineering Elective: Applied Mathematics A**	2.0	
9406	Mechanical Engineering Elective: Applied Mathematics B**	2.0	
4085	Mechanical Engineering Elective A	2.0	
1406	Mechanical Engineering Elective B	2.0	
8404	Special Studies in Mechanical Engineering	2.0	

SCHEDULE IX: EXAMINATIONS

(a) Final examinations in any subject or part of a subject will be held in one of the examination periods defined by the Council following the course of instruction in that subject or part of a subject.

(b) An examination counting as part of a final examination may be held in a part of a subject if the Faculty so approves. Such examinations will be held during one of the examination periods defined by the Council.

(c) Notwithstanding (a) and (b) above, in special circumstances and with the permission of Council, an examination may be held outside the examination period as defined by the Council.

* Not all subjects are offered each year. Information as to which subjects are to be offered in a given year will be available from the Department at the time of enrolment.

** Subject not offered by Department of Mechanical Engineering.

*** Available at Level III only in 1992.

**** Not available in 1992.

SCHEDULE X: CONCEDED PASSES

A candidate may present for the degree subjects for which a conceded pass grade has been awarded within the following limits:

(a) Subjects at Level II or above with an aggregate points value not exceeding 6 points.

(b) Up to two Level I subjects worth 1.5 points taught by departments in the Faculty of Engineering.

SCHEDULE XI: PRACTICAL EXPERIENCE

(a) General

A total of twelve weeks' practical experience is required under regulation 4(b), and this should be undertaken during the university vacations and normally completed before beginning the work of Level IV of the course.

The Faculty may grant either partial or total exemption from the requirements of this schedule to a candidate who produces satisfactory evidence of practical experience obtained before their first enrolment in the Faculty; and in special cases, the Faculty may grant dispensation from the requirements.

Credit will not normally be given for periods of less than three consecutive weeks.

A candidate should seek a variety of practical experience appropriate to the candidate's academic level.

Before beginning a period of practical experience, a candidate may ensure that it will be satisfactory to the Faculty by consulting the Head of the department concerned.

Upon completion of each period of practical experience (and no later than the following 31 March) each candidate is required to submit to the Faculty office, on the prescribed form, a statement of practical experience gained, certified by the employer for approval by the Faculty of Engineering.

(b) Chemical Engineering

It is desirable that at least half of the total number of weeks specified in clause (a) be spent in an approved chemical factory or research establishment on plant operation or industrial research or development.

(c) Computer Systems, Electrical and Electronic and Mechanical Engineering

As part of the total number of weeks specified in clause (a), candidates must complete a programme in Workshop Practice. Candidates in Computer Systems Engineering and Electrical and Electronic Engineering may normally satisfy this requirement by completing the subject 1062 Engineering Skills in Level III. Candidates in Mechanical Engineering must complete the subject 6710 Workshop Practice (Mechanical) which will normally occupy a one-week period during a semester break. On the satisfactory completion of 1062 Engineering Skills or 6710 Workshop Practice (Mechanical) as appropriate, candidates will automatically be credited with one week toward the 12 week work experience requirement.

SCHEDULE XII: TRANSFERS BETWEEN COURSES

The Faculty of Engineering may, subject to such conditions (if any) as it may see fit to impose in each case, permit a student to transfer with status from one Engineering course to another, or from any other course in the University or elsewhere to an Engineering course.

Any student contemplating such transfer should consult the Head of the Engineering Department responsible for the course to which the student wishes to transfer and apply

for admission to the course through the South Australian Tertiary Admissions Centre in the appropriate manner.

The Faculty has considered Technical and Further Education courses and how they articulate with the Bachelor of Engineering. A scheme of credit transfer from certain TAFE courses has been developed. Following admission to the Bachelor of Engineering course any student wishing to claim status must apply to the Faculty. Students must apply for admission to the course through the South Australian Tertiary Admissions Centre or to the University Admissions Officer, particularly concerning Special Entry. A copy of the scheme is held in the Faculty Office.

SCHEDULE XIII: SPECIAL CIRCUMSTANCES

When in the opinion of the Faculty of Engineering special circumstances exist, the Council, on the recommendation of the Faculty in each case, may vary any of the provisions of Schedules I to XIII.

DEGREE OF

BACHELOR OF ENGINEERING

SYLLABUSES

Text-books:

The lists of the text-books were correct at the time that this Volume went to press. It is possible however that amendments to these lists will be made before the start of lectures; and, if so, students attending classes will be notified appropriately by the lecturer concerned.

In general, students are expected to have their own copies of text-books; but they are advised to await advice from the lecturer concerned before buying any particular book. Only the prescribed edition of any text-book should be bought.

Reference books:

Although lists of books and journals for reference purposes are regarded as important, details have not been included in this Volume. These will however be issued from time to time by the departments concerned. It is hoped that all books and journals set for reference will be available to be consulted in the Barr Smith Library.

Examinations:

For each subject students may obtain from the department concerned details of the examination in that subject including the relative weights given to the components (e.g. such of the following as are relevant: assessments, semester or mid-semester tests, essays or other written or practical work, final written examinations, *viva voce* examinations).

LEVEL I

6878 Chemistry I

Level: I.

Syllabus: See under B.Sc. in Faculty of Science.

7422 Chemistry IHE

Level: I.

Points value: 3.0

Duration: Semester I.

Pre-requisites: None.

Assumed knowledge: Year 12 Chemistry and Physics and either Year 12 Mathematics IS or Mathematics I and II.

Contact hours: 3 lectures, 1 tutorial and 3 hours of practical work a week.

Content: An introduction to general chemical ideas, the chemical basis of the properties of materials and the chemical behaviour of important engineering systems. Electronic theories of bonding and the structure of molecules, crystals and metals. The general chemistry of important main group elements and metals. The preparation, chemistry and properties of polymers derived from alkenes, alcohols, acids and amines. Chemical equilibria, electrochemistry and surface chemistry. Rates of chemical reactions.

Assessment: End of semester examination 80%, laboratory work assessed during the practical classes 20%. Further details given in the Preliminary lecture.

Text-books: Chang, R., *Chemistry* (McGraw-Hill); Brown, W. H., *Introduction to Organic Chemistry* 4th edn. (Wadsworth International Students Edition). Students will be required to purchase a pair of safety glasses; advice on suitable types will be given in the Preliminary Lecture.

9167 Design Graphics

Level: I.

Points value: 1.5.

Duration: Semester I, repeated in Semester II.

Pre-requisites: None.

Contact hours: Approximately 13 hours of lectures and 39 hours of practice classes in the design office.

Content: Design graphics is the pictorial language of engineering design; an introduction to sketching, manual drafting and computer-aided design techniques. Layout of engineering diagrams. Vizualisation and representation of 3D objects on 2D media; orthogonal, axonometric, and projections. Specifying size and shape; dimensioning, tolerances, limit and fits. Drafting conventions. Assembly drawings and design presentation. Link between manufacturing techniques and design forms.

Assessment: Continuous assessment plus final examination. Full details at beginning of the semester.

Text-book: Australian Engineering Drawing Handbook; basic principles and techniques, (1987), Institution of Engineers, Australia.

2391 Dynamics

Level: I.

Points value: 1.5.

Duration: Semester I.

Pre-requisites: None.

Appropriate background: Year 12 Mathematics I and II, and Physics.

Contact hours: Approximately 26 hours of lectures and 13 hours of tutorial and practice classes.

Content: Kinematics of particles and rigid bodies; rectilinear, and curvilinear motion; motion relative to moving axis. Kinetics of particles and rigid bodies: application of Newton's Laws, and the principles of work, energy, power, and momentum in mechanical systems. Conservation of energy and momentum.

Assessment: Written examination and performance in tutorial practical classes. Full details at beginning of course.

Text-book: Beer, F. P. and Johnson, E. R., *Mechanics for engineers*, 4th edn. (McGraw-Hill).

6714 Electrical Systems

Level: I.

Points value: 1.5.

Duration: Semester II.

Pre-requisites: None.

Appropriate background: Year 12 Mathematics I and II, and Physics.

Contact hours: Approximately 20 hours of lectures, 8 hours of tutorials and 12 hours of practical classes.

Content: Circuit concepts: definitions and conventions, circuit elements and sources, network topology, analysis of resistive circuits.

Electrodynamics: basic field concepts and definitions, magnetisation and polarisation in practical materials: energy and force production, losses and efficiency, rotating machines.

Principles of electronic circuits: representation of diode and transistor action; waveshaping circuits, amplifiers, logic circuits.

Assessment: A combination of assignments and practical work and final examination. Full details at beginning of course.

6581 Statics

Level: I.

Points value: 1.5.

Duration: Semester II.

Pre-requisites: None.

Appropriate background: Year 12 Mathematics I and II, and Physics.

Contact hours: 26 lectures and 13 tutorials.

Content: Basic Concepts. Concepts of a force and equilibrium at a point. Moments and rigid body statics. Friction forces. Distributed forces. Geometry including areas, volumes, centroids and 2nd moments of Area.

Application to determinate Structures. Pin jointed trusses, beams, shear force, bending moments. Cables, Hydrostatics.

Assessment: Written examination and performance in tutorial work. Full details available at beginning of semester.

Text-book: Beer, F. P. and Johnston, E. R., *Mechanics for engineers,* 4th edn. (McGraw-Hill).

5729 Engineering Computing I

Level: I.

Points value: 1.5.

Duration: Semester I, repeated in Semester II.

Pre-requisites: None.

Appropriate background: Year 12 Mathematics I and II, and Physics.

Contact hours: Approximately 17 hours of lectures, 2 hours of tutorials and 20 hours of practical classes.

Content: Introductory computing: Pascal programming; introduction to engineering applications-oriented software. Introduction to microprocessors and machine language programming.

Assessment: Written examination together with performance in the computer-aided teaching suite and in the microprocessor laboratory in the development and use of software for solving problems relevant to engineering.

2853 Engineering Planning and Design

Level: I.

Points value: 1.5.

Duration: Semester I, repeated in Semester II.

Pre-requisites: None.

Appropriate background: Year 12 Mathematics I and II, and Physics.

Contact hours: 20 lectures, 6 tutorials plus 13 hours of project work.

Content: Introduction to engineering: engineering planning and design methodology: basic systems concepts; creative aspects of design; economic, environmental and social evaluation of engineering projects; decision theory; case studies.

Assessment: Written examination 50% and project work 50%. Full details at beginning of course.

Text-book: Dandy, G. C. and Warner, R. F., *Planning and design of engineering systems,* (Unwin, Hyman), 1989.

6866 Materials I

Level: I.

Points value: 1.5.

Duration: Semester I repeated in Semester II.

Pre-requisites: None.

Appropriate background: Year 12 Mathematics I and II, Physics and Chemistry.

Contact hours: 26 lectures plus 13 hours laboratory.

Content: The mechanical properties of materials, the distinction between elastic and plastic deformation of crystalline solids, the theoretical strength of crystalline solids, dislocations. Rheological properties of materials, models of viscoelastic behaviour. The formation of crystalline solids. Direct observation of the microstructure of materials. The Gibbs phase rule and its application to the interpretation of phase diagrams. Phase transformations under equilibrium and non-equilibrium conditions with particular reference to binary systems of special engineering significance. The failure of materials in engineering service.

Assessment: Written examination and performance in laboratory classes. Full details at beginning of course.

Text-books: Askeland, D. R., *The science and engineering of materials* SI edn. (Van Nostrand, Reinhold).

3018 Process Systems

Level: I.

Points value: 1.5.

Duration: Semester II.

Pre-requisites: None.

Appropriate background: Year 12 Mathematics I and II, Chemistry and Physics.

Contact hours: Approximately 26 hours of lectures and 13 hours of tutorial and practice classes.

Content: Introduction to process systems; conservation of mass, energy and momentum; transfer of mass, energy and momentum. Application of basic physico-chemical principles to solving simple engineering problems e.g. in combustion, energy conversion, electric power generation, fluid flow, heat transfer, and mass transfer.

Assessment: Written examination and performance in tutorial and practical classes. Full details will be provided at the beginning of the course.

Text-books: To be advised.

9786 Mathematics I

Level: I.

Syllabus: See under B.Sc. in the Faculty of Mathematical Sciences.

3643 Physics I

Level: I.

Syllabus: See under B.Sc. in the Faculty of Science.

5599 Physics IHE

Level: I.

Points value: 3.0.

Duration: Semester I.

Pre-requisites: None.

Assumed knowledge: A good knowledge of Year 12 Physics and Year 12 Mathematics I and II will be assumed.

Co-requisites: Students are strongly encouraged to take 9786 Mathematics I in parallel with this course.

Contact hours: 3 lectures, 1 tutorial and 3 hours of practical work a week. For the practical work students must provide a bound notebook consisting of alternate lined and graphical pages.

Content: The lectures are part of 3643 Physics I and include the following topics:

Classical Mechanics (calculus based): vector kinematics, applications of Newton's laws, gravitation, conservative forces, collisions, statics, rotational motion, non-inertial frames of reference. Kinetic Theory and Thermodynamics: gas laws, Maxwell-Boltzmann distribution, mean free path, reversible processes, entropy, black-body radiation. Oscillations: simple harmonic motion, damped, forced and natural oscillations. Waves: superposition, harmonic waves, Doppler effect. Relativity: Einstein's postulates, time dilation, length contraction, Lorentz transformations, velocity addition, relativistic momentum and energy.

Assessment: Mainly on written examination, but includes assignments and practical work.

Text-book: Giancoli, D. C., *Physics for science and engineering with modern physics* (Prentice-Hall).

References: Ohanian, H. C., *Physics*, 2nd extended edn. (Norton); Halliday, D. and Resnick, R., *Physics* 3rd edn. (Wiley); Marion, J. B. and Hornyak, W. F., *Physics for science and engineering* (Holt-Saunders); Sears, F. W., Zemansky, M. W. and Young, H. D., *University Physics* 7th edn. (Addison-Wesley).

CHEMICAL ENGINEERING

LEVEL II

1016 Differential Equations and Fourier Series E

Level: II.

Points value: 2.

Duration: Semester I.

Pre-requisite: 9786 Mathematics I (Div. 1).

Restriction: This subject may not be presented towards a degree together with 7243 Differential Equations II.

Contact hours: 2 weekly lectures plus 1 tutorial and 1 hour practical a fortnight.

Content: Ordinary and partial differential equations. Fourier series for functions of arbitrary period half range expansions, even and odd functions, complex form of Fourier series. Applications in boundary value problems.

Assessment: Final examination. A small percentage will be allocated to class exercises and computing. A satisfactory performance in computing exercises is a necessary pre-requisite for a pass in this subject.

Text-books: Kreyszig, E., *Advanced Engineering Mathematics*, 6th edn. (Wiley).

4569 Laplace Transforms and Probability and Statistical Methods

Level: II.

Points value: 2.0

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Contact hours: 2 weekly lectures plus 1 tutorial and a 1-hour practical a fortnight.

Content: Laplace transforms of derivatives and integrals, applications to differential equations (approximately 9 lectures). Probability and statistical methods — sample mean and variance, random variables, distributions, quality control, fitting straight lines (approximately 17 lectures).

Assessment: Final examination. A small percentage will be allocated to class exercises and computing. A satisfactory performance in computing exercises is a necessary pre-requisite for a pass in this subject.

Text-book: Kreyszig, E., *Advanced engineering mathematics*, 6th edn. (Wiley).

2187 Vector Analysis and Complex Analysis

Level: II.

Points value: 2.0.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Co-requisite: 1016 Differential Equations and Fourier Series E.

Restriction: This subject may not be presented towards a degree together with 6649 Methods in Applied Mathematics II.

Contact hours: 2 weekly lectures plus 1 tutorial and 1-hour practical a fortnight.

Content: Gradient, divergence and curl, integral theorems, orthogonal curvilinear coordinates, cartesian tensors (approximately 17 lectures). Complex analytic functions, complex integrals (approximately 9 lectures).

Assessment: Final examination. A small percentage will be allocated to class exercises and computing. A satisfactory performance in computing exercises is a necessary pre-requisite for a pass in this subject.

Text-book: Kreyszig, E., *Advanced engineering mathematics*, 6th edn. (Wiley).

8845 Chemical Engineering Projects II(N)

Level: II.

Points value: 2.0.

Duration: Full year.

Co-requisites: 6863 Process Fluid Mechanics, 6283 Chemical Process Principles II.

Contact hours: 78 hours of practical work in the Design Office.

Content: Fluid mechanics laboratory programme plus projects in chemical engineering computing and design.

Assessment: Assignments and projects.

Text-books: To be advised.

3798 Chemical Engineering Thermodynamics

Availability: Only for B.E.(Chemical) students admitted to the LL.B. course.

Level: II.

Points value: 2.

Duration: Semester II.

Assumed knowledge: 3018 Process Systems.

Contact hours: 26 lectures and 26 tutorials.

Content: Conservation of mass and energy; entropy; thermodynamics properties of real gases; multicomponent mixtures; phase equilibrium in mixtures; equilibrium for reacting systems; analysis of power and refrigeration cycles.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

6283 Chemical Process Principles II

Level: II.

Points value: 3.0.

Duration: Semester I.

Assumed knowledge: 9786 Mathematics I, 3018 Process Systems.

Contact hours: 39 lectures and 26 tutorials.

Content: Chemical process principles: process calculations (material and energy balance calculations); numerical solution of mass and energy balances (machine methods); equilibrium stage operations.

Assessment: Final examination.

Text-books: Reklaitis, G. V., *Introduction to material and energy balances,* (Wiley); McCabe, W. L., Smith, J. C.and Harriott, P., *Unit operations of chemical engineering,* (McGraw-Hill, 4th edn.); Himmelblau, D. M., *Basic principles and calculations in chemical engineering,* 5th edn. (Prentice-Hall).

9653 Chemistry IIE

Level: II.

Syllabus: See under B.Sc. in Faculty of Science.

8601 Introductory Process Fluid Mechanics

Level: II.

Points value: 2.0.

Duration: Semester II.

Assumed knowledge: 9786 Mathematics I.

Contact hours: 26 lectures and 26 tutorials.

Content: The statics and dynamics of fluids. Considerable emphasis is placed on the solutions of fluid flow problems frequently encountered in the process industries.

Assessment: Principally by examination with up to 20% for class-work.

Text-books: Gerhart, P. M. and Gross, R. J., *Fundamentals of fluid mechanics,* (Addison-Wesley).

7543 Process Heat Transfer

Level: II.

Points value: 1.5.

Duration: Semester II.

Contact hours: 24 lectures and 15 tutorials.

Content: The study of heat transfer by conduction, convection and radiation in chemical process systems. The topics include problem solution by analytical as well as numerical methods. Theoretical and practical aspects of design are discussed.

Assessment: Final examination.

Text-books: Holman, J. P., *Heat transfer,* (McGraw-Hill).

5022 Stress Analysis A

Level: II.

Points value: 1.5.

Duration: Semester I.

Pre-requisites: None.

Contact hours: 20 lectures, 10 tutorials and 19 hours practical work.

Content: Topics taken from: Mechanical properties of materials, stresses and strains, normal and shear, stress-strain relationships, temperature stresses, elastic theory. Cylinders; thick and thin walled theories. Torsion in round shafts and tubes. Beams; distribution of stress due to bending, moment-curvature relationships. Beams; shear stresses. Beams; composite bending stresses. Beams; deflections of simply supported and encastre beams by integration. Statically indeterminate beams. Columns; short, eccentric loads; long, buckling loads, tie-bars. Combined stresses, failure theories, stress concentration. Experimental stress analysis to illustrate the above.

Text-books: Agural, A.C., *Mechanics of materials* (McGraw-Hill).

LEVEL III

3824 Chemical Engineering Projects III

Level: III.

Points value: 4.0.

Duration: Full year.

Assumed knowledge: 7543 Process Heat Transfer, 6283 Chemical Process Principles II, 6863 Process Fluid Mechanics.

Co-requisites: 8310 Process Control and Instrumentation, 9816 Fluid and Particle Mechanics, 8462 Kinetics and Reactor Design, 5909 Transport Phenomena.

Contact hours: 156 hours of practical work.

Content: A laboratory programme illustrating principles of transport theory, fluid mechanics, unit operations, process dynamics and control and kinetics and reactor design.

Assessment: Project reports.

Text-books: To be advised.

5815 Electrical Circuits and Machines

Level: III.

Points value: 1.5.

Duration: Semester I.

Contact hours: 2 lectures a week, 12 tutorials and 12 hours of practical work.

Content: Transient and steady state circuit analysis, magnetic circuits, direct current machines, synchronomous machines, transformers and induction motor. Practical work in the laboratory is designed to illustrate the subject matter of the lectures.

Assessment: Principally by written examinations, with laboratory work and homework assignments also contributing to the overall result. A satisfactory standard in the laboratory work is required (regulation 5b).

Text-books: Either Carlson, A.B., and Gissen, D.G., *Electrical engineering concepts and applications* (Addison-Wesley); *or* Smith, R.J., *Circuits, devices and systems,* 3rd edn. (Wiley).

9816 Fluid and Particle Mechanics

Level: III.

Points value: 3.0.

Duration: Semester I.

Contact hours: 26 lectures and 26 tutorials.

Content: The behaviour of multi-phase system fluid flow.

Assessment: Principally by examination with up to 20% allowed for class-work.

Text-books: Perry, R. H. and Green, D. (eds), *Perry's chemical engineers handbook,* 6th edn. (McGraw-Hill).

8462 Kinetics and Reactor Design

Level: III.

Points value: 2.5.

Duration: Semester I.

Assumed knowledge: 5726 Applied Mathematics IIE or 5726 Applied Mathematics IIB, 9653 Chemistry IIE.

Contact hours: 26 lectures and 26 tutorials.

Content: The theory of simple and complex chemical kinetic systems and their application to the design of commercial-scale homogeneous reactors.

Assessment: A combination of assignments and final examination.

Text-books: Smith, J. M., *Chemical engineering kinetics* 3rd edn. (McGraw-Hill).

6758 Level III Elective

Level: III.

Points value: 1.5.

Duration: Semester II.

Contact hours: 18 lectures and 9 tutorials.

Content: A topic to be selected from the following topics: biotechnology, computer-aided design, prediction of thermodynamic properties, design of experiments, synthesis of heat exchanger networks, environmental studies, rheology.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

7738 Materials III(C)

Level: III.

Points value: 1.5.

Duration: Semester I.

Contact hours: 26 lectures, 26 hours combined laboratory/tutorial sessions.

Content: Mechanical and rheological properties of real and idealised materials, crystallography, imperfections in crystals, phase transformations and heat treatment of steels, poly structure composition and mechanical properties, methods of testing and processing. Corrosion theory and application. Composite materials, mechanisms of deformation and failure of materials.

Assessment: A combination of assignments, laboratory work and final examination.

Text-books: Askeland, D.R., *The science and engineering of materials*, S.I. edn. (Van Nostrand, Reinhold).

1345 Mechanism Design

Level: III.

Points value: 1.5.

Duration: Semester I.

Contact hours: 13 lectures and 39 hours in the Design office.

Content: The design process; accuracy of engineering quantities; tolerancing and fits; introduction to reliability and applications of statistics; friction clutches and brakes; power transmission — belts gears and chains; bearings — hydrodynamic, rolling element and rubbing.

Assessment: 30% class work, 70% final examination.

Text-books: Shigley, J. C., *Mechanical Engineering Design,* 1st metric edn. (McGraw-Hill).

8310 Process Control and Instrumentation

Level: III.

Points value: 2.5.

Duration: Semester II.

Assumed knowledge: 5726 Applied Mathematics IIE or 5726 Applied Mathematics IIB, 6283 Chemical Process Principles II or 9396 Chemical Engineering II.

Contact hours: 26 lectures and 26 tutorials.

Content: Control: Introduction to digital process control, including analysis of first and second order process systems dynamics and control.

Instrumentation: Topics include commonly used primary sensing elements, signal transmission for digital and analogue systems, final control elements.

Assessment: A combination of assignments and final examination.

Text-books: Stephanopoulos, G., *Chemical process control* (Prentice-Hall).

8083 Process Design

Level: III.

Points value: 1.0.

Duration: Semester II.

Assumed knowledge: 6283 Chemical Process Principles II or 9396 Chemical Engineering II.

Contact hours: 39 hours of practical work.

Content: An introductory design project solved using computer aided process design techniques.

Assessment: Project report.

5578 Separation Processes

Level: III.

Points value: 2.0.

Duration: Semester II.

Assumed knowledge: 6283 Chemical Process Principles II or 9396 Chemical Engineering II.

Contact hours: 24 lectures and 15 tutorials.

Content: Stage-wise and continuous contact processes; single and multi-stage operation; use of reflux; analysis and design. Processes considered include: liquid-liquid extractions, leaching, stripping, gas absorption, and distillation.

Assessment: A combination of assignments and final examination.

Text-books: Foust, A. S. et al, *Principles of unit operations,* 2nd edn. (Wiley).

8415 Seminar

Level: III.

Points value: 1.0.

Duration: Semester II.

Contact hours: Tutorials: (Discussion with supervisor).

Content: A four thousand word essay to be prepared on a topic of general interest. A short presentation is to be made based on the essay.

Assessment: Essay 50%, presentation 50%.

5909 Transport Phenomena

Level: III.

Points value: 2.0.

Duration: Semester II.

Assumed knowledge: 5726 Applied Mathematics IIE or 5726 Applied Mathematics IIB.

Contact hours: 26 lectures and 13 tutorials.

Content: An introduction to the transfer of momentum, thermal energy and mass by molecular means using shell balance and conservation equations. Turbulent transport and boundary layer methods are also discussed.

Assessment: A combination of assignments and final examination.

Reference: Bird, Stewart and Lightfoot, *Transport phenomena* (Wiley).

LEVEL IV

2932 Advanced Separation Techniques & Thermal Processes

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: Material contained in subjects in the first three levels of the B.E. (Chem.) course.

Contact hours: 36 lectures and 16 tutorials.

Content: Application of fundamental principles to the analysis of chemical process unit operations for design and operational management.

Assessment: Principally by examination with up to 20% allowed for class-work.

Reference: Perry, R. H. and Green D., *Perry's chemical engineers handbook*, (McGraw-Hill).

4459 Chemical Engineering Laboratory Projects IV

Level: IV.

Points value: 2.0.

Duration: Semester I.

Co-requisites: 2932 Advanced Separation Techniques and Thermal Processes and 3944 Electives.

Contact hours: 78 hours of practical work.

Content: A series of projects based on the lecture course for Advanced Separation Techniques and Thermal Processes and the Electives units. Originality and quality of report writing and presentation are taken into account.

Assessment: Project reports.

7348 Industrial Economics and Management

Level: IV.

Points value: 2.0.

Duration: Semester II.

Contact hours: 39 lectures and 10 tutorials.

Content: The life cycle of a chemical processing system from the research and development behind the initial concept through process design construction and operations management. Topics covered include patents, capital investment evaluation, construction planning and control, cost planning and control, basic management principles and a general treatment of the structure and environment of industry.

Assessment: A combination of assignments and final examination.

Text-books: Peters, M. S. and Timmerhaus, K. D., *Plant design and economics for chemical engineers*, 3rd edn. (McGraw-Hill); Merrett, A. J. and Sykes, A., *The finance and analysis of capital projects*, 2nd edn. (Longman).

5058 Plant Design Project

Level: IV.

Points value: 6.0.

Duration: Semester II.

Contact hours: 10 lectures, 25 tutorials and 150 hours of practical work.

Content: Lectures: Topics comprise sources and estimation of data, costing and economic analysis of alternative proposals, the application of Process Engineering and Operations Research techniques to the selection, sizing, design and optimisation of equipment and processes, project scheduling and control, and plant operation and safety considerations.

Project: the project involves the economic comparison of alternative processes for the manufacture of a nominated chemical product, the study of a selected process, calculation of material and energy balances, preparation of flow sheets, design of selected plant items, estimation of plant cost and process economics, preparation of a design report and drawing of plant lay-out.

Plant Tour: While undertaking this subject, each student must visit at least eight approved chemical plants or other approved process engineering establishments. A plant tour is arranged each year by the department.

Assessment: A combination of assignments and final examination.

Text-books: Recommended reading list to be advised.

1488 Process Dynamics and Control

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: 8310 Process Control and Instrumentation.

Contact hours: 26 lectures and 13 tutorials.

Content: The principles of process dynamics, stability and design of process control loops, overall plant control, and digital control systems. The theory is developed to a stage where it may be applied to a wide variety of practical problems in design and operation of chemical process plant.

Assessment: A combination of assignments and final examination.

Text-books: Stephanopoulos, G., *Chemical process control,* (Prentice-Hall).

8014 Chemical Engineering Research Project

Level: IV.

Points value: 2.0.

Duration: Full year.

Contact hours: 150 hours of practical work and seminar.

Content: Candidates are required to:

1. To complete satisfactorily a research project and submit a written report on a topic specified by the department.

2 Present a short seminar on their project results at the end of Semester II.

LEVEL IV ELECTIVES

Four electives to be selected from the following list. Not all these subjects will be offered each year. Information as to which subjects will be offered in a given year will be available from the Department of Chemical Engineering at the time of enrolment. With the approval of the Head of the Department of Chemical Engineering, subjects offered by other departments within the Faculty of Engineering may be included in the selection of electives.

6238 Advanced Materials Engineering

Level: IV.

Points value: 2.0.

Duration: Semester II.

Assumed knowledge: 6866 Materials I and either 2012 Materials Science and Engineering or 7738 Materials III(C).

Contact hours: 26 hours of lectures and 26 hours of practical work.

Content: The selection and fabrication of materials for engineering applications including corrosive and high temperature environments, structural and low alloy steels, the relation of structural variable sin polymers to their engineering properties, engineering properties of specific polymers. Processing and selection of plastics.

Assessment: A combination of assignments, laboratory work and final examination.

Text-books: To be advised.

2098 AI Applications in Engineering Design

Level: IV.

Points value: 2.0.

Duration: Semester I.

Contact hours: 26 lectures and 13 tutorials.

Content: The application of artificial intelligence techniques to engineering design. Topics covered include: rule-based systems, forward and backward chaining; list processing; the elements of heuristic search.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

2532 Biochemical Engineering

Level: IV.

Points value: 2.0.

Duration: Semester I.

Contact hours: 26 lectures and 13 tutorials.

Content: Cell structure and types; chemicals of life; kinetics of biological reactions; bioreactors; separation systems for bioprocessing — filtration, extraction, adsorption, elution chromatography, ultrafiltration; bio-process economics.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

4668 Biomedical Engineering

Level: IV.

Points value: 2.0.

Duration: Semester I.

Contact hours: 26 lectures and 13 tutorials.

Content: An introductory course on the application of engineering knowledge and principles in the medical area. Topics covered include engineering in orthopaedics; biomechanics; tissue and spinal mechanics; materials; lasers, radiography; magnetic resonance imaging; nuclear medicine; medical ultrasound and image processing.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

8273 Combustion Processes

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: 8462 Kinetics and Reactor Design.

Contact hours: 26 lectures and 13 tutorials.

Content: The aims of this course are to provide the basic principles which form the background to all combustion phenomena. Topics covered include explosions in closed vessels, flames and combustion waves, detonation waves in gases, combustion of hydrocarbons, combustion in mixed and condensed phases, high explosives, heating applications, combustion and the environment.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

9988 Environmental Engineering

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: 9816 Fluid and Particle Mechanics.

Contact hours: 26 lectures and 13 tutorials.

Content: The study of air and water pollution; pollutant dispersion; control equipment; primary, secondary and tertiary waste-water treatment; landfill and hazardous wastes.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

5734 Hydrocarbon Reservoirs

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: 9816 Fluid and Particle Mechanics.

Contact hours: 26 lectures and 13 tutorials.

Content: Introduction to broad concepts of petroleum geology, evaluation of the production capabilities of hydrocarbon reservoirs using well log data, geophysical basin characteristics and mathematical and physical models of porosity and permeability.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

9949 Industrial Rheology

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: 9816 Fluid and Particle Mechanics and 5909 Transport Phenomena.

Contact hours: 26 lectures and 13 tutorials.

Content: Characterisation of fluid flow behaviour with particular emphasis on industrial suspensions, polymers and composites. Applications include the design and optimisation of systems for handling, processing and transporting non-newtonian fluids.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

1532 Minerals Processing

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: 9816 Fluid and Particle Mechanics.

Contact hours: 26 lectures and 13 tutorials.

Content: The application of chemical engineering principles to minerals processing operations. Topics covered include flotation, size reduction, gravity separation and hydrometallurgy, etc.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

6856 Particulate Technology

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: 9816 Fluid and Particle Mechanics.

Contact hours: 26 lectures and 13 tutorials.

Content: A course describing the behaviour of particulate systems. Topics covered include: particle size distributions; sampling; population balances; kinetics of growth, aggregation and breakage; mixing of particulates and stress distributions in granular solids.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

9871 Plant and Safety Engineering

Level: IV.

Points value: 2.0.

Duration: Semester I.

Contact hours: 26 lectures and 13 tutorials.

Content: The course covers the management of safe operation and the care and maintenance of process-plant equipment in an integrated operational context. The studies will include the interpretation of industrial standards and legal requirements, in occupational health and safety, in environmental matters and in hazard and operability studies. Also covered are the techniques and methods for the quantitative assessment of plant reliability and availability and their effects on plant throughput.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

3324 Reaction Engineering

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: 8462 Kinetics and Reactor Design and 5726 Applied Mathematics IIE.

Contact hours: 26 lectures and 13 tutorials.

Content: The study of advanced kinetics and reactor design in chemical processing systems. The topics covered include temperature and pressure effects in homogeneous reactors and fundamental design strategies for heterogeneous reactor systems [fixed and fluidised bed systems].

Assessment: A combination of assignments and final examination.

Text-books: Levenspiel, O., *Chemical reaction engineering* (Wiley).

2088 Special Management Studies

Level: IV.

Points value: 2.0.

Duration: Semester I.

Contact hours: 26 lectures and 13 tutorials.

Content: A course of lectures on specialist management topics.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

1172 Special Studies in Chemical Engineering

Level: IV.

Points value: 2.0.

Duration: Semester I or II.

Assumed knowledge: As prescribed by the Head of Chemical Engineering.

Contact hours: 26 lectures and tutorials.

Content: Special topics in Chemical Engineering as determined by the Head of the Chemical Engineering Department. This subject may be offered from time to time and will be taught by visiting academic/s. Syllabus details will be published by the Department as the need arises.

Assessment: As determined by the Head of the Department of Chemical Engineering.

Text-books: As determined by the Head of the Department of Chemical Engineering.

1872 Thermal Process Synthesis and Integration

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: 6283 Chemical Process Principles II.

Contact hours: 26 lectures and 13 tutorials.

Content: Design and synthesis of HEN [heat exchanger networks] including evolutionary and algorithmic methods. Integration of power, work, separation and energy systems. Flexibility and operability studies; retrofit situations.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

CIVIL ENGINEERING

LEVEL II

1016 Differential Equations and Fourier Series E

Level: II.

Syllabus: See under Chemical Engineering.

2187 Vector Analysis and Complex Analysis

Level: II.

Syllabus: See under Chemical Engineering.

4569 Laplace Transforms and Probability and Statistical Methods

Level: II.

Syllabus: See under Chemical Engineering.

8795 Civil Engineering Construction

Level: II.

Points value: 1.5.

Duration: Semester II.

Contact hours: 18 hours of lectures, 8 hours of tutorials and 12 hours of site visits.

Content: Topics to be chosen from:

The construction industry — its structure, promoters, consultants, contractors, contract systems, contract documents, tendering.

Basic construction processes and equipment employed in excavation, foundations, concreting and steel construction.

Major fields of civil engineering and building works — bridges, roads, railways, airports, harbour works, water supply works, buildings.

Construction planning and organisation — programming techniques including:

Bar charts, critical path method; resource scheduling, site organisation, site personnel communication, cost control, responsibilities.

Assessment: Course work 60%, examination 40%.

Text-books: To be advised.

9290 Design of Structures II

Level: II.

Points value: 4.0.

Duration: Full year.

Pre-requisites: Pass (not Conceded Pass) in 6581 Statics and 9786 Mathematics I (Div. 1).

Co-requisites: 5538 Structural Mechanics II.

Assumed knowledge: 9786 Mathematics I.

Contact hours: 39 lectures, 39 hours of tutorial and design work and 20 hours of practical work/site visits.

Content: Introduction to structural engineering, concept of structural form, design criteria and limit states, loads, linear structural systems.

Materials technology — steel fabrication and erection; concrete materials, mix design and construction; structural behaviour of materials under load. Reinforced and prestressed concrete in flexure, structural connections.

Assessment: Detailed at start of year.

Text-books: Standards Association of Australia; *S.A.A. code for concrete structures, AS. 3600-1988; SAA steel structure code AS.4100; structures design package (U of A)*, Warner, R. F., et al. *Reinforced concrete,* 3rd edn. (Longman Cheshire).

3732 Geology IHE

Level: II.

Points value: 3.0.

Duration: Semester II.

Pre-requisites: None.

Contact hours: Semester II lectures of 2136 Geology I Course, 27 hours of practical work, 4 half-days of field work.

Content: Semester IIA *Turbulent interior:* The unification of observations through modelling to derive models of Earth's structure and crustal dynamics. Earth shells from geophysics and geochemistry. Dynamics of the lithosphere: plate tectonics and continental drift. Mountains, magmas and metamorphism. Practical applications of geology to the needs and problems of human society.

Semester IIB *Exploiting the Earth:* Our resources are finite and nonrenewable. Only a person operating on the shrivelled time scales of politics, economics and business could speak of a "glut" of oil, of supply exceeding demand. Informed public debate on the problems of locating and exploiting natural resources needs some grasp of the science of how they got here as workable concentrates and of how we find them — the science of geology. Fossil fuels. Metals and materials. Water and the environment. Economic geology of Australia.

Soils: formation and fertility — with emphasis on clays; origin, types, behaviour. Groundwater. Construction materials.

Applied geology: coastal processes, dam sites and construction, relevant case histories.

Assessment: End of semester theory examination 50%, Practical examinations, laboratory work and field excursions (attendance and report) comprise a compulsory and non-redeemable component 50%. A minimum of 40% must be obtained in both the theory and practical sections in order to obtain a pass.

Reference: Skinner, B.J. and Porter, S.C., *1987 Physical Geology* (J. Wiley & Sons, New York, 750p.).

3290 Geotechnical Engineering II

Level: II.

Points value: 2.0.

Duration: Semester II.

Assumed knowledge: 2509 Engineering INA or 6581 Statics; 9786 Mathematics I.

Contact hours: 26 lectures and 13 tutorials.

Content: An introduction to the fundamentals of soil and rock mechanics. The overall objective is to provide an awareness of the types of problems encountered in this field and to cover a number of areas that are fundamental to more advanced study. Topics included are:

the origin and composition of soil its description and classification and the computational methods used relating the soil-water-air phases; the effects of water under flow and no flow conditions on stresses in the soil and the principle of effective stress;

the concepts of shear strength and its measurement for both clay and sand soils;

soil compaction, optimum water content and maximum dry density and the properties of compacted soils;

stress distribution in an elastic homogeneous isotropic half space subjected to surface loads;

Rankine and Coulomb theories of failure in relation to horizontal stresses in the ground;

computation of bearing capacity of shallow footings on clays and sands.

Assessment: Examinations 80% and exercises 20%.

Text-book: Craig, R. F., *Soil mechanics* (Van Nostrand Reinhold), U.K. 1983.

Reference: Bolton, M., *A guide to soil mechanics* (Macmillan).

4760 Numerical and Computing Methods in Engineering II

Level: II.

Points value: 2.0.

Duration: Semester I.

Pre-requisite: 9786 Mathematics I (Div. I), 6581 Statics.

Contact hours: 26 lectures, 8 tutorials, six 3-hour computer practical sessions.

Content: Introduction to numerical methods (18 lectures): roots of equations, systems of linear equations, polynomial inter polation, cubic splines, numerical integration and differentiation, convergence criteria in numerical integration, numerical solution of ordinary differential equations, sorting, and searching. Computing (8 lectures); FORTRAN, review of PASCAL, spreadsheets (EXCEL), word processing, databases. Solution of numerical methods for a broad range of Civil Engineering problems using PASCAL.

Assessment: 20% class work, 80% final examination, successful completion of computer practical sessions.

Text-books: Chapra, S.C., Canale, R.P., *Numerical methods for engineers*, 2nd ed. (McGraw-Hill, 1989).

Reference: Press, W.H., Flannery, B.P., Teulolsky, S.A., Vetterline, W.T., "Numerical Recipes", Cambridge University Press, Cambridge.

5484 Strength of Materials II

Level: II.

Points value: 2.5.

Duration: Semester I.

Pre-requisites: Pass in 6581 Statics (not Conceded Pass).

Assumed knowledge: 9786 Mathematics I.

Contact hours: 34 hours of lectures, 18 hours of tutorials and 12 hours of practical work.

Content: Elastic, elastic-plastic and time dependent behaviour; plane stress and strain; constitutive relationships, principal values and vectors of stress and strain matrices; failure criteria; stresses in thick cylinders; bending and shearing stresses in beams, deflections of beams; asymmetric bending; short and long columns; Euler buckling; torsion of solid and hollow circular sections; shear flow, shear centre, elastic axis; introduction to statical indeterminancy and simple redundant structures; work and strain energy concepts.

Assessment: Examinations 60%, reports and tutorial work 40%.

Text-books: Ugural, A.C., *Mechanics of materials*, (McGraw-Hill).

3107 Surveying

Level: II.

Points value: 1.5.

Duration: Semester II.

Contact hours: 26 lectures and 18 hours of practical work.

Content: The surveying subject is intended to provide thorough familiarity and competence with linear measurement, levelling, measurement of angles and tacheometry including the associated principles and booking procedures. Awareness of other topics will be required such as error analysis, precise measurement techniques and photogrammetry.

Assessment: Examinations 70%, tutorials and field work 30%.

Text-book: Uren and Price, *Surveying for engineers* (Macmillan).

4100 Water Engineering II

Level: II.

Points value: 1.5.

Duration: Semester I.

Pre-requisites: 6581 Statics.

Assumed knowledge: 9786 Mathematics I; 2391 Dynamics.

Contact hours: 18 lectures, 8 tutorials and 27 hours of practical work.

Content: An introduction to hydraulic engineering. Description and properties of fluids; hydrostatics; laws of inviscid flow; dimensional analysis and model theory; steady uniform and non-uniform flows in closed conduits; steady uniform flow in open channels.

Assessment: Examinations 80%, laboratory work 15%, tutorials 5%.

Text-book: Streeter, V. L., and Wylie, E. B., *Fluid mechanics,* 1st edn., S.I. Version (McGraw-Hill).

LEVEL III

5815 Electrical Circuits and Machines

Level: III.

Points value: 1.5.

Duration: Semester I.

Contact hours: 26 lectures, 12 tutorials and 12 hours of practical work.

Content: Transient and steady state circuit analysis, magnetic circuits, direct current machines, synchronous machines, transformers and induction motor.

Practical work in the laboratory is designed to illustrate the subject matter of the lectures.

Assessment: Principally by written examinations, with laboratory work and homework assignments also contributing to the overall result. A satisfactory standard in the laboratory work is required (regulation 5b).

Text-books: Either Carlson, A.B. and Gissen, D.G., *Electrical engineering concepts and applications* (Addison-Wesley); *or* Smith, R.J., *Circuits, devices and systems,* 3rd edn. (Wiley).

8260 Environmental Chemistry

Level: III.

Points value: 3.0.

Syllabus: See under Master of Environmental Studies.

4611 Environmental Engineering III

Level: III.

Points value: 2.0.

Duration: Semester I.

Co-requisite: 8227 Water Engineering and Design III.

Contact hours: 26 lectures and 13 tutorials.

Content: Biogeochemical cycles in the environment; the hydrologic, carbon and nitrogen cycles. Basic hydrologic processes in a catchment and their disturbance by human activities. Pollution of water, air and soil; sources, characteristics and treatment technology. Noise assessment and reduction. Environmental impact assessment including data requirements.

Assessment: Examinations and assignments. Relative weighting to be announced at the start of the subject.

Text-book: To be advised.

3967 Environmental Design III

Level: III.

Points value: 0.5

Duration: Semester II.

Co-requisite: 4611 Environmental Engineering III

Contact hours: 13 x 2 hour Design Sessions.

Content: Environmental Engineering Design projects.

Assessment: Assignments 100%.

Text-book: To be advised.

4919 Heat Transfer and Design

Level: III.

Points value: 2.0.

Duration: Full year.

Assumed knowledge: 5726 Applied Mathematics IIE; 9290 Design of Structures II.

Contact hours: 13 lectures/tutorials plus 39 hours of design office work in Semester I. 13 lecture/tutorials in Semester II.

Content: Heat Transfer: An introduction to the principles of valuing the transfer of heat.

Mechanical Design: Accuracy of engineering qualities, tolerances and fits, basic statistical considerations; reliability of mechanical components; power transmission; bearings, introduction to fatigue failure and stress concentration.

Assessment: A combination of assignments and final examination.

Textbooks: Holman, J.P., *Heat transfer,* (1st version) 6th edn. (McGraw-Hill); Shigley, J.E., *Mechanical engineering design,* 1st metric edn. (McGraw-Hill).

9245 Geotechnical Engineering III

Level: III.

Points value: 2.0.

Duration: Semester II.

Pre-requisite: 3290 Geotechnical Engineering II.

Contact hours: 18 hours of lectures, 8 hours of tutorials and 27 hours of practical work.

Content: Topics include: One-dimensional settlement and consolidation, normally consolidated and overconsolidated soils, the basic differential equation for one-dimensional consolidation, isochrones and the interpretation of the oedometer test;

Volumetric strains in soils, constitutive relations for a single phase and two phase material, pore pressure parameters;

Elastic analysis of a semi-infinite ideal solid, numerical integration of point loads, the sector method, standard solutions for circular and rectangular foundations, the use of charts to determine influence factors, elastic settlements for an inhomogeneous solid;

The graphical analysis of stress in soils by Mohr circle construction, failure envelopes and the Coulomb failure criterion, top point construction and stress paths;

Water flow in soils, one-dimensional flow, unconfined flow, three-dimensional flow, flow nets and their construction for isotropic and anisotropic soils, transfer conditions;

Expansive soils, matrix and solute suction, pF, the instability index, calculation of total free ground movement;

Slope stability, analysis of vertical slopes, angle of repose, undrained loading of a non-vertical slope, the method of slices, circular and non-circular slip surfaces, forces and stresses at the base of a slice.

The laboratory tests include the following: determination of index properties, grain size analysis and soil classification, permeability testing, triaxial testing, and soil compaction tests.

Assessment: Coursework 30%, Open book examination 70%.

Text-book: Bowles, J.E., *Foundation analysis and design* (McGraw-Hill, International Student Edition).

References: Atkinson, J. H. and Bransby, P. L., *The mechanics of soils, an introduction to critical state soil mechanics* (McGraw-Hill, 1978); Lambe, T. W. and Whitman R. V., *Soil mechanics* (John Wiley & Sons, 1969); Poulos, H. G. and Davis, E. H., *Elastic solutions for soil and rock mechanics* (John Wiley & Sons, 1979); Scott, R. F., *An introduction to soil mechanics and foundations* (Applied Science, London, 1974).

9566 Management and Planning

Level: III.

Points value: 2.0.

Duration: Semester II.

Contact hours: 26 lectures and 13 tutorials.

Content: Basic economic concepts; Project evaluation including benefit-cost analysis and multi-objective planning; use of mathematical models and optimisation in the planning process; activity scheduling using critical path methods; decision analysis; applications to civil engineering practice.

Assessment: Examination 85%, assignments 15%.

References: Meredith, Wong, Woodhead and Wortman, *Design and planning of engineering systems,* 2nd ed. (Prentice-Hall); Dandy, G. C. and Warner R. F., *Planning and design of engineering systems* (Unwin Hyman).

7455 Numerical and Computing Methods in Engineering III

Level: III.

Points value: 2.0.

Duration: Semester I.

Pre-requisite: 4760 Numerical Methods and Computing II, 1016 Differential Equation and Fourier Series E, 4569 Laplace Transforms, Probability and Statistics.

Contact hours: 31 lectures, 6 tutorials, five 3-hour computer practical sessions.

Content: Probabilistic analysis (16 lectures); revision of basic probability concepts; jointly distributed random variables; common distributions including: normal, log-normal, gamma, extreme value distributions; transformations of data; empirical determination of distributions; parameter estimation; regression and correlation analysis; first order, second moment methods and reliability; Monte Carlo simulation; auto-correlation, cross-correlation, multiple regression; Markov processes; random number generation; Civil Engineering examples, computer session problems.

Numerical methods (10 lectures); eigensystems; Fourier transform spectral methods; integration of coupled sets of ordinary differential equations; systems of non-linear equations; finite difference methods.

Computing (5 lectures); advanced programming concepts in PASCAL and FORTRAN, spreadsheet macros, UNIX.

Assessment: 20% classwork, 80% final examination, successful completion of computer practical sessions.

Text-books: Ang & Tang, *Probability concepts in engineering planning and design*, Vol 1 (Wiley, 1975); Cooke, Craven and Clarke, *Statistical computing in pascal*, Edward Arnold 1985; Chapra, S.C., Canale, R.P., *Numerical methods for engineers*, 2nd ed. (McGraw-Hill, 1989).

4967 Structural Design III (Concrete).

Level: III.

Points value: 3.0.

Duration: Semester II.

Pre-requisites: 9290 Design of Structures II.

Assumed knowledge: 5538 Structural Mechanics II.

Co-requisites: 8128 Structural Mechanics III.

Contact hours: 26 hours of lectures and 39 hours of design and tutorial work.

Content: Design methodology, preliminary design procedures, simplified methods of analysis of framed buildings and approximate proportioning methods, presentation of design calculations for concrete structures. Application of plasticity concepts to concrete structures. Detailed design procedures for prestressed and reinforced concrete structures including beams, slab systems and axially loaded members. Introduction to prestressed concrete.

Students will undertake substantial design projects to apply lecture material.

Assessment: Design projects 50% and examination 50%.

Text-books: Warner, Rangan & Hall, *Reinforced concrete,* 3rd edn. (Longman Cheshire); Standards Association of Australia *Australian standards for concrete structures, AS 3600-1988.*

Reference: Warner & Faulkes, *Prestressed concrete*, 2nd edn. (Longman Cheshire).

6859 Structural Design III (Steel)

Level: III.

Points value: 3.0.

Duration: Semester I.

Pre-requisites: 9290 Design of Structures II.

Assumed knowledge: 5538 Structural Mechanics II.

Co-requisites: 8128 Structural Mechanics III.

Contact hours: 26 hours of lectures and 39 hours of design and tutorial work.

Content: Design methodology, preliminary design procedures, simplified methods of analysis of framed buildings and approximate proportioning methods, presentation of design calculations, detailed design procedures for steel structures, including; design of ties, struts, beams, columns, connections and frame systems.

Students will undertake steel structure design project to apply lecture material.

Assessment: Design projects 50% and examination 50%.

Text-book: To be advised.

8128 Structural Mechanics III

Level: III.

Points value: 2.5.

Duration: Full year.

Pre-requisite: 5538 Structural Mechanics II.

Contact hours: 39 lectures and 13 tutorials.

Content: General introduction to the modelling and analysis of articulated structures. Static stability analysis of frameworks. Force method analysis of statically determinate plane and space frames. The principle of virtual work; the unit load theorem and their application in determining truss deflections. Force method analysis of statically indeterminate trusses. Analysis of self equilibrating stress systems due lack of fit, prestress and thermal effects. Force method analysis of statically indeterminate continuous beams and plane frames. Influence lines. Approximate methods of analysis of indeterminate trusses and building frames. Analysis of beams and plane frames by method of moment distribution. Collapse load analysis of continuous beams and plane frames.

Assessment: Examinations 80% and tutorials 20%.

Reference: Coates, Coutie and Kong, *Structural analysis* (Nelson).

8227 Water Engineering and Design III

Level: III.

Points value: 4.0.

Duration: Full year.

Pre-requisites: 4100 Water Engineering II.

Assumed knowledge: 1016 Differential Equations and Fourier Series E; 2187 Vector Analysis and Complex Analysis.

Contact hours: 43 lectures, 39 hours of tutorials/design work and 27 hours of practical work.

Content: Fluid mechanics and hydraulic engineering design. Elements of pipeline and network design, unsteady flow in closed conduits; Non-uniform flow in open channels, super and subcritical transition and curve design, hydraulic structure and dissipator design; Flow measurement techniques; Elements of hydrodynamics and boundary layer theory; Hydraulic machine basics and selection; Flood routing; elements of water and waste water treatment.

Assessment: Examinations 70%; Laboratory, Design Work and Assignments, 30%.

Text-books: Streeter, V.L. and Wylie, E.B., *Fluid Mechanics,* 1st SI Edition (McGraw-Hill) OR Vennard, J.K. and Street, R.L., *Elementary Fluid Mechanics,* 5th Edition (SI units) (Wiley).

LEVEL IV

6211 Civil Engineering Design Project

Level: IV.

Points value: 4.0.

Duration: Full year.

Pre-requisites: Except with permission of the Dean, all Level III Civil Engineering subjects (see Schedule IV).

Contact hours: 117 hours of design work.

Content: Broad scope feasibility studies; preliminary and detailed design. Students will undertake a large-scale realistic design project encompassing several branches of Civil Engineering.

Assessment: Evaluation of design project.

5880 Civil Engineering Research Project

Level: IV.

Points value: 4.0.

Duration: Full year.

Pre-requisites: Except with permission of the Dean, all Level III Civil Engineering subjects (see Schedule IV).

Contact hours: 117 hours of practical work.

Content: Students work in groups on a research project under the supervision of an academic staff member. They present a research seminar and write a comprehensive research report.

Assessment: Evaluation of research activity and research report.

6908 Environmental Engineering IV

Level: IV.

Points value: 3.0.

Duration: Semester II.

Availability: From 1993 onwards.

Pre-requisites: Except with the permission of the Dean, all Level III Civil Engineering Subjects.

Contact hours: 26 lectures, 26 hours of tutorials/technical projects.

Content: Topics to be selected from: Water Resources and the hydrologic cycle. The need for protection of the environment, water conservation. The linking of hydrological information with water quality information. Understanding modelling. Prediction of consequences.

Automated systems for collection of environmental data. Introduction to data collection systems in South Australia. Remote Sensing. The use of GIS.

Water Quality Processes in rivers, lakes and urban areas. The movement of nutrients and other determinands will be included. Diffusion and dispersion. Modelling processes.

Soil transport and erosion processes. This incorporates both movement due to wind and rain. The design of sedimentation ponds. Project planning to avoid sediment movement. Rehabilitation of mining sites.

Air quality issues. Sources of air quality problems. Air pollution processes.

The planning process. Environment considerations. Meeting environmental regulations.

Assessment: Examination 60%, Assignments 40%.

Text-book: To be advised.

9978 Geotechnical Engineering IV

Level: IV.

Points value: 1.5.

Duration: Semester I.

Pre-requisites: Except with permission of the Dean, all Level III Civil Engineering subjects (see Schedule IV).

Contact hours: 13 lectures, 13 tutorials and 18 hours of practical work.

Content: A combination of applied foundation engineering topics and some more advanced theoretical areas. Topics comprise:

soil investigation and field testing in the design programme; settlement prediction in the design of raft foundations including effects of superstructure stiffness;

the prediction of settlement and bearing capacity for piles and pile groups;

the design of tension systems including piles and earth anchors; allowable settlements and movements in foundations and earth systems;

an introduction to critical state soil mechanics;

the design of highway pavements.

The practical sessions will revolve around the design for a structure at a specified site. A site investigation, field testing and laboratory testing programme will be conducted using a range of specified techniques to enable the completion of the design.

Assessment: Examination 70%, practical reports and tutorial exercises 30%.

6944 Instrumentation and Computing IV

Level: IV.

Points value: 2.0.

Duration: Semester II.

Pre-requisites: Except with permission of the Dean, all Level III Environmental or Civil subjects.

Contact hours: 26 lectures, 26 tutorials/technical projects.

Content: Instrumentation (18 lectures); instrumentation and data collection problems associated with engineering investigations. Detailed examination of transducers for measuring strain, displacement pressure, velocity acceleration, flow discharge, time and temperature. Recording media assessment, pen, magnetic tape (F.M. & digital), C.R.O. Digital data system elements, sampling theorem and digital storage and display systems. Computing (8 lectures); dynamic array allocation, debugging tools, overview of other types of programming languages; awareness of expert systems; object oriented programming.

Assessment: 20% class work, 80% final examination, successful completion of practicals.

Reference: Doeblin, E.O., *Measurement systems — application and design* 3rd edn. (McGraw-Hill, 1983).

6026 Management, The Profession and Society

Level: IV.

Points value: 2.0.

Duration: Semester II.

Pre-requisites: Except with permission of the Dean, all Level III Civil Engineering subjects (see Schedule IV).

Contact hours: 26 lectures and 13 tutorials.

Content: Tenders, contracts and their variation, contract documents, estimating methods; arbitration; site organisation and elements of cost control; private and government engineering organisations; trusts and boards; professional liability; environmental impacts assessment, including case studies. Social impact of civil engineering, past and present. Preparing for public review.

Some lectures will be given by visiting specialists.

Assessment: Examination 30% plus assignments 70%.

Text-books: To be advised.

2872 Structural Mechanics IV

Level: IV.

Points value: 3.0.

Duration: Full year.

Pre-requisites: Except with permission of the Dean, all Level III Civil Engineering subjects (see Schedule IV).

Contact hours: 39 lectures and 13 tutorials.

Content: Selected topics from: Stiffness method of linear analysis of plane and space frameworks. Stiffness matrix assembly and solution for arbitrary assemblages. Non linear structural analysis. General theory of elasticity, plate and shell structures and torsion on non-circular sections. The finite element method of analysis of plates, shells and solids. Dynamic analysis of structures. Analysis and design of structures for seismic loading.

Assessment: Examination 70%, assignments 30%.

Text-books: To be advised.

8046 Water Engineering IV

Level: IV.

Points value: 1.5.

Duration: Semester II.

Pre-requisites: Except with permission of the Dean, all Level III Civil Engineering subjects (see Schedule IV).

Contact hours: 18 lectures, 8 tutorials and 18 hours of practical work.

Content: Selected topics from: Advanced topics in fluid mechanics and hydraulic engineering; turbulence, cavitation, valves, steady and unsteady fluid forces, wind loading and density current flow, and others. Steady flow through porous media and unsteady well flow problems are discussed with interfacial problems.

Assessment: Examination 100%.

References: Daily, J. W. and Harleman, D. R. F. *Fluid dynamics* (Addison Wesley, 1966); Raudkivi, A. J. and Callander, R. A., *Advanced fluid mechanics* (Edward Arnold, 1975); Sacks, P., *Wind forces in Engineering* (Pergamon Press, 1972); Randkivi, A. J. and Callander, R. A., *Analysis of ground waterflow* (Edward Arnold, 1976).

SPECIALISATION SUBJECTS

Students are required to take three specialisation subjects in their final year. Subjects offered by the Department of Civil Engineering will be chosen from the following list (a maximum of six subjects will be offered in any particular year). Other suitable subjects offered by other departments within the University may be taken with the permission of the Head of Department of Civil Engineering.

4174 Steel Structures Specialisation

8595 Reinforced Concrete Structures Specialisation

7357 Prestressed Concrete Structures Specialisation

5076 Structural Dynamics Specialisation

9785 Steel-Concrete Composite Structures Specialisation

5252 Structural Engineering Specialisation

1825 Coastal Engineering Specialisation

7157 Hydraulics Specialisation

6719 Hydrology and Water Resources Specialisation

5865 Water Engineering Specialisation

2937 Rock Mechanics Specialisation

9190 Soils Engineering Specialisation

7040 Geotechnical Engineering Specialisation

3535 Engineering Systems Planning Specialisation

4325 Engineering Management Specialisation

9123 Resource and Infrastructure Management Specialisation

5575 Environmental Engineering Specialisation

8851 Special Studies in Civil Engineering

1963 Earthquake Engineering Specialisation

Points value: 2.0 each.

Availability: Check with Department at time of enrolment. Subjects are offered on the basis of availability of staff and resources.

Contact hours: Each subject will consist of 39 contact hours including lectures and tutorials.

Content: Each subject will constitute an extension of previous studies into more advanced and specialised work in the area mentioned. The details of this work will vary from year to year within the area specified, in order to take advantage of the specialist expertise of the lecturer involved.

ELECTRICAL AND ELECTRONIC ENGINEERING

LEVEL II

9635 Circuit Analysis E

Level: II.

Points value: 2.0.

Duration: Semester I.

Pre-requisites: None.

Assumed knowledge: 9786 Mathematics I, 3643 Physics I, 6714 Electrical Systems.

Contact hours: 26 hours of lectures, 8 of tutorials.

Content: Kirchhoff's laws, models and element equations, mesh, nodal and mixed methods of analysis, free and forced response of networks, convolution, network theorems, steady state a.c. methods, transformers, polyphase systems, resonance and complex frequency, two ports, Laplace and Fourier Transform methods.

Assessment: Principally by written examinations, with homework assignments also contributing to the overall result.

Text-books: Hayt, W. H. & Kemmerley, J. E., *Engineering circuit analysis.*

2772 Electronics IIE

Level: II.

Points value: 2.0.

Duration: Full year.

Assumed knowledge: 9786 Mathematics I, 3642 Physics I, 6714 Electrical Systems.

Contact hours: 26 hours of lectures, 8 of tutorials.

Content: Outline of semi-conductor theory. Analysis of pn junction and mos devices. Discrete devices, their characteristics and equivalent circuits; rectifiers, limiters, clamps and gates. Single stage amplifiers with resistive and reactive loads. Multistage amplifiers with RC, LC and transformer coupling. High Frequency equivalent circuits and frequency response. Class A, AB and B operation, power amplifiers. Feedback amplifiers. Controlled rectifiers.
Operational amplifiers: their internal construction and external characterisation; ideal and non-ideal behaviour; common circuit configuration; application to signal amplification, combination, filtering and shaping, and impedance conversion matching and generation.

Assessment: Principally by written examination, with homework assignments also contributing to the overall result.

Text-books: Either Boylestad, R. L. and Nashelsky, L., *Electronic devices and circuit theory,* 3rd edn. (Prentice-Hall); *or* Sedra, A. S. and Smith, K. C., *Microelectronic circuits* (Holt, Rinehart and Winston).

2733 Fields and Energy Conversion E

Level: II.

Points value: 2.0.

Duration: Semester II.

Assumed knowledge: 9876 Mathematics I, 3643 Physics I, 6714 Electrical Systems.

Contact hours: 26 hours of lectures, 8 of tutorials.

Content: Energy Storage and Conversion (18 lectures): Physical aspects; the magnetic circuit; a.c. excitation of magnetic structures; transformers. Electromechanical energy conversion principles, stored energy; forces and torques of electromagnetic origin. Theory and operation of d.c. machines.
Applied Electromagnetics (8 lectures): Definition of field vectors. The conservation equation. Maxwell's equations. General vector theorems. Constitutive relations. Depolarising and demagnetising factors. Gyromagnetism. Electromagnetic boundary conditions. Energy and power transfer. The Poynting vector. Assumptions implicit in lumped circuit theory.

Assessment: Principally by written examinations, with homework assignments also contributing to the overall result.

Text-books: Slemon, G. R. and Straughen, A., *Electric machines,* (Addison-Wesley); Sadiku, M.N.O., *Elements of electromagnetics* (Saunders College Publishing).

8969 Experimental Electrical Engineering II

Level: II.

Points value: 2.

Duration: Full year.

Pre- or Co-requisites: 9635 Circuit Analysis E, 2733 Fields & Energy Conversion E, 2772 Electronics IIE.

Contact hours: 6 lectures, 18 tutorials and 54 hours of practical work.

Content: Electrical safety: the nature of electric shock, the hazards associated with electrical installations, safe working practices, protective devices, earthing.

Experimentation: random and systematic errors, error propagation, precision, accuracy and repeatability, standards and calibration, the design, execution and recording of experiments.

Practical considerations: limitations of instruments — frequency, loading and waveform effects, techniques for minimising noise.

Practical work: familiarisation with laboratory facilities and instrumentation, common procedures and techniques, specific experiments to augment level II theoretical subjects.

Assessment: Laboratory performance (25%), formal report (15%), examination (60%).

2653 Physics II

Level: II.

Syllabus: See under B.Sc. in Faculty of Science.

1016 Differential Equations and Fourier Series E

Level: II.

Syllabus: See under Chemical Engineering.

2187 Vector Analysis and Complex Analysis

Level: II.

Syllabus: See under Chemical Engineering.

4569 Laplace Transforms and Probability and Statistical Methods

Level: II.

Syllabus: See under Chemical Engineering.

1642 Linear Programming and Numerical Analysis

Level: II.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Restriction: This subject may not be presented towards a degree together with xxxx Operations Research II.

Assumed knowledge: 1016 Differential Equations and Fourier Series E.

Contact hours: 2 weekly lectures plus 1 tutorial and 1 hour practical a fortnight.

Content: Linear Programming — Simplex algorithm, duality, transportation problems. Numerical Analysis — numerical solution of ordinary and partial differential equations.

Assessment: Final examination. A small percentage will be allocated to class exercises and

computing. A satisfactory performance in computing exercises is a necessary pre-requisite for a pass in this subject.

Text-books: Kreyszig, E., *Advanced engineering mathematics*, 6th edn. (Wiley).

LEVEL III

3085 Electronics IIIE

Level: III.

Points value: 2.0.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: 7199 Electronics II, 4926 Circuit Analysis, Level II Applied Mathematics subjects listed in BE (Elec) Schedule.

Contact hours: 26 hours of lectures, 6 of tutorials.

Content: Electronic logic systems, combinational and sequential, Electron devices as switches. Dynamic models of electron devices. Electron devices in circuits. Design principles including operational amplifiers. Communication system principles. Waveform generation and filtering.

Assessment: Principally by written examinations, with homework assignments also contributing to the overall result.

Text-books: Sedra, A. S. and Smith, K. C., *Microelectronic circuits* (Holt, Rinehard and Winston).

9133 Energy Conversion E

Level: III.

Points value: 2.0.

Duration: Full year.

Assumed knowledge: 4926 Circuit Analysis, 1481 Fields and Energy Conversion, Level II Applied Mathematics Subjects listed in BE (Elec.) and BE (Comp. Sys.) Schedules.

Contact hours: 26 hours of lectures, 6 of tutorials.

Content: Steady state performance of three phase induction and synchronous machines. Single phase motors. Symmetrical components.

Assessment: Principally by written examinations, with homework assignments also contributing to the overall result.

Text-books: Slemon, G. R. and Straughten, A., *Electric machines* (Addison-Wesley).

7091 Fields Lines and Guides E

Level: III.

Points value: 2.0.

Duration: Full year.

Assumed knowledge: 7199 Electronics II, 4926 Circuit Analysis, 1481 Fields and Energy Conversion, Level II Applied Mathematics subjects listed in BE (Elec.) and BE (Comp. Sys.) Schedules.

Contact hours: 26 hours of lectures, 6 of tutorials.

Content: An elementary treatment of transmission lines, plane waves, guided waves and radiation using circuit and field concepts where appropriate. An introduction to waveguides and microwave components.

Assessment: Principally by written examinations, with homework assignments also contributing to the overall result.

9623 Control IIIE

Level: III.

Points value: 2.0.

Duration: Full year.

Assumed knowledge: 7199 Electronics II, 4926 Circuit Analysis, Level II Applied Mathematics subjects listed in BE (Elec.) and BE (Comp. Sys.) Schedules.

Contact hours: 26 hours of lectures, 6 of tutorials.

Content: Transfer functions; transient and steady state analysis; stability; root locus; Bode and Nyquist plots; series compensation using root locus and frequency response techniques. An introduction to discrete time systems, z transform methods, digital filters.

Assessment: Principally by written examinations, with homework assignments also contributing to the overall result.

Text-books: Franklin, G. F., Powell, J. D. and Emami-Naeni, A., *Feedback control of dynamic systems* (Addison-Wesley).

8366 Electrical Project

Level: III.

Points value: 1.0.

Duration: Semester II.

Assumed knowledge: 7199 Electronics II, 4926 Circuit Analysis, Level II Applied Mathematics subjects listed in BE (Elec.) and BE (Comp. Sys.) Schedules.

Contact hours: 4 hours of tutorials and 24 of practical work.

Content: Design, construction and testing of an electrical system, written report.

Assessment: Based on project performance and the written report.

6733 Concepts of Computer Science

Level: III.

Points value: 2.0.

Duration: Semester I.

Pre-requisites: Year 12 Mathematics I and II.

Restriction: This subject is available only to students enrolled for the B.E. in Electrical and Electronic Engineering or Computer Systems Engineering. The subject is also available to students enrolled in the Postgraduate Diploma in Computer Science.

Contact hours: 2 lectures and 2 hours practical work a week, plus 1 tutorial a fortnight.

Content: Programming in Ada: types, control structures, procedures and functions, input and output. Computer systems: assembly and machine language, gates, registers, data buses, adders. System software: compilers and operating systems. Discrete mathematics: logic, induction, set theory, relations and boolean algebra, graphs and counting. Algorithms: complexity, computability, pre-conditions, loop invariants, termination.

Assessment: 2 hour written examination and compulsory practical exercises.

Text-book: Goldschlager, L. and Lister A., *Introduction to computer science: a modern introduction* (Prentice-Hall, 1988); Ross, K. and Wright, C., *Discrete mathematics*, (Prentice-Hall, 1988).

5132 Programming and Data Structures A

Level: III.

Syllabus: See under B.Sc. in Faculty of Mathematical and Computer Sciences.

1006 Programming and Data Structures B

Level: III.

Syllabus: See under B.Sc. in Faculty of Mathematical and Computer Sciences.

9753 Digital Systems

Level: III.

Points value: 2.0.

Duration: Semester II.

Assumed knowledge: 5724 Engineering Computing I and 6714 Electrical Systems.

Contact hours: 26 hours of lectures, 7 of tutorials.

Content: Number systems, Binary arithmetic and logical operations, maxterms and minterms, combinational logic, simplification of logic, asynchronous and synchronous sequential circuits analysis and synthesis. Computer architecture-basic concepts. Logic in silicon and introductory VLSI design.

Assessment: By written examination.

Text-books: Pucknell, D. A., *Fundamentals of digital logic design with VLSI circuit applications* (Prentice-Hall, 1989).

8528 Experimental Electrical Engineering III

Level: III.

Points value: 3.

Duration: Full year.

Pre- or Co-requisites: 3085 Electronics IIIE, 9133 Energy Conversion E, 7091 Fields Lines & Guides E, 9623 Control IIIE, 9753 Digital Systems.

Contact hours: 4 lectures, 19 tutorials and 114 hours of practical work.

Content: Data acquisition: transducers, isolation techniques, practical requirements for digital/analogue and analogue/digital conversion.

Design considerations: design for testability, high-frequency concepts and techniques, circuit board systems, handling of components; solder, wire-wrap and surface mount techniques.

Practical work: Computer based instrumentation, specific experiments to augment level III theoretical subjects.

Assessment: Laboratory performance (25%), formal report (15%), examination (60%).

1062 Engineering Skills

Level: III.

Points value: 1.

Duration: Full year.

Pre- or Co-requisites: None.

Contact hours: 7 hours on oral communication skills, 32 hours in workshop sessions.

Content: Oral skills: small-group sessions on construction, delivery and critique of short oral presentations.

Workshop skills: Basic machine tools and processes, fabrication techniques for modern production processes.

Assessment: oral skills (20%) on quality of presentation, workshop skills (80%) on performance in workshop activities and written assignments.

5022 Stress Analysis A

Level: III.

Points value: 1.5.

Duration: Semester I.

Contact hours: 20 lectures, 10 tutorials and 9 hours practical work.

Content: Selected topics from: Mechanical properties of materials, stresses and strains, normal and shear, stress-strain relationships, temperature stresses, elastic theory. Cylinders; thick and thin walled theories. Torsion in round shafts and tubes. Beams; distribution of stress due to bending, moment-curvature relationships. Beams; shear stresses. Beams; composite bending stresses. Beams; deflections of simply supported and encastre beams by integration. Statistically indeterminate beams. Columns; short, eccentric loads; long, buckling loads, tie-bars. Combined stresses, failure theories, stress concentration. Experimental stress analysis to illustrate the above.

Assessment: By examination and satisfactory completion of practical work.

Text-books: Agural, A.C., *Mechanics of materials* (McGraw-Hill).

1211 Machine Design

Level: III.

Points value: 1.5.

Duration: Semester II.

Pre-requisites: None.

Contact hours: 13 lectures and 39 hours in the Design Office.

Content: Materials for machine parts; stress concentration; repeated stressing, fatigue and endurance strength; combined stresses and applications of theories of failure. Creep in machine components; compression members; screws for fastening; bolted and welded joints; springs, shifts; shaft connections — keys, pins, shrink coupling.

Assessment: 30% class work, 70% final examination.

Text-book: Shigley, J. C., *Mechanical engineering design* 1st metric edn. (McGraw-Hill).

1345 Mechanism Design

Level: III.

Points value: 1.5.

Duration: Semester I.

Pre-requisites: None.

Contact hours: 13 lectures and 39 hours in the Design Office.

Content: The design process; accuracy of engineering quantities; tolerancing and fits; introduction to reliability and applications of statistics; friction clutches and brakes; power transmission — belts gears and chains; bearings — hydrodynamic, rolling element and rubbing.

Assessment: 30% class work, 70% final examination.

Text-book: Shigley, J. C., *Mechanical engineering design* 1st metric edn. (McGraw-Hill).

LEVEL IV

4907 Communications and Signals

Level: IV.

Points value: 3.

Duration: Full year.

Pre- or Co-requisites: None.

Contact hours: 39 lectures, 5 tutorials.

Content: Signals and spectra; network theory; signals and noise; noise in amplifiers; modulation systems; sampling; pulse code modulation; digital data transmission; information theory; coding.
Classification of telecommunication systems; topology, mode; traffic, loss, delay and congestion; proportioning of links; redundancy and alternate routing; protocols.

Discrete-time signals; digital filters; time and frequency resolution; discrete and fast Fourier transforms and convolution; windows.

Assessment: By written examination.

9334 Advanced Communication Theory

Level: IV.

Points value: 1.0.

Duration: Semester II.

Pre- or Co-requisites: 4907 Communications and Signals.

Contact hours: 13 lectures, 2 tutorials.

Content: Detection of signals in noise, classification of signals and receivers, coherent or synchronous detection, matched filters, minimum mean square error filters, decision theory, estimation theory.

Assessment: By written examination.

1008 Advanced Signal Processing

Level: IV.

Points value: 1.0.

Duration: Semester II.

Pre- or Co-requisites: 4907 Communications and Signals.

Contact hours: 13 lectures, 2 tutorials.

Content: Orthogonal functions expansion of signals, transforms, sources of orthogonal functions, time-bandwidth product, spectral estimation, adaptive signal processing.

Assessment: By written examination.

3471 Circuit Analysis and Synthesis

Level: IV.

Points value: 1.

Duration: Full year.

Assumed knowledge: 2876 Electronics III, 3098 Control III.

Contact hours: 13 hours of lectures and 2 of tutorials.

Content: Synthesis of passive and active networks; LC and RC immittances, transfer functions, approximation theory and active RC circuits.

Assessment: By written examination.

7673 Analogue Techniques

Level: IV.

Points value: 1.

Duration: Full year.

Assumed knowledge: 2876 Electronics III, 3098 Control III.

Contact hours: 13 hours of lectures and 2 of tutorials.

Content: Linear computing circuits, function generators, multipliers, system simulation, operational amplifiers, common hybrid computer techniques.

Assessment: By written examination.

5072 Digital Electronics and Systems

Level: IV.

Points value: 3.

Duration: Full year.

Pre- or Co-requisites: None.

Contact hours: 39 lectures, 5 tutorials.

Content: Digital systems: Characteristic equations for digital events, application equations and associated design processes, fast processing techniques, stack base architecture, memory interleaving, cache stores, aspects of MSI and LSI circuits.

Microprocessors: Interfacing aspects of microprocessors, DMA, interrupts, A/D and D/A interfacing, address decoding, instruction sets, addressing modes.

Reliability: Reliability as a performance characteristic, definitions, types of failure, confidence levels, probability of survival, m.t.b.f., predictions from life test data, maintenance considerations, parallel and standby redundancy, environmental factors, reliability aspects of integrated circuits, yield factors.

VLSI Systems: Semiconductor preparation, processing and properties, MOS technology, electrical parameters, switch and gate logic, design rules and fabrication, delay estimates, floor planning, regularised architectures, introduction to simulation, events suitable for integration, system considerations.

Assessment: By written examination.

5497 Digital Computer Hardware Design

Level: IV.

Points value: 1.0.

Duration: Semester II.

Pre- or Co-requisites: 5072 Digital Electronics and Systems.

Contact hours: 13 lectures, 2 tutorials.

Content: Bus design, standard bus systems, multiprocessors, RISC and other architectures, systems integration, HDL and RTL approaches to design and physical realisations, control unit design, fault tolerant architectures, testability.

Assessment: By written examination.

6281 Advanced Microprocessors

Level: IV.

Points value: 1.0.

Duration: Semester II.

Pre- or Co-requisites: Digital Electronics & Systems.

Contact hours: 4 lectures, 18 hours of practicals.

Content: More advanced architectural aspects, microcontrollers. The 68000 family of microprocessors, hardware and software development tools, practical work using 68000-based outfits.

Assessment: By written examination and laboratory performance.

4526 VLSI Laboratory

Level: IV.

Points value: 1.

Duration: Semester I.

Pre- or Co-requisites: 5072 Digital Electronics & Systems.

Contact hours: 26 hours of practical work.

Content: Practical work to complement the VLSI systems lectures. Design exercises and subsystem layout using CAD tools.

Assessment: By project report.

4312 Advanced VLSI

Level: IV.

Points value: 1.

Duration: Semester II.

Pre- or Co-requisites: 5072 Digital Electronics & Systems.

Contact hours: 13 lectures, 2 tutorials.

Content: Emerging technologies, floorplanning, silicon computers, clocking schemes, complexity management, algorithm transformation and mapping, testability.

Assessment: By written examination.

9416 Real Time Systems

Level: IV.

Points value: 1.0.

Duration: Semester II.

Pre- or Co-requisites: None.

Contact hours: 13 lectures, 2 tutorials.

Content: Hard and soft real-time computation systems, scheduling theory and realisations for single-processor, multi-processor and distributed systems.

Assessment: By written examination.

3846 Electromagnetic Engineering

Level: IV.

Points value: 2.

Duration: Full year.

Pre- or Co-requisites: None.

Contact hours: 26 lectures, 5 tutorials.

Content: Introduction and fundamental concepts: Maxwell's equations, Poynting vector, Lorentz reciprocity theorem, elementary antenna theory.

Plane waves in lossless and dissipative media, propagation in waveguides, distributed circuit theory, resonant cavities, strip line systems, microwave devices, radiation analysis of wire type antennas, linear arrays and structures with image planes, impedances of wire type antennas.

Assessment: By written examination.

5650 Advanced Electromagnetic Engineering

Level: IV.

Points value: 1.0.

Duration: Semester II.

Pre- or Co-requisites: 3846 Electromagnetic Engineering.

Contact hours: 13 lectures, 2 tutorials.

Content: Advanced electromagnetic concepts and theorems; gyromagnetism; advanced propagation analysis; reciprocity, orthogonality and normal mode expansions; perturbational and variational techniques; numerical analysis techniques; radiation analysis of aperture type antennas; antennas as scattering systems; broadband antenna systems; antenna synthesis techniques.

Assessment: By written examination.

1290 Optical Communications

Level: IV.

Points value: 1.0.

Duration: Semester II.

Pre- or Co-requisites: None.

Contact hours: 13 lectures, 2 tutorials.

Content: Electro-optic effects and media; benefits from optical communications; optical signal sources and detectors; light wave propagation; modulation techniques; switching techniques; demodulation and mixing; optical instrumentation.

Assessment: By written examination.

7027 Control IV

Level: IV.

Points value: 1.

Duration: Semester I.

Assumed knowledge: 3098 Control III.

Contact hours: 13 hours of lectures and 2 of tutorials.

Content: Performance specifications for control system design. Small signal analysis and describing function techniques for non-linear systems. State equations. Controllability and observability. Full and partial state feedback. Observers. Introduction to digital control systems. Z transforms. Discrete equivalents of analogue controllers. Discrete transfer function of zero-order hold and plant. Discrete state equations. State feedback and estimators. Design using computer-aided methods.

Assessment: By written examination.

Text-books: Fortmann, T. E. and Hitz, K. L., *An introduction to linear control systems* (Dekker); Franklin, G. F. and Powell, J. D., *Digital control of dynamic systems* (Addison-Wesley).

2283 Power Electronics

Level: IV.

Points value: 1.

Duration: Semester II.

Pre- or Co-requisites: None.

Contact hours: 13 lectures, 2 tutorials.

Content: Commutation, voltage controllers, controlled rectifiers; inverters. Applications to the control of electrical machines.

Assessment: By written examination.

9288 Power Systems and Machine Dynamics A

Level: IV.

Points value: 2.

Duration: Full year.

Assumed knowledge: 1525 Energy Conversion.

Co-requisites: None.

Contact hours: 26 hours of lectures and 3 of practical work.

Content: Network representation, components of power systems, network analysis and load flow, power and frequency control, voltage and reactive power control, fault calculations, HVDC Transmission.
Mathematical modelling of electrical machinery and associated control equipment, with particular reference to power station generators. Dynamic and transient stability of power systems.

Assessment: By written examination.

Text-books: Weedy, B. M., *Electric power systems*, 3rd edn. (Wiley).

1560 Advanced Control

Level: IV.

Points value: 1.0.

Duration: Semester II.

Pre- or Co-requisites: 7027 Control IV.

Contact hours: 13 lectures, 2 tutorials.

Content: Stochastic processes, stochastic state models, prediction and filtering theory, identification, adaptive control.

Assessment: By written examination.

8323 Power Systems and Machine Dynamics B

Level: IV.

Points value: 1.

Duration: Semester II.

Assumed knowledge: 1525 Energy Conversion, 9288 Power Systems and Machine Dynamics A (concurrently).

Co-requisites: None.

Contact hours: 13 hours of lectures and 2 of tutorials.

Content: Advanced topics in power systems and machine dynamics.

Assessment: By written examination.

4053 Management

Level: IV.

Points value: 2.

Duration: Full year.

Contact hours: 26 hours of lectures.

Content: Law for Engineers; Contracts, Product liability, negligence. Industrial property. Personnel and Industrial relations, occupational safety, trade unions, and topics selected from: decision making, management accounting, industrial development, international trade, organisation structures, nature of management, patents, trade practices, banking and finance, market research, advertising, etc.

Assessment: By written examination.

6341 Essays and Specialist Lectures

Level: IV.

Points value: 1.0.

Duration: Full year.

Contact hours: 20 hours of lectures.

Content: Specialist lectures will be given by practising engineers from industry and government establishments on topics such as the operation of power systems, television techniques, telecommunications, signal processing and radar. The subject materials of these lectures will form part of the required background for written assignments.

Assessment: Written assignments involving reports, proposals and commentaries.

2356 Project A

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: Level IV subjects (concurrently).

Contact hours: 80 hours of practical work.

Content: Each candidate is required to conduct an investigation involving a theoretical survey and the design, development and testing of hardware and/or software. The results of the investigation are to be presented as a written report, and also as a seminar and demonstration of equipment where appropriate.

Assessment: Based on the performance in the project, the written report and the seminar presentation.

7345 Project B

Level: IV.

Points value: 3.0.

Duration: Semester II.

Assumed knowledge: Level IV subjects (concurrently).

Contact hours: 120 hours of practical work.

Content: Each candidate is required to conduct an investigation involving a theoretical survey and the design, development and testing of hardware and/or software. The results of the investigation are to be presented as a written report, and also as a seminar and demonstration of equipment where appropriate.

Assessment: Based on the performance in the project, the written report and the seminar presentation.

7286 Special Studies in Electrical Engineering

Level: IV.

Points value: 1.0.

Duration: Semester I or II.

Contact hours: 13 lectures and tutorials.

Assumed knowledge: As prescribed by the Head of Electrical Engineering.

Content: Special topics in Electrical Engineering as determined by the Head of the Electrical Engineering Department. This subject may be offered from time to time and will be taught by visiting academic/s. Syllabus details will be published by the Department as the need arises.

Assessment: As determined by the Head of the Department of Electrical Engineering.

Text-book: As determined by the Head of the Department of Electrical Engineering.

COMPUTER SYSTEMS ENGINEERING

LEVEL II

9289 Physics IIE

Level: II.

Points value: 4.0.

Duration: Full year.

Assumed knowledge: 3663 Physics I, 9786 Mathematics I; concurrent 2187 Vector Analysis and Complex Analysis.

Contact hours: 50 hours of lectures, 26 of tutorials and 26 of practical work.

Content: Electromagnetism, electrostatics, electric and magnetic fields in material media, electromagnetic potential. Maxwell's equations. Relativity: space-time structure, four-vectors. Optics: lenses and aberrations, interference, polarisation, crystal optics, instrumentation. Electrical Circuit Theory: D.C. and A.C. circuits, circuit theorems, electrons in solids.

Assessment: End of Semester written examinations, laboratory work, assignments.

Text-books: To be advised.

6733 Concepts of Computer Science

Level: II in the Standard Course for Computer Systems Engineering.

Level: III in the Transition Course for Computer Systems Engineering.

Syllabus: See under Electrical and Electronic Engineering.

5132 Programming and Data Structures A

Level: II.

Syllabus: See under B.Sc. in Faculty of Mathematical and Computer Sciences.

1006 Programming and Data Structures B

Level: II.

Syllabus: See under B.Sc. in Faculty of Mathematical and Computer Sciences.

The following Level II subjects are common to the course in Electrical and Electronic Engineering, and are described under that heading:

9635 Circuit Analysis E

2772 Electronics IIE

2733 Fields and Energy Conversion E

8969 Experimental Electrical Engineering II

2187 Vector Analysis and Complex Analysis

1016 Differential Equations and Fourier Series E

4569 Laplace Transforms, Probability and Statistical Methods

LEVEL III

8056 Experimental Electrical Engineering IIIC

Level: III.

Points value: 2.5.

Duration: Full year.

Pre- or Co-requisites: 3085 Electronics IIIE, 9133 Energy Conversion E, 7091 Fields Lines & Guides E, 9623 Control IIIE, 9753 Digital Systems.

Contact hours: 4 lectures, 16 tutorials and 96 hours of practical work.

Content: Data acquisition: transducers, isolation techniques, practical requirements for digital/analogue and analogue/digital conversion.

Design considerations: design for testability, high-frequency concepts and techniques, circuit board systems, handling of components; solder, wire-wrap and surface mount techniques.

Practical work: Computer based instrumentation, specific experiments to augment level III theoretical subjects.

Assessment: Laboratory performance (25%), formal report (15%), examination (60%).

3655 Numerical Methods

Level: III.

Syllabus: See under B.Sc. in Faculty of Mathematical and Computer Sciences.

The following Level III subjects are common to the course in Electrical and Electronic Engineering, and are described under that heading:

3085 Electronics IIIE

9133 Energy Conversion E

7091 Fields Lines and Guides E

9623 Control IIIE

8366 Electrical Project

9753 Digital Systems

1062 Engineering Skills

5022 Stress Analysis A

1211 Machine Design

1345 Mechanism Design

LEVEL IV

All subjects comprising Level IV of the Computer Systems Engineering course are drawn from Level IV subjects in Electrical and Electronic Engineering and Level III subjects in Computer Science, as specified in the Schedules. Detailed syllabus information is given under these two headings.

MECHANICAL ENGINEERING

LEVEL II

1016 Differential Equations and Fourier Series E

Level: II.

Syllabus: See under Chemical Engineering.

2187 Vector Analysis and Complex Analysis

Level: II.

Syllabus: See under Chemical Engineering.

4569 Laplace Transforms and Probability and Statistical Methods

Level: II.

Syllabus: See under Chemical Engineering.

1642 Linear Programming and Numerical Analysis

Level: II.

Syllabus: See under Electrical and Electronic Engineering.

1360 Computational and Experimental Techniques I

Level: II.

Points value: 1.5.

Duration: Full year.

Contact hours: 10 lectures, 60 hours computing, laboratory work and report writing.

Content: Lecture series: Laboratory safety, measurement techniques, report writing, introduction to engineering computing, computer hardware, Unix and DOS operating systems, engineering applications software and personal computer based software applications.

Practical sessions: computing workshop sessions will provide experience with using applications software, operating systems and an introduction to personal computer hardware. The Experimental programme will illustrate principles of Fluid mechanics, Thermodynamics and other aspects of the Mechanical Engineering course.

Assessment: Continuous assessment based on computing assignments and laboratory reports and log book entries.

Text-books: None.

7872 Design for Function

Level: II.

Points value: 1.5.

Duration: Semester I.

Contact hours: 13 lectures and 39 hours in the Design Office.

Content: The design process; sources of design information; accuracy of engineering quantities; introduction to reliability and applications of statistics; tolerancing and fits; friction clutches and brakes; power transmission—belts, gears and chains; rubbing, rolling element and hydrodynamic bearing selection and design.

Assessment: A combination of assignments and final examination.

Text-books: Jurinall, R. C. and Marshek, K. M., *Fundamentals of machine component design* 2nd edn. 1991 (Wiley); *Design standards for mechanical engineering students,* SAA HB6 - 1988, (Stds. Assoc. Aust.).

Reference: Dieter, G. E., *Engineering design,* 1st metric edn. (McGraw-Hill); Pahl, G. and Beitz, E., *Engineering design,* (Design Council); Shigley, J. E., *Mechanical Engineering design,* 1st metric edn. (McGraw-Hill).

5533 Design Project (Level II)

Level: II.

Points value: 1.0.

Duration: Semester I.

Contact hours: 39 hours in the Design Office.

Content: Group design/build/test project involving: conceptual embodiment and detail design; sources of design information; material selection; fabrication methods; troubleshooting; system development; group dynamics; project organisation.

Assessment: Achievement of design goals; concept report; final report.

Reference books: Shigley, J. E., *Mechanical engineering design,* 1st metric edn. (McGraw-Hill); *Design standards for mechanical engineering students,* SAA HB6 — 1988 (Standards Association of Australia); Dieter, G. E., *Engineering design,* 1st metric edn. (McGraw-Hill); Pahl, G. and Beitz, E., *Engineering design,* (Design Council); Jurinall, R. C. and Marshek, K. M., *Fundamentals of machine component design* 2nd edn. 1991 (Wiley).

4766 Design for Strength

Level: II.

Points value: 1.5.

Duration: Semester II.

Assumed knowledge: 9561 Stress Analysis B.

Contact hours: 13 lectures and 39 hours in the Design Office.

Content: Materials for machine parts; combined stresses and theories of failure; endurance, strength and fatigue; stress concentration; shafts; keys, pins, retaining rings and shrink couplings; bolts; bolted and welded joints; springs; gears.

Assessment: A combination of assignments and final examination.

Text-book: Jurinall, R. C. and Marshek, K. M., *Fundamentals of machine component design* 2nd edn. 1991 (Wiley).

Reference: Dieter, G. E., *Engineering design*, 1st metric edn. (McGraw-Hill); Shigley, J. E., *Mechanical engineering design*, 1st metric edn. (McGraw-Hill).

5815 Electrical Circuits & Machines

Level: II and III.

Points value: 1.5.

Duration: Semester I.

Contact hours: 26 lectures, 12 tutorials and 12 hours of practical work.

Content: Transient and steady state circuit analysis, magnetic circuits, direct current machines, synchronous machines, transformers and induction motor. Practical work in the laboratory is designed to illustrate the subject matter of the lectures.

Assessment: Principally by written examinations, with laboratory work and homework assignments also contributing to the overall result. A satisfactory standard in the laboratory work is required (regulation 5b).

Text-books: Either Carlson, A.B. and Gissen, D.G., *Electrical engineering concepts and applications* (Addison-Wesley); or Smith, R.J., *Circuits, devices and systems*, 3rd edn. (Wiley).

8781 Fluid Mechanics 1

Level: II.

Points value: 1.5.

Duration: Semester II.

Assumed knowledge: 3643 Physics I; 9786 Mathematics I.

Contact hours: 26 hours of lectures/tutorials and practical work as part of 1360 Computational and Experimental Techniques 1.

Content: Basic fluid mechanics including: kinematics and dynamics of fluid flows; conservation laws applied to fluid flow; Euler, Bernoulli, Navier-Stokes equations; dimensional analysis; differential and integral flow analysis; flow visualization.

Assessment: A combination of assignments and final examination.

Text-books: Gerhart, P. M. and Gross, R. J., *Fundamentals of fluid mechanics*, (Addison-Wesley); The Japan Society of Mechanical Engineers, *Vizualized Flow (Pergamon Press)*.

4103 Machine Dynamics

Level: II.

Points value: 1.5.

Duration: Semester II.

Contact hours: 26 hours of lectures and tutorials, laboratory and practical work as part of 1360 Computational and Experimental Techniques 1.

Assumed knowledge: 2391 Dynamics.

Content: Acceleration in mechanisms/linkages; balancing of rotating masses; gear trains; flywheels; crank effort diagrams, force analysis of plane mechanisms; kinematics and dynamics of spur, bevel, helical and worm gearing; balancing of reciprocating masses.

Assessment: A combination of assignments and final examination.

Text-books: Mabie, H.H. and Reinholtz, C.F., *Mechanisms and dynamics of machinery* 4th edn. (Wiley, 1987).

References: Shigley, J.E. & Uicker, Jr., J.J., *Theory of machines and mechanisms* (McGraw-Hill, 1981); Erdman, A.G. and Sandor, G.N., *Mechanism Design: Analysis and synthesis* (Prentice Hall, 1984).

6231 Manufacturing Engineering 1

Level: II.

Points value: 1.5.

Duration: Semester II.

Contact hours: 13 lectures and 39 hours of site visits, case studies and practical work.

Content: Manufacturing past, present and future; introduction to the manufacturing function. The design of production systems. Techniques for the analysis and operation of production systems. Introduction to manufacturing processes; economics of machine operations; Theory of casting, metal cutting and welding.

Assessment: A combination of assignments and final examination.

Text-books: Wild, R., *Production and operations management* (Cassell); Kalpatjian, S., *Manufacturing engineering and technology* (Addison-Wesley, 1989).

2810 Materials II

Level: II.

Points value: 1.5.

Duration: Semester I.

Pre-requisite: 6866 Materials I.

Contact hours: 26 lectures plus 13 hours tutorial/laboratory.

Content: Mechanical and rheological properties of real and idealized materials, crystallography, imperfections in crystals, phase transformations and heat treatment of steels, polymer structure composition and mechanical properties, methods of testing and processing. Corrosion theory and application. Composite materials, mechanisms of deformation and failure of materials.

Assessment: Written examination and laboratory work.

Text-book: Askeland, D. R., *The science and engineering of materials*, S.I. edn. (Van Nostrand, Reinhold).

6953 Stress Analysis

Level: II.

Points value: 1.5.

Duration: Semester I.

Assumed knowledge: 6581 Statics, 9786 Mathematics I.

Contact hours: 26 lectures and tutorials and practical work as part of Computational and Experimental Techniques 1.

Content: Mechanical properties of materials, stresses and strains, normal and shear, stress-strain relationships, temperature stresses, elastic theory. Torsion in round shafts and tubes.Beams; distribution of stress due to bending, moment-curvature relationships, shear stresses and composite bending stresses in beams, deflections of simply supported and encastre beams; statically indeterminate beams. Short columns with eccentric loads, buckling of long columns, tie bars.

Assessment: A combination of assignments and final examination.

Text-books: Hibbeler, R. C., *Mechanics of materials* 1991 (Maxwell Macmillan Int. Edns.).

References: Gere and Timoshenko, *Mechanics of materials* 2nd S.I. Edition, 1987, (Van Nostrand Reinhold); Beer and Johnston, Jr., *Mechanics of materials,* S.I. Metric Edition, 1987 (McGraw-Hill); Benham and Crawford, *Mechanics of engineering materials,* 1987 (Longman Scientific & Technical).

1376 Thermodynamics 1

Level: II.

Points value: 1.5.

Duration: Semester I.

Assumed knowledge: 9786 Mathematics I; 5945 Physics IE or 5599 Physics IHE.

Contact hours: 26 hours of lectures/tutorials; laboratory work and one industrial visit as part of 1360 Computational and Experimental Techniques 1.

Content: An introduction to mechanical engineering thermodynamics dealing with the application of the first and second laws of thermodynamics to the thermodynamic design and performance analysis of typical thermo-mechanical plant using condensible vapours and gases as the working fluid.

Assessment: A combination of assignments and final examination.

Text-books: Van Wylen, G. T. and Sonntag, R. E., *Fundamentals of classical thermodynamics,* 3rd edn., S.I. version, (Wiley).

Reference: Reynolds, W. C., *Thermodynamic properties,* SI, (Stanford University, 1979).

6710 Workshop Practice (Mechanical)

Level: II.

Points value: 0.

Duration: One week between Semester I and Semester II (apply as Full year).

Contact hours: Approximately 40 hours.

Content: Hands-on experience with manufacturing processes. Use of milling machines, lathes and NC machines.

LEVEL III

5893 Automatic Control

Level: III.

Points value: 1.5.

Duration: Semester II.

Assumed knowledge: Level II Applied Mathematics subjects with an aggregate points value of 8.

Contact hours: 26 lectures and tutorials and laboratory and practical work as part of 4066 Computational and Experimental Techniques 2.

Content: Fundamentals of feedback control systems, modelling plants and processes, laplace transforms and transfer functions; error analysis; block and signal flow diagrams, closed-loop stability analysis; Routh, Nyquist and root-locus methods, frequency response, use of Bode and Nichols' plots; controller actions; lag and lead compensation.

Assessment: A combination of assignments and final examination.

Text-books: Distefano, J. J., et al, *Feedback and Control Systems* (McGraw-Hill).

6375 Communication and Seminar

Level: III.

Points value: 1.0.

Duration: Semester I.

Contact hours: 24 hours of lectures, tutorials and attendance at seminar programme.

Content: A seminar on a topic of general interest to be presented and written up in a form suitable for publication. Training will be provided.

Assessment: By seminar and written report.

4066 Computational and Experimental Techniques 2

Level: III.

Points value: 1.5.

Duration: Full year.

Contact hours: 10 lectures, 60 hours computing, laboratory work and report writing.

Content: Lecture series: Computer hardware, use of X windows, engineering applications software and library routines, high level programming, operating systems, engineering experimentation.

Practical sessions: Computing workshop sessions will provide experience with using application software, operating systems and X windows, high level programming, numerical methods and engineering applications. The experimental programme will illustrate principles of Fluid mechanics, Thermodynamics, Vibrations, Automatic Control and other aspects of the Mechanical Engineering course.

Assessment: Continuous assessment based on computing assignments and laboratory reports and log book entries.

Text-books: To be advised.

2046 Design for Manufacture

Level: III.

Points value: 1.5.

Duration: Semester II.

Contact hours: 26 lectures and tutorials.

Content: Quality management, planning and costing; design for manufacture and assembly; design of experiment and design review; failure mode and effect analysis; reliability, maintainability and safety; process control and capability.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

4958 Structural Design Analysis

Availability: Not offered in 1992.

Level: III.

Points value: 1.5.

Duration: Semester II.

Contact hours: 26 lectures, 26 tutorials and Design work.

Pre-requisites: 6581 Statics, 6953 Stress Analysis, 9786 Mathematics I.

Content: Analysis of statically indeterminate structures for forces and displacements. Design of steel and concrete structures. Design of beams, columns, ties and struts, bolted and welded connections, slabs and foundations.

Assessment: Examination 70%, tutorials and design project 30%.

Text-book: None.

3536 System Design

Level: III.

Points value: 1.5.

Duration: Semester I.

Contact hours: 13 lectures and 39 hours in the Design Office.

Content: Reliability of systems; hydraulic and pneumatic power transmission and control; design for assembly; design for maintenance; design codes and standards; manufacturing codes and standards; ergonomic design; prime mover/load matching.

Assessment: A combination of assignments and final examination.

Text-books: Jurinall, R. C. and Marshek, K. M., *Fundamentals of machine component design* 2nd edn. 1991 (Wiley); *Design standards for mechanical engineering students,* SAA HB6 — 1988 (Standards Assoc. of Australia); Dieter, G. E., *Engineering design,* 1st metric edn. (McGraw-Hill).

References: Pahl, G. and Beitz, E., *Engineering design,* (Design Council); Shigley, J. E., *Mechanical engineering design,* 1st metric edn. (McGraw-Hill).

8432 Design Project (Level III)

Level: III.

Points value: 1.5.

Duration: Semester II.

Contact hours: 39 hours in the design office.

Content: Group design project related to industrial problems which may involve conceptual design, selection of materials, manufacturing processes and systems, assembly methods and project management techniques.

Assessment: Final group report and exhibition.

5815 Electrical Circuits and Machines

Level: II and III.

Points value: 1.5.

Duration: Semester I.

Contact hours: 26 lectures, 12 tutorials and 12 hours of practical work.

Content: Transient and steady state circuit analysis, magnetic circuits, direct current machines, synchronous machines, transformers and induction motor. Practical work in the laboratory is designed to illustrate the subject matter of the lectures.

Assessment: Principally by written examinations, with laboratory work and homework assignments also contributing to the overall result. A satisfactory standard in the laboratory work is required (regulation 5b).

Text-books: Either Carlson, A. B. and Gissen, D. G., *Electrical engineering concepts and applications* (Addison-Wesley); or Smith, R. J., *Circuits, devices and systems*, 3rd. edn. (Wiley).

7980 Electronics

Level: III.

Points value: 1.5.

Duration: Semester II.

Contact hours: 26 lectures, 12 tutorials and 12 hours of practical work.

Content: Analogue Electronics: Overview of electronic systems; operational amplifier circuits and applications; electronic power supplies; grounding and shielding practices; reliability of electronic systems. Digital Electronics: Selected topics in circuit theory, logical concepts, switching algebra, truth tables, digital circuit elements, counters, memory devices and wave shaping circuits. Microcomputers--number systems, microcomputer architecture, programming techniques and applications.

VLSI: MOS transistors, patterning and fabrication, switch logic, gate logic, stick diagrams, electrical parameters, subsystems.

Practical work in the laboratory is designed to illustrate the subject matter of the lectures.

Assessment: Principally by written examinations, with laboratory work and homework assignments also contributing to the overall result. A satisfactory standard in the laboratory work is required.

Reference: Pucknell, D. A., *Fundamentals of digital logic design* (Prentice-Hall); Smith, R. J., *Circuits, devices and systems* (Wiley).

5526 Fluid Mechanics 2

Level: III.

Points value: 1.5.

Duration: Semester II.

Assumed knowledge: 8781 Fluid Mechanics 1, 5726 Applied Mathematics IIE.

Contact hours: 26 lectures and tutorials and laboratory and practical work as part of 4066 Computational and Experimental Techniques 2.

Content: Potential flow; Integral analysis of fluid flow, flow of invisicid and viscous fluids; laminar and turbulent flow in pipes and boundary layers; forces on bodies, aerofoil theory; incompressible-flow machines.

Assessment: A combination of assignments and final examination.

Text-books: Gerhart, P. M. and Gross, R. J., *Fundamentals of fluid mechanics,* (Addison-Wesley).

9900 Heat Transfer

Level: III.

Points value: 1.5.

Duration: Semester I.

Contact hours: 26 lectures/tutorials and one practical session.

Content: An introduction to the three modes of heat transfer, i.e. conduction, convection and radiation. Analytical approaches will be stresses where appropriate, but emphasis will

be placed on numerical and empirical techniques. Special topics might include heat exchanger applications, mass transfer, heat transfer enhancement and solar radiation.

Assessment: A combination of assignments and final examination.

Text-books: Holman, J.P. 1989, *Heat transfer,* (SI metric edn.) (McGraw-Hill) or Incropera, F.P. and DeWitt, D.P. 1990, *Fundamentals of heat and mass transfer* (3rd edn.), John Wiley and Sons.

7915 Manufacturing Engineering 2

Level: III.

Points value: 1.5.

Duration: Semester II.

Assumed knowledge: 6231 Manufacturing Engineering I.

Contact hours: 13 lectures and 39 hours of practical work.

Content: The subject is a continuation of the work presented in Manufacturing Engineering 1; it develops further the student's ability to design, analyse and synthesise manufacturing systems and processes.

Assessment: A combination of assignments and final examination.

Text-books: Wild, R., *Production and operations management* (Cassell); Kalpatjian, S., *Manufacturing engineering and technology* (Addison-Wesley, 1989).

2079 Materials III(M)

Level: III.

Points value: 1.5.

Duration: Semester II.

Pre-requisite: Materials II.

Contact hours: 26 lectures and 26 hours laboratory/tutorial.

Content: The metallography, properties and heat treatment of alloy steels, stainless steels, cast irons, aluminium alloys and copper-based alloys; the selection of tool steels; the plastic deformation and failure of metals and alloys; fracture mechanics; corrosion; the structure and properties of polymeric materials; elastomers; adhesives and adhesive joints.

Assessment: Final written examination plus laboratory assessment.

Text-books: To be advised.

5424 Engineering Mathematics III

Level: III.

Points value: 2.0.

Duration: Semester I.

Contact hours: 39 lectures and tutorials/computing practicals.

Assumed knowledge: 7243 Differential Equations II *or* 1016 Differential Equations and Fourier Series E, *and* 2187 Vector Analysis and Complex Analysis; 4569 Laplace Transforms and Probability and Statistical Methods; 1642 Linear Programming and Numerical Analysis.

Content: Material selected from the following topics: Advanced topics on differential equations; integral transforms, complex function theory; computational mathematics; robotics; optimisation; Calculus of variations; operations research, simple queues.

Assessment: By written examination. A small percentage may be allocated to class and computing exercises.

Text-books: To be advised.

4109 Solid Mechanics

Level: III.

Points value: 1.5.

Duration: Semester I.

Contact hours: 26 lectures and tutorials.

Assumed knowledge: 9561 Stress Analysis B, Level II Applied Mathematics subjects with an aggregate points value of 8.

Content: General laws of mechanics and introduction of stress concepts, cartensian tensor analysis, theory of photoelasticity, three dimensional photoelasticity, strain-gauge and rosette analysis, finite element methods, elementary plasticity, fatigue analysis, creep and viscoelasticity, pressure vessels, thermal stresses, stress waves, contact stresses and residual stresses, elastic foundations.

Assessment: A combination of assignments and final examination.

Text-books: Gere and Timoshenko, *Mechanics of materials,* 2nd SI edn. Van Nostrand Reinhold (U.K.); Timoshenko and Goodier, *Theory of elasticity,* 3rd edn (McGraw-Hill).

References: Cook, R.D., *Concept and application of finite element analysis*, 2nd edn. (John-Wiley); Irons, B. and Shrive, *Finite element primer* (John-Wiley & Sons); Dally, J.W. and Riley, W.F., *Experimental stress analysis*, 2nd edn. (McGraw-Hill); Boresi and Sidebottom, *Advanced mechanics of materials*, 4th edn. (John-Wiley).

9813 Thermodynamics 2

Level: III.

Points value: 1.5.

Duration: Semester II.

Assumed knowledge: 1376 Thermodynamics 1.

Contact hours: 26 lectures and tutorials, laboratory and practical work as part of 4066 Computational and Experimental Techniques 2.

Content: Power cycles; refrigeration cycles; thermodynamic relations; non-reacting mixtures; psychrometry; combustion.

Assessment: A combination of assignments and final examination.

Text-books: Van Wylen, G. J. and Sonntag, R. E., *Fundamentals of classical thermodynamics,* S.I. version, 3rd edn. (Wiley, 1985).

6602 Vibrations

Level: III.

Points value: 1.5.

Duration: Semester I.

Assumed knowledge: Level II Applied Mathematics subjects with an aggregate points value of 8.

Contact hours: 26 lectures and tutorials, laboratory work and practical work as part of 4066 Computational and Experimental Techniques 2.

Content: Fundamentals of vibrations; free vibrations of single degree of freedom systems; forced vibrations; damped vibrations; vibrations isolation; two degree of freedom system; multidegree of freedom systems; determination of natural frequencies and mode shapes; vibrations of continuous systems; vibration measurement and control.

Assessment: A combination of assignments and final examination.

Text-books: Thomson, W. T., *Theory of vibration with applications,* 3rd edn. 1988 (Unwin Hyman).

References: Tse, F.S., Morse, T.E. and Hinkle, R.T., *Mechanical vibrations, theory and application,* 2nd edn (Allyn & Bacon, 1978); Newland, D.E., *Mechanical vibration analysis and computation* Longman Scientific & Technical, 1989.

LEVEL IV

5802 Management 1A and 1B

Level: IV.

Points value: 1.0.

Duration: Semester I.

Contact hours: 18 lectures and tutorials; 9 lectures for each part of subject.

Content: Introduction to law for Engineers, contracts, product liability, industrial relations.

Assessment: Final examination.

Text-books: To be advised.

6393 Engineering Management

Level: IV.

Points value: 2.0.

Duration: Semester II.

Contact hours: 26 lectures and tutorials.

Content: Production Management: economic development, forms of business ownership, corporate finance, organisation, critical path methods, work study, quality assurance. Engineering Economy: money time relationship, project evaluation, financial accounts.

Assessment: A combination of assignments and a final examination.

Text-books: Samson, D. A. (editor), *Management for engineers* (Longman Cheshire).

1483 Computational and Experimental Techniques 3

Level: IV.

Points value: 1.0.

Duration: Full year.

Contact hours: 72 hours of laboratory work and report writing.

Content: A series of experiments on aspects of Fluid Mechanics, Thermodynamics, Acoustics, Vibration and Manufacturing with emphasis on the design of experiments, instrumentation, accuracy analysis and effective report writing.

Assessment: Assessment of reports.

Text-books: None.

4153 Mechanical Engineering Project (Level IV)

Level: IV.

Points value: 10.

Duration: Full year (at least 360 hours).

Content: Candidates are required to carry out a project involving both design and research components. The aim of the project is to provide solutions to engineering problems related to industry or to departmental research, with emphasis on project management and effective communication.

Assessment: Based on preliminary report, exhibition and conference for presentation of results and final report.

LEVEL IV ELECTIVES

Note: The subjects listed below are electives, **not all of which will be offered each year.** Information as to which subjects are to be offered in a given year will be available from the Department of Mechanical Engineering at the time of enrolment.

All candidates are required to select five electives of which not less than three must be subjects offered by the Department of Mechanical Engineering. The choice of electives may, with the approval of the Head of the Department of Mechanical Engineering, include not more than two subjects offered by other departments within the University.

5962 Advanced Automatic Control

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: 5893 Automatic Control.

Contact hours: 26 lectures and tutorials, laboratory and practical work as part of 1483 Computational and Experimental Techniques 3.

Content: Frequency response methods; state space methods; and an introduction to non-linear and digital control.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

9463 Advanced Heat and Mass Transfer

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: 9900 Heat Transfer, 5526 Fluid Mechanics 2.

Contact hours: 26 lectures and tutorials, laboratory and practical work is part of 1483 Computational and Experimental Techniques 3.

Content: Conservation principles; transport equations; differential and integral equations for boundary layers and duct flows; laminar and turbulent states; approximation; gas mixtures with phase changes; gas mixtures with chemical reaction; application to airconditioning, refrigeration, steam plant, combustion.

Assessment: A combination of assignments and final examination.

Text-books: Kays, W. M., *Convective heat and mass transfer,* (McGraw-Hill, 1966); Kays, W. M. and London, A. L., *Compact heat exchangers,* 3rd edn (McGraw-Hill, 1984).

9274 Advanced Vibrations

Level: IV.

Points value: 2.0.

Duration: Semester II.

Assumed knowledge: Level II Applied Mathematics subjects with an aggregate points value of 8, 6602 Vibrations.

Contact hours: 26 lectures and tutorials, laboratory and practical work as part of 1483 Computational and Experimental Techniques 3.

Content: Advanced multi-degree of freedom system analysis, modal analysis; spectrum analysis—machine fault diagnosis; statistical energy analysis; use of vibration; principles of design of vibration equipment; structure borne vibration—machinery structures, mobility; reciprocity; finite element analysis, non-linear vibrations.

Assessment: A combination of assignments and final examination.

Text-book: Tse, F. S. and others, *Mechanical vibrations* (Allyn and Bacon).

Reference: Collacott, R. A., *Vibration monitoring and diagnosis,* (Halstead Press); Randall, R. B., *Spectrum Analysis,* (Bruel & Kjaer, 1987); Lyon, R. H., *Machinery noise & diagnostics,* (Butterworths, 1987); Norton, M. P., *Fundamentals of noise and vibration analysis for engineers* (Cambridge University Press, 1989); Ewins, D. J., *Modal analysis* (Research Studies Press, 1984).

6804 Airconditioning and Refrigeration

Level: IV.

Points value: 2.0.

Duration: Semester II.

Contact hours: 26 lectures and tutorials, laboratory and practical work as part of 1483 Computational and Experimental Techniques 3.

Assumed knowledge: 9813 Thermodynamics 2.

Content: Principles and equipment of refrigeration and airconditioning, design procedures.

Assessment: A combination of assignments and final examination.

Text-books: Stooker, W. F. and Jones, J. W., *Refrigeration and air conditioning*, 2nd. edn. (McGraw-Hill/I.S.E.).

Reference: American Society of Heating, Refrigerating and Airconditioning Engineers, *Ashrae Handbook. Fundamentals, systems, equipment, applications*; Stooker, W. F., *Industrial refrigeration* (Anal examination Publishing Co.);

3539 Boundary Layers

Level: IV

Points value: 2.0.

Duration: Semester I.

Contact hours: 26 lectures and tutorials plus practical work as part of 1483 Computational and Experimental Techniques 3.

Assumed knowledge: 5526 Fluid Mechanics 2.

Content: Calculation of laminar and turbulent boundary layers in non-zero pressure gradient. Boundary layer drag estimation. Criteria for flow separation.

Assessment: Final examination. A small percentage may be allocated to class, exercises and assignments.

Text-books: Young, A. D., *Boundary Layers* (B.S.P. Professional Books).

4668 Biomedical Engineering

Level: IV.

Points value: 2.0.

Duration: Semester I.

Contact hours: 26 lectures and 13 tutorials.

Content: An introductory course on the application of engineering knowledge and principles in the medical area. Topics covered include engineering in orthopaedics,

biomechanics; tissue and spinal mechanics; materials; lasers, radiography; magnetic resonance imaging; nuclear medicine; medical ultrasound and image processing.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

1322 Computational Mathematics

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: 1016 Differential Equations and Fourier Series E or 5726 Applied Mathematics IIE (formerly IIB).

Contact hours: 26 lectures plus 1 tutorial and 2 hours practical per 3 weeks.

Content: Topics selected from: Inversion of large sparse matrices. Numerical solution of ordinary differential equations, initial value problems, boundary value problems. Partial differential equations; finite differences, methods of lines, finite element, boundary element and spectral methods. Numerical integration. Numerical solution of integral equations. Super computing.

Assessment: Final examination. A small percentage may be allocated to class and/or computing exercises.

Note: Subject not offered by Department of Mechanical Engineering.

3701 Design Automation

Level: IV.

Points value: 2.0.

Duration: Semester I.

Contact hours: 26 lectures and tutorials plus practical work as part of 1483 Computational and Experimental Techniques 3.

Content: The elements of Computer Integrated Manufacture including CAD/CAM/CAE/CAPP/MRPII/FMS robotics, plant layout, process simulation and an introduction to ergonomics.

Assessment: A combination of assignments and final examination.

Text-books: None.

2368 Elasticity

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: Both 1016 Differential Equations and Fourier Series E and 2187 Vector Analysis and Complex Analysis; or 5726 Applied Mathematics IIE (formerly IIB).

Contact hours: 39 lectures and tutorials. (Offered by Department of Applied Mathematics.)

Content: Stress vector. Stress tensor. Equations of motion and equilibrium. Symmetry of the stress tensor.

Displacement vector. Infinitesimal strain tensor. Cubical dilatation. Compatibility equations for linear strains.

Generalized Hooke's law. Stress-strain law for an isotropic material. Physical interpretation of the elastic constants for an isotropic elastic material.

Displacement and traction boundary-value problems. Principle of superposition. Saint

Venant's principle. Longitudinal extension of a cylinder. Bending of beams — exact and approximate theories. Plane strain, Plane stress. Problems with cylindrical and spherical symmetry.

Elastic waves. Plane waves. Primary and secondary waves. Rayleigh waves. Waves in bars. Free vibrations of elastic materials.

Assessment: Final examination. A small percentage may be allocated to class and/or computing exercises.

Text-books: To be advised.

Note: Subject not offered by Department of Mechanical Engineering.

3312 Engineering Acoustics

Level: IV.

Points value: 2.0.

Duration: Semester II.

Assumed knowledge: Level II Applied Mathematics subjects with an aggregate points value of 8.

Contact hours: 26 lectures and tutorials plus 4 hours practical work as part of 1483 Computational and Experimental Techniques 3.

Content: The fundamentals of soundwave description and propagation, the hearing mechanism, acoustic instrumentation, noise criteria, sound source types and radiated sound fields, outdoor sound propagation, sound power measurement techniques, sound in enclosed spaces, sound transmission loss, acoustic enclosures mufflers, vibration reduction for noise control.

Assessment: A combination of class assignments and final examination.

Text-books: Bies, D. A. and Hansen, C. H., *Engineering noise control: theory and practice,* (Unwin Hyman).

References: Pierce, A. D., *Acoustics: an introduction to its physical principles and applications* (McGraw Hill/Acoustical Society of America); L. L. Beranek (ed.), *Noise and vibration control* (McGraw Hill or Acoustical Society of America); Kinsler, L. E. and Frey, R. E., *Fundamentals of acoustics* 3rd edn. (Wiley); Norton, M. P., *Fundamentals of noise and vibration analysis for engineers* (Cambridge University Press, 1989).

3635 Entrepreneurship and Innovation

Level: IV.

Points value: 2.0.

Duration: Semester II.

Contact hours: 30 lectures and 30 tutorials.

Content: Role of entrepreneurship and innovation in the economy; infrastructure; opportunity; information; product development, venture development, venture financing; entrepreneurial team; the business plan.

Assessment: 2 reports 25%, contributions to class discussion and team performance 10%, examination 15%, the business plan 50%.

Text-books: Drucker, P., *Innovation and entrepreneurship* (Pan Books, 1985); Vesper, T., *New venture strategies* (Prentice Hall, 1980).

Note: Subject not offered by Department of Mechanical Engineering.

5769 Gas Dynamics and Compressible Flow Machines

Level: IV.

Points value: 2.0.

Duration: Semester II.

Assumed knowledge: 5526 Fluid Mechanics 2.

Contact hours: 26 lectures and tutorials, laboratory and practical work as part of 1483 Computational and Experimental Techniques 3.

Content: One-dimensional compressible flow; one-dimensional and two-dimensional wave motion. Flow in ducts and nozzles. Centrifugal and axial compressors.

Assessment: Combination of assignments and final examination.

Text-books: Gerhart, P. M. and Gross, R. J., *Fundamentals of fluid mechanics* (Addison-Wesley); Cohen, R. and Saravanamutto, *Gas turbine theory* (S.I. Units).

5758 Heat Recovery and Process Integration

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: 9813 Thermodynamics 2.

Contact hours: 26 lectures and tutorials.

Content: Opportunities for energy conservation in industry through heat recovery and combined heat and power generation. Optimal design of recovery systems through process integration (the application of the "pinch" principle).

Assessment: A combination of assignments and final examinations.

Text-books: User guide on process integration for efficient use of energy (I. Chem. E, 1982).

4085 Mechanical Engineering Elective A

Level: IV.

Points value: 2.0.

Duration: Semester I.

Assumed knowledge: To be advised.

Contact hours: 26 lectures and tutorials.

Content: One Mechanical Engineering topic offered in Semester I with the approval of the Head of Department of Mechanical Engineering.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

1406 Mechanical Engineering Elective B

Level: IV.

Points value: 2.0.

Duration: Semester II.

Assumed knowledge: To be advised.

Contact hours: 26 lectures and tutorials.

Content: One Mechanical Engineering topic offered in Semester II with the approval of the Head of Department of Mechanical Engineering.

Assessment: A combination of assignments and final examination.

Text-books: To be advised.

2742 Mechanical Engineering Elective: Applied Mathematics A

Level: IV.

Points value: 2.0.

Duration: Semester I.

Pre-requisites: Level II Applied Mathematics subjects with an aggregate points value of 8.

Contact hours: 26 lectures and tutorials. Practical work: variable.

Content: One Applied Mathematics Honours topic offered in Semester I to be selected with the approval of the Heads of the Departments of Mechanical Engineering and Applied Mathematics.

Assessment: 2-hour examination plus small amount for class exercises and computing exercises.

Text-books: To be advised.

Note: Subject not offered by the Department of Mechanical Engineering.

9406 Mechanical Engineering Elective: Applied Mathematics B

Level: IV.

Points value: 2.0.

Duration: Semester II.

Pre-requisites: Level II Applied Mathematics subjects with an aggregate points value of 8.

Contact hours: 26 lectures and tutorials. Practical work: variable.

Content: One Applied Mathematics Honours topic offered in Semester II to be selected with the approval of the Heads of the Departments of Mechanical Engineering and Applied Mathematics.

Assessment: 2-hour examination plus small amount for class exercises and computing exercises.

Text-books: To be advised.

Note: Subject not offered by the Department of Mechanical Engineering.

8404 Special Studies in Mechanical Engineering

Level: IV.

Points value: 2.0.

Duration: Semester I or II.

Assumed knowledge: As prescribed by the Head of Mechanical Engineering.

Contact hours: 26 lectures and tutorials.

Content: Special topics in Mechanical Engineering as determined by the Head of the Mechanical Engineering Department. This subject may be offered from time to time and will be taught by visiting academic/s. Syllabus details will be published by the Department as the need arises.

Assessment: As determined by the Head of the Department of Mechanical Engineering.

Text-books: As determined by the Head of the Department of Mechanical Engineering.

GRADUATE DIPLOMA IN COMPUTER SYSTEMS ENGINEERING

Note: Postgraduate tuition fees may apply to this course.

REGULATIONS

1. There shall be a Graduate Diploma in Computer Systems Engineering.

2. Except as provided in Regulation 3 an applicant for admission to the course of study for the Graduate Diploma shall either:

(i) have qualified for the degree of Bachelor of Engineering in Electrical and Electronic Engineering in the University of Adelaide; or

(ii) hold a qualification accepted by the Faculty of Engineering as being equivalent to the degree of Bachelor of Engineering in Electrical and Electronic Engineering in the University of Adelaide.

3. Subject to the approval of the Council the Faculty of Engineering may, in special cases and subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for the Graduate Diploma an applicant who does not qualify for admission under Regulation 2 but has given evidence satisfactory to the Faculty of Engineering of fitness to undertake work for the Graduate Diploma.

4. To qualify for the Graduate Diploma a candidate shall satisfactorily complete a course of full-time study extending over at least one year or its part-time equivalent. Except with the permission of the Faculty of Engineering the work for the Graduate Diploma shall be completed within three years.

5. (a) The Council, after receipt of advice from the Faculty of Engineering, shall from time to time prescribe schedules defining:

(i) the subjects of study for the Graduate Diploma; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by the candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The head of Department or Centre may approve minor changes to any previously approved syllabus.

6. A candidate who desires that examinations which he or she has passed in the University or elsewhere be counted for the Graduate Diploma in Computer Systems Engineering may on written application be granted such exemption from the requirements of these regulations as the Council may determine. However no subject counted for any other award of this University or other institution shall be counted as part of the requirements for the Graduate Diploma.

7. There shall be three classifications of pass in each subject for the Graduate Diploma: Pass with Distinction, Pass with Credit, and Pass. If a subject has a Conceded Pass classification for the purpose of another award, any such subject passed with this classification shall not count towards the requirements for the Graduate Diploma.

8. (a) A candidate shall not be eligible to attend for examination unless the prescribed work has been completed to the satisfaction of the teaching staff concerned.

(b) A candidate who fails (or obtains a conceded pass) in a subject and desires to take the subject again shall again attend lectures and satisfactorily do such written and practical

work as the teaching staff concerned may prescribe, unless specifically exempted therefrom after written application to the Faculty for such exemption.

(c) A candidate who has twice failed or obtained conceded passes in any subject may not enrol for that subject again except by special permission of the Faculty and then only under such conditions as may be prescribed.

(d) A candidate shall not be eligible to attend for examination unless the prescribed work has been completed to the satisfaction of the teaching staff concerned. A candidate who is not eligible to attend for examination shall be deemed to have failed the examination.

9. A candidate who complies with the foregoing conditions and satisfies the examiners shall be awarded the Graduate Diploma in Computer Systems Engineering.

Regulations allowed 21 Feb. 1991.
Awaiting allowance: 5(b).

GRADUATE DIPLOMA IN COMPUTER SYSTEMS ENGINEERING

SCHEDULES

SCHEDULE I: SUBJECTS OF STUDY

1. The following shall be subjects for the Graduate Diploma in Computer Systems Engineering. (Unless otherwise noted each subject has a point value of 2.)

(a)Group A Subjects — Compulsory Subjects — Department of Electrical and Electronic Engineering.

5411 Microcomputer Systems
2266 Digital Computer Architecture and Design
3714 Real Time Computer Systems
9489 Data Communications
7038 Project

(b) Group B Subjects — Department of Computer Science

Level II and Level III subjects offered by the Department of Computer Science as approved by the Heads of the Departments of Computer Science and Electrical and Electronic Engineering.

(c) Group C Subjects — Department of Electrical and Electronic Engineering
3151 Advanced VLSI Systems Design
6519 Signal Processing (Telecommunications)
7436 Stochastic Processes in Communication Systems

(d) Group D Subjects

Other relevant subjects offered for awards of the Faculty of Engineering and the Faculty of Mathematical and Computer Sciences, as may be approved by the Head of the Department of Electrical and Electronic Engineering.

2. Notwithstanding the above, the availability of all subjects is conditional on:
(a) the availability of staff and facilities; and
(b) sufficient enrolments.

SCHEDULE II: COURSE OF STUDY

1. To qualify for the Graduate Diploma in Computer Systems Engineering a candidate shall satisfactorily complete subjects from Schedule I with an aggregate points value of at least 24, including 10 points from Group A, 10 points from Group B, and at least 2 points from Group C. The subjects presented shall not include any which is, in the opinion of the Faculty, substantially equivalent to another subject presented for the Diploma or already counted towards another qualification.

2. Candidates wishing to enrol in subjects for which they do not have the necessary preliminary knowledge may be required to take such bridging subjects prior to the commencement of their Diploma studies as may be deemed appropriate by the Head of the Department of Electrical and Electronic Engineering. No academic credit toward the Diploma will be awarded for such studies.

3. To complete a course of study in a subject a candidate shall, unless exempted by the head of the department offering the subject:

(a) regularly attend the prescribed lectures, tutorials, workshops and seminars; and

(b) undertake such computing work, project work, practical work, field work and case studies, do such reading, written and oral work and pass such examinations as the head of the department offering the subject may prescribe.

4. Each candidate's course of study must be approved by the Head of the Department of Electrical and Electronic Engineering (or nominee) at enrolment each year.

Note (not forming part of the Schedules)

Each year the Department of Electrical and Electronic Engineering shall determine which of the subjects in Groups A and C will be offered and in which semesters they will be offered. The availability of subjects in Group B will be determined by the Department of Computer Science.

GRADUATE DIPLOMA IN COMPUTER SYSTEMS ENGINEERING

SYLLABUSES

3151 Advanced VLSI Systems Design

Points value: 2.0.

Duration: One Semester.

Assumed knowledge: 6925 Digital systems and microprocessors; 9980 VLSI Design, or equivalents.

Contact hours: 16 hours lectures, 4 hours tutorial, 12 hours practical work.

Content: Topics from: Submicron technology, floor planning and chip architecture, algorithm transformation, VLSI design methodologies, clocking of VLSI circuits and systems, testing approaches and fault analysis, very high speed logic, noise analysis, sub-threshold logic, neural network computation blocks, technology trends, design examples.

Assessment: By written examination, assignments and through performance in the practical work.

Text-book: Weste, N. H. and Eshraghlan, K., *Principles of CMOS VLSI design — a systems perspective* (Addison-Wesley).

9409 Data Communications

Points value: 2.0.

Duration: One Semester.

Assumed knowledge: 1312 Communication Systems or equivalent.

Contact hours: 22 hours lectures and 4 hours tutorial.

Content: Topics from: Network architecture, wide area (WAN), local area (LAN), contention bus, token bus, ring networks, protocols, communication layers, transport layers, application layers, broad and integrated networking, high speed LANs, standards.

Assessment: By written examination.

2266 Digital Computer Architecture and Design

Points value: 2.0.

Duration: One Semester.

Assumed knowledge: 9753 Digital Systems; 6925 Digital systems and microprocessors or equivalents.

Contact hours: 22 hours lectures and 4 hours tutorial.

Content: Topics from: ASM description and design, register transfer level notation, register transfer level operations, the design of digital architecture, event driven logic, RISC architecture, CISC architecture, special processors, micro-operations, micro-coding, microprogramming, bus operations, processor design, control unit design, instruction format and addressing modes, etc.

Assessment: By written examination.

Text-books: Mano, *Computer engineering — hardware design* (Prentice-Hall).

5411 Microcomputer Systems

Points value: 2.0.

Duration: One Semester.

Assumed knowledge: 9753 Digital Systems; 6925 Digital systems and microprocessors or equivalents.

Contact hours: 16 hours lectures, 4 hours tutorial, 12 hours practical work.

Content: Topics from: More advanced aspects of microcomputer architecture, addressing modes, DMA, synchronous and asynchronous interfacing, buses (Multibus, VME, IEEE488, Futurbus), interrupt handling, complex instruction sets, reduced instruction sets, multiple processor systems, fault tolerant systems, virtual memory, caches, etc.

Assessment: By written examination and through performance in the practical work.

Text-books: Motorola, *M68000 16132-bit microprocessor-programmer's reference manual* (Prentice-Hall).

7038 Project

Points value: 2.0.

Duration: One Semester.

Assumed knowledge: 9753 Digital Systems; 6925 Digital systems and microprocessors or equivalents and other Graduate Diploma (CSE) topics concurrently.

Contact hours: 80 hours of practical work.

Content: Each candidate is required to conduct theoretical studies and background reading in order to specify a hardware and/or software system to meet a particular need. The system is then to be designed, developed and tested and the results presented as a written report and as a seminar with demonstration.

Assessment: Based on the written report and on the seminar.

3714 Real Time Computer Systems

Points value: 2.0.

Duration: One Semester.

Assumed knowledge: 6925 Digital systems and microprocessors or equivalents.

Contact hours: 22 hours lectures and 4 hours tutorial.

Content: Topics from: an overview of current practices, specification, design and analysis for multi-tasking systems, scheduling in a single processor, multi-processor and distributed systems, operating system Kernels, real time languages, etc.

Assessment: By written examination.

6519 Signal Processing (Telecommunications)

Points value: 2.0.

Duration: One Semester.

Assumed knowledge: 9913 Signal Processing or equivalent.

Contact hours: 20 hours lectures and 6 hours tutorials and laboratory.

Content: Topics from: review of sampled data systems, Fourier transforms, spectral analysis, orthogonal transforms and the orthogonality principle, optimal and adaptive filtering and prediction, 2D transforms, filtering and optical signal processing, introduction to neural networks.

Assessment: By written examination.

Text-book: To be advised.

7436 Stochastic Processes in Communication Systems

Points value: 2.0.

Duration: One Semester.

Assumed knowledge: 1312 Communication Systems or equivalent.

Contact hours: A total of 26 hours of lectures and tutorials.

Content: Topics from: Fourier transforms and linear systems, random variables, stochastic processes, power spectra of stationary processes, the matched filter, decision theory, linear mean square estimation, recursive linear estimation, normal or Gaussian processes.

Assessment: By written examination.

Reference book: Carlson, A. B., *Communication systems,* 3rd edn. (McGraw-Hill); Papoulis, A., *Probability, random variables and stochastic processes* (McGraw-Hill).

OTHER SUBJECTS OFFERED BY DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

SYLLABUSES: See under Electrical and Electronic Engineering in section on B.E.

SUBJECTS OFFERED BY DEPARTMENT OF COMPUTER SCIENCE

SYLLABUSES: See under Computer Science in section on B.Sc. in Faculty of Mathematical and Computer Sciences.

DEGREE OF

MASTER OF ENGINEERING

REGULATIONS

1. Subject to these regulations, a person who has been admitted in the University of Adelaide to the degree of Bachelor of Engineering in the Honours grade or Pass grade may proceed to the degree of Master of Engineering: provided that persons who have or have had a substantial association with the University may be accepted as candidates for the degree on such conditions as the Faculty may prescribe.

2. To qualify for the degree a candidate shall:

(a) submit in writing to the Registrar for approval by the Faculty of Engineering the subject on which the candidate proposes to present a thesis;

(b) not earlier than one year after the approval of the subject by the Faculty, present a thesis which should be a significant contribution to the practice of engineering.* The thesis may be:

(i) an original design for some engineering work; *or*

(ii) an account, giving evidence of ability on the part of the candidate to cope successfully with engineering difficulties, of some engineering work for the design or construction of which the candidate has been largely responsible; *or*

(iii) an account of some original research, development, inquiry or investigation made by the candidate into some matter involved with engineering;

(c) if so required by the Faculty, adduce evidence to its satisfaction of the originality of, and the degree of the candidate's responsibility for, the work embodied in the thesis; and

(d) if so required by the Faculty pass an examination, written or oral or both, in the field of study immediately relevant to the thesis.

3. (a) On completion of the work the candidate shall lodge with the Registrar three copies of the thesis prepared in accordance with directions given to candidates from time to time.**

(b) Unless the Faculty expressly approve an extension of time in a particular case the thesis shall be submitted within four years from the date of approval of the candidate's subject by the Faculty.

(c) On submission of the thesis the Faculty shall nominate examiners, who may recommend that the thesis:

(i) be accepted, with or without conditions; *or*

(ii) be sent back to the candidate for revision, and re-submission within such time as the Faculty may allow; *or*

(iii) be rejected.

4. A candidate who fulfils the requirements of these regulations and satisfies the examiners under regulations 2 and 3 may, on the recommendation of the Faculty, be admitted to the degree of Master of Engineering.

Regulations allowed 15 January, 1976.

Amended: 4 Feb. 1982; 2, 3. 20 Jul. 1989: 2(b), 3(b). Awaiting allowance: 2(a), 2(b)(iii), 2(c), 3(a).

*FOOTNOTE (not forming part of the regulations): Contributions should be clearly recognisable as more than competent applications of standard engineering practice and should usually be related to professional work done outside the University. No provision is made for academic supervision.

**Published in "Guidelines on Higher Degrees by Research and Specifications for Thesis": *see* Contents.

DEGREE OF

MASTER OF ENGINEERING SCIENCE

REGULATIONS

1. There shall be a degree of Master of Engineering Science.

2. The following may be accepted as a candidate for the degree:

(a) a person who has qualified in the University of Adelaide for the Honours degree of Bachelor of Engineering or the degree of Bachelor of Engineering in the Honours grade; *or*

(b) a person who holds a qualification accepted by the Faculty of Engineering as being equivalent* to the Honours degree of Bachelor of Engineering or the degree of Bachelor of Engineering in the Honours grade in the University of Adelaide; or

(c) a person who has qualified in the University of Adelaide for the Ordinary degree of Bachelor of Engineering or the degree of Bachelor of Engineering in the Pass grade or who holds a qualification accepted by the Faculty of Engineering as being equivalent* to the Ordinary degree of Bachelor of Engineering or the degree of Bachelor of Engineering in the Pass grade in the University of Adelaide, and who has, in addition, successfully undertaken advanced studies and/or work in engineering practice which is considered by the Faculty of Engineering to be an adequate preparation for candidature.

3. With the approval of the Board of Graduate Studies acting with authority wittingly devolved to it by Council the Faculty may, in exceptional circumstances and subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for the degree a person who does not qualify under regulation 2, but who has given evidence satisfactory to the Faculty of fitness to undertake work for the degree.

4. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the degree; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to previously approved syllabuses.

5. A candidate shall be admitted on probation. The period of probation shall not exceed six months in the case of a full-time candidate nor twelve months in the case of a part-time candidate. At the end of the period each candidate's performance shall be reviewed by the Faculty of Engineering and the candidature confirmed, with or without special conditions, or terminated.

6. A candidate's progress shall be reviewed by the Faculty at the end of each academic year. If, in the opinion of the Faculty of Engineering, a candidate is not making satisfactory progress the Faculty may, with the consent of the Council, terminate the candidature.

7. To qualify for the degree a candidate shall:

(a) on completion of any preliminary work which may be prescribed in the schedules and after consultation with the Head of the department in which the majority of the candidate's work falls, submit in writing to the Registrar, for approval by the Faculty, the

* "Equivalent" shall refer to both academic and professional equivalence.

programme of advanced study and project work as prescribed in the schedules and designed to extend over either one calendar year if taken full-time or not less than two and not more than five calendar years if taken part-time;

(b) undertake an approved programme of advanced study and project work under the direction of a supervisor or supervisors who shall be members of the full-time academic staff of the University and appointed by the Faculty, but in special circumstances the Faculty may also appoint an external supervisor;

(c) pass such examinations on the candidate's course of advanced study as may be required by the Faculty; and

(d) present a thesis embodying the results of the candidate's project work.

8. (a) Except by permission of the Faculty, the whole of the work for the degree must be completed within the University.

(b) If for academic reasons the Faculty so permits, parts of the study may be undertaken at other tertiary educational institutions, but such parts shall not however count for more than one-sixth of the work for the degree.

(c) Subject to such conditions as it may determine in each case, the Faculty may permit project work to be undertaken outside the University provided that it can be satisfied:

(i) that this will result in mutual academic benefit to the candidate and the candidate's supervising department;

(ii) that there will be adequate contact and interaction between the candidate and the candidate's supervising department; and

(iii) that the supervisor's access to any experimental work, the candidate's availability for seminars and other discussions, and the publication of results will not thereby be prejudiced.

9. A candidate may not count a subject or closely related subject or part of a subject already presented for another degree or diploma.

10. (a) On completion of his or her work the candidate shall lodge with the Registrar three copies of his or her thesis prepared in accordance with directions given to candidates from time to time.*

(b) Unless the Faculty expressly approves an extension of time in a particular case the thesis shall be submitted within six months of the completion of the candidate's programme.

(c) On submission or re-submission of the thesis the Faculty shall nominate examiners who may recommend that it;

(i) be accepted, with or without conditions; *or*

(ii) be accepted, with or without conditions, subject to satisfactory oral examination; *or*

(iii) be sent back to the candidate for revision; *or*

(iv) be rejected.

11. A candidate who fulfils the requirements of these regulations may, on the recommendation of the Faculty, be admitted to the degree of Master of Engineering Science.

Regulations allowed 23 January, 1975.

Amended: 15 Jan. 1976: 3; 23 Dec. 1976: 6, 7; 2 Feb. 1978: 6, 7; 8 Feb. 1979: 7; 4 Feb. 1982: 6, 9; 24 Feb. 1983: 4, renumbering 5-11; 1 Mar. 1990: 2, 3, 5, 6, 7, 8, 10. 21 Feb. 1991: 2, 3. Awaiting allowance: 4(b).

*Published in "Guidelines on Higher Degrees by Research and Specifications for Thesis"; *see* Contents.

DEGREE OF

MASTER OF ENGINEERING SCIENCE

SCHEDULES

(Made by the Council under Regulation 4.)

SCHEDULE I: PRELIMINARY WORK

1. A person whose qualifications have been accepted under either section (a) or section (b) of regulation 2 shall be deemed to have satisfied the requirements of this schedule.

2. Before being admitted either under section (c) of regulation 2 or under regulation 3 a person shall complete the requirements of this schedule by undertaking, and satisfying the examiners in, such courses of study and/or other work as may in his case be prescribed by the Faculty of Engineering.

SCHEDULE II: COURSES OF STUDY AND PROJECT WORK

The programme of study and project work shall consist of:

(a) supervised project work which may make up the whole of the work but which shall be not less than one-third of the work for the degree;

(b) graduate courses and seminars which may make up not more than two-thirds of the work for the degree; and

(c) other relevant courses, which may make up not more than one-third of the work for the degree, as may be prescribed by the Faculty of Engineering.

DEGREE OF

MASTER OF ENGINEERING SCIENCE

SYLLABUSES

Text-books:

In general, students are expected to have their own copies of text-books; but they are advised to await advice before the commencement of lectures from the lecturer concerned before buying any particular book. Only the prescribed edition of any text-book should be bought.

Reference books:

Lists of books and journals for reference purposes will be issued from time to time by the department concerned. It is hoped that all books and journals set for reference will be available to be consulted in the Barr Smith Library.

Examinations:

For each subject students may obtain from the department concerned details of the examination in that subject including the relative weights given to the components (e.g. such of the following as are relevant: assessments, term or mid-year tests, essays or other written or practical work, final written examinations, *viva voce* examinations).

4527 M.Eng.Sc. Course Work one-third—Civil.

5268 M.Eng.Sc. Course Work two-thirds—Civil.

4584 M.Eng.Sc. Course Work one-third—Electrical and Electronic

2329 M.Eng.Sc. Course Work two-thirds—Electrical and Electronic

6590 M.Eng.Sc. Course Work one-third—Mechanical

2461 M.Eng.Sc. Course Work two-thirds—Mechanical

NOTE: This degree is awarded on the satisfactory completion of a programme of work, normally undertaken within the University, designed to extend over either one calendar year if taken full-time, or not less than two and not more than five calendar years if taken part-time. It will involve supervised project work, and may also include advanced study. The credit obtained for advanced study courses shall not make up more than two-thirds of the work for the degree. A thesis embodying the results of the project work, shall be submitted within six months of the completion of the candidate's programme.

Courses for each candidate are selected in consultation with an adviser to graduate students, and may, within limits, include undergraduate and postgraduate courses given in other faculties.

The postgraduate courses which are offered by departments may change from year to year depending on availability of staff and the demand for particular courses. Details of courses expected to be available each year are obtainable from the Postgraduate Course Advisers in each department.

For 1991 the Faculty of Engineering does not expect to offer advanced subjects, excepting those undertaken by Level IV students and those subjects offered by the Department of Electrical and Electronic Engineering in the courses for the Graduate Certificate in Telecommunications and the Graduate Diploma in Computer Systems Engineering. Applicants wishing to include a course work component in their degree are required to present a proposal acceptable to the Faculty of Engineering.

DEGREE OF

MASTER OF APPLIED SCIENCE

REGULATIONS

1. There shall be a degree of Master of Applied Science.

2. The following may be accepted as a candidate for the degree:

(a) a person who has qualified in the University of Adelaide for the Honours degree of Bachelor of Science, Applied Science or Agricultural Science;

(b) a person who holds a qualification accepted by the Faculty of Engineering as being equivalent to that of (a) above; *or*

(c) a person who has qualified in the University of Adelaide for the degree of Bachelor of Science, Applied Science or Agricultural Science or who holds another academic qualification accepted by the Faculty of Engineering as being sufficient. Persons admitted under this sub-clause may not be awarded the degree before the expiration of two years from the date of qualification for candidature, and will normally be required to carry out preliminary work at Honours standard as set out in schedule I.*

3. With the approval of the Board of Graduate Studies, acting with authority wittingly devolved to it by Council the Faculty may, in exceptional circumstances and subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for the degree a person who does not qualify under regulation 2 but who has given evidence satisfactory to the Faculty of fitness to undertake work for the degree.

4. A candidate shall be admitted on probation. The period of probation shall not exceed six months in the case of a full-time candidate nor twelve months in the case of a part-time candidate. At the end of the period each candidate's performance shall be reviewed by the Faculty of Engineering and the candidature confirmed, with or without special conditions, or terminated.

5. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the degree; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to previously approved syllabuses.

6. A candidate's progress shall be reviewed by the Faculty at the end of each academic year. If, in the opinion of the Faculty of Engineering a candidate is not making satisfactory progress the Faculty may, with the consent of the Council, terminate the candidature.

7. To qualify for the degree a candidate shall:

(a) on completion of any preliminary work which may be prescribed in the schedules and after consultation with the Head of the Department in which the majority of the work falls, submit in writing to the Registrar, for approval by the Faculty, the programme of advanced study and project work as prescribed in the schedules and designed to extend over either one calendar year if taken full-time or not less than two and not more than five calendar years if taken part-time;

*NOTE (not forming part of the regulations): The purpose of this requirement is to allow a candidate who does not have qualifications acceptable under (a) or (b) above to acquire additional competence through study or experience.

(b) undertake an approved programme of advanced study and project work under the direction of a supervisor or supervisors who shall be members of the full-time academic staff of the University and appointed by the Faculty, but in special circumstances the Faculty may also appoint an external supervisor:

(c) pass such examination on the course of advanced study as may be required by the Faculty; and

(d) present a thesis embodying the results of the project.

8. (a) Except by permission of the Faculty, the whole of the work for the degree must be completed within the University.

(b) If for academic reasons the Faculty so permits, parts of the study may be undertaken at other tertiary educational institutions, but such parts shall not however count for more than one-sixth of the work for the degree.

(c) Subject to such conditions as it may determine in each case, the Faculty may permit project work to be undertaken outside the University provided that it can be satisfied:

(i) that this will result in mutual academic benefit to the candidate and the supervising department;

(ii) that there will be adequate contact and interaction between the candidate and the candidate's supervising department; and

(iii) that the supervisor's access to any experimental work, the candidate's availability for seminars and other discussions, and the publication of results will not thereby be prejudiced.

9. A candidate may not count a subject or closely related subject or part of a subject already presented for another degree or diploma.

10. (a) On completion of the work the candidate shall lodge with the Registrar three copies of the thesis prepared in accordance with directions given to candidates from time to time.*

(b) Unless the Faculty expressly approves an extension of time in a particular case the thesis shall be submitted within six months of the completion of the candidate's programme.

(c) On submission or re-submission of the thesis the Faculty shall nominate examiners who may recommend that it:

(i) be accepted, with or without conditions; *or*

(ii) be accepted, with or without conditions, subject to satisfactory oral examination; *or*

(iii) be sent back to the candidate for revision; *or*

(iv) be rejected.

11. A candidate who fulfils the requirements of these regulations may, on the recommendation of the Faculty, be admitted to the degree of Master of Applied Science.

Regulations allowed 23 December, 1976.

Amended: 2 Feb. 1978: 6, 7; 8 Feb. 1979: 6, 7; 4 Feb. 1982: 6, 9; 24 Feb. 1983: 5, renumbering 6-11. 21 Feb. 1991: 3. Awaiting allowance: 4, 5(b), 6, 7, 8(c)(i), 8(c)(ii), 10(a).

* Published in "Guidelines on Higher Degrees by Research and Specifications for Thesis": *see* Contents.

DEGREE OF

MASTER OF APPLIED SCIENCE

SCHEDULES

(Made by the Council under Regulation 6.)

SCHEDULE I: PRELIMINARY WORK

1. A person whose qualifications have been accepted under either section (a) or section (b) of regulation 2 shall be deemed to have satisfied the requirements of this schedule.

2. Before being admitted either under section (c) of regulation 2 or under regulation 3 a person shall complete the requirements of this schedule by undertaking, and satisfying the examiners in, such courses of study and/or other work as may in his case be prescribed by the Faculty of Engineering. The purpose of this schedule is that the person should demonstrate his ability to perform at Honours standard.

SCHEDULE II: COURSES OF STUDY AND PROJECT WORK

The programme of study and project work shall consist of:

(a) supervised project work which may make up the whole of the work but which shall be not less than one-third of the work for the degree;

(b) graduate courses and seminars which may make up not more than two-thirds of the work for the degree; and

(c) other relevant courses, which may make up not more than one-third of the work for the degree, as may be prescribed by the Faculty of Engineering.

Where the programme consists of both study and project work, the course of study shall normally constitute either one-third or two-thirds of the requirements for the degree.

SYLLABUSES

The Syllabuses for the degree of Master of Applied Science are the same as those for the degree of Master of Engineering Science.

3491 M.App.Sc. Course Work one-third — Civil

9583 M.App.Sc. Course Work two-thirds — Civil

3473 M.App.Sc. Course Work one-third — Mechanical

1828 M.App.Sc. Course Work two-thirds — Mechanical

NOTE: for 1991 the Faculty of Engineering does not expect to offer advanced subjects, excepting those undertaken by Level IV students and those subjects offered by the Department of Electrical and Electronic Engineering in the courses for the Graduate Certificate in Telecommunications and the Graduate Diploma in Computer Systems Engineering. Applicants wishing to include a course work component in their degree are required to present a proposal acceptable to the Faculty of Engineering.

DEGREE OF

DOCTOR OF ENGINEERING

REGULATIONS

1. (a) Subject to these regulations a person who has been admitted in the University of Adelaide to an Honours degree of Bachelor or a degree of Master in Science, Agricultural Science, Applied Science, Engineering or Engineering Science, or to the degree of Doctor of Philosophy in a field of study approved by the Faculty of Engineering, may proceed to the degree of Doctor of Engineering.

(b) On the recommendation of the Faculty of Engineering the Council may accept as a candidate for the degree a person who has been admitted to a degree in the University of Adelaide other than one named in section (a) of this regulation, or who is a graduate of another university or institution of higher education recognised by the University of Adelaide and has a substantial association with the University; provided that in each case the graduate concerned has, in the opinion of the Faculty of Engineering, had an adequate engineering training.

(c) On the recommendation of the Faculty of Engineering the Board of Graduate Studies, acting with authority wittingly devolved to it by Council may, in special cases, accept as a candidate for the degree a person who does not hold a degree of a university or institution of higher education, provided that in each case the candidate concerned has a substantial association with the University and has, in the opinion of the Faculty of Engineering, adequate engineering credentials.

(d) Except where a person has been accepted as a candidate under regulation 1(c), no person shall be accepted as a candidate for the degree of Doctor of Engineering before the expiration of five years from the date of the original graduation.

2. (a) A person who desires to become a candidate for the degree shall give notice of the intended candidature in writing to the Registrar and with such notice shall furnish particulars of the applicant's engineering achievements and of the work to be submitted for the degree.

(b) The Faculty of Engineering shall appoint a committee to examine the information submitted and to advise the Faculty on whether the Faculty should:

(i) allow the applicant to proceed, and approve the subject or subjects of the work to be submitted; or

(ii) advise the applicant not to submit his work: and the Faculty's decision shall be conveyed to the applicant.

(c) If it accepts the candidature and approves the subject or subjects of the work to be submitted the Faculty shall nominate examiners of whom one at least shall be an external examiner.

3. (a) To qualify for the degree the candidate shall furnish satisfactory evidence that the candidate has made an original contribution of distinguished merit adding to the knowledge, understanding or practice of any subject with which the Faculty is directly concerned.

(b) The degree shall be awarded primarily on a consideration of such of published works as the candidate may submit for examination.

(c) The candidate in submitting published works shall state generally in a preface and specifically in notes the main sources from which the information is derived and the extent to which the candidate has made use of the work of others, especially where joint publications are concerned. The candidate may also signify in general terms the portions of his work which he claims as original.

(d) The candidate is required to indicate what part, if any, of the work has been submitted for a degree in this or any other university.

4. The candidate shall lodge with the Registrar three copies of the work prepared in accordance with the directions given in sub-paragraph (b) of clause 2B of Chapter XXV of the Statutes. If the work is accepted for the degree the Registrar will transmit two of the copies to the University Library.

5. A candidate who complies with the foregoing conditions and satisfies the examiners may, on the recommendation of the Faculty of Engineering, be admitted to the degree of Doctor of Engineering.

6. Notwithstanding anything contained in the preceding regulations, the Faculty may recommend the award of the degree to any person who is not a member of the staff of the University. Any such recommendation must be accompanied by evidence that the person for whom the award is proposed has made an original and substantial contribution of distinguished merit to the knowledge or understanding of a subject with which the Faculty is directly concerned, of a standard not less than that required by regulation 3.

Regulations allowed 15 January, 1976.
Amended: 4 Feb. 1982: 2, 4. 21 Feb. 1991: 1. Awaiting allowance: 1(d), 2(a), 3(a), 3(b), 3(c), 3(d).

FACULTY OF MATHEMATICAL AND COMPUTER SCIENCES

REGULATIONS, SCHEDULES AND SYLLABUSES

DEGREE OF

BACHELOR OF SCIENCE

IN THE FACULTY OF MATHEMATICAL AND COMPUTER SCIENCES

and

BACHELOR OF INFORMATION SCIENCE

REGULATIONS

1. (a) There shall be an Ordinary degree of Bachelor of Science and an Ordinary degree of Bachelor of Information Science in the Faculty of Mathematical and Computer Sciences. A candidate may obtain either degree or both.
(b) There shall be an Honours degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences. A candidate may obtain either an Ordinary degree of Bachelor of Science or an Honours degree of Bachelor of Science or both.

2. The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(a) the subjects of study for the degree; and

(b) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by Council or such other date as the Council may determine.

3. The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

4. Except by permission of the Faculty, a candidate shall not enrol in any subject for which the pre-requisite studies as prescribed in the syllabus for that subject have not been satisfactorily completed.

5. A candidate shall not be eligible to attend for examination unless the prescribed work has been completed to the satisfaction of the teaching staff concerned.

6. In determining a candidate's final result in a subject (or part of a subject) the examiners may take into account oral, written, practical and other work, provided that the candidate has been given adequate notice at the commencement of the teaching of the subject of the way in which such work will be taken into account and of its relative importance in the final result.

7. There shall be three classifications of pass in the final assessment of any subject for the Ordinary degree, as follows: Pass with Distinction, Pass with Credit, Pass. If the Pass classification be in two divisions, a pass in the higher division may be prescribed in the syllabuses as a pre-requisite for admission to further studies in that subject or to other subjects or as assumed knowledge for such studies. There shall also be a classification of Conceded Pass. A candidate may present for the Ordinary degree only a limited number of subjects for which a Conceded Pass has been obtained, as specified in the relevant schedule made under these regulations.

8. A candidate will be permitted to take a supplementary examination in a subject only in circumstances approved by the department administering such subject, and consistent with any expressed Council policy.

9. A candidate who fails a subject for the Ordinary degree or who obtains a lower division pass and who desires to take that subject again shall, unless exempted wholly or partially

therefrom by the Head of the Department concerned, again complete the required work in that subject to the satisfaction of the teaching staff concerned.

10. A candidate who has twice failed any subject for the Ordinary degree may not enrol for that subject again or for any other subject which in the opinion of the Faculty contains a substantial amount of the same material, except by permission of the Faculty and then only under such conditions as the Faculty may prescribe.

11. There shall be three classifications of Pass in the final assessment of any subject for the Honours degree as follows: First Class, Second Class, Third Class. The Second Class classification shall be divided into two divisions as follows: Division A and Division B.

12. If a candidate is unable to complete the course for the Honours degree within the time allowed, or if a candidate's work is unsatisfactory at any stage of the course, or if a candidate withdraws from the course, such fact shall be reported to the Faculty. The Faculty may permit the candidate to re-enrol for an Honours degree under such conditions (if any) as it may determine.

13. A candidate who has passed subjects in other faculties or in other institutions, may, on written application to the Registrar, be granted such exemption from the requirements of the schedules made under these regulations as the Faculty may determine.

14. If in any year/semester the student enrolment for a particular subject offered by the Faculty is less than the minimum specified by the Faculty that subject may not be offered.

Regulations allowed 21 December, 1972.

Amended: 15 Jan. 1976: 3; 23 Dec. 1976: 5; 31 Jan. 1980: 7; 4 Feb. 1982: 5, 8, 12; 24 Feb. 1983: 3; 17 Jan. 1985: 3(a), 4, 5(c), 7, 9(c); 12 Feb. 1987: 7(b); Awaiting allowance: 1, 3.

Regulations repealed, substituted and allowed: 20 Jul, 1989.

DEGREE OF

BACHELOR OF SCIENCE

IN THE FACULTY OF MATHEMATICAL AND COMPUTER SCIENCES

and

BACHELOR OF INFORMATION SCIENCE

SCHEDULES

(Made by the Council under Regulation 2)

SCHEDULE I: SUBJECTS OF STUDY FOR THE ORDINARY DEGREE OF BACHELOR OF SCIENCE (MATHEMATICAL AND COMPUTER SCIENCES)

NOTES: Syllabuses of subjects for the degree of B.Sc. in the Faculty of Mathematical and Computer Sciences are published below, immediately after these schedules. For syllabuses of subjects taught for other degrees and diplomas see the table of subjects at the end of the volume.

Students are advised that some subjects cannot be counted with others towards the degree of B.Sc. in the Faculty of Mathematical and Computer Sciences. A list of unacceptable combinations is available from the Faculty Office.

Notwithstanding the schedules and syllabuses published in this volume, a number of the subjects listed in the course leading to the degree of B.Sc. in the Faculty of Mathematical and Computer Sciences may not be offered in 1992.

The availability of all subjects is conditional upon the availability of staff and facilities.

The points value of subjects is indicated after each subject title.

LEVEL I SUBJECTS

1. Mathematical and Computer Sciences Subjects

9276	Computer Science I*	6	9134	Mathematical Applications I	3
1073	Programming and Applications I*	3	9786	Mathematics I	6
7780	Computational Methods I*	3	5543	Statistics I	3
6918	Scientific Computing I	3	3617	Mathematics IM	6

* A quota will apply in 1992.

2. Arts Subjects

Level I Arts subjects listed in Schedule II for the degrees of B.A. and B.A. (Jur.), except those subjects listed there which are taught by the Departments of Economics and Commerce.

3. Economics and Commerce Subjects

Subjects listed in Schedule I(a)(i) for the degree of B.Ec. except the subjects 9101 Business Data Analysis I, 7626 Mathematical Economics I and 7263 Mathematics for Economists I. Subjects listed in Schedule I(a)(i) for the degree of B.Com.

4. Engineering Subjects

9167	Design Graphics	1.5	6866	Materials I	1.5
2391	Dynamics	1.5	3018	Process Systems	1.5
6714	Electrical Systems	1.5	6581	Statics	1.5
2835	Engineering Planning and Design	1.5			

5. Science Subjects

Level I Science subjects listed in Schedule III of the degree of B.Sc. in the Faculty of Science.

6. Architectural Studies Subjects

Level I Architectural Studies subjects listed in Schedule II for the degree of B.Arch.St.

LEVEL II SUBJECTS

1. Mathematical Sciences Subjects

Applied Mathematics

7243	Differential Equations II	2	6649	Methods in Applied Mathematics II	2
3096	Dynamic Modelling II	2	7416	Operations Research II	2

Computer Science

1956	Computer Systems	2	3655	Numerical Methods	2
3169	Database and Information Systems	2	5132	Programming and Data Structures A	2
			1006	Programming and Data Structures B	2

Mathematical Physics

9600	Classical Fields and Mathematical Methods II	2	2656	Classical Mechanics II	2

Pure Mathematics

1429	Discrete Mathematics II	2	7389	Multivariable Calculus II	2
5807	Algebra II	2	2959	Real and Complex Analysis II	2

Statistics

4523	Data Analysis II	2	8878	Inference II	2
4107	Distribution Theory II	2	1675	Linear Models II	2

2. Information Science Subjects

9595	Mathematics IIM	4

3. Arts Subjects

Level II Arts subjects listed in Schedule II for the degrees of B.A. and B.A. (Jur.).

4. Economics and Commerce Subjects

Subjects listed in Schedule I(a)(ii) and I(a)(iv) for the degree of B.Ec. except the subjects 3784 Economic Data Analysis II, 8623 Introductory Econometrics and 8620 Mathematical Economics II/III. Subjects listed in Schedule I(a)(ii) and I(a)(iv) for the degree of B.Com.

5. Law Subjects

1826	Australian Legal System	4
3131	Contract	4

6. Science Subjects

Level II Science subjects listed in Schedule II for the degree of B.Sc. in the Faculty of Science.

LEVEL III SUBJECTS

1. Mathematical Sciences Subjects

Applied Mathematics

4447	Applied Probability III	2	1733	Hydrodynamics III	2
6128	Variational Methods and Optimal Control III	2	2506	Mathematical Biology III	2
1322	Computational Mathematics III	2	2039	Mathematical Programming III	2
9787	Differential Equations III	2	9482	Mathematics of Finance III	2
2368	Elasticity III	2	2314	Optimisation III	2
			2208	Random Processes III	2

Computer Science

6378	Artificial Intelligence	2	9820	Numerical Analysis	2
6720	Compiler Construction	2	4468	Operating Systems	2
2328	Computer Networks	2	7343	Programming Language Concepts	2
5141	Computer Architecture	2	1116	Systems Analysis	2
9811	Non-Procedural Programming	2	5204	Principles of Software Engineering	2

Mathematical Physics

7099	Advanced Dynamics	2	7633	Relativity and Classical Field Theory	2
1067	Advanced Quantum Mechanics	2	5547	Statistical Mechanics	2
4324	Mathematical Methods	2			
4964	Quantum Mechanics	2			

Pure Mathematics

6848	Analysis III	2	1273	Groups III	2
3337	Complex Analysis III	2	1845	Integration III	2
3874	Convexity III	2	5780	Logic III	2
3786	Geometry III	2	3401	Number Theory III	2
4102	Geometry of Surfaces III	2	6508	Rings, Fields and Matrices III	2

Statistics

2991	Distribution Theory III	2	2658	Linear Models III	2
9800	Experimental Design III	2	8892	Medical Statistics III	2
4853	Finite Population Sampling III	2	5030	Multivariate Analysis III	2
3837	Generalized Linear Modelling III	2	8387	Non-parametric Methods III	2
2251	Inference III	2	2993	Statistics for Quality Improvement III	2
1411	Life Contingencies III	2	5675	Time Series III	2

2. Arts Subjects

Level III Arts subjects listed in Schedule II for the degrees of B.A. and B.A. (Jur.).

3. Economics and Commerce Subjects

Subjects listed in Schedule I(a)(iii) for the degree of B.Ec. Subjects listed in Schedule I(a)(iii) and I(a)(iv) for the degree of B.Com.

No more than 8 points of Level II/III subjects listed in Schedule I(a)(iv) for the Bachelor of Economics or for the Bachelor of Commerce may be presented at Level III for the degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences.

4. Law Subjects

8433 Constitutional Law	6	9365 Torts	6
8821 Property	6		

5. Science Subjects

Level III Science subjects listed in Schedule III for the degree of B.Sc. in the Faculty of Science.

SCHEDULE II: THE ORDINARY DEGREE OF BACHELOR OF SCIENCE (MATHEMATICAL AND COMPUTER SCIENCE)

1. The course of study for the Ordinary degree shall extend over three years of full-time study or the equivalent.

2. To qualify for the Ordinary degree a candidate shall, subject to the conditions and modifications specified under Clause 3 below, pass subjects from Schedule II to the value of at least 72 points which satisfy the following requirements:

(a) A candidate shall present passes in Mathematical and Computer Sciences subjects to the value of at least 36 points, of which subjects to the value of at least 12 points shall be Level III Mathematical and Computer Sciences subjects;

(b) A candidate shall present passes in subjects not listed as Mathematical and Computer Sciences subjects or Information Science subjects to the value of at least 6 points;

(c) A candidate shall present passes at Pass Division I standard or higher in either 9736 Mathematics I or both 3617 Mathematics IM and 9595 Mathematics IIM;

(d) A candidate shall present passes in Level I subjects to the value of at least 21 points;

(e) A candidate shall present passes in Level II subjects to the value of at least 20 points;

(f) A candidate presenting 3617 Mathematics IM and 9595 Mathematics IIM shall present passes in Level II subjects other than 9595 Mathematics IIM to the value of at least 24 points;

(g) A candidate shall present passes in Level III subjects to the value of at least 24 points.

3. A candidate may present for the degree subjects passed at the conceded pass level within the following limits: Level II and/or Level III subjects with an aggregate points value of not more than 6 provided that no subject thus presented has a points value of more than 3.

4. A candidate who has been previously enrolled in other faculties and who, before enrolling in the Faculty of Mathematical and Computer Sciences, has passed the following subjects may count these subjects as Mathematical and Computer Sciences subjects:

5726 Applied Mathematics IIE	8 points	2187 Vector Analysis and Complex Analysis	2 points
8522 Computer Science IIE	8 points		
4569 Laplace Transforms and Probability and Statistical Methods	2 points		

NOTES (not forming part of the Schedules)
This clause enables Electrical and Electronic Engineering students who have completed the third year of the course for the B.E.(Elec.) to qualify for the B.Sc.(Ma.) with one additional year of study by fulfilling the requirements of clause 6 below. Such students will be granted 1.5 points status at Level I on account of 5729 Engineering Computing I. Electrical and electronic engineering students wishing to qualify for the B.Sc.(Ma.) in this way must lodge an application with the South Australian Tertiary Admissions Centre (SATAC).

5. Except with the permission of the Faculty, a candidate may not enrol in subjects to the value of more than 18 points taught by departments outside the Faculty before obtaining at least a Division I pass in 9786 Mathematics I or 3617 Mathematics IM. These subjects to the value of not more than 18 points shall not include subjects in which a candidate has failed or from which a candidate has withdrawn.

6. A graduate in another faculty who wishes to qualify for the Ordinary degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences and to count towards that degree subjects which have already been presented for another degree may do so

providing such a candidate presents a range of subjects which fulfils the requirements of clause 2 above, including Level III subjects to the value of at least 24 points which have not been presented for any other degree.

7. No candidate will be permitted to count for the degree any subject together with any other subject which, in the opinion of the Faculty, contains a substantial amount of the same material; and no subject may be counted twice towards the degree. No candidate may present the same section of a subject in more than one subject for the degree.

8. Candidates who commenced their courses of study for the degree prior to 1989 may qualify for the degree by fulfilling the requirements of the regulations and schedules in force prior to 1989, with such modifications as the Faculty may deem necessary to take account of changes to subjects from 1989 onwards. Alternatively, candidates may complete their courses of study under present regulations and schedules, with such modifications as the Faculty may deem necessary to ensure that subjects validly passed under previous regulations and schedules may be counted under the present schedules. For the purposes of this clause the following equivalences will be used:

Subjects in schedules prior to 1989	**Equivalent point values**
First year subject	6 points at Level I
First year half-subject	3 points at Level I
Second year subject	8 points at Level II
Second year half-subject	4 points at Level II
Third year subject	12 points at Level III
Third year half-subject	6 points at Level III

9. When in the opinion of the Faculty, special circumstances exist, the Council, on the recommendation of the Faculty in each case, may vary any of the provisions of clauses 1-8 above.

NOTES (not forming part of the Schedules)

1. Work required to complete the degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences.

To qualify for the degree:

(a) students who have completed at another institution part of the equivalent of the requirements for the Adelaide degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences will be required as a minimum to complete Level III subjects from Schedule I with an aggregate points value of 24 including Mathematical Sciences subjects with an aggregate points value of 12.

(b) with special permission of the Faculty, a student who has completed most of the subjects for the degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences at the University of Adelaide including Level III subjects with an aggregate points value of 12 may be permitted to complete the requirements for the degree at another institution.

All applications must be made in writing to the Registrar.

SCHEDULE III: THE HONOURS DEGREE OF BACHELOR OF SCIENCE (MATHEMATICAL AND COMPUTER SCIENCES)

1. A candidate may, subject to the approval of the Head of the Department concerned, proceed to the Honours degree in one of the following subjects:

3152	Honours Applied Mathematics	24	5174	Honours Pure and Applied Mathematics	24
9750	Honours Computer Science	24	6676	Honours Pure Mathematics	24
5724	Honours Mathematical Physics	24	1346	Honours Statistics	24

2. A candidate may, subject to the approval of the Faculty in each case, proceed to the Honours degree in a subject taught in a department in another faculty. Such candidates must consult the Head of the Department concerned and apply, in writing to the Registrar for admission to the Honours course.

3. The work of the Honours course must be completed in one year of full-time study, save that on the recommendation of the Head of the Department concerned, the Faculty may

permit a candidate to spread the work over two years, but no more, under such conditions as it may determine.

4. Unless granted permission to spread the work of the Honours course over two years under clause 3, a candidate for the Honours degree in any subject shall not begin Honours work in that subject until he/she has qualified for the Ordinary degree of Bachelor of Arts or Bachelor of Science or such other degree as may be acceptable to the Faculty. A candidate who has been granted permission to spread the work of the Honours course over two years must fulfil the requirements for the Ordinary degree before beginning the work of the second year of the Honours course.

5. A graduate who has obtained the Honours degree of Bachelor of Arts may not proceed to the Honours degree of Bachelor of Science in the same subject.

6. A graduate who has obtained the Ordinary degree of Bachelor of Arts and has fulfilled the requirements of Schedule III of the Degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences shall be awarded the Honours degree of Bachelor of Arts.

7. A candidate may not enrol a second time for the Honours course in the same subject if he/she:

(a) has already qualified for Honours in that subject; or

(b) has presented himself/herself for examination in that subject but has failed to obtain Honours; or

(c) withdraws from the course unless the Faculty under regulation 12 permits re-enrolment.

8. When, in the opinion of the Faculty, special circumstances exist, the Council, on the recommendation of the Faculty in each case, may vary the provisions of clauses 1-7 above.

SCHEDULE IV: SUBJECTS OF STUDY FOR THE ORDINARY DEGREE OF BACHELOR OF INFORMATION SCIENCE

NOTES: Syllabuses of subjects for the degree of B.Inf.Sc. in the Faculty of Mathematical and Computer Sciences are published below, immediately after these schedules. For syllabuses of subjects taught for other degrees and diplomas see the table of subjects at the end of the volume.

Students are advised that some subjects cannot be counted with others towards the degree of B.Inf.Sc. in the Faculty of Mathematical and Computer Sciences. A list of unacceptable combinations is available from the Faculty Office.

Notwithstanding the schedules and syllabuses published in this volume, a number of the subjects listed in the course leading to the degree of B.Inf.Sc. in the Faculty of Mathematical and Computer Sciences may not be offered in 1992.

The availability of all subjects is conditional upon the availability of staff and facilities.

The points value of subjects is indicated after each subject title.

LEVEL I SUBJECTS

1. Mathematical Sciences Subjects

7780 Computational Methods I*	3	3617 Mathematics IM	6
9276 Computer Science I*	6	1073 Programming and Applications I*	3
9134 Mathematical Applications I	3	5543 Statistics I	3
9786 Mathematics I	6		

* A quota will apply in 1992.

2. Arts Subjects

6001 Argument and Critical Thinking 3

Other Level I Arts subjects listed in Schedule II for the degrees of B.A. and B.A.(Jur.) except those subjects listed there which are taught by the Departments of Economics and Commerce.

3. Economics and Commerce Subjects

Subjects listed in Schedule I(a)(i) for the degree of B.Ec. except the subjects 9101 Business Data Analysis, 7626 Mathematical Economics I and 7263 Mathematics for Economists I. Subjects listed in Schedule I(a)(i) for the degree of B.Com.

4. Engineering Subjects

9167 Design Graphics	1.5	6866 Materials I	1.5
2391 Dynamics	1.5	3018 Process Systems	1.5
6714 Electrical Systems	1.5		
2835 Engineering Planning and Design	1.5	6581 Statics	1.5

5. Science Subjects

Level I Science subjects listed in Schedule III of the degree of B.Sc. in the Faculty of Science.

6. Architectural Studies Subjects

Level I Architectural Studies subjects listed in Schedule II for the degree of B.Arch.St.

LEVEL II SUBJECTS

1. Mathematical Sciences Subjects

Applied Mathematics

7243 Differential Equations II Fourier Series	2	3096 Dynamic Modelling II	2
		7416 Operations Research II	2
6649 Methods in Applied Mathematics II	2		

Computer Science

1956 Computer Systems	2	1006 Programming and Data Structures B	2
3655 Numerical Methods	2		
5132 Programming and Data Structures A	2		

Mathematical Physics

9600 Classical Fields and Mathematical Methods II	2	2656 Classical Mechanics II	2

Pure Mathematics

7389 Multivariable Calculus II		1429 Discrete Mathematics II	2

Statistics

4523 Data Analysis II	2	8878 Inference II	2
4107 Distribution Theory II	2	1675 Linear Models II	2

2. Information Science Subjects

9595 Mathematics IIM 4

3. Arts Subjects

Level II Arts subjects listed in Schedule II for the degrees of B.A. and B.A.(Jur.).

4. Economics and Commerce Subjects

Subjects listed in Schedule I(a)(ii) and I(a)(iv) for the degree of B.Ec. except the subjects 3784 Economic Data Analysis II, 8623 Introductory Econometrics and 8620 Mathematical Economics II/III. Subjects listed in Schedule I(a)(ii) and I(a)(iv) for the degree of B.Com.

5. Science Subjects

Level II Science subjects listed in Schedule II for the degree of B.Sc. in the Faculty of Science.

LEVEL II/III SUBJECTS

1. Mathematical and Computer Sciences subjects

Pure Mathematics

5807 Algebra II	2	2959 Real and Complex Analysis II	2

Computer Science

2687 Database and Information Systems	2

LEVEL III SUBJECTS

1. Mathematical Sciences Subjects

Applied Mathematics

4447 Applied Probability III	2	2039 Mathematical Programming III	2
1322 Computational Mathematics III	2	9482 Mathematics of Finance III	2
9787 Differential Equations III	2	2314 Optimisation III	2
2368 Elasticity III	2	2208 Random Processes III	2
1733 Hydrodynamics III	2	6128 Variational Methods and Optimal Control III	2
2506 Mathematical Biology III	2		

Computer Science

6378 Artificial Intelligence	2	9820 Numerical Analysis	2
6720 Compiler Construction	2	4468 Operating Systems	2
2328 Computer Networks	2	7343 Programming Language Concepts	2
5141 Computer Architecture	2	2687 Systems Analysis	2
9811 Non-Procedural Programming	2	5204 Principles of Software Engineering	2

Mathematical Physics

7099 Advanced Dynamics	2	4964 Quantum Mechanics	2
1067 Advanced Quantum Mechanics	2	7633 Relativity and Classical Field Theory	2
4324 Mathematical Methods	2	5547 Statistical Mechanics	2

Pure Mathematics

6848 Analysis III	2	1273 Groups III	2
3337 Complex Analysis III	2	1845 Integration III	2
3874 Convexity III	2	5780 Logic III	2
3786 Geometry III	2	3401 Number Theory III	2
4102 Geometry of Surfaces III	2	6508 Rings, Fields and Matrices III	2

Statistics

2991 Distribution Theory III	2	8892 Medical Statistics III	2
9800 Experimental Design III	2	5030 Multivariate Analysis III	2
4853 Finite Population Sampling III	2	8387 Non-parametric Methods III	2
3837 Generalized Linear Modelling III	2	5675 Time Series III	2
2251 Inference III	2	2993 Statistics for Quality Improvement III	2
1411 Life Contingencies III	2		
2658 Linear Models III	2		

2. Arts Subjects

Level III Arts subjects listed in Schedule II for the degrees of B.A. and B.A.(Jur.).

3. Economics and Commerce Subjects

Subjects listed in Schedule I(a)(iii) for the degree of B.Ec. Subjects listed in Schedule I(a)(iii) for the degree of B.Com.

No more than 8 points of Level II/III subjects listed in Schedule 1(a)(iv) for the Bachelor of Economics or for the Bachelor of Commerce may be presented at Level III for the degree of Bachelor of Information Science.

4. Science Subjects

Level III Science subjects listed in Schedule III for the degree of B.Sc. in the Faculty of Science.

SCHEDULE V: THE ORDINARY DEGREE OF BACHELOR OF INFORMATION SCIENCE

1. The course of study for the ordinary degree of B.Inf.Sc. shall extend over three years of full time study or the equivalent.

2. To qualify for the degree a candidate shall, subject to Clause 4 below, present passes in subjects from Schedule IV to the value of at least 72 points including:
(a) at least 36 points for subjects listed as Mathematical and Computer Sciences subjects or Information Science subjects;
(b) not more than 30 points for Level I subjects;
(c) at least 24 points for Level III and Level II/III subjects combined, of which at least 12 points must be for subjects listed as Mathematical and Computer Sciences or Information Science subjects and at most 8 points can be for Level II/III subjects.

3. The subjects presented must include:
(a) either 9786 Mathematics I or both 3617 Mathematics IM and 9595 Mathematics IIM at Division I or higher standard;
(b) 5543 Statistics I and 4523 Data Analysis II;
(c) either 9276 Computer Science I, or both 5662 Programming and Applications I and 7780 Computational Methods I;
(d) 6001 Argument and Critical Thinking.

4. A candidate may present for the degree subjects passed at the conceded pass level within the following limits: Level II and/or Level III subjects with an aggregate points value of not more than 6 provided that no subject thus presented has a points value of more than 3.

5. Courses of study must be approved by the Dean of the Faculty of Mathematical and Computer Sciences (or nominee) as compatible with an approved programme in Information Science.

6. A graduate in another faculty who wishes to qualify for the Ordinary degree of Bachelor of Information Science and to count towards that degree subjects which have already been presented for another degree may do so providing such a candidate presents a range of subjects which fulfils the requirements of clauses 2 and 3 above, including Level III subjects to the value of at least 24 points which have not been presented for any other degree.

7. No candidate will be permitted to count for the degree any subject together with any other subject which, in the opinion of the Faculty, contains a substantial amount of the same material; and no subject may be counted twice towards the degree. No candidate may present the same section of a subject in more than one subject for the degree.

8. When in the opinion of the Faculty, special circumstances exist, the Council, on the recommendation of the Faculty in each case, may vary any of the provisions of clauses 1-7 above.

Notes (not forming part of the Schedules)

1. Work required to complete the degree of Bachelor of Information Science.

To qualify for the degree:

(a) students who have completed at another institution part of the equivalent of the requirements for the Adelaide degree of Bachelor of Information Science will be required as a minimum to complete Level III subjects from Schedule I with an aggregate points value of 24 including Mathematical and Computer Sciences subjects with an aggregate points value of 12.

(b) with special permission of the Faculty, a student who has completed most of the subjects for the degree of Bachelor of Information Science at the University of Adelaide including Level III subjects with an aggregate points value of 12 may be permitted to complete the requirements for the degree at another institution.

All applications must be made in writing to the Registrar.

DEGREE OF

BACHELOR OF SCIENCE

IN THE FACULTY OF MATHEMATICAL AND COMPUTER SCIENCES

and

BACHELOR OF INFORMATION SCIENCE

SYLLABUSES

Text-books:

The lists of the text-books were correct at the time that this Volume went to press. It is possible however that amendments to these lists will be made before the start of lectures and, if so, students attending classes will be notified appropriately by the lecturer concerned.

In general, students are expected to have their own copies of text-books but they are advised to await advice from the lecturer concerned before buying any particular book. Only the prescribed edition of any text-book should be bought.

Reference books:

Although lists of books and journals for reference purposes are regarded as important, details have not been included in this Volume. These will however be issued from time to time by the departments concerned. It is hoped that all books and journals set for reference will be available to be consulted in the Barr Smith Library.

Examinations:

For each subject students may obtain from the department concerned details of the examination in that subject including the relative weights given to the components (e.g. such of the following as are relevant: assessments, semester tests, essays or other written or practical work, final written examinations, *viva voce* examinations).

APPLIED MATHEMATICS AND PURE MATHEMATICS

LEVEL I

9134 Mathematical Applications I

Level: I.

Points value: 3.

Duration: Semester II.

Pre-requisites: None.

Assumed knowledge: Year 12 Mathematics I & II: Knowledge such as that obtained by taking 9786 Mathematics I in parallel with this subject.

Contact hours: 4 lectures, 1 tutorial and 1 hour computing laboratory session a week.

Content: The subject is based on a series of modules—approximately 6-8 modules of about 6-8 lectures each with the emphasis on computer-based mathematical modelling and the use of computer packages (not programming).

The topics from which modules will be chosen include dynamical systems (robots, planetary motion nonlinear systems, chaos and attractors); applications of mathematical modelling in economic theory, commerce and industry; applications of mathematical modelling in medicine and biology; the use of common projections in cartography; the use of matrices and probability in game theory; the study and application of groups of symmetries (using the package CAYLEY); cryptography; applications of linear algebra.

Assessment: Primarily on a 3 hour examination with a percentage based on class exercises and computing work. Satisfactory performance in class exercises, tutorials and the computing laboratory will be an essential requirement.

9786 Mathematics I

Level: I.

Points value: 6.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Year 12 Mathematics I & II.

Contact hours: 4 lectures and 2 tutorials a week. Some tutorials will be computing tutorials using a mathematical package.

Content: Calculus: Functions of one and more than one variable, differentiation and integration. Taylor series and differential equations. Algebra: Linear equations, matrices, the vector space R^n, determinants, convex sets and optimisation, eigenvalues and eigenvectors, linear transformations.

Assessment: 3 hour examinations at the end of each semester. In addition, a small percentage may be allocated to class exercises and tutorial work.

Text-books: Edwards, C. and Penny, D., *Calculus and analytic geometry*, 3rd edn. (Prentice-Hall); Anton, H. and Rorres, L., *Elementary linear algebra: applications version*, 6th edn. (Wiley).

4357 Mathematics IH

Level: I.

Points value: 3.

Restriction: Not available for students in the B.Sc.(Ma.) course.

Duration: Semester I.

Pre-requisites: None.

Assumed knowledge: Year 12 Mathematics IS.

Contact hours: 4 lectures and 2 tutorials a week. Some tutorials will be computing tutorials using a mathematical package.

Content: Differential and integral calculus, differential equations, vectors, linear equations, matrices and determinants, application of linear algebra.

Assessment: A 3 hour final examination. A small percentage will be allocated to class exercises and tutorials.

3617 Mathematics IM

Level: I.

Points value: 6.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Year 12 Mathematics IS.

Contact hours: 4 lectures and 2 tutorials a week. Some of the tutorial hours will be computing laboratory sessions.

Content: Calculus: Differential and integral calculus with applications; differential equations; functions of two real variables; Algebra: vectors, linear equations and matrices, determinants, eigenvalues; applications of linear algebra; optimisation.

Assessment: 3 hour examination at the end of each semester with a small percentage based on class exercises and tutorial work.

Text-books: Goldstein, L., Lay, D., and Schneider, D., *Calculus and its applications* (Prentice-Hall); Anton, H. and Rorres, C., *Elementary linear algebra: applications version* 6th edn. (Wiley).

9595 Mathematics IIM

Availability: Not offered in 1992.

Level: II.

Points value: 4.

Duration: Semester I.

Pre-requisites: Mathematics IM.

Restriction: Cannot be counted toward a degree together with 9786 Mathematics I. See the Schedules for the constraints on this subject within the B.Sc.(Ma) degree.

Contact hours: 4 hours lectures and 2 hours tutorials weekly.

Content: Sequences, limits, continuity, Rolle's Theorem, Taylor series, Mathematical Induction, Convex Sets and Optimisation, The Real Vector Space, Linear Transformations and Orthogonal Similarity. There will be a strong emphasis on applications in this subject.

Assessment: One 3-hour examination together with a small percentage for assignments.

Text-books: To be advised.

LEVEL III

9482 Mathematics of Finance III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisite: 9786 Mathematics I.

Contact hours: 2 lectures a week plus 1 hour tutorial and 2 hours practical every 3 weeks.

Content: Difference equations. Theory of interest rates. Annuities. Cash flows. Valuation of Securities. Capital gains tax. Consumer credit. Stochastic interest rate models.

Assessment: To be determined in consultation with students at commencement.

Text-books: A range of books and journal articles in the Mathematics of Finance literature.

APPLIED MATHEMATICS AND STATISTICS

LEVEL I

6918 Scientific Computing I

Level: I.

Points value: 3.

Duration: Semester I.

Co-requisite: 9766 Mathematics I or 3617 Mathematics IM or 4357 Mathematics IH.

Contact hours: 3 hours lectures and 3 hours practicals per week.

Content: The course is based on the implementation of scientific algorithms. Programming in Fortran: basic unix, data types, I/O fortran control, structured programming, mathematical algorithms, modular design, subroutines and functions, common, style and debugging. Using spreadsheets, tables, graphics, chaining and parameters, iteration, data management. A selection from the following topics: Vector computing, introduction, vector operations, algorithms for vector computers. Simulation modelling: concepts, Monte Carlo simulation, modelling examples.

Assessment: 2 hour examination, projects and exercises.

Text-books: To be advised.

APPLIED MATHEMATICS

LEVEL II

Students taking Level II subjects in Applied Mathematics are advised to obtain some knowledge of computer programming beforehand, e.g. via any of the Level I subjects offered by the Department of Computer Science or via 5729 Engineering Computing I. Special arrangements will be made to assist students who do not possess such prior computing knowledge.

The following pairs of subjects cannot both be counted towards a degree.

(a) 6649 Methods in Applied Mathematics II and 2187 Vector Analysis and Complex Analysis.

(b) 7416 Operations Research II and 1642 Linear Programming and Numerical Analysis.

(c) 7243 Differential Equations II and 1016 Differential Equations and Fourier Series E.

Note: The subjects 2187 Vector Analysis and Complex Analysis and 1016 Differential Equations and Fourier Series E are not Mathematical Science subjects. However, students with valid reasons, such as timetable clashes, may apply to the Head of the Department of Applied Mathematics to take 2187 Vector Analysis and Complex Analysis in place of 6649 Methods in Applied Mathematics II and/or 1016 Differential Equations and Fourier Series E instead of 7243 Differential Equations II.

7243 Differential Equations II

Level: II.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Contact hours: 2 weekly lectures plus 1 tutorial and 1 hour practical a fortnight.

Content: Ordinary and partial differential equations. Fourier Series for functions of arbitrary period half range expansions, even and odd functions, complex form of Fourier series. Applications in boundary value problems.

Assessment: Final examination. A small percentage will be allocated to class exercises and computing. A satisfactory performance in computing exercises is a necessary pre-requisite for a pass in this subject.

Text-books: Kreyszig, E., *Advanced engineering mathematics,* 6th edn. (Wiley).

1016 Differential Equations and Fourier Series E

Syllabus: See under B.E. degree in Faculty of Engineering.

7416 Operations Research II

Level: II.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 6649 Methods in Applied Mathematics II.

Contact hours: 2 weekly lectures plus 1 tutorial and 1 hour practical a fortnight.

Content: Probability and Applications: Formulation and solution of probability problems in applications. Includes topics from: gambler's ruin, dimensioning teletraffic networks, epidemic modelling, economic applications. Linear Programming: Simplex algorithm, phase II and phase I duality theory and complementary slackness, interpretation of dual variables, sensitivity analysis.

Assessment: Final examination. A small percentage will be allocated to class exercises and computing. A satisfactory performance in computing exercises is a necessary prerequisite for a pass in this subject.

Text-books: To be advised.

4569 Laplace Transforms and Probability and Statistical Methods

Syllabus: See under B.E. degree in Faculty of Engineering.

3096 Dynamic Modelling II

Level: II.

Points value: 2.

Duration: Semester II.

Assumed knowledge: 7243 Differential Equations II.

Pre-requisite: Mathematics I (Div. I).

Contact hours: Two weekly lectures per week plus one tutorial and one hour practical a fortnight.

Content: Dynamical systems in mechanics and biology: state space, equilibria, stability, periodic behaviour, chaos and optimal control. Continuum mechanics: basic laws of continuum mechanics, one-dimensional continuum mechanics in car traffic, morphogenesis, gas dynamics, elasticity, blood flow, introduction to analysis of stress and strain in solid and fluid mechanics.

Assessment: Final examination. A small percentage will be allocated to class exercises and

computing. A satisfactory performance in computing exercises is a necessary prerequisite for a pass in this subject.

Text-books: Beltrami, E., *Mathematics for dynamic modelling* (Academic).

Reference: Fung, Y. C., *A first course in continuum mechanics* (Prentice-Hall).

1642 Linear Programming and Numerical Analysis

Syllabus: See under B.E. degree in Faculty of Engineering.

2187 Vector Analysis and Complex Analysis

Syllabus: See under B.E. degree in Faculty of Engineering.

6649 Methods in Applied Mathematics II

Level: II.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Co-requisites: 7243 Differential Equations II.

Contact hours: 2 weekly lectures plus 1 tutorial and 1 hour practical a fortnight.

Content: Vector calculus: Vector fields, gradient, divergence and conservation of fluid. Curl, vorticity and Laplace's equation in cartesian and curvilinear coordinates. Line, surface and volume integrals with applications of the divergence and Stokes' theorems. Transforms: Laplace transforms applied to the solution of differential and integral equations, z-transforms and convolutions.

Assessment: Final examination. A small percentage will be allocated to class exercises and computing. A satisfactory performance in computing exercises is a necessary prerequisite for a pass in this subject.

Text-books: Kreyszig, E., *Advanced engineering mathematics,* 6th edn. (Wiley).

LEVEL III

To qualify for a major in Applied Mathematics a student must present passes (not Conceded Passes) in Level III subjects offered by the Department of Applied Mathematics to the value of at least ten points.

Knowledge obtained from certain Level II subjects is assumed for each Level III subject. Students who do not have this assumed knowledge as indicated in the syllabus entries should consult the Department of Applied Mathematics before completing their enrolment. Intending honours students are referred to the statement on pre-requisites listed under the subject 3152 Honours Applied Mathematics.

4447 Applied Probability III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 2929 Laplace Transforms and Probability and Applications *or* 7416 Operations Research II.

Contact hours: 2 weekly lectures plus 1 tutorial and 2 hours practical per 3 weeks.

Content: Markov chains: recurrence and transience, minimality properties, discrete renewal

theorem, global and partial balance equations, reversibility. Kolmogorov criterion, potentials.

Assessment: Final examination. A small percentage may be allocated to class and/or computing exercises.

Text-books: To be advised.

6128 Variational Methods and Optimal Control III

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 7243 Differential Equations II *or* 1016 Differential Equations and Fourier Series E.

Contact hours: 2 weekly lectures plus 1 tutorial and 2 hours practical per 3 weeks.

Content: 1. Classical Theory: Euler Lagrange equations, constrained extrema and Lagrange multipliers, in one and several variables. Applications to mechanics. Hamiltonian formulation. 2. Optimal Control: Pontryagin maximum principle and applications to optimal control. Bang-Bang controls. Applications to economics. 3. Numerical Methods: Introduction to finite element methods for finding approximate solution to partial differential equations.

Assessment: Final examination. A small percentage may be allocated to class and/or computing exercises.

Text-books: To be advised.

1322 Computational Mathematics III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 7243 Differential Equations II *or* 1016 Differential Equations and Fourier Series E.

Contact hours: 2 weekly lectures plus 1 tutorial and 2 hours practical per 3 weeks.

Content: Topics selected from: Inversion of large sparse matrices. Numerical solution of non-linear algebraic equations. Numerical solution of ordinary differential equations, initial value problems, boundary value problems. Partial differential equations: finite differences, methods of lines, finite element, boundary element and spectral methods. Numerical integration—Numerical solution of integral equations. Super-computing.

Assessment: Final examination. A small percentage may be allocated to class and/or computing exercises.

Text-books: To be advised.

9787 Differential Equations III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: Both 7243 Differential Equations II *or* 1016 Differential Equations

and Fourier Series E *and* 7833 Vector Analysis and Continuum Mechanics *or* 2187 Vector Analysis and Complex Analysis; *or* 6649 Methods in Applied Mathematics II.

Contact hours: 2 weekly lectures and 1 tutorial and 2 hours practical per 3 weeks.

Content: A selection of topics from: Existence and uniqueness. Critical points and stability theory. Analysis of linear systems. Sturm-Liouville theory. Eigenfunction expansions. Integral equations. Partial differential equations. Asymptotic expansions.

Assessment: Final examination. A small percentage may be allocated to class and/or computing exercises.

Text-books: To be advised.

2368 Elasticity III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: Both 7243 Differential Equations II *or* 1016 Differential Equations and Fourier Series E *and* 7833 Vector Analysis and Continuum Mechanics *or* 2187 Vector Analysis and Complex Analysis; *or* 6649 Methods of Applied Mathematics II.

Contact hours: 2 weekly lectures and 1 tutorial and 2 hours practical per 3 weeks.

Content: An introduction to metric tensor, analysis of stress and strain, stress-strain relations for elastic materials, plane and three dimensional boundary value problems.

Assessment: Final examination. A small percentage may be allocated to class and/or computing exercises.

Text-books: To be advised.

1733 Hydrodynamics III

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: Both 7243 Differential Equations II *or* 1016 Differential Equations and Fourier Series E *and* 7833 Vector Analysis and Continuum Mechanics *or* 2187 Vector Analysis and Complex Analysis; *or* 6649 Methods of Applied Mathematics II.

Contact hours: 2 weekly lectures and 1 tutorial every 3 weeks and 2 hours practical per 3 weeks.

Content: Classical hydrodynamics of an inviscid fluid. Bernoulli theorom. Irrotational flows. Introduction to viscous flows.

Assessment: Final examination. A small percentage may be allocated to class and/or computing exercises.

Text-books: To be advised.

2506 Mathematical Biology III

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 7243 Differential Equations II *or* 1016 Differential Equations and Fourier Series E.

Contact hours: 2 weekly lectures and 1 tutorial and 2 hours practical per 3 weeks.

Content: Topics from: A survey of applications of mathematics to various biological science problem areas: epidemics, genetics, evolution, enzyme kinetics, diffusion, cardiovascular system, compartmental analysis, drug distribution problems, biological fluid dynamics, plant and animal behaviour, pollination ecology, population dynamics, population extinction, community ecology.

Assessment: Final examination. A small percentage may be allocated to class and/or computing exercises.

Text-books: To be advised.

2039 Mathematical Programming III

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 1642 Linear Programming and Numerical Analysis *or* 2795 Linear Programming and Dynamical Systems *or* 7416 Operations Research II.

Contact hours: 2 weekly lectures and 1 tutorial and 2 hours practical per 3 weeks.

Content: A selection of topics from: advanced linear programming, network theory, integer programming, dynamic programming and applications.

Assessment: Final examination. A small percentage may be allocated to class and/or computing exercises.

Text-books: To be advised.

2314 Optimisation III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 1642 Linear Programming and Numerical Analysis *or* 2795 Linear Programming and Dynamical Systems *or* 7416 Operations Research II.

Contact hours: 2 weekly lectures and 1 tutorial and 2 hours practical per 3 weeks.

Content: Single and multi-variable optimisation, search and gradient methods. Kuhn-Tucker theory for constrained optimisation: algorithms and applications.

Assessment: Final examination. A small percentage may be allocated to class and/or computing exercises.

Text-books: To be advised.

2208 Random Processes III

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 2929 Laplace Transforms and Probability and Application *or* 7416 Operations Research II.

Contact hours: 2 weekly lectures and 1 tutorial and 2 hours practical per 3 weeks.

Content: Continuous-time Markov processes. The nonhomogeneous Poisson Process. Reversing Markov processes with examples from queueing theory. Methods of phases. Supplementary variable method. Renewal theory.

Assessment: Final examination. A small percentage may be allocated to class and/or computing exercises.

Text-books: To be advised.

9482 Mathematics of Finance

Syllabus: See under Applied and Pure Mathematics—Level III.

HONOURS LEVEL

3152 Honours Applied Mathematics (B.A. or B.Sc.)

Students who are considering taking this subject are advised to see the Head of the Department as soon as possible, preferably before enrolling for their Level III subjects.

All students are required to obtain the approval of the Department of Applied Mathematics before enrolling for 3152 Honours Applied Mathematics.

Level: IV.

Points value: 24.

Duration: Full year.

Pre-requisites: (i) Level III Applied Mathematics subjects with an aggregate points value of at least eight.

(ii) Level III Mathematical Sciences subjects to the value of at least eight points offered by other departments in the Faculty.

Students with a different background of Level III subjects or third-year subjects may be accepted at the discretion of the Head of the Department of Applied Mathematics.

Content: The lecture programme will be determined from year to year. Students will be required to make a selection from topics offered by the Departments of Applied Mathematics, Pure Mathematics, Statistics, Computer Science, Physics and Mathematical Physics, the Schools of Mathematical and Earth Sciences at The Flinders University of S.A. and such other departments as may be agreed to by the Department of Applied Mathematics. It may be possible for students to take any appropriate Level III Applied Mathematics subject which has not already been taken.

Only under exceptional circumstances will the Department recommend to the Faculty that a candidate be permitted to spread the work for the Honours degree over two years.

Each student will be assigned a supervisor who will advise on and approve the choice of lecture programme and give guidance in the writing of a project on some topic in Applied Mathematics. Possible topics should be discussed with the staff before the end of the preceding year. Work on the chosen project should begin in the Department in the first week of February and should be completed by the end of the second semester's lecture programme.

Assessment: For topics offered by the Department of Applied Mathematics there will be a three-hour examination at the end of the semester in which the subject is offered (unless other arrangements are notified). The project also contributes to the final result.

SPECIAL COURSES FOR PROSPECTIVE TEACHERS

Special subjects are available for students taking 3152 Honours Applied Mathematics as a preparation for teaching mathematics in, for example, a secondary school. A comprehensive course for such students will be determined according to their background of Level II and

Level III subjects, and the normal honours project may be replaced by two minor projects relevant to mathematics teaching. Such students are strongly advised to see the Head of the Department as soon as possible.

5174 Honours Pure and Applied Mathematics (B.A. or B.Sc.)

Level: IV.

Points value: 24.

Duration: Full year.

Content: Prospective students should consult the two Departments early in the year to obtain advice as to the specific content of the subject.

COMPUTER SCIENCE

LEVEL I

9276 Computer Science I

Level: I.

Points value: 6.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Year 12 Mathematics I & II or Year 12 Mathematics IS.

Restriction: Cannot be counted toward a degree together with 1073 Programming and Applications I.

Co-requisites: None.

Contact hours: 3 lectures, 1½ hours of tutorials (Semester II), plus 3 hours of practical work (Semester I) and 1½ hours (Semester II) per week.

Content: Semester I. Introduction to UNIX; introduction to applications: spreadsheets, document preparation; algorithm design and problem solving; syntax; semantics; Ada programming; constants, variables, basic types, subtypes, derived types, arrays, records, files, input, output, assignment, selection, repetition, procedures, functions, packages and exceptions; introduction to software engineering; debugging; correctness and complexity of simple algorithms; NP-completeness; computability; invariants; termination; databases; relational models; introduction to artificial intelligence.

Semester II. Computer Systems: Basic components: CPU; memory; I/O systems; disk storage; registers; buses; gates; flip-flops; adders; address decoders; microprogrammed computer; networks; file management; operating systems; assemblers; compilers. Discrete mathematics: deductive reasoning and logic; mathematical induction; set theory; theory of relations; and boolean algebra.

Assessment: 2 hour examination at the end of each semester. Students are required to attend a minimum number of practicals and tutorials.

Text-books: Goldschlager, L. and Lister, A., *Computer science: a modern introduction* 2nd edn. (Prentice-Hall 1987); Bover, D. C., Maciunas, K. J. & Oudshoorn, M. J., *Ada: a first course in programming and software engineering* (Addison-Wesley, 1992).

Reference: Ross, K. and Wright, C., *Discrete mathematics* (Prentice-Hall, 1988).

1073 Programming and Applications I

Level: I.

Points value: 3.

Duration: Semester I.

Pre-requisites: None.

Assumed knowledge: Year 12 Mathematics I & II or Year 12 Mathematics IS.

Restriction: Cannot be counted toward a degree together with 9276 Computer Science I.

Co-requisites: None.

Contact hours: 3 lectures and 3 hours of practical work a week.

Content: Introduction to UNIX; introduction to applications; spreadsheets, document preparation; algorithm design and problem solving; syntax; semantics; Ada programming; cosntants, variables, basic types, subtypes, derived types, arrays, records, files, input, output, assignment, selection, repetition, procedures, functions, packages and exceptions; introduction to software engineering; debugging; correctness and complexity of simple algorithms; NP-completeness; computability; invariants; termination; databases; relational models; introduction to artificial intelligence.

Assessment: 2 hour final examination. Students are required to attend a minimum number of practicals.

Text-books: Goldschlager, L. and Lister, A., *Computer science: a modern introduction* 2nd edn. (Prentice-Hall 1987); Bover, D. C., Maciunas, K. J. and Oudshoorn, M. J., *Ada: a first course in programming and software engineering* (Addison-Wesley, 1992).

7780 Computational Methods I

Level: I.

Points value: 3.

Duration: Semester II.

Pre-requisites: 1073 Programming and Applications I.

Co-requisites: 9786 Mathematics I or 3617 Mathematics IM.

Restriction: Cannot be counted towards a degree together with 9276 Computer Science I.

Contact hours: 3 lectures, 1½ hours of tutorials, plus 1½ hours practicals per week.

Content: Introduction to Pascal. Computer systems: CPU, memory, registers, assembly programming, aspects of operating systems. Elements of discrete mathematics. Engineering of numerical software: Floating point numbers and error control. Limits and detection of numerical convergence. Pitfalls in computation: ill-conditioning and instability. Performance evaluation of program execution. Parameterizing numerical software. Parameterizing mathematical models. Elementary computing with combinators. Symbolic calculation. Numerical calculation and graphics with packages. Introduction to simulation. Sources of standard mathematical software.

Assessment: 2 hour examination and the completion of prescribed practical work.

Text-books: To be announced.

LEVEL II

5132 Programming and Data Structures A

Level: II.

Points value: 2.

Duration: Semester I.

Pre-requisites: A Division I pass in 9276 Computer Science I as a pre-requisite, or 6733

Concepts of Computer Science as a co-requisite, and a Division 2 pass in 9786 Mathematics I or a Division 1 pass in 3617 Mathematics IM.

Co-requisites: None.

Contact hours: 2 lectures and 2 hours of practical work a week, plus 1 tutorial a fortnight.

Content: Records, sets, general files; program development techniques including basic ideas of correctness; stacks and queues; dynamic storage; pointers; linked lists; representation of stacks and queues, general list operations.

Notions of complexity and analysis; notion of abstract data type; sets and sequences as examples; searching and information retrieval — illustrating with a "table" abstract data type; various representations of a "table" abstract data type; recursion.

Assessment: 2 hour written examination 90% and programming exercises 10%.

References: Aho, A., Hopcroft, J. and Ullman, J. D., *Data structures and algorithms* (Addison-Wesley, 1987); Barnes, J. G. P., *Programming in Ada* 3rd edn. (Addison-Wesley, 1989).

1006 Programming and Data Structures B

Level: II.

Points value: 2.

Duration: Semester II.

Pre-requisites: A Division I pass in 9276 Computer Science I as a pre-requisite, or 6733 Concepts of Computer Science as a co-requisite, and a Division 2 pass in 9786 Mathematics I or a Division 1 pass in 3617 Mathematics IM.

Co-requisites: None.

Assumed knowledge: 5132 Programming and Data Structures A.

Contact hours: 2 lectures and 2 hours of practical work a week, plus 1 tutorial a fortnight.

Content: Sorting algorithms; graph structures and algorithms; queues and priority queues. Finite state automata and their applications. Case study to show design of data structures.

Assessment: 2 hour written examination 90% and programming exercises 10%.

1956 Computer Systems

Level: II.

Points value: 2.

Duration: Semester I.

Pre-requisites: A Division I pass in 9276 Computer Science I as a pre-requisite, or 6733 Concepts of Computer Science as a co-requisite, and a Division 2 pass in 9786 Mathematics I or a Division 1 pass in 3617 Mathematics IM.

Co-requisites: None.

Contact hours: 2 lectures and 2 hours of practical work a week, plus 1 tutorial a fortnight.

Content: Basic hardware: review of combinational circuits, multiplexers, encoders, arithmetic circuits; synchronous and asynchonous sequential circuits, flip-flops, counters, finite state machines. Elements of computers: machine language, addressing modes; ALU and registers; control unit, instruction format and decoding, interrupts and traps; memory hierarchy, cache, paging; interfaces, buses; operating system support.

Assessment: 2 hour examination, compulsory practicals, exercises.

Text-book: Mano, M.M. *Computer engineering hardware design* (Prentice-Hall, 1988).

3655 Numerical Methods

Level: II.

Points value: 2.

Duration: Semester II.

Pre-requisites: A Division I pass in 9276 Computer Science I as a pre-requisite, or 6733 Concepts of Computer Science as a co-requisite, and a Division 2 pass in 9786 Mathematics I or a Division 1 pass in 3617 Mathematics IM.

Co-requisites: None.

Contact hours: 2 lectures and 2 hours of practical work a week, plus 1 tutorial a fortnight.

Content: Floating point numbers; representation, subtractive cancellation, machine epsilon. Solution of non-linear equations by fixed point iteration methods. Approximation of functions by polynomial and spline functions. Methods of numerical integration: simple and composite rules. Numerical solution of differential equations.

Assessment: 2 hour written examination 90% and programming exercises 10%.

Reference: Conte, S.D. and de Boor, C., *Elementary numerical analysis* 3rd edn (McGraw Hill, 1980).

3169 Database and Information Systems

Level: II/III.

Points value: 2.

Duration: Semester I.

Pre-requisites: A Division I pass in 9276 Computer Science I as a pre-requisite, or 6733 Concepts of Computer Science as a co-requisite, and a Division II pass in 9786 Mathematics I or a Division I pass in 3617 Mathematics IM.

Restriction: Cannot be counted toward a degree together with the previously offered 2687 Databases and Information Systems.

Contact hours: 2 lectures and 2 hours of practical work a week, plus 1 tutorial a fortnight.

Content: The SQL data base query language; queries, subqueries, updates and transactions. Concurrency issues; record locking, deadlock and recovery. Distributed Databases. Database Security in SQL.
The relational, hierarchical and network database models. Theory of relational databases; the relational algebra and relational calculus. Query transformation. Object-oriented databases.
Practical use of a 4th generation system (e.g., Ingres) to generate screen-based forms, and reports.
A low-level database programming language (e.g., Cobol or ESQL). Design of random access and sequential access update programs.

Assessment: 2 hour examination, completion of practical work, submission of written tutorials. There may be a practical component to the exam.

References: C. J. Date, *A guide to Ingres*, Addison Wesley, (1987); B. P. Desai, *An introduction to database systems*, West (1990).

LEVEL III

To major in Computer Science, a student must present passes (not conceded passes) in subjects offered by the Department of Computer Science at Level II to the value of 8 points and at Level III to the value of 10 points. At least one subject must be from Group A below, and at least one subject must be from Group B. Students who intend to take 9750 Honours Computer Science are referred to the statement on pre-requisites for that subject.

Group A
4468 Operating Systems
5141 Computer Architecture
6720 Compiler Construction
2328 Computer Networks

Group B
9820 Numerical Analysis
7343 Programming Language Concepts
1116 Systems Analysis
5204 Principles of Software Engineering
9811 Non-Procedural Programming
6378 Artificial Intelligence

6378 Artificial Intelligence

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 5132 Programming and Data Structures A.

Co-requisites: None.

Contact hours: 2 lectures and 2 hours of practical work a week, plus 1 tutorial every 3 weeks.

Content: AI methodology and fundamentals; description matching and goal-reduction; ANALOGY; AND/OR trees; exploiting natural constraints: Waltz algorithm; search: hill-climbing, beam, best-first, A *; minimax procedure and alpha-beta pruning for game-playing; learning: parameter-adjustment and Winston near-miss/reinforcement procedure; means-end analysis and GPS; rule-based systems: forward- and backward- chaining, MYCIN, Xcon; generate and test paradigm with Dendral. Representation issues: inheritance, demons, defaults, perspectives, frames, primitives; aspects of Prolog; neural networks: recurrent backpropagation technique.

Assessment: 2 hour examination, practicals and exercises.

Text-book: Winston, P. H., *Artificial intelligence* 2nd edn. (Addison-Wesley, 1984).

Reference: Rowe, N. C., *Artificial intelligence through Prolog* (Prentice-Hall, 1988).

5141 Computer Architecture

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 1956 Computer Systems.

Co-requisites: None.

Contact hours: 2 lectures and 2 hours of practical work a week, plus 1 tutorial every 3 weeks.

Content: Fundamentals of computer design; modelling and simulation, VHDL; quantifying cost and performance; instruction set architecture; program behaviour and measurement of instruction set use; processor datapaths control; pipelining, handling pipeline hazards; memory hierarchies and performance; I/O devices, controllers and drivers; I/O and system performance; multiprocessors and special purpose processors; RISC principles, examples and comparison with CISC.

Assessment: 2 hour examination, exercises and practicals.

Text-books: D. A. Patterson & J. L. Hennessy, *Computer architecture: a quantitative approach*, Morgan Kaufmann, 1990.

References: Ward, S. H. and Halstead, R. H., Jr., *Computation structures* (MIT Press, 1990). IEEE Standard 1076-1987, *IEEE Standard VHDL Language Reference Manual*, 1987.

9820 Numerical Analysis

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 3655 Numerical Methods.

Co-requisite: None.

Contact hours: 2 lectures and 2 hours of practical work a week, plus 1 tutorial every 3 weeks.

Content: Topics will include computer arithmetic, numerical solution of non-linear equations, numerical solution of systems of linear equations and the computation of eigenvalues and eigenvectors. The course is intended to be an analysis, rather than a methods course. Equipment: Pocket calculator with the elementary functions.

Assessment: 2 hour final examination 90% and exercises 10%.

References: Atkinson, K. E., *An introduction to numerical analysis* (Wiley, 1978); Conte, S. D. and de Boor, C., *Elementary numerical analysis* (1972); Ralston, A. and Rabinowitz, P., *A first course in numerical analysis* 2nd edn. (McGraw-Hill, 1978); Hager, W.W., *Applied numerical linear algebra* (Prentice-Hall, 1988).

7343 Programming Language Concepts

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 5132 Programming and Data Structures A and 1006 Programming and Data Structures B.

Co-requisites: None.

Contact hours: 2 lectures and 2 hours of practical work a week, plus 1 tutorial every 3 weeks.

Content: A survey of concepts present in programming languages, illustrated by examples from various programming languages. Typical of the concepts covered are the following: binding (including static versus dynamic binding), scope of names (including implicit versus explicit scoping schemes), data types (including coercion, conversion, subtypes and abstract types), statement-level control constructs (including nondeterministic ones), subprogram-level control constructs (including procedures, functions, coroutines, generators and concurrent processes), and functional programming (including the language Lisp). Typical of the languages used for illustration are the following: ACL, Ada, Algol 68, APL, CLU, Lisp and Pascal.

Assessment: 2 hour examination.

Text-books: Ghezzi, C. and Jazayeri, M., *Programming language concepts* 2nd edn. (Wiley, 1987).

References: Pratt, T. W., *Programming languages: design and implementation* 2nd edn. (Prentice-Hall, 1984); MacLennon, B. J., *Principles of programming and languages: design, evaluation and implementation* 2nd edn. (Holt, Rinehart and Winston, 1987); Marcotty, M. and Ledgard, H. F., *Programming language landscape: syntax/semantics/implementation* 2nd edn. (Science Research Associates, 1986); Sethi, R., *Programming languages: concepts and constructs* (Addison-Wesley, 1989).

5204 Principles of Software Engineering

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 5132 Programming and Data Structures A and 1006 Programming and Data Structures B.

Contact hours: 2 lectures and 2 hours practical per week, plus 1 tutorial every 3 weeks.

Content: This is a first course in software engineering and provides an introduction to the production of high quality software solutions to large tasks. Among the topics covered in this course are the following: models of the software life-cycle, requirements analysis and specification, program design techniques and paradigms, software specification techniques, configuration management and version control, quality assurance, integration and testing, project management, computer-aided software engineering and integrated software engineering environments.

Assessment: The assessment in this course will consist of a two-hour examination and a large project.

Text-books: C. Ghezzi, M. Jazayeri & D. Mandrioli, *Fundamentals of Software Engineering* (Prentice-Hall International, 1991).

6720 Compiler Construction

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 1956 Computer Systems, 5132 Programming and Data Structures A, and 1006 Programming and Data Structures B.

Co-requisites: None.

Assumed knowledge: 7343 Programming Language Concepts.

Contact hours: 2 lectures and 2 hours of practical work a week, plus 1 tutorial every 3 weeks.

Content: The structure of compilers: lexical analysis, syntax analysis (top-down and bottom-up techniques), environmental handling, the handling of context-sensitive and context-free errors, type checking and code generation. Run-time support for Algol-like languages, including storage management. BNF languages and grammars. This lecture course is closely coupled with the writing of a moderately large, compulsory programming project.

Assessment: 2 hour examination and compulsory exercise.

References: Aho, A. V., Sethi, R. and Ullman, J. D., *Compilers: principles, techniques and tools* (Addison-Wesley, 1986).

2328 Computer Networks

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 1956 Computer Systems and 5132 Programming and Data Structures A.

Co-requisites: None.

Contact hours: 2 lectures and 2 hours of practical work a week, plus 1 tutorial every 3 weeks.

Content: Introduction to computer networking via the OSI model. Overview of digital and analog data transmission: Nyquist and Shannon results, modulation and encoding. OSI reference model, and real-world examples from some of the layers. Local Area Networks (LANs): ISO 8802/3 and ISO 8802/5. Wide Area Networks (WANs) and Metropolitan Area Networks (MANs): ISDN, B/ISDN, SONET and ATM. Aspects of FDDI. Routing problems in LANs and WANs. Overview of TCP/IP. Security in networks.

Assessment: 2 hour examination, practicals and exercises.

References: Bertsekas, D. and Gallager, R., *Data networks* (Prentice-Hall, 1987); Halsall, F., *Introduction to data communications and computer networks* (Addison-Wesley, 1985); Tanenbaum, A.S., *Computer networks* (Prentice-Hall, 1988).

9811 Non-Procedural Programming

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 5132 Programming and Data Structures A and 1006 Programming and Data Structures B.

Co-requisites: None.

Assumed knowledge: 7343 Programming Language Concepts.

Contact hours: 2 lectures and 2 hours of practical work a week, plus 1 tutorial every 3 weeks.

Content: A selection of topics from the following: functional programming in Miranda: recursive programming techniques; graph reduction; the lambda-calculus; programming in Scheme (a dialect of Lisp); streams and networks of processes; data flow. Object oriented programming concepts: classes, objects and messages; inheritance; encapsulation.

Assessment: 2 hour examination, practicals and exercises.

References: Bird, R. and Wadler, P., *Introduction to functional programming* (Prentice-Hall, 1988); Glaser, H., Hankin, C. and Till, D., *Principles of functional programming* (Prentice-Hall, 1984); Abelson, H. and Sussman, G. J., *Structure and interpretation of computer programs* (MIT Press, 1985); MacLennan, B., *Functional programming practice and theory* (Addison-Wesley, 1990); Henderson, P., *Functional programming: application and implementation* (Prentice-Hall, 1980).

4468 Operating Systems

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 1956 Computer Systems.

Co-requisites: None.

Contact hours: 2 lectures and 2 hours of practical work a week, plus 1 tutorial every 3 weeks.

Content: OS purposes: resource management and the extended virtual computer; historical development. Processes: critical sections and mutual exclusion, semaphores, monitors, classical problems, deadlock; process scheduling. Input and Output: hardware and software control; disks, terminals, clocks. Memory management: multiprocessing needs; swapping; virtual memory, paging and segmentation; page replacement; File System: operations, implementation, performance, protection. Throughout the MINIX implementation will be studied.

Assessment: 2 hour examination and exercises.

Text-book: Tanenbaum, A.S., *Operating systems — design and implementation* (Prentice-Hall, 1987).

References: Shaw, A. C. and Bic, L., *The logical design of operating systems* (Prentice-Hall, 1988); Finkel, R. A., *An operating systems vade mecum* (Prentice-Hall, 1986); Calingaert, P., *Operating system elements* (Prentice-Hall, 1982); Kernighan, B. W. and Ritchie, D. M., *The C programming language* 2nd edn. (Prentice-Hall, 1988).

1116 Systems Analysis

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 2687 Database and Information Systems.

Contact hours: 2 lectures and 2 hours of practical work per week, plus 1 tutorial every 3 weeks.

Content: The design of databases using Entity-Relationship modelling, NIAM, and normalisation approaches. The design of batch systems, and multi-user interactive systems. System design methodologies, including Structured Analysis/Structured Design, and Jackson System Design. The use of CASE tools. The design of programs, using 'Structured Design' and JSD methodologies. Human Factors, including design of interactive dialogues and screens. Feasibility Studies; discounted cash-flow, investment analysis. Systems Simulation.

Assessment: 2 hour examination, completion of practical work, submission of written tutorials.

References: M. A. Jackson, *System development* (Prentice-Hall, 1982); T. DeMarco, *Structured analysis and system specification* (Yourdon Press, 1978); I. T. Hawryszkiewycz, *Introduction to systems analysis and design* (Prentice-Hall, 1991).

HONOURS LEVEL

9750 Honours Computer Science

Note: Students intending to enrol in Honours Computer Science are advised to consult the Head of the Department of Computer Science, preferably before enrolling for Level III subjects. They should be prepared to begin work on a suitable project in the first week of February.

Level: IV.

Points value: 24.

Duration: Full year.

Pre-requisites: For students who have qualified for an Ordinary degree before 1989, passes at a standard satisfactory to the Head of the Department in the following: 5837 Computer Science III *or* 1365 Computer Science IIIA *or* 8253 Computer Science IIIM and one other third year subject offered by the Departments of Pure Mathematics, Applied Mathematics or Statistics. For students who have qualified for an Ordinary degree after 1988, passes at a standard satisfactory to the Head of the Department in a suitable collection of Level II and Level III subjects in the Faculty of Mathematical Sciences. Students with a different background of second-year and third-year courses (or Level II and Level III subjects) may be accepted at the discretion of the Head of the Department.

Assumed knowledge: The content of various Level II and Level III Computer Science subjects (or second-year subjects and third-year options if completed before 1989) depending on the composition of a particular student's Honours programme.

Contact hours: 8 lectures and 25 hours of practical work a week, plus 1 tutorial a fortnight.

Content: The course will be determined from year to year and will consist partly of lectures given in the Department of Computer Science. Other courses may be included, subject to

the approval of the Head of the Department. Students will be required to undertake a major computing project, under the guidance of a supervisor.

Assumed knowledge: Final assessment is based on performance in eight lecture courses, plus a major project which is weighted as two lecture courses.

ECONOMICS AND COMMERCE

FOR THE DEGREE OF BACHELOR OF SCIENCE IN THE FACULTY OF MATHEMATICAL AND COMPUTER SCIENCES

INTRODUCTORY NOTES

The Economics and Commerce subjects available to Mathematical and Computer Sciences students are listed below. For syllabuses please see under the degrees of Bachelor of Economics and Bachelor of Commerce in the Faculty of Economics and Commerce.

ACCOUNTANCY

Quotas apply to Economics IA and IB and Financial Accounting IA and IB. Enrolment of students in the Faculty of Mathematical and Computer Sciences in these subjects is dependent upon successfully competing for available places on the basis of matriculation scores.

To complete the B.Sc. (Mathematical and Computer Sciences) course and accountancy qualifications in minimum time, it is necessary for students to undertake an overloaded programme of study. This should be discussed with a Course Advisor of the Faculty of Mathematical and Computer Sciences.

For students wishing to gain accountancy qualifications in a Mathematical and Computer Sciences degree, the recommended choice of subjects is:

Economics and Commerce Subjects

First Year:

4309 Economics IA	3
2076 Economics IB	3
4359 Financial Accounting IA	3
3086 Financial Accounting IB	3
6362 Commercial Law I	3
	15

Second Year:

4190 Business Finance II	4
7651 Financial Accounting II	4
1282 Commercial Law II	4
	12

Third Year:

5471 Management Accounting IIIA	4
7440 Auditing III	4
5473 Income Tax Law III	4
8315 Company Accounting III	4
	16

Mathematical and Computer Sciences Subjects:

First Year:

9786	Mathematics I	6
5543	Statistics I	3
1073	Programming and Applications I	3
		12

Second Year:
Level II Mathematical and Computer Sciences subjects to the value of 12 points.

Third Year:
Level III Mathematical and Computer Sciences subjects to the value of 12 points.

The Economics subjects available to Mathematical and Computer Sciences students are listed below with syllabuses provided under the Degree of B.Ec. in the Faculty of Economics and Commerce. Depending on staff availability, some subjects may not be taught in any given year.

LEVEL I

4309 Economics IA
2076 Economics IB
9073 Economic History I
2148 Economic Institutions and Policy I

LEVEL II

9467 East Asian Economies
1682 Economic History A
7350 Economic History C
5920 Economics of Resources and the Environment
5426 Industrial Relations II/III
9893 Macroeconomics II
8620 Mathematical Economics II/III
8870 Microeconomics II

LEVEL III

8178 Agricultural Economics III
4883 Applied Econometrics III
5284 Business and Government III
3751 Economic Development IIIA
5942 Economic Development IIIB
7739 Econometrics III
8518 Economics of Labour III
2100 Economic Theory III
7981 Public Finance III

The Commerce subjects available to Mathematical and Computer Science students are listed below with syllabuses provided under the degree of B.Comm. in the Faculty of Economics and Commerce.

LEVEL I

4359	Financial Accounting IA	3	6362	Commercial Law I	3
3086	Financial Accounting IB	3	2499	Information Systems I	3

LEVEL II

7651	Financial Accounting II	4	4190	Business Finance II	4
1282	Commercial Law II	4	2663	Information Systems II	4
5312	Marketing II	4	4807	Management & Organisations II	4

LEVEL III

5741	Management Accounting IIIA	4	9790	Management Accounting IIIB	4
8315	Company Accounting III	4	7440	Auditing III	4
5177	Business Finance III	4	5473	Income Tax Law	4
9885	Marketing III	4	9759	Management & Organisation III	4
5247	Information Systems III	4	4196	Accounting Theory III	4

HONOURS ECONOMICS AND COMMERCE

Mathematical and Computer Sciences students may proceed to Honours in either Economics or Commerce, subject to the permission of the Faculty of Mathematical and Computer Sciences and the Faculty of Economics and Commerce. Students interested in this possibility should consult either the Head of the Department of Economics or the Head of the Department of Commerce, whoever is relevant, before enrolling.

LAW

Note on Law studies within the Degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences.

Students who have successfully completed 24 points at Level I of the B.Sc. (Ma.) degree may be eligible for admission to Law studies. Applications for admission to Law studies may be made through SATAC by mid-October of the year during which they complete their Level I subjects. Except with the permission of the Dean of the Faculty of Law or a nominee, 1826 Australian Legal System must be undertaken concurrently with the Law subject 3731 Contract. These two subjects are pre-requisites for each of the third year Law subjects 8433 Constitutional Law, 9365 Torts, 8821 Property. After admission to Law studies students will remain candidates for the degree of B.Sc. in Mathematical and Computer Sciences and may present for the degree of B.Sc. the subjects: 1826 Australian Legal System; 3731 Contract; 8433 Constitutional Law; 9365 Torts; and 8821 Property. On completion of the B.Sc. (Ma.) degree such students will automatically be eligible to be candidates for the LL.B. degree.

2. A scheme of study, for those wishing to complete the B.Sc. degree in the Faculty of Mathematical and Computer Sciences and to then proceed to the LL.B. degree in the minimum time, is as follows:

First Year:	9786 Mathematics I, 9276 Computer Science I, 5543 Statistics I, and other Level I subjects to the value of 9 points chosen from the schedules for the degree of B.Sc. (Ma.).
Second Year:	Level II subjects to the value of 16 points chosen from the Schedules for the degree of B.Sc. (Ma.) and 1826 Australian Legal System and 3731 Contract, each of which counts as 4 points towards the B.Sc. (Ma.) degree.
Third Year:	Level III Mathematical Sciences subjects to the value of 12 points chosen from the Schedules for the degree of B.Sc. (Ma.) and 8433 Constitutional Law, 9365 Torts and 8821 Property, each of which counts as 6 points towards the B.Sc. (Ma.) degree. To complete the LL.B. degree in the minimum time students would need to take all these subjects although this does involve an overload and is not a requirement of the B.Sc. (Ma.) degree.

Before enrolment in the Law subjects in the above scheme, students should consult the Law Course Adviser.

3. See also the Schedules for the LL.B. degree, and see, in particular, the Introductory Notes to the LL.B. Syllabuses.

PHYSICS AND MATHEMATICAL PHYSICS

INTRODUCTORY NOTES

1. A student may major in Mathematical Physics by presenting passes (not conceded passes) in five of the third year subjects: 4964 Quantum Mechanics, 5547 Statistical Mechanics, 4324 Mathematical Methods, 7099 Advanced Dynamics, 7633 Relativity and Classical Field Theory, 1067 Advanced Quantum Mechanics offered by the Department of Physics and Mathematical Physics.

2. Students who wish to major in Mathematical Physics are recommended to take the following subjects:

Level I: 9786 Mathematics I, 3643 Physics I.

Level II: 2656 Classical Mechanics II, 9600 Classical Fields and Mathematical Methods II, together with either the subjects 3418 Electromagnetism and Relativity II and 6051 Introductory Quantum Mechanics and Applications or 2653 Physics II.
Students should consult the Course Co-ordinator in Mathematical Physics for advice concerning their choice of other second year subjects.

Level III: To qualify for a major in Mathematical Physics a student must present passes (not Conceded Passes) in Level III Mathematical Physics subjects to the value of at least ten points.

3. Students intending to do 5724 Honours Mathematical Physics are advised to take at least eight Level III subjects from the Department of Physics and Mathematical Physics, and the Departments of Pure and Applied Mathematics, chosen in consultation with the Course Co-ordinator.

LEVEL II

6453 Classical Fields and Mathematical Methods II

Level: II.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. 1).

Assumed knowledge: 3643 Physics I.

Contact hours: 2 weekly lectures and 1 tutorial a fortnight.

Content: Newtonian gravitation, electrostatics, Laplace and Poisson equations, method of images, boundary value problems, use of special functions. Delta-functions, Green's functions, eigenvalue expansions. Fourier transforms.

Potential theory, Laplace's equation. Boundary value problems. Green's functions. Method of images. Multipole expansions, spherical harmonics.

Heat equation.

Assessment: Class exercises, final 2 hour examination.

References: Mackie, A.G., *Boundary value problems* (Oliver and Boyd); Sneddon, I.N., *Elements of partial differential equations* (McGraw-Hill).

7553 Classical Mechanics II

Level: II.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. 1).

Assumed knowledge: 3643 Physics I.

Contact hours: 2 weekly lectures and 1 tutorial a fortnight.

Content: Newton's Laws, conservation laws. Many particle systems. Rigid bodies, Angular momentum, Moment of inertia tensor, Lagrange's equations, generalized coordinates. Central force motion. Hamilton's equations.

Assessment: Class exercises and 2 hour final examination.

Text-book: Fowles, G.R., *Analytical mechanics* 4th edn (Holt, Rinehard and Winston).

LEVEL III

7099 Advanced Dynamics

Level: III.

Points value: 2.

Duration: Semester I.

Assumed knowledge: 6298 Mathematical Physics/Pure Mathematics II; *or* 6862 Mathematical Physics/Applied Mathematics II; *or* 2656 Classical Mechanics II.

Contact hours: 2 weekly lectures and 1 tutorial a fortnight.

Content: Hamilton's principle. Lagrangian mechanics on manifolds. Exterior differential forms and Hamiltonian dynamics. Canonical transformations and Hamilton-Jacobi theory. Introduction to chaotic motion.

Assessment: Class exercises and 2 hour examination.

Reference: Arnold, V. I., *Mathematical methods of classical mechanics* (Springer-Verlag); Percival, I. and Richards, D., *Introduction to dynamics* (Cambridge University Press).

1067 Advanced Quantum Mechanics

Level: III.

Points value: 2.

Duration: Semester II.

Assumed knowledge: 7181 Quantum Mechanics.

Contact hours: 2 weekly lectures and 1 tutorial a fortnight.

Content: Symmetries and conservation laws for many-particle systems. The density matrix. Approximation methods with applications. Non-degenerate and degenerate time-independent perturbation theory. The time-development operator and interaction representation. Time-dependent perturbation theory. Scattering theory and the S-matrix. Absorption and emission of electromagnetic radiation.

Assessment: Class exercises and 2 hour examination.

Reference Texts: Sakurai, J.J., *Modern quantum mechanics* (Addison-Wesley); Gottfried, K., *Quantum mechanics* (Benjamin).

4324 Mathematical Methods

Level: III.

Points value: 2.

Duration: Semester I.

Assumed knowledge: 5807 Algebra II.

Contact hours: 2 lectures per week and 1 tutorial every 3 weeks.

Content: Review of vector spaces and inner products. Introduction of dual spaces. Introduction to Hilbert spaces. Self-adjoint and unitary operators. Application to Sturm-Liouville equations. Distributions as duals of spaces of test functions. Fourier transforms of

distributions. Applications to Green's functions. Cartesian tensors. General co-ordinate transformations and introduction to tensor calculus.

Assessment: 2 hour examination plus a small percentage for class exercises.

Text-books: To be advised.

4964 Quantum Mechanics

Level: III.

Points value: 2.

Duration: Semester I.

Assumed knowledge: Both 6051 Introductory Quantum Mechanics and Applications II and 2656 Classical Mechanics II *or* 2653 Physics II.

Contact hours: 2 weekly lectures and 1 tutorial a fortnight.

Content: Review of principles of quantum mechanics. Dirac bra-ket notation. Particle dynamics; the position and momentum representations. Examples: Harmonic Oscillator and occupation number representation. Rotations and properties of angular momentum. Central forces. Composite systems, identical particles. Elementary approximation methods: truncation of basis, first order perturbation theory, Rayleigh-Ritz variational bound.

Assessment: Class exercises and 2 hour examination.

Text-books: Gasiorowicz, S., *Quantum physics* (Wiley); Merzbacher, E., *Quantum mechanics* (Wiley); Sakurai, J. J., *Modern quantum mechanics* (Addison-Wesley).

7633 Relativity and Classical Field Theory

Level: III.

Points value: 2.

Duration: Semester II.

Assumed knowledge: 9600 Classical Fields and Mathematical Methods II and either 3418 Electromagnetism and Relativity II *or* 2653 Physics II.

Contact hours: 2 weekly lectures and 1 tutorial a fortnight.

Content: Einstein's principle of relativity. Minkowski space, 4-tensors. Relativistic kinematics, Lorentz transformations. Relativistic mechanics. Maxwell's equations in tensor form. Motion of charged particles. Variational principles. Energy-stress tensors. Green's function for the wave equation, Lienard-Wiechert potentials. Radiative reaction.

Assessment: Class exercises and 2 hour examination.

Text-books: To be advised.

5547 Statistical Mechanics

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: None.

Assumed knowledge: 7181 Quantum Mechanics.

Contact hours: 2 weekly lectures and 1 tutorial a fortnight.

Content: An introduction to concepts essential for the understanding of both classical and quantum statistical mechanics. Topics covered include the classical thermodynamic laws and their application, postulates of statistical mechanics, statistical interpretation of thermodynamics. Microcanonical, canonical and grand canonical ensembles. The methods of statistical mechanics are then used to develop the statistics for Bose-Einstein, Fermi-

Dirac and photon gases. Selected topics from low temperature physics, electrical and thermal properties of matter and astrophysics will be discussed.

Assessment: A 2 hour examination and class exercises.

Text-books: Reif, F., *Fundamentals of statistical and thermal physics* (McGraw-Hill); Ohanian, *Physics* Vol. 2 (Norton).

HONOURS LEVEL

5724 Honours Mathematical Physics

Note: Students who are considering taking this subject are advised to see the Head of the Department of Physics and Mathematical Physics as soon as possible, preferably before enrolling for their third-year course.

Level: IV.

Points value: 24.

Duration: Full year.

Pre-requisites: Students who have reached a satisfactory standard before 1989 in at least four of the third-year Mathematical Physics options 7136, 2543, 7181, 6307, 2965 and other third-year Science or Mathematical Sciences options *or* after 1988 in at least five of the Level III Mathematical Physics subjects and other Level III Science or Mathematical Sciences subjects, may be permitted to proceed to the Honours course in Mathematical Physics.

Content: The lecture programme will be determined from year to year. Students will be required to make a selection from subjects offered by the Department of Physics and Mathematical Physics and the Departments of Pure and Applied Mathematics. Honours topics from other Departments in the Faculty of Mathematical Sciences, and the Schools of Mathematical Sciences and Physical Sciences at Flinders University may be considered appropriate.

Lectures will be included on the following subjects: general theory of relativity, relativistic quantum mechanics, quantum field theory, many-body theory, statistical mechanics, theoretical nuclear and particle physics.

Each student will be assigned a supervisor who will advise on the choice of lecture programme and give guidance in the writing of a project on some topic in mathematical physics, to be approved in advance by the Head of the Department of Physics and Mathematical Physics.

Assessment: Examinations and project.

PURE MATHEMATICS

INTRODUCTORY NOTES

1. To qualify for a major in Pure Mathematics a student must present passes (not Conceded Passes) in Level III subjects offered by the Department of Pure Mathematics to the value of at least ten points. In addition it is recommended that students take all four Pure Mathematics subjects at Level II. Intending Honours students are referred to the statement on pre-requisites listed under the subject 6676 Honours Pure Mathematics.

2. While 9786 Mathematics I (Div. I) is the usual and recommended pre-requisite for all Level II and Level III Pure Mathematics subjects, students who have obtained a good result

in Mathematics IM (usually Distinction level) may, with the approval of the Head of the Department, be allowed to enrol in Level II and Level III subjects.

3. Students who do not have the assumed knowledge which is given under the syllabus entries for Level III Pure Mathematics subjects should consult the Department before completing their enrolment.

4. For students with special interest in mathematical logic, philosophy courses (with the logic options) are particularly suitable for combining with pure mathematics.

5. A student who may wish to become a teacher of mathematics is strongly advised to study some computer science and statistics in addition to mathematics.

LEVEL II

5807 Algebra II

Level: II.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Contact hours: 2 weekly lectures and 1 tutorial a fortnight.

Content: Linear Algebra: Vector spaces over the real and complex numbers, linear transformations, bases, eigenspaces and diagonalization, inner products, Cauchy-Schwarz inequality and Gram-Schmidt process, adjoint, bilinear forms, the matrix of a form, and the orthogonal and unitary groups.

Group Theory: symmetries and permutations, abstract groups, permutations and matrix groups, cyclic groups and Lagrange's Theorem.

Assessment: 1½ hour examination, together with a small percentage for class exercises.

References: Hoffman, K. and Kunze, R., *Linear algebra;* Frahleigh, J. B., *A first course in abstract algebra.*

1429 Discrete Mathematics II

Level: II.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Contact hours: 2 weekly lectures and 1 tutorial a fortnight.

Content: Permutations and Combinations, Recurrence Relations, Generating Functions and the Inclusion-Exclusion Principle. Graph Theory: Paths, circuits, directed graphs and trees. Introduction to Codes. This course is designed to be of particular benefit to students studying Computer Science subjects.

Assessment: 1½ hour examination, together with a small percentage for class exercises.

References: Anderson, I., *A first course in combinatorial mathematics;* Prather, R. E., *Elements of discrete mathematics;* Cooke, D. J. and Bez, H. E., *Computer mathematics;* Townsend, M., *Discrete mathematics: applied combinations and graph theory.*

9595 Mathematics IIM

Availability: Not offered in 1992.

Level: II.

Points value: 4.

Duration: Semester I.

Pre-requisites: Mathematics IM.

Restriction: Cannot be counted toward a degree together with 9786 Mathematics I. See the Schedules for the constraints on this subject within the B.Sc.(Ma) degree.

Contact hours: 4 hours lectures and 2 hours tutorials weekly.

Content: Sequences, Limits, Continuity, Rolle's Theorem, Taylor series, Mathematical Induction, Convex Sets and Optimisation, The Real Vector Space, Linear Transformations and Orthogonal Similarity. There will be a strong emphasis on applications in this subject.

Assessment: 3 hour examination, together with a small percentage for class exercises.

References: To be advised.

7389 Multivariable Calculus II

Level: II.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Contact hours: 2 weekly lectures and 1 tutorial a fortnight.

Content: Continuous functions on R. Differentiable functions, partial derivatives and directional derivatives, the Chain Rule and higher partial derivatives. The Hessian matrix and Taylor's Theorem. Inverse Function and Implicit Function Theorems. Smooth surfaces and tangent spaces. Dual spaces, Lagrange multipliers. Multiple integrals.

Assessment: 1½ hour examination, together with a small percentage for class exercises.

References: Baxandall, P. R. and Liebeck, H., *Differential vector calculus.*

2959 Real and Complex Analysis II

Level: II.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Contact hours: 2 weekly lectures and 1 tutorial a fortnight.

Content: Properties of the Real Numbers. Real and complex sequences and limit properties. Series: convergence tests for series, conditional and absolute convergence of series. Power series and differentiation of power series. Continuous real valued functions. Complex functions: differentiability and continuity. Integration of complex functions including Cauchy's theorem, integral formula and residue theorem.

Assessment: 1½ hour examination, together with a small percentage for class exercises.

References: Spivak, M., *Calculus;* Marsden, J. E., *Basic complex analysis;* Churchill, R. V., et al *Complex variables and applications.*

LEVEL III

6848 Analysis III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 8925 Pure Mathematics II *or* 2959 Real and Complex Analysis.

Contact hours: 2 weekly lectures and 1 tutorial every three weeks.

Content: Metrics and norms, continuity, convergence and topological concepts. Completeness and compactness, uniform convergence. Connectedness. Contraction mappings.

Assessment: 2 hour examination and a small percentage may be allocated to class exercises.

References: Apostol, T. M., *Mathematical analysis.*

3337 Complex Analysis III

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 8925 Pure Mathematics II *or* 2959 Real and Complex Analysis.

Contact hours: 2 weekly lectures and 1 tutorial every three weeks.

Content: The basic theory of holomorphic functions including conformal mapping. Cauchy's integral theorem and the residue theorem, together with selected applications.

Assessment: 2 hour examination and a small percentage may be allocated to class exercises.

References: Ahlfors, L. V., *Complex analysis* or Marsden, J. E., *Basic complex analysis.*

3874 Convexity III

Availability: Not offered in 1992.

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Contact hours: 2 weekly lectures and 1 tutorial every three weeks.

Content: An introduction to the properties of convex sets in n-dimensional Euclidean space, duality, polytopes, Helly's theorem, Caratheodory's theorem, convex functions, Blaschke's selection theorem, mixed volumes.

Assessment: 2 hour examination plus a small percentage for class exercises.

Reference: Eggleston, H. G., *Convexity.*

3786 Geometry III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 8925 Pure Mathematics II or 5807 Algebra.

Contact hours: 2 weekly lectures and 1 tutorial every three weeks.

Content: A review of Euclidean geometry. An introduction to projective geometry via axioms and coordinates; incidence theorems, collineations, projectivities and the conic. One of the topics: Affine and Euclidean geometry, non-Euclidean geometry, finite geometry.

Assessment: 2 hour examination and a small percentage may be allocated for class exercises.

References: Maxwell, E. A., *The methods of plane projective geometry based on the use of general homogeneous coordinates.*

4102 Geometry of Surfaces III

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 8925 Pure Mathematics II *or* both 5807 Algebra and 7389 Multivariable Calculus.

Contact hours: 2 weekly lectures and 1 tutorial every three weeks.

Content: Curves in R^n, R^3. Surfaces in R^3. Multilinear forms and integration on lines, surfaces and volumes in R^3. Stokes Theorem, Jacobians and change of variable. Geometry of surfaces, curves on surfaces, curvature, Gaussian curvature, geodesics, the Gauss map and the Gauss-Bonnet theorem.

Assessment: 2 hour examination and a small percentage may be allocated for class exercises.

Text-books: Baxandall, P. R. and Liebeck, H., *Differential vector calculus.*

1273 Groups III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 8925 Pure Mathematics II *or* 5807 Algebra.

Contact hours: 2 weekly lectures and 1 tutorial every three weeks. Some tutorials may be computing tutorials using the group theory package Cayley.

Content: Permutations, cyclic groups, homomorphisms, normal subgroups and factor groups, isomorphism theorems. Direct products. Groups acting on sets and applications to p-group conjugacy classes. Finitely generated abelian groups. Sylow's Theorems. Presentation of groups.

Assessment: 2 hour examination and a small percentage may be allocated for class exercises and tutorial work.

References: Frahleigh, J. B., *A first course in abstract algebra.*

1845 Integration III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 8925 Pure Mathematics II *or* 2959 Real and Complex Analysis.

Contact hours: 2 weekly lectures and 1 tutorial every three weeks.

Content: Countability. Additive set functions, σ-algebras and Lebesgue measure and integral; convergence theorems, Fubini's theorem and change of variable theorem. Applications in probability and analysis.

Assessment: 2 hour examination and a small percentage may be allocated for class exercises.

References: Rudin, W., *Principles of mathematical analysis;* Rudin, W., *Real and complex analysis* 2nd edn.

5780 Logic III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: None.

Contact hours: 2 weekly lectures and 1 tutorial every three weeks.

Content: Propositional Calculus, First Order Theories, Interpretations and models. Godel's Completeness Theorem for Predicate Calculus. Computability: Turing machines, recursive functions and the halting problem. Undecidability of Predicate Calculus. Godel's Theorem for Elementary Number Theory.

Assessment: 2 hour examination and a small percentage may be allocated for class exercises.

References: Crossley, J. N., *What is mathematical logic?*

3401 Number Theory III

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: None.

Contact hours: 2 weekly lectures and 1 tutorial every three weeks.

Content: Congruences, arithmetical functions, finite fields, quadratic fields, irrational numbers and applications. An elementary knowledge of computer programming will be assumed in this subject.

Assessment: 2 hour examination plus a small percentage for class exercises.

6508 Rings, Fields and Matrices III

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 8925 Pure Mathematics II *or* 5807 Algebra.

Contact hours: 2 weekly lectures and 1 tutorial every three weeks.

Content: Rings, integral domains, homomorphisms, ideals, subrings. Polynomials. Principal Ideal Domains, Fields, finite fields. Rational, Primary rational and Jordan Canonical forms for matrices.

Assessment: 2 hour examination and a small percentage may be allocated for class exercises.

References: Frahleigh, J. B., *A first course in abstract algebra.*

9482 Mathematics of Finance III

Syllabus: See under Applied and Pure Mathematics—Level III.

HONOURS LEVEL

6676 Honours Pure Mathematics (B.A. or B.Sc.)

Note: Students are required to consult with the Head of the Department of Pure Mathematics, preferably no later than the end of the year preceding their enrolment, in order to ensure that they have obtained the necessary pre-requisite knowledge at a satisfactory standard, to plan their course of study and discuss their choice of project. All students are required to obtain the approval of the Head of the Department of Pure Mathematics before enrolling for 6676 Honours Pure Mathematics.

Level: IV.

Points value: 24.

Duration: Full year.

Pre-requisites: The normal pre-requisites are:

(i) 8864 Pure Mathematics III or at least 6 Level III Pure Mathematics subjects including 3198 Analysis and 1925 Groups;

(ii) a knowledge of the material of options 2986 Rings and Modules and 2556 Groups or of subjects 6508 Rings, Fields and Matrices, and 2556 Integration;

(iii) a third year subject offered by another department in the Faculty of Mathematical and Computer Sciences, or 7082 Mathematical Physics III or 9730 Mathematical Physics IIIA or 4185 Mathematical Physics IIIM, or Level III Mathematical Sciences subjects to the value of at least eight-points offered by other departments.

Students with a different background of third year or Level III subjects may be accepted at the discretion of the Head of the Department of Pure Mathematics.

Content: The lecture programme will be determined from year to year. Students will be required to make a selection from options offered by the Departments of Pure Mathematics, Applied Mathematics, Computer Science, Statistics, Physics and Mathematical Physics and by the School of Mathematical Sciences at The Flinders University of South Australia, including some compulsory options in Algebra and Analysis; options offered by other departments may also be available.

Only under exceptional circumstances will the Department recommend to the Faculty that a candidate be permitted to spread the work for the Honours degree over two years.

Each student will be assigned a supervisor who will advise on the choice of lecture programme and give guidance in the writing of a project on some topic in mathematics. Work on this project should begin in the Department in the first week of February and should be completed by the end of the second semester's lecture programme.

Assessment: For options given in the Department of Pure Mathematics, there will be a three-hour examination at the end of the semester in which the option is given (unless other arrangements are notified). The project also contributes to the final result.

RECOMMENDED PROGRAMME FOR TEACHERS OR PROSPECTIVE TEACHERS

The Department of Pure Mathematics offers an optional Recommended Programme for Teachers or Prospective Teachers within 6676 Honours Pure Mathematics. This Programme consists of a recommended selection of options, some of which have been specially designed for the purposes of the Programme. Students taking the whole of this Programme may be permitted to replace the project normally required by two minor projects on topics appropriate to the Programme. The Programme is recommended in particular to potential secondary mathematics teachers.

Some options within the Recommended Programme for Teachers or Prospective Teachers

will be available to suitably qualified secondary mathematics teachers who wish to attend as Visiting Students.

5174 Honours Pure and Applied Mathematics (B.A. or B.Sc.)

Level: IV.

Points value: 24.

Duration: Full year.

Content: Prospective students should consult the Department early in the year in which the subject is being offered to obtain advice as to the specific content of the subject.

STATISTICS

LEVEL I

5543 Statistics I

Level: I.

Points value: 3.

Duration: Semester I and II.

Pre-requisites: None.

Assumed knowledge: Year 12 Mathematics I & II *or* Year 12 Mathematics IS.

Restriction: 5543 Statistics I and 9101 Business Data Analysis I (pre-1992 8179 Economic Statistics I or 7322 Economic Statistics IA) cannot both be counted towards a degree.

Contact hours: 3 lectures, 1 tutorial and 2 hours of practical work a week.

Content: This course is an introduction to the theory and application of statistical methods to experimental data. It is suitable for students who are likely to be users of statistical methods in the future, or who intend to pursue a degree in mathematical sciences. Topics covered include the organisation, description and presentation of data; probability and relative frequency; random variables and probability distributions; binomial and hypergeometric distributions; continuous distributions; the Normal distribution; the use of inference to draw conclusions from data; tests of significance for means and variances; confidence intervals; goodness of fit tests; the t, X^2 and F distributions; fitting straight lines to data; the method of least squares; regression and analysis of variance.
Students will be introduced to the statistical computer package Minitab which will be used throughout the course.

Assessment: Formal examination (at least 80%) and exercises, practicals and project work (at most 20%).

Text-books: Lecture notes are available from the Department of Statistics.

LEVEL II

Four Level II subjects are offered by the Department. All have 5543 Statistics I as a pre-requisite, but 4523 Data Analysis is a practical course aimed, like 5543 Statistics I, at both those who require a knowledge of statistics in other fields and those who wish to continue with statistics as a discipline. The other three Level II units have a more mathematical

flavour and accordingly have additional pre-requisites in the form of 9786 Mathematics I or 3617 Mathematics IM.

4523 Data Analysis II

Level: II.

Points value: 2.

Duration: Semester I.

Pre-requisites: 5543 Statistics I (Div. I).

Assumed knowledge: Either 9786 Mathematics I *or* 3617 Mathematics IM *or* 4357 Mathematics IH.

Contact hours: 2 lectures and 1 hour of practical work a week, plus 1 tutorial a fortnight.

Content: This course is an extension of Statistics I, providing a broader and deeper understanding of the application of statistical methods to data. Topics covered include randomisation, blocking and the design and analysis of experiments; analysis of variance, fixed and random effects; elementary factorial designs; linear and multiple regression, regression diagnostics, the analysis of residuals; the design and analysis of surveys, simple random sampling, the analysis of frequency data; elementary distribution-free methods such as the sign test, Wilcoxon tests and rank tests.
Students will use the statistical package Minitab throughout the course.

Assessment: Formal examination (at least 80%) and exercises, practicals and project work (at most 20%).

Text-books: Lecture notes to be provided.

4107 Distribution Theory II

Level: II.

Points value: 2.

Duration: Semester I.

Pre-requisites: 5543 Statistics I (Div. I) and *either* 9786 Mathematics I (Div. I) or 3617 Mathematics IM (distinction or exceptionally, with the approval of the Chairman of the Department at credit standard).

Contact hours: 2 lectures and 1 hour of practical work a week, plus 1 tutorial a fortnight.

Content: This course provides the mathematical and statistical foundation necessary for the further study of statistical modelling and inference. Random processes and probability. Conditional probability and independent events. Univariate discrete probability distributions, including Binomial, hypergeometric, Poisson and waiting-time distributions. Continuous distributions, including Normal and Gamma distributions. Transformation of variates. Bivariate distributions, marginal and conditional distributions (discrete and continuous). Transformed variates. The X^2, F and t distributions, with applications to Normal sampling theory. Univariate population and sample characteristics. Expectations. Moment generation functions. Generalizations to multivariate distributions. Expectations, mean vector and variance matrix. Independent variates and some of their properties, with applications in sampling theory.

Assessment: Formal examination (at least 80%) and exercises, practicals and project work (at most 20%).

Text-books: Lecture notes to be provided.

8878 Inference II

Level: II.

Points value: 2.

Duration: Semester II.

Pre-requisites: 5543 Statistics I (Div. I) and *either* 9786 Mathematics I (Div. I) or 3617 Mathematics IM (distinction or exceptionally, with the approval of the Chairman of the Department at credit standard).

Assumed knowledge: 4107 Distribution Theory II.

Contact hours: 2 lectures and 1 hour of practical work a week, plus 1 tutorial a fortnight.

Content: Estimation. Properties of estimators: unbiasedness, consistency, efficiency, sufficiency. Method of moments. Maximum likelihood: score, information, large sample properties. Minimum variance bound. Tests of hypotheses. Type I, II errors, significance level, power. Likelihood ratio, and other large-sample equivalents. Interval estimation. Confidence intervals. Pivotal quantity. Intervals based on test procedures. Likelihood intervals.

Assessment: Formal examination (at least 80%) and exercises, practicals and project work (at most 20%).

Reference: Silvey, S. D., *Statistical inference* (Chapman & Hall).

Text-books: Lecture notes to be provided.

1675 Linear Models II

Level: II.

Points value: 2.

Duration: Semester II.

Pre-requisites: 5543 Statistics I (Div. I) and *either* 9786 Mathematics I (Div. I) or 3617 Mathematics IM (distinction or exceptionally, with the approval of the Chairman of the Department at credit standard).

Assumed knowledge: 4107 Distribution Theory II and 4523 Data Analysis.

Contact hours: 2 lectures and 1 hour of practical work a week, plus 1 tutorial a fortnight.

Content: Linear subspace definition of linear models in the special case where the variance matrix has the form v^2I. Examples from regression and Analysis of Variance. Least Squares estimation of the means, and its equivalence with Best Linear Unbiased Estimation and with Maximum Likelihood Estimation when Normality is assumed. Estimation of v^2, Hypothesis testing and confidence intervals. A more detailed account of the general theory in the special cases of regression and Analysis of Variance. The MATLAB package is used for the associated data analysis.

Assessment: Formal examination (at least 80%) and exercises, practicals and project work (at most 20%).

Text-books: Lecture notes to be provided.

LEVEL III

Assumed knowledge for each of the 12 Level III subjects is:

1) 7387 Mathematical Statistics II *or* all four Level II Statistics subjects listed above (*except* that 2991 Distribution Theory III assumes only the single Level II subject 4107 Distribution Theory II).

2) 8925 Pure Mathematics II *or* 6302 Applied Mathematics IIA *or* 5726 Applied Mathematics IIB *or* 6862 Mathematical Physics/Applied Mathematics II *or* 6298 Mathematical Physics/Pure Mathematics II *or* Level II Pure Mathematics and/or Applied Mathematics and/or Mathematical Physics subjects to the value of six points.

Note: Students are strongly advised to have included in their course 8925 Pure Mathematics II or the Pure Mathematics subject 7389 Multivariable Calculus II, and the Applied Mathematics subject 7243 Differential Equations II.

To qualify for a major in Statistics a student must present passes (not Conceded Passes) in Level III subjects offered by the Department of Statistics to the value of at least ten points.

Students who intend to proceed to Honours Statistics are advised to include in their course the following Pure Mathematics and Applied Mathematics subjects: 6848 Analysis III, 1845 Integration III, 6508 Rings, Fields and Matrices III, 4102 Geometry of Surfaces III, 4447 Applied Probability III *and* 2208 Random Processes III. These are guide lines, and students who wish, or who think they may wish to proceed to Honours Statistics are advised to discuss their course programme with the Head of the Department of Statistics as early as possible.

Twelve subjects are listed but only six or seven will be taught in any one year. The subjects to be offered in any year will be posted on the Departmental Notice Board adjacent to Room 103 of the Mathematics Building in January.

2991 Distribution Theory III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: See initial statement for Level III subjects.

Contact hours: 2 lectures and 1 hour of practical work a week, plus 1 tutorial a fortnight.

Content: Calculus of distributions. Moments and cumulants. Moment generating functions. Multivariate distributions. Marginal and conditional distributions. Conditional Expectation and Variance operators. Change of variables in multivariate distributions. Exact distributions of interest in statistics. Definition and properties of the multivariate Normal distribution. Weak convergence of distributions. Central Limit Theorem. Asymptotic Approximation of distributions.

Assessment: Formal examination (at least 80%) and exercises, practicals and project work (at most 20%).

Text-books: Lecture notes to be provided.

9800 Experimental Design III

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: See initial statement for Level III subjects. In addition, 2658 Linear Models III.

Contact hours: 2 lectures and 1 hour of practical work a week, plus 1 tutorial a fortnight.

Content: Principles of experimental design, including randomisation, replication and blocking. Factorial experiments, confounding and fractional replication. Split plot designs, other multi-stratum experiments and their analysis. Incomplete block designs, canonical efficiencies and analysis by generalised sweeps. There will be an emphasis on practical aspects of the subject. The statistical package Genstat will be used throughout the course.

Assessment: Formal examination (at least 80%) and exercises, practicals and project work (at most 20%).

References: Cox, D. R., *Planning of experiments* (Wiley); Box, G. E. P., Hunter, W. G. & Hunter, J. S., *Statistics for experimenters* (Wiley); Mead, R., *The design of experiments* (Cambridge).

Text-books: Lecture notes to be provided.

4853 Finite Population Sampling III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: See initial statement for Level III subjects.

Contact hours: 2 lectures and 1 hour of practical work a week, plus 1 tutorial a fortnight.

Content: Introduction: Experiments and Surveys; Steps in planning a survey. Statistical characterizations of finite populations; Total, mean, variance, mean square. Randomization approach to sampling and estimation; Sampling distribution of estimator; Expected values, variances; Generalization of probability sampling. Prediction approach; Inadequacies of randomization approach; Decomposition of population total; Concomitant variables; Models: regression through the origin; Estimation by least squares; Ratio estimator; Variance formulas. Balance and Robustness; Royal-Herson theorem; Tallis's theorem; Best fit sample. Stratified sampling; Estimation; Allocation; Construction of strata; Stratification on size variables; Post-stratification. Two stage sampling; Estimation; Allocation.

Assessment: Formal examination (at least 80%) and exercises, practicals and project work (at most 20%).

Text-books: Lecture notes to be provided.

3837 Generalized Linear Modelling III

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: See initial statement for Level III subjects. In addition, 2991 Distribution Theory III and 2658 Linear Models III.

Contact hours: 2 lectures and 1 hour of practical work a week, plus 1 tutorial a fortnight.

Content: Large sample maximum likelihood and likelihood ratio theory. Generalized linear models with error distributions in a special exponential family. Definition and properties of the natural link function. Application of generalized linear model theory to the analysis of multi-way frequency tables. Throughout the course emphasis is given to the interactive use of the GLIM system to study several realistic practical examples.

Assessment: Formal examination (at least 80%) and exercises, practicals and project work (at most 20%).

Text-books: Lecture notes to be provided.

2251 Inference III

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: See initial statement for Level III subjects.

Contact hours: 2 lectures and 1 hour of practical work a week, plus 1 tutorial a fortnight.

Content: The likelihood function. Sufficiency and the sufficiency principle. Score and information. Construction of point estimators. Consistency. Efficiency. Cramer-Rao bound. Rao-Blackwell theorem. Maximum likelihood estimators, with large sample properties. Hypothesis tests and confidence regions. Likelihood ratio and chi-squared tests.

Assessment: Formal examination (at least 80%) and exercises, practicals and project work (at most 20%).

Text-books: Lecture notes to be provided.

1411 Life Contingencies III

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: See initial statement for Level III subjects.

Contact hours: 2 lectures and 1 hour of practical work a week, plus 1 tutorial a fortnight.

Content: Life tables and the force of mortality; select, aggregate and ultimate mortality tables; annuities immediate and due, assurances and premiums. Relations between mortality functions; policy values, reserves and mortality profit. Multi-decrement tables and associated single-decrement, combined tables and monetary functions. Both practical and theoretical aspects of the above will be discussed.

Assessment: Formal examination (at least 80%) and exercises, practicals and project work (at most 20%).

Text-books: Lecture notes to be provided.

2658 Linear Models III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: See initial statement for Level III subjects.

Contact hours: 2 lectures and 1 hour of practical work a week, plus 1 tutorial a fortnight.

Content: The general linear model, maximum likelihood, least squares and minimum variance estimates of the parameters, consistency, sufficiency, sampling distributions of the estimate, orthogonal projections, redundant specification. Principles of experimental design. Canonical efficiency factors. Variance component models.

Assessment: Formal examination (at least 80%) and exercises, practicals and project work (at most 20%).

Text-books: Lecture notes to be provided.

8892 Medical Statistics III

Level: III.

Points value: 2.

Duration: Semester I or Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: See initial statement for Level III subjects.

Contact hours: 2 lectures and 1 hour of practical work a week, plus 1 tutorial a fortnight.

Content: This subject covers elementary actuary concepts associated with the interpretation and construction of life tables. These ideas are then extended to prospective trials yielding complete life time data. The process of censoring is then introduced and the analysis modified accordingly. Competing risk theory is discussed in enough detail to provide models for multiple causes of death. Methods for analysing retrospective trials are given. Large sample inferential procedures are used.

Assessment: Formal examination (at least 80%) and exercises, practicals and project work (at most 20%).

Text-books: Lecture notes to be provided.

5030 Multivariate Analysis III

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: See initial statement for Level III subjects.

Contact hours: 2 lectures and 1 hour of practical work a week, plus 1 tutorial a fortnight.

Content: Multivariate analysis: Multinormal regression, maximum likelihood estimators of the regression and variance matrices, the likelihood ratio test for the general linear hypothesis and the moments of its null distribution. Tests for extra variates, sample and population multiple discriminant functions, profile analysis. Multivariate data analysis using GLIM and MATLAB computer programmes. Tensor product of vector spaces and matrices. Nonlinear regression.

Assessment: Formal examination (at least 80%) and exercises, practicals and project work (at most 20%).

Text-books: Lecture notes to be provided.

8387 Non-parametric Methods III

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: Mathematics I (Div. I).

Assumed knowledge: Distribution Theory III, Linear Models III.

Contact hours: 2 lectures and 1 hour of practical work a week, plus 1 tutorial a fortnight.

Content: Rank based non-parametric tests for the comparison of two or more treatments, with and without blocking. Tests of randomness and independence. Exact and asymptotic results under the randomization model, various population and finite population models. Parallels between non-parametric and parametric methods.

Assessment: Exercises, practicals during the semester, examination at the end of the semester.

Text-book: Lecture notes will be provided.

2993 Statistics for Quality Improvement III

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: Mathematics I (Div. I).

Assumed knowledge: 4523 Data Analysis II.

Contact hours: 2 lectures and 1 hour of practical work per week, plus 1 tutorial per fortnight.

Content: The Deming philosophy of quality; design and use of control charts for attributes and variables; process capability; CUSUM charts; the 7 tools of Total Quality Control; industrial experiments, particularly fractional factorial and response surface designs; Taguchi methods; signal/noise ratios; components of variance; measurement error.

Assessment: Formal examination (at least 80%) and exercises, practicals and project work (at most 20%).

References: Deming, W. E., (1987) *Out of the crisis* (MIT Press); Box, G. E. P., Hunter, W. G. & Hunter, J. S., *Statistics for experimenters* (Wiley); Montgomery, D. C., (1985), *Introduction to statistical quality control* (Wiley).

5675 Time Series III

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: See initial statement for Level III subjects.

Contact hours: 2 lectures and 1 hour of practical work a week, plus 1 tutorial a fortnight.

Content: Stationary processes in discrete time: autocorrelation function, its properties and estimates, linear filters and suppression of noise. Estimation of trend and seasonal components. Autoregressive and Moving Average processes. Identification and invertibility. Box-Jenkins modelling and forecasting, use of MINITAB for estimating Box-Jenkins coefficients.

Assessment: Formal examination (at least 80%) and exercises, practicals and project work (at most 20%).

Text-books: Lecture notes to be provided.

HONOURS LEVEL

1346 Honours Statistics (B.A. or B.Sc.)

Note: Students are required to consult with the Head of the Department of Statistics preferably no later than the end of the year preceding their enrolment, in order to ensure that they have obtained the necessary proposed pre-requisite knowledge at a satisfactory standard. All students are required to obtain the approval of the Head of the Department of Statistics before enrolling for 1346 Honours Statistics.

Level: IV.

Points value: 24.

Duration: Full year.

Pre-requisites: For students who have completed third year studies before 1989:

(i) 2403 Mathematical Statistics III;

(ii) a third-year subject offered by another Department in the Faculty of Mathematical and Computer Sciences.

For students who have completed Level III studies after 1988:

(i) Completion of a major in Statistics at sufficiently high standard;

(ii) Passes at a sufficiently high standard in Level III subjects to the value of at least ten points taught by a Department in the Faculty of Mathematical and Computer Sciences.

Students with a different background of third-year subjects may be accepted at the discretion of the Head of the Department of Statistics.

Content: The lecture programme will be determined from year to year. Students will be required to make a selection from subjects offered by the Department of Statistics, by other departments of the Faculty of Mathematical and Computer Sciences, by the School of Mathematical Sciences at The Flinders University of S.A. and by such other departments as

may be agreed to by the Department of Statistics. Some compulsory subjects may be prescribed.

Each student will be assigned a supervisor who will advise on the choice of lecture programme and give guidance in the writing of a project. Work on this project should begin in the Department in the first week of March and should be completed by the end of the second semester's lecture programme.

GRADUATE CERTIFICATE IN MATHEMATICS EDUCATION

REGULATIONS

1. There shall be a Graduate Certificate in Mathematics Education.

2. An applicant for admission to the course of study for the Graduate Certificate shall:

(a) have qualified for a degree and a Graduate Diploma in Education of the University or hold qualifications from another institution accepted by the University for the purpose.

(b) have completed such other work as may be prescribed in the schedules.

3. Subject to the approval of the Council, the Faculty may, in special cases and subject to such conditions as it may see fit to impose in each case, accept as a candidate for the Certificate an applicant who does not satisfy the requirements of Regulation 2 above but who has given evidence satisfactory to the Faculty of fitness to undertake work for the Certificate.

4. To qualify for the Certificate a candidate shall satisfactorily complete a course of study and comply with conditions as prescribed in the schedules.

5. Except with the special permission of the Faculty the course for the the Certificate shall be completed in one semester of full-time study or not more than two years of part-time study.

6. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the Certificate; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

7. In special cases, on written application by the candidate, and on the advice of the Faculty, a candidate may be granted such exemption from the requirements of these regulations as the Council shall determine.

8. If in the opinion of the Faculty a candidate for the Certificate is not making satisfactory progress, the Faculty may, with the consent of the Council, terminate the candidature and the candidate shall cease to be enrolled for the Certificate.

Regulations allowed 1 March, 1990. Awaiting allowance: 6(b).

GRADUATE CERTIFICATE IN MATHEMATICS EDUCATION

SCHEDULES

SCHEDULE I: SUBJECTS OF STUDY

(NOTE: The points value of each subject is given after its subject title.)

1. The following shall be the subjects for the Graduate Certificate in Mathematics Education.

(a) **Core Subjects** [Provisional list]

Group A Core Subjects

9143	School Mathematics Curriculum	2
4931	Exploratory Data Analysis	2
3825	Geometry for Teachers	2
1231	Thinking Mathematically	2
7724	Applying Mathematics	2

Group B Core Subjects

8762	Modern Statistics	2
2741	Modelling with Mathematics	2
8575	Discrete Mathematics	2
1707	Mathematics in Education	2

(b) **Further Subjects**

Group C Subjects

7798	Certificate Project	2
3923	Minor Certificate Project	1
7843	Certificate Mathematical Studies	2
3404	Directed Reading Studies	2
8289	Minor Directed Reading Studies	1

Group D Subjects

Any other mathematical sciences or mathematics education subject or other relevant subject offered within the University of Adelaide and approved for the purpose by the Dean (or nominee).

Group E Subjects

Other mathematical sciences or mathematics education subjects which may be offered from time to time by the Flinders University of South Australia, and the University of South Australia and are approved for the purpose by the Dean (or nominee).

2. Each year the Faculty shall determine which of the above subjects will be offered in the following year and in which semesters they will be offered.

3. Notwithstanding the above, the availability of all subjects is conditional on the availability of staff and facilities.

SCHEDULE II: COURSE OF STUDY

1. To qualify for the Certificate a candidate shall satisfactorily complete subjects from Schedule I with an aggregate points value of at least 12 satisfying the following requirements:

(a) Unless otherwise agreed by the Faculty, the subjects presented for the Certificate must include Core subjects with an aggregate value of at least 8.

(b) The subjects presented for the Certificate shall not include any subject which is, in the opinion of the Faculty, substantially equivalent to another subject presented for the Certificate or already counted towards another qualification gained by the candidate.

2. Candidates wishing to enrol in subjects for which they do not have the necessary preliminary knowledge may be required to take such bridging studies prior to the commencement of their Certificate studies as may be deemed appropriate by the Dean (or nominee).

3. To complete a course of study, a candidate, unless exempted by the Faculty, shall:

(a) regularly attend the prescribed lectures, tutorials, workshops and seminars; and

(b) undertake such computing work, practical work, field work and case studies, do such reading, written and oral work and pass such examinations, as the Faculty may prescribe.

4. The syllabus for each subject for the Certificate shall specify whether passes shall be non-graded or whether there shall be three classifications of pass: Pass with Distinction, Pass with Credit, and Pass.

5. Each candidate's course of study must be approved by the Dean (or nominee) at enrolment each year.

6. When, in the opinion of the Faculty, special circumstances exist, the Council, on the recommendation of the Faculty, may vary the provisions of clauses 1 to 5 above.

GRADUATE CERTIFICATE IN MATHEMATICS EDUCATION

The Faculty of Mathematical and Computer Sciences, in co-operation with the Department of Education offers a Graduate Certificate in Mathematics Education. The aim of the course is to enable graduates in teaching to gain professional development in modern mathematics content and processes, in mathematics education and in relevant teaching methodology, within an applied context.

The course is intended for holders of a qualification for teaching at diploma or degree level, or equivalent (for example a three-year degree plus a diploma or a four-year bachelor of education degree). Graduates wishing to enrol should consult the University of Adelaide Liaison Officer, Graduate Certificate in Mathematics Education, through the Office of the Dean in early October of the year before they plan to enrol.

In some cases, students may need to undertake preliminary bridging studies prior to the time of enrolment, to ensure that they have the necessary mathematical background indicated in the syllabuses.

Each student will be assigned a supervisor who will advise, where applicable, on project work, directed reading and selection of subjects. At enrolment time, following consultation between the student and supervisor, each student's programme must be formally approved by the Dean or nominee (normally by the Liaison Officer).

The course may be taken in one semester of full-time study or up to two years of part-time study. It consists of subjects with an aggregate points value of at least 12 points, not equivalent to subjects already offered by the candidate for another award. These subjects must include core subjects with an aggregate value of at least 8 points. (If subjects equivalent to core subjects have been offered for another award, other subjects may be specified in their place.)

The core subjects are currently offered in a joint programme by the South Australian higher education institutions, in association with the Adelaide Consortium for Mathematics Education. A 2 point core subject typically involves 26 to 30 contact hours; some subjects will be based entirely on seminars and workshops while others will involve formal lectures with some associated workshops.

The core subjects are divided into two groups and normally a student's core subjects will all be from the same group. It is anticipated that all core subjects from the same group will be offered at the same venue, but this may be on a campus of another institution. Group A core subjects are intended as a basis for "re-skilling" of teachers who are currently teaching some junior secondary mathematics, or who wish to undertake such teaching, but whose training was in some other area (for example, science). Group B core subjects are intended for professional development of mathematics specialist teachers who wish to update their background in mathematics relevant to the senior secondary curriculum, in mathematics education and teaching methodology and in the use of modern technology. While the course focusses mainly on these two categories, other applicants (for example, primary teachers) will be accepted if a satisfactory programme of study appropriate to their needs is available within the framework of the Certificate.

Students enrolled for the Certificate at the University of Adelaide will usually select their non-core subjects from Group C, which comprises subjects offered at the University of Adelaide. They will normally include a subject whose work requirement consists of a project.

In the course for the Certificate there will be an emphasis on applications, investigations and problem-solving, and all students will take some subjects involving the use of computer

packages (though no knowledge of computer programming is required). Project work may involve practical experience in industry, business or a school or tertiary education.

Students who enrol for the degrees of Bachelor of Educational Studies, Master of Educational Studies or Master of Education awards are able to apply for credit to a maximum value of 12 points on account of work completed towards this Graduate Certificate.

SYLLABUSES

Quota: May apply to course enrolments for students taking Group A core subjects and for those taking Group B core subjects.

Contact hours: The core subjects are currently offered in a joint programme by the South Australian higher education institutions. This part of the course may be taught at the campus of another institution.

Prescribed and recommended reading: Prescribed and recommended reading will play an important part in the course. Reading lists provided for each subject will cover relevant material in books and journal articles and also in packages produced by centres such as the Shell Centre for Mathematics and the Open University.

Assessment and subject requirements: To be determined in consultation with students at or before commencement of study of each subject and confirmed in writing within one week of commencement. Details to be determined include the nature of the requirements for each component and the relative weight given to the components (e.g., such of the following as are relevant: seminar papers; seminar or workshop participation; written or practical or computing assignments; essays, reports or book reviews; written or oral examination; project). Passes may be either reported as non-graded passes or classified, as specified in the syllabus for the subject.

CORE SUBJECTS

Group A Subjects (for teachers trained in other areas)

Assumed knowledge: These subjects all assume a knowledge of at least one of the publicly examined SSABSA Year 12 Mathematics Subjects, or the equivalent.

9143 School Mathematics Curriculum

Points value: 2.

Duration: Semester II.

Contact hours: 2 hours per week for 13 to 15 weeks or equivalent over a shorter period.

Content: The subject aims to develop an awareness of the junior mathematics school curriculum in the context of the overall mathematics curriculum (from Reception to Year 12 and beyond). Issues related to curriculum objectives, and consequent appropriate teaching methodologies, will be investigated, along with a more detailed analysis of particular areas of the curriculum.

Assessment: To be determined in consultation with students at or before commencement of study of the subject. Assessment to be based on practical curriculum development projects of use to students in their work.

Recommended reading: Students will be expected to read widely in their areas of interest. Reading lists will be developed by consultation between students and staff.

4931 Exploratory Data Analysis

Points value: 2.

Duration: Semester II.

Contact hours: 2 hours per week for 13 to 15 weeks or equivalent over a shorter period.

Content: The subject aims to help students gain a practical understanding of the application of exploratory data analysis, within the context of investigations, sufficient for the purposes of teaching at junior secondary level. It introduces the fundamental ideas and nature of statistics: data (sources, types, levels), graphical tools (stem and leaf, box plots), summary statistics. It considers exploratory tools for single and paired, variables (e.g., box trace, correlation, scatter plot, resistant line) and concludes with a brief introduction to the nature and philosophy of hypothesis testing.

Assessment: To be determined in consultation with students at or before commencement of study of the subject. Assessment to be based on class work and assignments rather than examination.

Recommended reading: Graham, A., *Statistical investigations in the secondary school* (Open University Course PM646, C.U.P., 1986).

3825 Geometry for Teachers

Points value: 2.

Duration: Semester II.

Contact hours: 2 hours per week for 13 to 15 weeks or equivalent over a shorter period.

Content: The subject aims to help students develop skills and understanding in solving a range of elementary geometrical problems and in relating these problems to a variety of problems from outside mathematics, particularly to computer graphics where possible. It provides a practical approach to a selection of topics in two and three dimensional geometry which are relevant to applications and hence to the teaching of geometry. Associated workshops will focus on teaching methodology and also include some historical and cultural background.

Assessment: To be determined in consultation with students at or before commencement of study of the subject. Assessment to be based on class work and assignments rather than examination.

Recommended reading: Dougliss, A., *Ideas in mathematics* (Saunders).

1231 Thinking Mathematically

Points value: 2.

Duration: Semester II.

Contact hours: 2 hours per week for 13 to 15 weeks or equivalent over a shorter period.

Content: The subject focusses on aspects of mathematical thinking relevant to the teaching of secondary mathematics, particularly problem solving (including mathematization of real life problems). Participants will develop their own skills in this area and gain a background of ideas and experience which will help the teaching of such skills. Background covered will include the relevant ideas of cognitive science and the approaches of mathematical authors such as Polya and Mason. Workshop sessions will provide practical experience using tools from junior secondary mathematics, with applications to class room practice.

Assessment: To be determined in consultation with students at or before commencement of study of the subject. Assessment to be based on class work and assignments rather than examination.

Recommended reading: Mason, J. and Stacey, K., *Thinking mathematically*, 2nd edn. (Addison-Wesley, 1987); Nickerson, R. S. et al, *The teaching of thinking* (Lawrence Erlbaum Associated Inc., 1985).

7724 Applying Mathematics

Points value: 2.

Duration: Semester II.

Contact hours: 2 hours per week for 13 to 15 weeks or equivalent over a shorter period.

Content: The aim of the subject is to introduce junior secondary mathematics teachers to the application of mathematical modelling to a broad range of problems. On completion of the subject, participants should have developed: an appreciation of the potential for mathematics as a medium for modelling a large variety of problems; skills in recognising appropriate modelling methods; and mathematical skills in using models to solve a number of problems. The content will be based mainly on material in "Mathematics at Work". The emphasis will be on the modelling process and the implementation of models using computer software. Topics will be drawn from the following: financial mathematics (income and tax, budgeting, investment, inflation and insurance, and credit); probability (insurance, games of change, and simulation); linear programming (models of transportation, depot location and rostering); growth and decay (a discussion of population and radioactive decay).

Assessment: To be determined in consultation with students at or before commencement of study of the subject. Assessment to be based on assignments and seminar presentation rather than examination.

Text-books: Low, I., *Mathematics at work* (Australian Academy of Science, 1988); Giordans, F. R. & Weir, M. D., *A first course in mathematical modelling* (Brookes/Cole, 1985).

Group B Core Subjects

Assumed knowledge: These subjects will assume that students have passed at least one first year tertiary level mathematics subject such as Mathematics I or Mathematics IM at the University of Adelaide.

8762 Modern Statistics

Points value: 2.

Duration: Semester I.

Contact hours: 2 hours per week for 13 to 15 weeks or equivalent over a shorter period.

Content: The subject aims to help students examine and use modern statistical techniques, within the context of investigations, and would provide suitable preparation for teaching applications of statistics within Year 12 subjects. It introduces data sources types and levels. It considers graphical tools, stem and leaf plots, and summary statistics. The subject considers single and multivariate cases, box trace, correlation, scatterplot, resistant line, least square, regression, time series and smoothing. The subject culminates with an introduction to the nature and philosophy of hypothesis testing using a variety of non-parametric tests to exemplify the concepts involved.

Assessment: To be determined in consultation with students at or before commencement of study of the subject. Assessment to be based on class work and assignments rather than examination.

Recommended reading: Graham, A., *Statistical investigations in the secondary school* (Open University Course PM646, C.U.P., 1986); Branford, A., *Graphical and computational statistics: 1988 Lectures Notes* (Flinders University).

2741 Modelling with Mathematics

Points value: 2.

Duration: Semester I.

Contact hours: 2 hours per week for 13 to 15 weeks or equivalent over a shorter period.

Content: The subject aims to help students develop the modelling process as well as explore mathematical techniques. It introduces topics via the use of case studies. It considers curve

fitting in the context of advertising and sales, administration of drugs, supply and demand, car operating costs, alcohol and accidents and handicapping. The subject considers algebraic equations for rostering, minimization of materials, annuities, and curve fitting. The subject develops linear programming models for product mix, rostering, portfolio management, transportation and location. It concludes with an introduction to difference and differential equations for compound interest, growth and decay and population models. Workshop topics will include generation of case studies suitable for classroom use.

Assessment: To be determined in consultation with students at or before commencement of study of the subject. Assessment to be based on class work and assignments rather than examination.

Recommended reading: Giordans, F. R. & Weir, W. E., *A first course in mathematical modelling* (Brookes/Coke, 1985); Boyec, W. E., *Case studies in mathematical modelling* (Pitman, 1981).

8575 Discrete Mathematics

Points value: 2.

Duration: Semester I.

Contact hours: 2 hours per week for 13 to 15 weeks or equivalent over a shorter period.

Content: The subject provides an introduction to topics in discrete mathematics relevant to applications, particularly in decision making, computer science and communications. Topics will be chosen from those becoming prominent in early tertiary courses and relevant to enrichment of secondary mathematics studies. A selection of the following will be included: elementary logic and truth tables; counting processes and probablistic modelling; recurrence and iteration; algorithms and complexity; representation of discrete systems via graphs, networks and groups; applications to encryption and error correcting codes.

Assessment: To be determined in consultation with students at or before commencement of study of the subject. Assessment to be based on class work and assignments rather than examination.

Text-book: Albertson, M. O. & Hutchinson, J. P., *Discrete mathematics with algorithms* (Wiley, 1988).

1707 Mathematics in Education

Points value: 2.

Duration: Semester I.

Contact hours: 2 hours per week for 13 to 15 weeks or equivalent over a shorter period.

Content: Critical concepts in school mathematics. Samples of current practice in school mathematics. Examination of appropriate methodology arising from considerations of current issues such as alternate modes of evaluation and assessment, calculators and computers, gender, special groups of learners.

Assessment: To be determined in consultation with students at or before commencement of study of the subject. Assessment to be based on class work and assignments rather than examination.

FURTHER SUBJECTS

Group C Subjects

Students enrolled at this University will normally select their non-core subjects from this group.

7798 Certificate Project

Points value: 2.

Duration: Semester I and II.

Requirement: The student will undertake a project in mathematics or mathematics education with the general guidance of the student's supervisor. The project may, for example, involve an investigation in mathematics or computing, or an applied problem, or a period of practical experience in business and industry, or in a classroom situation in a school or tertiary institution. The nature and scope of the project will be agreed by student and supervisor before detailed work commences.

Assessment: To be based on a written report submitted by an agreed date.

3923 Minor Certificate Project

Points value: 1.

Duration: Semester I and II.

Requirement: This subject is similar to 7798 Certificate Project except that the points value and time commitment are less and the scope is accordingly narrower. It is particularly suitable for projects based on a short period of work experience.

Assessment: As for 7798 Certificate Project except for scale.

7843 Certificate Mathematical Studies

Points value: 2.

Duration: Semester I and II.

Contact hours: 2 hours per week.

Pre-requisite: A qualification acceptable to the relevant department in the Faculty of Mathematical Sciences.

Content: One option (not already offered for any award from those offered in Honours Pure Mathematics, Honours Applied Mathematics, Honours Statistics, Honours Computer Science and Honours Mathematical Physics, selected in consultation with the student's supervisor. (Honours options recommended for prospective teachers are particularly suitable for this purpose.)

Assessment: See Honours Mathematical Sciences syllabuses.

3404 Directed Reading Studies

Points value: 2.

Duration: Semester I and II.

Requirement: The student will undertake a programme of independent study in a clearly defined area, based mainly on reading and also, where available, on attendance at research seminars. The programme will be determined in consultation with the student's supervisor (or, where necessary, with another supervisor appointed for the purpose) who will also be available for consultation as necessary.

Assessment: Based on a written report to be submitted by an agreed date.

8289 Minor Directed Reading Studies

Points value: 1.

Duration: Semester I and II.

Requirement: This subject is similar to 3404 Directed Reading Studies except that the points value and time commitment are less and the scope is accordingly narrower. It can be taken in conjunction with 3923 Minor Certificate Project.

Assessment: As for 3404 Directed Reading Studies except for scale.

Other Group D Subjects

For syllabuses of other mathematical sciences or mathematics education subjects or other

relevant subjects offered within the University of Adelaide please see the relevant entries elsewhere in this calendar.

Note that inclusion of such subjects in the Certificate requires approval by the Dean or nominee (normally the Liaison Officer). Approval will normally be given for inclusion of such a subject provided it is appropriate to the student's background and interests and the aims of the Certificate and does not significantly overlap other subjects offered for the Certificate (or for another previous award).

Group E Subjects

These are subjects in other institutions. No subjects are currently approved for this group, but a particular subject could be approved under special circumstances. Students normally enrol in the institution where the projects and other non-core subjects available are appropriate to their interests and needs.

GRADUATE CERTIFICATE IN TELECOMMUNICATIONS

Note: Postgraduate tuition fees may apply to this course.

REGULATIONS

1. There shall be a Graduate Certificate in Telecommunications.

2. Except as provided for in Regulation 3 an applicant for admission to the course of study for the Graduate Certificate shall:

(i) have qualified for a degree of the University or for a degree of another institution accepted for the purpose by the University.

(ii) have obtained the approval of the Dean (or nominee) of the Faculty of Mathematical and Computer Sciences.

3. Subject to the approval of the Council the Faculty may, in special cases and subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for the Certificate a person who does not qualify for admission to the course under Regulation 2 but has given evidence satisfactory to the Faculty of fitness to undertake work for the Certificate.

4. To qualify for the Certificate a candidate shall satisfactorily complete a course of full-time study extending over at least one semester or of part-time study extending over at least one year. Except with the permission of the Faculty the work for the Certificate shall be completed within two years.

5. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the Certificate; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by the candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

6. A candidate who desires that the examinations which he or she has passed in the University or elsewhere should be counted for the Graduate Certificate in Telecommunications may on written application be granted such exemption from the requirements of these regulations as the Council shall determine. Otherwise no subject counted for any other award of the University shall be counted as part of the requirements for the Certificate.

7. There shall be three classifications of pass in each subject for the Certificate: Pass with Distinction, Pass with Credit, and Pass.

8. (a) A candidate shall not be eligible to attend for examination unless the prescribed work has been completed to the satisfaction of the teaching staff concerned.

(b) A candidate who fails in a subject and desires to take the subject again shall again attend lectures and satisfactorily do such written and practical work as the teaching staff concerned may prescribe, unless specifically exempted therefrom after written application to the Registrar for such exemption.

(c) A candidate who has twice failed the examination in any subject or division of a subject

may enrol for that subject again except by special permission to be obtained in writing from the Registrar and then only under such conditions as may be prescribed.

(d) For the purpose of this Regulation a candidate who is refused permission to sit for examination, or who without a reason accepted by the Dean of Mathematical and Computer Sciences (or nominee) fails to attend all or part of a final examination (or supplementary examination if granted) after remaining enrolled for at least eight teaching weeks of that semester, shall be deemed to have failed the examination.

9. A candidate who complies with the foregoing conditions and satisfies the examiners shall be awarded the Graduate Certificate in Telecommunications.

Regulations allowed 1 March, 1990. Awaiting allowance: 5(b).

GRADUATE CERTIFICATE IN TELECOMMUNICATIONS

SCHEDULES

SCHEDULE I: SUBJECTS OF STUDY

1. The following shall be the subjects for the Graduate Certificate in Telecommunications. (Note: Each subject has a points value of 2.)

(a) **Group A Subjects** — Faculty of Mathematical Sciences
2208 Random Processes
2314 Optimisation
2039 Mathematical Programming
4485 Teletraffic Models
3908 Routing in Data Networks
8427 Mathematical Coding and Cryptology
9694 Spectral Analysis and Signal Processing

(b) **Group B Subjects** — Electrical and Electronic Engineering Department
7529 Network Architecture and Switching
7436 Stochastic Processes in Communications Systems
6519 Signal Processing

(c) **Group C Subjects** — Electronic Engineering, University of South Australia
Network Protocols
Communication System Theory
Digital Transmission
Error Control Coding
Optical Communications
Radio Wave Propagation

(d) **Group D Subjects**

Other relevant subjects or work as may be approved by the Dean of Mathematical and Computer Sciences (or nominee).

2. Each year the Faculty shall determine which of the above subjects will be offered in the following year and in which semesters they will be offered.

3. Notwithstanding the above, the availability of all subjects is conditional on the availability of staff and facilities.

SCHEDULE II: COURSE OF STUDY

The Graduate Certificate in Telecommunications is a collaborative programme between the Faculties of Mathematical and Computer Sciences and Engineering and is administered by the Faculty of Mathematical and Computer Sciences for practical reasons.

1. To qualify for the certificate a candidate shall satisfactorily complete subjects from Schedule I with an aggregate points value of at least 12 and satisfy the requirement that the subjects presented shall not include any which is, in the opinion of the Faculty, substantially

equivalent to another subject presented for the Certificate or already counted towards another qualification gained by the candidate.

2. Candidates wishing to enrol in subjects for which they do not have the necessary preliminary knowledge may be required to take such bridging studies prior to the commencement of their Certificate studies as may be deemed appropriate by the Dean of the Faculty of Mathematical and Computer Sciences (or nominee).

3. To complete a course of study, a candidate, unless exempted by the Faculty, shall:

(a) regularly attend the prescribed lectures, tutorials, workshops and seminars; and

(b) undertake such computing work, practical work, field work and case studies, do such reading, written and oral work and pass such examinations, as the Faculty may prescribe.

4. Each candidate's course of study must be approved by the Dean of the Faculty of Mathematical and Computer Sciences (or nominee) at enrolment each year.

5. When, in the opinion of the Faculty, special circumstances exist, the Council, on the recommendation of the Faculty, may vary the provisions of clauses 1 to 4 above.

GRADUATE DIPLOMA IN APPLIED STATISTICS

Note: Postgraduate tuition fees may apply to this course.

REGULATIONS

Note: Persons wishing to apply for admission to the course should contact the Department of Statistics as early as possible before Enrolment Week for a detailed prospectus.

1. There shall be a Graduate Diploma in Applied Statistics.

2. Except as provided for in regulation 3 a candidate for admission to the course for the Graduate Diploma shall have qualified for admission to a degree of the University or to a degree of another university accepted for the purpose by the University and have obtained the approval of the Department of Statistics.

3. Subject to the approval of the Council the Faculty may, in special cases and subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for the Graduate Diploma a person who does not hold a degree of a university but has given evidence satisfactory to the Faculty of his fitness to undertake work for the diploma.

4. To qualify for the Graduate Diploma a candidate shall satisfactorily complete a course of full-time study extending over at least one year or of part-time study extending over at least two years.

5. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the Graduate Diploma; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

6. A candidate who desires that the examinations which he has passed in the University or elsewhere should be counted for the Graduate Diploma in Applied Statistics, may on written application be granted such exemption from the requirements of these regulations as the Council shall determine.

7. There shall be three classifications of pass at an annual examination in any subject for the diploma; Pass with Distinction, Pass with Credit, and Pass.

8. (a) A candidate who fails to pass in a subject and desires to take the subject again shall again attend lectures and satisfactorily do such written and practical work as the professor or lecturer concerned may prescribe, unless specifically exempted therefrom after written application to the Registrar for such exemption.

(b) A candidate who has twice failed to pass the examination in any subject or division of a subject may not enrol for that subject again except by special permission to be obtained in writing from the Registrar and then only under such conditions as may be prescribed.

(c) For the purpose of this regulation a candidate who is refused permission to sit for examination, or who fails, without a reason accepted by the Head of the Department of Statistics as adequate, to attend all or part of a final examination (or supplementary

examination if granted) after remaining enrolled for at least eight teaching weeks of that semester, shall be deemed to have failed to pass the examination.

9. A candidate who complies with the foregoing conditions and satisfies the examiners shall be awarded the Graduate Diploma in Applied Statistics.

Regulations allowed 29 January, 1981.
Amended: 4 Feb. 1982; 24 Feb. 1983: 5; 17 Jan. 1985: 7. 20 Jul, 1989: 8. 1 March 1990: diploma to graduate diploma.
Awaiting allowance: 5(b).

GRADUATE DIPLOMA IN APPLIED STATISTICS

SCHEDULES

(Made by the Council under Regulation 5.)

SCHEDULE I: COURSES OF STUDY

Note: The points value of each subject is indicated by a number after each subject title.

1. A candidate for the Graduate Diploma shall regularly attend lectures and tutorials, do such written work as may be prescribed, and pass examinations in a selection of subjects chosen from the following list, with an aggregate value of at least 16 points:

(a) 2349 Statistical Software (compulsory) 2

(b) The nine Level III Statistics subjects:

2991 Distribution Theory III	2	1411 Life Contingencies III	2
9800 Experimental Design III	2	2658 Linear Models III	2
4853 Finite Population Sampling III	2	8892 Medical Statistics III	2
3837 Generalized Linear Modelling III	2	5030 Multivariate Analysis III	2
2251 Inference III	2	5675 Time Series III	2
2993 Statistics for Quality Improvement	2	8387 Non-Parametric Methods III	2

(c) At most two of the Level III Applied Mathematics subjects:

4447 Applied Probability	2	2039 Mathematical Programming	2
2056 Mathematical Biology	2	2208 Random Processes	2

(d) Topics taught by the Discipline of Statistics at The Flinders University of South Australia:

65303 Applied Statistical Science A	3	65301 Theoretical Statistical Science A	3
65304 Applied Statistical Science B	3	65302 Theoretical Statistical Science B	3
65305 Stochastic Process	2		

Note: For details of these topics see Volume II of the Calendar of The Flinders University of South Australia. Students wishing to enrol in these subjects for credit to their Adelaide Graduate Diploma in Applied Statistics need to obtain approval in writing from the Registrar in advance and must comply with Flinders University enrolment procedures.

(e) Statistics subjects listed in Schedule II 1(c)(i) for the degree of Master of Mathematical Science.

(f) Other subjects which may be offered from time to time by the Department of Statistics in The University of Adelaide, the Discipline of Statistics in The Flinders University of South Australia and the Biometry Section, the Waite Campus, The University of Adelaide.

2. 6181 Statistics Project 8

In addition to the course work each student will be expected to complete a project chosen in consultation with and supervised by a supervisor from either the Biometry Section, Waite Campus, or the Department of Statistics. The project has a points value of 8.

GRADUATE DIPLOMA IN APPLIED STATISTICS

SYLLABUSES

Text-books:

Students are expected to procure the latest edition of all text-books prescribed.

Examinations:

For each subject students may obtain from the department concerned details of the examination in that subject including the relative weights given to the components (e.g. such of the following as are relevant: assessments, semester or mid-year tests, essays or other written or practical work, final written examinations, *viva voce* examinations.

GRADUATE DIPLOMA IN COMPUTER SCIENCE

Note: Postgraduate tuition fees may apply to this course.

REGULATIONS

1. There shall be a Graduate Diploma in Computer Science.

2. Except as provided for in regulation 3 a candidate for admission to the course for the Graduate Diploma shall have qualified for admission to a degree of the University or to a degree of another university accepted for the purpose by the University and have obtained the approval of the Department of Computer Science.

3. Subject to the approval of the Council the Faculty may, in special cases and subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for the Graduate Diploma a person who does not hold a degree of a university but has given evidence satisfactory to the Faculty of his fitness to undertake work for the Graduate Diploma.

4. To qualify for the Graduate Diploma a candidate shall satisfactorily complete a course of study extending over at least one year.

5. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the degree; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

6. A candidate who desires that the examinations which he has passed in the University or elsewhere should be counted for the Graduate Diploma in Computer Science, may on written application be granted such exemption from the requirements of these regulations as the Council shall determine.

7. There shall be three classifications of pass at an annual examination in any subject for the Graduate Diploma: Pass with Distinction, Pass with Credit, and Pass.

8. (a) A candidate who fails to pass in a subject and desires to take the subject again shall again attend lectures and satisfactorily do such written and practical work as the professor or lecturer concerned may prescribe, unless specifically exempted therefrom after written application to the Registrar for such exemption.

(b) A candidate who has twice failed to pass the examination in any subject or division of a subject may not enrol for that subject again except by special permission to be obtained in writing from the Registrar and then only under such conditions as may be prescribed.

(c) For the purpose of this regulation a candidate who is refused permission to sit for examination, or who fails, without a reason accepted by the Head of the Department of Computer Science as adequate, to attend all or part of a final examination (or supplementary examination if granted) after remaining enrolled for at least eight teaching weeks of that semester, shall be deemed to have failed to pass the examination.

9. A candidate who complies with the foregoing conditions and satisfies the examiners shall be awarded the Graduate Diploma in Computer Science.

Regulations allowed 28 January, 1965.
Amended: 21 Dec. 1972: 6, 7; 28 Feb. 1974: 2, 3; 23 Jan. 1975: 2; 15 Jan. 1976; 5; 23 Dec. 1976; 2; 4 Feb. 1982: 8; 24 Feb. 1983: 1, 2, 5, 6, 8, 9; 1 March 1984: 4; 17 Jan. 1985: 7. 20 Jul. 1989. 1 March 1990: diploma to graduate diploma.
Awaiting allowance: 5(b).

GRADUATE DIPLOMA IN COMPUTER SCIENCE

SCHEDULES

SCHEDULE I: COURSES OF STUDY

1. A candidate for the Graduate Diploma shall regularly attend lectures and tutorials, do such written work as shall be prescribed, and pass examinations in subjects offered by the Department of Computer Science totalling 20 points, with at least 8 points at Level II and at least 10 points at Level III from the following list. Each subject is worth 2 points.

(a) (i) **Level II subjects:**

6733	Concepts of Computer Science	2
5132	Programming & Data Structures A	2
1956	Computer Systems	2
1006	Programming & Data Structures B	2
3655	Numerical Methods	2
2687	Database and Information Systems	2

(ii) **Level III subjects:**

6378	Artificial Intelligence	2
9820	Numerical Analysis	2
6720	Compiler Construction	2
4468	Operating Systems	2
5141	Computer Architecture	2
2328	Computer Networks	2
9811	Non-Procedural Programming	2
7343	Programming Language Concepts	2
2687	Systems Analysis	2
5204	Principles of Software Engineering	2

(b) Subjects chosen from Clause I of the Schedules for the degree of Master of Computer Science.

2. A candidate will also satisfactorily undertake and complete a course of practical work:

3975	Computer Science Diploma Project	4

3. On the recommendation of the Head of the Department of Computer Science, the Faculty may exempt a candidate from the need to satisfy the pre-requisites prescribed for the course.

GRADUATE DIPLOMA IN COMPUTER SCIENCE

SYLLABUSES

Text-books and Reference Books:
Booklists will be made available by the Department of Computer Science.

3975 Computer Science Diploma Project

Points value: 4.

Duration: Full year.

Restriction: Only available to students enrolled in the Postgraduate Diploma in Computer Science.

Pre-requisites: Dependent on the choice of the project topic.

Contact hours: 4 hours of practical work per week.

Content: A practical programming project on a topic chosen from a selection, determined at the start of each year.

Assessment: Completion of written work and software as required for the chosen topic, followed by a 2-hour written examination.

6733 Concepts of Computer Science

Syllabus: See under Electrical and Electronic Engineering, Bachelor of Engineering.

All other Diploma subjects: Syllabus details are contained in the syllabuses for the Bachelor of Science in the Faculty of Mathematical and Computer Sciences.

Examinations:
Details of subject assessment are made available at the relevant lectures during Orientation Week.

GRADUATE DIPLOMA IN MATHEMATICAL SCIENCE

Note: Postgraduate tuition fees may apply to this course.

REGULATIONS

1. There shall be a Graduate Diploma in Mathematical Science.

2. Except as provided for in Regulation 3 an applicant for admission to the course of study for the Graduate Diploma shall:

(i) have qualified for a degree of the University or for a degree of another institution accepted for the purpose by the University.

(ii) have obtained the approval of the Dean (or nominee) of the Faculty of Mathematical and Computer Sciences.

3. Subject to the approval of the Council the Faculty may, in special cases subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for the Graduate Diploma a person who does not hold a degree of a university but has given evidence satisfactory to the Faculty of fitness to undertake work for the Graduate Diploma.

4. To qualify for the Graduate Diploma a candidate shall satisfactorily complete a course of full-time study extending over at least one year or of part-time study extending over at least two years. Except with the permission of the Faculty, the work for the Graduate Diploma shall be completed within four years.

5. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the Graduate Diploma; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by the candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

6. A candidate who desires that the examinations which he or she has passed in the University or elsewhere should be counted for the Graduate Diploma in Mathematical Science may on written application be granted such exemption from the requirements of these regulations as the Council shall determine. Otherwise no subject counted for any other award of the University shall be counted as part of the requirements for the Graduate Diploma.

7. There shall be three classifications of pass in each subject for the Graduate Diploma (except for the Project option for which there is only the grade of Pass): Pass with Distinction, Pass with Credit, and Pass.

8. (a) A candidate shall not be eligible to attend for examination unless the prescribed work has been completed to the satisfaction of the teaching staff concerned.

(b) A candidate who fails to pass in a subject and desires to take the subject again shall again attend lectures and satisfactorily do such written and practical work as the teaching staff concerned may prescribe, unless specifically exempted therefrom after written application to the Registrar for such exemption.

(c) A candidate who has twice failed the examination in any subject or division of a subject

may not enrol for that subject again except by special permission to be obtained in writing from the Registrar and then only under such conditions as may be prescribed.

(d) For the purpose of this Regulation a candidate who is refused permission to sit for examination, or who without a reason accepted by the Dean of Mathematical and Computer Sciences (or nominee) fails to attend all or part of a final examination (or supplementary examination if granted) after remaining enrolled for at least eight teaching weeks of that semester, shall be deemed to have failed the examination.

9. A candidate who complies with the foregoing conditions and satisfies the examiners shall be awarded the Graduate Diploma in Mathematical and Computer Science.

Regulations allowed 1 March 1990.
Awaiting allowance: 5(b).

GRADUATE DIPLOMA IN MATHEMATICAL SCIENCES

SCHEDULES

SCHEDULE I: COURSES OF STUDY

1. To qualify for the Graduate Diploma, a candidate shall satisfactorily complete work to the value of at least 24 points.

2. The courses of study for the Graduate Diploma in Mathematical Sciences will consist of subjects to the value of at least 20 points chosen from:

(a) Any Level III subject listed in the Calendar by the Departments of the Faculty of Mathematical and Computer Sciences (including Level III subjects listed in the Faculty of Mathematical and Computer Sciences entry by the Department of Physics and Mathematical Physics.

(b) Other subjects listed in the Calendar for any Ordinary Degree of the University approved for the purpose by the Dean of Mathematical and Computer Sciences (or nominee) except that subjects chosen under this provision shall:

(i) not comprise more than 1/3 of the requirements for the Graduate Diploma without the explicit approval of the Faculty.

(ii) Be chosen in consultation with the Dean of Mathematical and Computer Sciences (or nominee).

(c) Subjects listed in Schedule II(c)(i) for the degree of Master of Mathematical Science.

3. Project option. This option may comprise up to 4 points of the work for the award. The topics and level of such project work will be decided in consultation with a supervisor appointed by the Faculty. The project options are:

7835 Mathematical Sciences Diploma Project A	2
6488 Mathematical Sciences Diploma Project B	2

4. Formal approval of enrolment must be obtained from the Dean of Mathematical and Computer Sciences (or nominee).

GRADUATE DIPLOMA IN MATHEMATICAL SCIENCES

SYLLABUSES

Textbooks: These are listed in the calendar under the subject entries for each of the Departments in the Faculty or are made available at the commencement of the course.

Examinations: Details of these are made available at the relevant lectures during orientation week.

Assumed knowledge: Applicants for the Graduate Diploma will be expected to have a knowledge of mathematics equivalent to that which would be obtained by passing 4 level II subjects offered by the Faculty of Mathematical and Computer Sciences (i.e. 8 points).

The Faculty of Mathematical and Computer Sciences offers the Graduate Diploma in Mathematical Sciences as a full-time or part-time course to cater for a number of different demands:

(i) It is designed for graduates with some mathematical training who wish to extend their mathematical or computing knowledge for professional (e.g. teachers) or other reasons. The Graduate Diploma allows a flexible programme to suit the background of the individual. Thus it may

(a) extend a modest knowledge of mathematics to say the level attained by a graduate with an Ordinary Degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences,

or

(b) at the other extreme provide a programme comparable to the level of the Honours degree.

(ii) Graduates of a University or other institution who have an interest in proceeding to research in some area of the mathematical sciences but lack the preparation necessary may enrol for the Graduate Diploma in Mathematical Sciences with the view to gaining the background to begin a programme at the Masters level either by coursework or by research.

Graduates wishing to enrol may consult the Dean of Mathematical and Computer Sciences for details of the subjects offered preferably in the December of the year preceding their enrolment.

The course is normally one year of full-time study or two years part-time. The Graduate Diploma requires a satisfactory performance in approved subjects totalling 24 points. Provision is made in the schedules for candidates to remedy deficiencies in preparation through inclusion of subjects at level II. Up to 4 points may be in the form of supervised project work. Students will be allocated a supervisor at the time of enrolment.

DEGREE OF

MASTER OF APPLIED SCIENCE (COMMUNICATIONS)

Note: Postgraduate tuition fees may apply to this course.

REGULATIONS

1. There shall be a degree of Master of Applied Science (Communications).

2. The following may be accepted as a candidate for the degree:

(a) a person who has qualified in the University of Adelaide for the degree of Bachelor of Engineering, Science or Applied Science or holds another academic qualification accepted by the Faculty of Mathematical and Computer Sciences as being sufficient for the purpose. A person admitted under this sub-regulation will normally be required satisfactorily to complete sufficient work of Honours standard as is deemed necessary by the Faculty in addition to satisfying the requirements of the Masters degree.

(b) a person who has qualified in the University of Adelaide for the Honours degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences or the Honours degree of Bachelor of Engineering or the Honours degree of Bachelor of Science in Mathematical Physics.

(c) a person who holds a qualification accepted for the purpose by the University.

3. With the approval of the Board of Graduate Studies acting with authority wittingly devolved to it by Council the Faculty may, in exceptional circumstances and subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for the degree a person who does not qualify under Regulation 2 but who has given evidence satisfactory to the Faculty of fitness to undertake work for the degree.

4. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the degree; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

5. If in the opinion of the Faculty of Mathematical and Computer Sciences a candidate is not making satisfactory progress the Faculty may, with the consent of the Council, terminate the candidature.

6. To qualify for the degree a candidate shall:

(a) on completion of any preliminary work which may be prescribed in the schedules and after consultation with the Dean (or nominee) of the Faculty of Mathematical and Computer Sciences, submit in writing to the Registrar, for approval by the Faculty, a programme of advanced study and project work as prescribed in the schedules and designed to extend over either one year if taken full-time or not less than two and not more than five years if taken part-time.

(b) undertake an approved programme of advanced study and project work under the direction of a supervisor or supervisors who shall be members of the full-time academic

staff of the University and appointed by the Faculty, except that in special circumstances the Faculty may also appoint an external supervisor.

(c) pass such examination on the candidate's course of advanced study as may be required by the Faculty; and

(d) present a thesis embodying the results of the candidate's project.

7. Subject to such conditions as it may determine, the Faculty may permit project work to be undertaken outside the University provided that it can be satisfied.

(a) that this will result in mutual academic benefit to the candidate and the supervising department.

(b) that there will be adequate contact and interaction between the candidate and the supervising department; and

(c) that the supervisor's access to any experimental work, the candidate's availability for seminars and other discussions, and the publication of results will not thereby be prejudiced.

8. A candidate may not count a subject or closely related subject or part of a subject already presented for another degree or diploma.

9. (a) On completion of the project work the candidate shall lodge with the Registrar three copies of the thesis prepared in accordance with directions given to candidates from time to time.

(b) Unless the Faculty expressly approves an extension of time in a particular case the thesis shall be submitted by December 31 of the year in which candidature commenced, in the case of full-time studies, or at a time determined by the Dean (or nominee) of the Faculty of Mathematical and Computer Sciences in the case of part-time studies.

(c) On submission or re-submission of the thesis the Faculty shall nominate examiners who may recommend that it:

(i) be accepted, with or without conditions; or

(ii) be accepted, with or without conditions, subject to satisfactory oral examination; or

(iii) be sent back to the candidate for revision; or

(iv) be rejected.

10. A candidate who fulfils the requirements of these regulations may, on the recommendation of the Faculty, be admitted to the degree of Master of Applied Science (Communications).

Regulations allowed 1 March, 1990.
21 Feb. 1991: 3. Awaiting allowance: 4(b).

DEGREE OF

MASTER OF APPLIED SCIENCE (COMMUNICATIONS)

SCHEDULES

(Made by the Council under regulation 6.)

SCHEDULE I: PRELIMINARY WORK

1. A person whose qualifications have been accepted under either section (b) or section (c) of regulation 2 shall be deemed to have satisfied the requirements of this schedule.

2. Before being admitted either under section (a) of regulation 2 or under regulation 3 a person shall complete the requirements of this schedule by undertaking, and satisfying the examiners in, such courses of study and/or other work as may in his or her case be prescribed by the Faculty of Mathematical and Computer Sciences. The purpose of this schedule is that the person should demonstrate the ability to perform at Honours standard.

SCHEDULE II: COURSES OF STUDY AND PROJECT WORK

The programme of study and project work shall consist of:

(a) One project option chosen from the following list:

8397	Applied Mathematics Communications Project A	2	
6450	Applied Mathematics Communications Project B	4	
3328	Applied Mathematics Communications Project C	6	
2000	Applied Mathematics Communications Project D	8	
8648	Applied Mathematics Communications Project E	10	
7784	Pure Mathematics Communications Project A	2	
5567	Pure Mathematics Communications Project B	4	
6147	Pure Mathematics Communications Project C	6	
3222	Pure Mathematics Communications Project D	8	
3995	Pure Mathematics Communications Project E	10	
4284	Electrical and Electronic Communications Project A	2	
5208	Electrical and Electronic Communications Project B	4	
9153	Electrical and Electronic Communications Project C	6	
2206	Electrical and Electronic Communications Project D	8	
4573	Electrical and Electronic Communications Project E	10	

Note: Candidates should consult the Department in which they intend to do their project about the choice of a suitable supervisor.

(b) graduate subjects and seminars which may be chosen from the following list of subjects in the Communications area. All candidates must satisfactorily complete a minimum of 7 subjects. Each subject represents 1/12 of the requirements for the degree.

(i) **Compulsory subject:** Masters Seminar.

(ii) **Group A Subjects**

4485 Teletraffic Models
8427 Mathematical Coding and Cryptology
9694 Spectral Analysis and Signal Processing

2297 Masters Topic in Communications

(iii) **Group B Subjects**

These are subjects offered by the Department of Electrical and Electronic Engineering and whose availability may vary from year to year.

7529 Network Architecture and Switching
7436 Stochastic Processes in Communications Systems
6519 Signal Processing

(iv) **Group C Subjects**

Electronic Engineering, University of South Australia
Network Protocols

Candidates may also choose from subjects offered by the School of Mathematical Sciences at Flinders University or by the Departments of Mathematics and Electronic Engineering at the University of South Australia and deemed suitable for the degree programme by the Dean of Mathematical and Computer Sciences (or nominee) from whom a list of such subjects may be obtained at the commencement of studies.

(c) other relevant subjects or work which may make up not more than one-third of the work for the degree, as may be approved by the Faculty of Mathematical and Computer Sciences.

The Dean of Mathematical and Computer Sciences (or nominee) shall approve in the case of each candidate a programme of study consisting of lectures, seminars and project work and decide the relative proportion of each subject to the constraints listed above. To assist with this choice from time to time lists of subjects available to candidates for the degree in groups B and C will be issued by the Faculty of Mathematical and Computer Sciences (after they have been approved by Faculty and the Executive Committee). Notwithstanding the above the availability of all subjects is conditional on there being adequate staffing levels.

DEGREE OF

MASTER OF APPLIED SCIENCE (COMMUNICATIONS)

SYLLABUSES

Textbooks: Students are expected to procure the latest edition of all text-books prescribed.

Examinations: For each subject students may obtain from the department concerned details of the examination in that subject including the relevant weight given to the components (e.g. such as the following as are relevant: assessments, semester or mid-semester tests, essays or other written or practical work, final written examinations, *viva voce* examinations).

Note: The postgraduate subjects which are offered by departments may vary slightly from year to year. Details of which subjects will be available each year are obtainable from the Dean of the Faculty of Mathematical and Computer Sciences.

DEGREE OF

MASTER OF COMPUTER SCIENCE

Note: Postgraduate tuition fees may apply to this course.

REGULATIONS

1. There shall be a degree of Master of Computer Science.

2. (a) The Faculty of Mathematical and Computer Sciences may accept as a candidate for the degree any person who has qualified:

(i) for the degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences, with a major in Computer Science, of the University of Adelaide, or for a degree of some other institution accepted for the purpose by the University; or

(ii) for the Graduate Diploma in Computer Science of the University of Adelaide or some other award from another institution accepted for the purpose by the University.

(b) With the approval of the Board of Graduate Studies acting with authority wittingly devolved to it by Council the Faculty may, in exceptional circumstances and subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for the degree a person who does not qualify under Regulation 2(a), but who has given evidence satisfactory to the Faculty of fitness to undertake work for the degree.

3. A candidate may proceed to the degree by full-time study; or, with the approval of the Department of Computer Science and subject to any conditions imposed in the particular case, by part-time study; or as an external student. Except by permission of the Faculty, the work for the degree shall be completed:

(i) in the case of a full-time candidate, not less than two years and not more than four years from the date of candidature accepted by the Faculty;

(ii) in the case of a part-time or external candidate, not less than four years and not more than six years from the date of candidature accepted by the Faculty;

(iii) in the case of a candidate with an Honours degree in Computer Science, or equivalent, in not less than one year of full-time study or two years of part-time study.

4. To qualify for the degree a candidate shall:

(i) satisfy examiners in subjects of study as prescribed in the schedules;

(ii) comply with conditions as prescribed in the schedules; and

(iii) present a satisfactory written report and seminar on a supervised project on a subject approved by the Department of Computer Science.

5. If in the opinion of the Faculty of Mathematical and Computer Sciences a candidate for the degree is not making satisfactory progress, the Faculty may, with the consent of the Council, terminate the candidature and the candidate shall cease to be enrolled for the degree.

6. A candidate who fulfils the foregoing requirements shall on the recommendation of the Faculty of Mathematical and Computer Sciences be admitted to the degree of Master of Computer Science.

Regulations allowed 1 March 1990.
21 Feb. 1991: 2.

DEGREE OF

MASTER OF COMPUTER SCIENCE

SCHEDULES

SUBJECTS OF STUDY

Note: Intending students should consult the Department of Computer Science early in the year in which they plan to study in order to ascertain:

- whether particular subjects will be available in that year;
- in which semester they will be taught; and
- their precise content.

The points value of subjects is indicated after each subject title.

1. A candidate for the degree shall complete satisfactorily a total of 20 subjects.

2. A candidate for the degree shall regularly attend lectures and tutorials, do such written and practical work as may be prescribed, and pass examinations in at least twelve subjects offered by the Department of Computer Science at the Honours or Masters level. Other subjects may be included, subject to the approval of the Head of the Department. The subjects which may be offered by the Department of Computer Science are:

6521 Advanced Computer Architecture A 2.5
6102 Advanced Computer Architecture B 2.5
3280 Advanced Computer Architecture C 2.5
9037 Software Engineering A 2.5
2618 Software Engineering B 2.5
5711 Software Engineering C 2.5
6731 Advanced Programming Languages A 2.5
6532 Advanced Programming Languages B 2.5
4069 Advanced Programming Languages C 2.5
5436 Advanced Programming Languages D 2.5
5689 Advanced Artificial Intelligence A 2.5
1783 Advanced Operating Systems A 2.5
7513 Advanced Operating Systems B 2.5
9026 Advanced Operating Systems C 2.5
6220 Advanced Numerical Analysis A 2.5
8109 Advanced Numerical Analysis B 2.5
8247 Advanced Numerical Analysis C 2.5
8993 Real-Time Systems 2.5
5766 Relational Programming 2.5
5209 Performance Evaluation 2.5
8684 Parallel Computation 2.5
7024 Compiler Construction (M.Comp.Sc.) 2.5
6293 Non-Procedural Programming (M.Comp.Sc.) 2.5
9516 Artificial Intelligence (M.Comp.Sc.) 2.5
3263 Programming Language Concepts (M.Comp.Sc.) 2.5
6031 Computer Architecture (M.Comp.Sc.) 2.5
6794 Computer Networks (M.Comp.Sc.) 2.5
9901 Operating Systems (M.Comp.Sc.) 2.5
3675 Principles of Software Engineering (M.Comp.Sc.) 2.5
9047 Numerical Analysis (M.Comp.Sc.) 2.5
7307 University of South Australia Subject A 2.5
6782 University of South Australia Subject B 2.5
1752 University of South Australia Subject C 2.5
6417 University of South Australia Subject D 2.5
6037 University of South Australia Subject E 2.5
9284 University of South Australia Subject F 2.5
1703 Flinders University Subject A 2.5
6156 Flinders University Subject B 2.5
9260 Flinders University Subject C 2.5
8031 Flinders University Subject D 2.5
8759 Flinders University Subject E 2.5
7470 Flinders University Subject F 2.5

3. A candidate shall also satisfactorily undertake and complete at least five Masters Project subjects, under the guidance of a supervisor, and provide a public seminar and written report on the investigation. The Masters Project subjects are:

9112	Master Project A	2.5	3444	Master Project E	2.5
3126	Master Project B	2.5	9574	Master Project F	2.5
4292	Master Project C	2.5	9882	Master Project G	2.5
5866	Master Project D	2.5	8868	Master Project H	2.5

4. In the case of a candidate with an Honours degree in Computer Science, the subjects required for the award of the Master's degree may be reduced.

DEGREE OF

MASTER OF MATHEMATICAL SCIENCE

Note: Postgraduate tuition fees may apply to this course.

REGULATIONS

1. There shall be a degree of Master of Mathematical Science.

2. The following may be accepted as a candidate for the degree:
(a) a person who has qualified in the University of Adelaide for the Honours degree of Bachelor of Science in the Faculty of Mathematical and Computer Science or the Honours degree of Bachelor of Engineering or the Honours degree of Bachelor of Science in Mathematical Physics, or holds another academic qualification accepted by the Faculty of Mathematical and Computer Sciences as equivalent.
(b) a person who has qualified in the University of Adelaide for the degree of Bachelor of Engineering, Science or Applied Science or holds another academic qualification accepted for the purpose by the Faculty of Mathematical and Computer Sciences. A person admitted under this sub-regulation will normally be required satisfactorily to complete sufficient work of Honours standard as is deemed necessary by the Faculty in addition to satisfying the requirements of the Masters degree;

3. With the approval of the Board of Graduate Studies acting with authority wittingly devolved to it by Council the Faculty may, in exceptional circumstances and subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for the degree a person who does not qualify under Regulation 2 but who has given evidence satisfactory to the Faculty of fitness to undertake work for the degree.

4. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:
   (i) the subjects of study for the degree; and
   (ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

5. A candidate shall:
(a) complete any preliminary work which may be prescribed;
(b) undertake an approved programme of advanced study and project work under the direction of a supervisor or supervisors extended over one year if taken full-time or not less than two and not more than four years if taken part-time.

6. The Faculty shall appoint one or more supervisors to guide a candidate's work.

7. To qualify for the degree a candidate shall:
(a) pass such examination on the candidate's course of advanced study as may be required by the Faculty; and
(b) present a satisfactory dissertation on the candidate's project.

8. Subject to such conditions as it may determine, the Faculty may permit project work to be undertaken outside the University provided that it can be satisfied:
(a) that this will result in mutual academic benefit to the candidate and the supervising department.
(b) that there will be adequate contact and interaction between the candidate and the supervising department; and

(c) that the supervisor's access to any experimental work, the candidate's availability for seminars and other discussions, and the publication of results will not thereby be prejudiced.

9. A candidate may not count a subject or closely related subject or part of a subject already presented for another degree or diploma.

10. If in the opinion of the Faculty of Mathematical and Computer Sciences a candidate is not making satisfactory progress the Faculty may, with the consent of the Council, terminate the candidature.

11. A candidate who fulfils the requirements of these regulations may, on the recommendation of the Faculty, be admitted to the degree of Master of Mathematical Science.

Regulations allowed 21 February 1991. Awaiting allowance: 4(b).

DEGREE OF

MASTER OF MATHEMATICAL SCIENCE

SCHEDULES

(Made by the Council under regulation 6.)

SCHEDULE I: PRELIMINARY WORK

1. A person whose qualifications have been accepted under section (b) of regulation 2 shall be deemed to have satisfied the requirements of this schedule.

2. A candidate admitted under either section (a) of regulation 2 or under regulation 3 shall complete the requirements of this schedule by undertaking, and satisfying the examiners in, such courses of study and/or other work as may in his or her case be prescribed by the Faculty of Mathematical and Computer Sciences. The purpose of this schedule is that the person should demonstrate the ability to perform at Honours standard and the requirements would be satisfied for example by the successful completion of Honours subjects totalling 20 points.

SCHEDULE II: COURSES OF STUDY AND PROJECT WORK

1. The programme of study and project work to the value of at least 24 points shall consist of:

(a) supervised project work consisting of one of the following:

2427 Masters Applied Mathematics minor project	5	2545 Masters Pure Mathematics minor project	5
8223 Masters Applied Mathematics major project	7.5	7538 Masters Pure Mathematics major project	7.5
4818 Masters Mathematical Physics minor project	5	2159 Masters Statistics minor project	5
4495 Masters Mathematical Physics major project	7.5	2750 Masters Statistics major project	7.5

(b) 3072 Masters Seminar 1.5

(c) Subjects:

(i) chosen from the following list

Note: Intending students should consult the relevant department early in the year in which they plan to study in order to ascertain:

* whether particular subjects will be available in that year;
* in which semester they will be taught; and
* their precise content.

Applied Mathematics

6071 Networks of Queues	2.5	5061 Continuum Mechanics	2.5
8918 Asymptotic Approximations	2.5	5507 Advanced Hydrodynamics	2.5
2233 Variational Methods for PDEs	2.5	8943 Boundary Value Problems	2.5
5621 Combinatorial Optimisation	2.5	6130 Martingales	2.5
4820 Mathematical Methods (Masters)	2.5	8250 Stochastic Processes	2.5
5440 Stochastic Differential Equations	2.5	6779 Chaos and Fractals	2.5

1178 Teletraffic Models (Masters) 2.5
6576 Mathematical Economics (Masters) 2.5
6426 Routing in Data Networks (Masters) 2.5
5136 Robotics 2.5
6574 Finite Difference Methods for PDEs 2.5
4645 Modelling and Analysis of Computer Networks 2.5
5383 Flow Around Vehicles 2.5
4169 Systems of Queues 2.5
8510 Applied Mathematics Honours Topic A 2.5
6501 Applied Mathematics Honours Topic B 2.5
5819 Applied Mathematics Honours Topic C 2.5
1128 Applied Mathematics Honours Topic D 2.5

Mathematical Physics

6080 Advanced Electromagnetism V 2.5
4928 Cosmology V 2.5
3927 General Relativity V 2.5
4578 Gauge Theory V 2.5
4060 Quantum Mechanics/Particle Physics V 2.5
3681 Relativistic Quantum Mechanics and Fields V 2.5
5938 Statistical Mechanics/Many-Body Theory V 2.5
1679 Topics in Mathematical Physics VA 2.5
3348 Topics in Mathematical Physics VB 2.5

Pure Mathematics

7757 Galois Theory 2.5
9160 Measure Theory 2.5
1179 Analysis 1 2.5
7745 Analysis 2 2.5
7584 Analysis 3 2.5
4808 Algebra 1 2.5
4276 Algebra 2 2.5
2642 Algebra 3 2.5
1820 Geometry 1 2.5
5477 Geometry 2 2.5
9480 Geometry 3 2.5
1912 Number Theory 1 2.5
8468 Number Theory 2 2.5
7777 Advanced Convexity 2.5
6406 Topology 2.5
2903 Problem Solving 2.5
2342 Coding Theory 2.5
4362 Analysis and Signal Processing 2.5
1512 Set Theory 2.5
4122 History of Mathematics (Masters) 2.5
7965 Pure Mathematics Honours Topic A 2.5
1538 Pure Mathematics Honours Topic B 2.5
9735 Pure Mathematics Honours Topic C 2.5
5344 Pure Mathematics Honours Topic D 2.5

Statistics

7464 Advanced Multivariate Methods 2.5
2466 Advanced Nonparametric Statistics 2.5
8331 Statistical Software (Masters) 2.5
3228 Analysis of Repeated Measurements 2.5
9553 National Markets Statistics 2.5
6061 Advanced Experimental Design 2.5
9148 Regression Diagnostics 2.5
1884 Advanced Medical Statistics 2.5
9348 Advanced Inference 2.5
2684 Statistics Honours Topic A 2.5
6827 Statistics Honours Topic B 2.5
7467 Statistics Honours Topic C 2.5
4013 Statistics Honours Topic D 2.5

(ii) Other subjects offered by the University of Adelaide or other tertiary institutions in South Australia which are accepted by the Faculty as being equivalent to those listed above.

(iii) Students may present other relevant subjects or work, to the value of at most five points, as may be approved by the Faculty of Mathematical and Computer Sciences.

2. The availability of all subjects in any year is conditional on there being adequate staffing levels.

DEGREE OF

MASTER OF MATHEMATICAL SCIENCE

SYLLABUSES

Prospective students should consult the Department early in the year in which the subject is being offered to obtain advice as to the specific content of the subject. The field of study major and minor projects can also be determined at that time.

DEGREE OF

MASTER OF SCIENCE

IN THE FACULTY OF MATHEMATICAL AND COMPUTER SCIENCES

REGULATIONS

1. The following persons may become candidates for the degree of Master of Science in the Faculty of Mathematical and Computer Sciences: (a) Bachelors of Arts, (b) Bachelors of Science, (c) other graduates whose academic qualifications are accepted by the Faculty of Mathematical and Computer Sciences as sufficient.

Provided that, subject to the approval of the Board of Graduate Studies acting with authority wittingly devolved to it by Council, the Faculty may, in special cases and subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for the degree a person who does not hold a degree of a university, but has given evidence satisfactory to the Faculty of fitness to undertake work for the degree.

Unless an applicant has obtained an Honours degree from a University in a suitable Mathematical and Computer Sciences discipline or a qualification deemed by the Faculty to be equivalent the applicant shall, before being admitted as a candidate, pass such qualifying examination as the Faculty may in the circumstances determine.

2. A person seeking enrolment as a candidate for the degree shall apply to the Registrar and shall submit as part of that application, a statement of that person's academic standing, accompanied, in the case of a person who is not a graduate of the University of Adelaide, by acceptable proof of such standing. Each applicant shall submit an outline of the research work or investigation on which it is intended to submit a thesis. The Faculty, if it approves the subject of this research, may appoint a supervisor to guide the candidate in the work.

3. A candidate may proceed to the degree by full-time study; or, with the approval of the department concerned and subject to any conditions imposed in the particular case, by part-time study; or, as an external student. Except by special permission of the Faculty, the work for the degree shall be completed and the thesis submitted:

(i) in the case of a full-time candidate, not less than one year or more than three years from the date of candidature accepted by the Faculty;

(ii) in the case of a part-time or external candidate, not less than two years nor more than six years from the date of candidature accepted by the Faculty.

5. To qualify for the degree a candidate shall submit a thesis upon an approved subject and shall adduce sufficient evidence that the thesis is his own work. The thesis shall give the results of original research or of an investigation on which the candidate has been engaged. A candidate may also submit other contributions to mathematical sciences in support of his candidature.

6. A candidate's progress shall be reviewed annually by the Faculty, under the provisions of clause 4c of Chapter XXV of the Statutes.

7. The Faculty shall appoint a Board of Examiners to report upon the thesis and any supporting papers that the candidate may submit. The Board of Examiners may require any candidate to pass an examination in the branch of science to which the candidate's original research or investigation is cognate.

8. A candidate for the degree of Doctor of Philosophy whose work is considered by the Faculty, after report by the examiners appointed to adjudicate upon it, not to be of sufficient merit to qualify for the degree of Doctor but of sufficient merit for the degree of Master may be admitted to the degree of Master provided that the candidate is qualified to become a candidate for the degree.

9. On completion of the work a candidate shall lodge with the Registrar three copies of the thesis prepared in accordance with directions given to candidates from time to time.*

10. A candidate who complies with the foregoing conditions and satisfies the Board of Examiners shall on the recommendation of the Faculty of Mathematical and Computer Sciences be admitted to the degree of Master of Science in the Faculty of Mathematical and Computer Sciences.

Regulations allowed 21 December, 1972.

Amended: 28 Feb. 1974: 3; 23 Jan. 1975: 6; 15 Jan. 1976: 6; 4 Feb. 1982: 9; 17 Jan. 1985: 5. 20 Jul. 1989: 1, 2, 3, 4, 5; 21 Feb. 1991: 1.

*Published in "Guidelines on Higher Degrees by Research and Specifications for Thesis": *see* Contents.

DEGREE OF

DOCTOR OF SCIENCE

IN THE FACULTY OF MATHEMATICAL AND COMPUTER SCIENCES

REGULATIONS

1. (a) Subject to these regulations a person who has been admitted in the University of Adelaide to an Honours degree of Bachelor of Science or a degree of Master of Science, Arts or Economics, or to the degree of Doctor of Philosophy in a field of study approved by the Faculty of Mathematical and Computer Sciences, may proceed to the degree of Doctor of Science in the Faculty of Mathematical and Computer Sciences.

(b) On the recommendation of the Faculty of Mathematical and Computer Sciences the Board of Graduate Studies acting with authority wittingly devolved to it by Council may accept as a candidate for the degree a person who has been admitted to a degree in the University of Adelaide other than one named in section (a) of this regulation, or who is a graduate of another university or institution of higher education recognised by the University of Adelaide and has a substantial association with the University; provided that in each case the graduate concerned has, in the opinion of the Faculty of Mathematical and Computer Sciences, had an adequate training in the mathematical sciences.

(c) No person shall be accepted as a candidate for the degree of Doctor of Science in the Faculty of Mathematical and Computer Sciences before the expiration of five years from the date of his original graduation.

2. (a) A person who desires to become a candidate for the degree shall give notice of his intended candidature in writing to the Registrar and with such notice shall furnish particulars of his achievements in the mathematical sciences and of the work which he proposes to submit for the degree.

(b) The Faculty of Mathematical and Computer Sciences shall appoint a committee to examine the information submitted and to advise the Faculty on whether the Faculty should—(i) allow the applicant to proceed, and approve the subject or subjects of the work to be submitted; or (ii) advise the applicant not to submit his work: and the Faculty's decision shall be conveyed to the applicant.

(c) If it accepts the candidature and approves the subject or subjects of the work to be submitted the Faculty shall nominate examiners of whom one at least shall be an external examiner.

3. (a) To qualify for the degree the candidate shall furnish satisfactory evidence that he has made an original contribution of distinguished merit adding to the knowledge or understanding of any subject with which the Faculty is directly concerned.

(b) The degree shall be awarded primarily on a consideration of such of his published works as the candidate may submit for examination.

(c) The candidate in submitting his published works shall state generally in a preface and specifically in notes the main sources from which his information is derived and the extent to which he has availed himself of the work of others, especially where joint publications are concerned. He may also signify in general terms the portions of his work which he claims as original.

(d) The candidate is required to indicate what part, if any, of the work he has submitted for a degree in this or any other university.

4. The candidate shall lodge with the Registrar three copies of the work prepared in accordance with the directions given in sub-paragraph (b) of clause 2B of Chapter XXV of the Statutes. If the work is accepted for the degree the Registrar will transmit two of the copies to the University Library.

5. A candidate who complies with the foregoing conditions and satisfies the examiners may, on the recommendation of the Faculty of Mathematical and Computer Sciences, be admitted to the degree of Doctor of Science in the Faculty of Mathematical and Computer Sciences.

6. Notwithstanding anything contained in the preceding regulations, the Faculty may recommend the award of the degree to any person who is not a member of the staff of the University. Any such recommendation must be accompanied by evidence that the person for whom the award is proposed has made an original and substantial contribution of distinguished merit to the knowledge or understanding of a subject with which the Faculty is directly concerned, of a standard not less than required by regulation 3.

Regulations allowed 28 February, 1974.
Amended: 15 Jan. 1976: 6; 4 Feb. 1982: 2, 4; 21 Feb. 1991: 1.

FACULTY OF MEDICINE

REGULATIONS, SCHEDULES AND SYLLABUSES

DEGREE OF

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY

REGULATIONS

1. (a) The course of study for the degrees of Bachelor of Medicine and Bachelor of Surgery, unless otherwise approved by the Council on the recommendation of the Faculty, shall extend over six years of full-time study.

(b) A candidate may intermit the course:

(i) for the purpose of proceeding to the Honours degree of Bachelor of Medical Science; or

(ii) for such period and on such conditions as may in each case be determined by the Faculty.

2. To qualify for the degrees a candidate must attend regularly such tutorials and seminar work, satisfactorily perform such laboratory, practical, clinical and written work, and pass such examinations as the Council may from time to time prescribe.

3. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the degree; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabuses.

4. A candidate shall pass the whole of one examination before entering into the courses of study and practice leading to the next examination, subject to the provisions of Regulation 9(d) hereof, and provided that in the case of the First and Fourth Year Examinations, the Board of Examiners may permit a candidate, who has failed in a part only of the Examination, to proceed into the courses of study leading to the subsequent Examination. A candidate may not enter into the courses of study leading to the Fourth Year Examination until the candidate has passed the whole of the First, Second and Third Year Examinations and to the Final (Sixth-Year) Examination until the candidate has passed the whole of the five previous examinations.

5. A candidate shall not present for the examinations unless the candidate has completed to the satisfaction of the professors and lecturers concerned, prior to the beginning of the examination, the courses of study and practice prescribed for it.

6. The examiners in any subject may take into consideration written or practical work required of candidates during the course of study and practice and the results of other examinations in the subjects.

NOTES: (1) The reference to study and practice in regulations 3 to 7 above includes all that practical work and clinical instruction prescribed in schedule 1.

(2) The Faculty of Medicine regards lectures as a valuable teaching method. Consequently candidates are advised to attend regularly such courses of lectures as may be provided.

7. A candidate who fails to pass in an examination shall, before presenting for the examination again, attend again such part or parts of the course of study and practice leading to that examination as the Faculty may direct.

8. (a) Candidates who pass in the whole of an examination prescribed in the schedules shall be awarded a non-graded pass and their names shall be arranged in alphabetical order.

(b) Except as otherwise provided in the Schedules there shall be three classifications of pass in any component subject of the medicine course, as follows: Pass with Distinction, Pass with Credit, Pass. The names of the candidates in each of the classifications shall be published in accordance with the provisions of the relevant schedule made under the regulations.

(c) A candidate whose results in the Third-Year, Fourth-Year, Fifth-Year and Final (Sixth-Year) Examinations, in the medicine course have been adjudged by the Faculty of Medicine to have been of distinguished merit may, by the decision of the Faculty on the recommendation of the Board of Examiners in the final year of the course, be awarded the degrees of Bachelor of Medicine and Bachelor of Surgery (with Honours).

9. (a) The Board of Examiners may grant a candidate who has been prevented by illness or other sufficient cause from sitting for the whole or part of an examination permission to sit for a special or supplementary examination; the extent of such special or supplementary examination to be determined by the Board in each case.

(b) The Board of Examiners may grant a candidate who has failed in part only of an examination permission to sit for a supplementary examination in the subject or subjects in which the candidate has failed.

(c) On passing in a special or supplementary examination granted under this regulation a candidate shall be deemed to have completed the whole of the examination; but if the candidate fails in such special or supplementary examination the candidate shall take again, and pass in, the whole of the examination before proceeding with the courses of study and practice leading to the next examination: provided that, subject to the provisions of Clause 4 thereof, for the First-Year and Second-Year Examination the Board of Examiners may require a candidate to repeat only those subjects in which the candidate has failed.

(d) A candidate granted permission to sit for a supplementary or special examination may enter provisionally upon the courses of study and practice leading to the next examination pending publication of the result of the supplementary examination.

10 (a) A candidate who has passed subjects in other faculties or universities or elsewhere, may on written application to the Registrar be granted such exemption from these regulations and from schedules made under them as the Council on the recommendation of the Faculty may determine.

(b) Subject to approval by the Faculty and on such conditions as may be determined by the Faculty, a candidate may substitute a subject or subjects from another course for specified components of the First Year Examination.

11. All regulations hitherto in force concerning the degrees of Bachelor of Medicine and Bachelor of Surgery are hereby repealed; provided that this repeal shall not affect

(a) anything done or suffered under any regulation hereby repealed; or

(b) any right or status acquired, duty imposed, or liability incurred by or under any regulation hereby repealed.

Regulations allowed 28 January, 1965.

Amended: 24 Dec. 1969: 2; 17 Dec. 1970: 8; 16 Dec. 1971: 9, 10; 21 Dec. 1972: 8; 23 Jan. 1975: 8, 9; 15 Jan. 1976: 3; 31 Jan. 1980: 1, 8; 4 Feb. 1982: 5, 8, 10; 24 Feb. 1983: 3, 8; 17 Jan. 1985: 8(b); 12 Feb. 1987: 8. 20 Jul. 1989. 21 Feb 1991: 4, 9. Awaiting allowance: 3(b).

DEGREE OF

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY

SCHEDULES

The hospital clinical year usually begins on the fourth Monday in the year. Syllabuses of subjects for the degrees of M.B., B.S. are published below, immediately after these schedules.

SCHEDULE I: SUBJECTS OF STUDY

(Made by the Council under Regulation 3(a))

The following are the subjects of study for the six Examinations for the degrees of Bachelor of Medicine and Bachelor of Surgery.

1870 First-Year Examination

4201 Anatomy IMB
7788 Behavioural Science IM
5847 Biology IM
7412 Biomedical Statistics I
9681 Chemistry IM
6594 Introductory Medicine I
3117 Medical Physics I

Students with appropriate Year 12 results in one or two of Biology, Chemistry and Physics may be permitted by the Faculty to substitute one or more approved subjects from other disciplines in the University of a similar weighting to 5847 Biology IM, 9681 Chemistry IM and 3117 Medical Physics I.

2034 Second-Year Examination

8946 Anatomy IIMB
7100 Biochemistry IIM
5460 Genetics IIM
9405 Human Physiology IIMB
6408 Medicine in the Community II

3980 Third-Year Examination

8824 Clinical Science and Skills
9782 Human Physiology IIIMB
6105 Microbiology and Immunology IIIMB
6950 Pathology III
1494 Pharmacology IIIMB
9726 Social & Preventive Medicine III

8508 Fourth-Year Examination

1113 Clinical Science IV
2976 Clinical Skills IV
8475 Psychiatry IV
6915 Research Project

The Board of Examiners may require a candidate repeating the Fourth Year Examination to complete
2643 Clinical Skills IVA
instead of
6915 Research Project

3192 Fifth-Year Examination

9691 Clinical Science V
4369 Clinical Skills V
7240 Obstetrics & Gynaecology V
4376 Paediatrics V

The Board of Examiners may require a candidate who was unsuccessful in completing both the Fourth Year and Fifth Year Examinations at the first attempt to successfully complete the subjects
8425 Clinical Science IV/V
4943 Clinical Skills IV/V
in order to complete the requirements of the two Examinations.

1106 Final (Sixth-Year) Examination

9950 Applied Pathology and Forensic Medicine VI
4686 Clinical Competence VI
8958 Community Practice VI
2434 Medicine and Surgery VI
6460 Paediatrics VI
4364 Psychiatry VI

SCHEDULE II: COURSE OF STUDY AND EXAMINATIONS

(Made by the Council under Regulation 3(a))

1. (a) To qualify for the degrees of Bachelor of Medicine and Bachelor of Surgery, a candidate shall complete the requirements of the six Examinations by:

(i) regularly attending lectures, tutorials, seminars, demonstrations;

(ii) satisfactorily participating in tutorial, practical and project work, clinical programs and attachments; and

(iii) satisfactorily completing the range of assessment tasks, including examinations,

that are prescribed in the Syllabus for each of the subjects of the Examinations as set out in Schedule I.

(b) In addition, a student is required to undertake either a period of elective study approved by the Faculty of Medicine before commencing the study and practice for the Final (Sixth Year) Examination or if so directed by the Board of Examiners for the Fourth or Fifth Year Examination, a prescribed revision course of study and clinical practice, in lieu of undertaking a period of elective study, in a subject area of the Fourth Year or Fifth Year Examination.

2. (a) In the event that a student fails a subject of an examination the Faculty's Board of Examiners for the relevant Examination may offer supplementary or special assessment tasks, including examinations, after considering the student's academic performance in all subjects undertaken in an academic year and any evidence of a medical or compassionate nature which may be placed before it. Where supplementary examinations are offered, they will normally be undertaken during an official University Supplementary Examination period.

(b) A candidate who has been offered a supplementary or special examination on account of a failure in a subject of the Fourth Year or Fifth Year Examination, shall normally be required to undertake a prescribed revision course of study and clinical practice, in lieu of undertaking a period of elective study, before undertaking the examination.

3. (a) A candidate shall normally pass the whole of one Examination before entering into the course of study and practice leading to the next examination.
(b) Where a candidate has been grated status in the course under the provisions of Regulation 10(a), on account of other tertiary studies, the Faculty may permit the student to undertake subjects from more than one Examination where the Dean or designated nominee is satisfied the candidate's program of study and practice for the degree is academically sound.
(c) A candidate who fails the First Year Examination will be required to repeat the work and assessment requirements only for the subject or subjects which were failed. With the approval of the Dean or designated nominee the candidate may concurrently undertake subjects of the Second Year Examination.
(d) A candidate who fails the Second Year Examination will be required to repeat the work and assessment requirements only for the subject or subjects which were failed. The candidate normally will not be permitted by the Faculty to undertake any study or practice towards a subsequent Examination.
(e) A candidate who fails the Third Year Examination normally will be required to repeat the work and assessment requirements of the subjects set out for the Third Year Examination in Schedule I.
(f) The overall performance of a candidate who fails the Fourth Year Examination, and the extent of the failure, shall be considered by the Board of Examiners in determining whether:

(i) the candidate be permitted to proceed to the Fifth Year Examination and undertake, in lieu of a period of elective study, a prescribed revision course of study and clinical practice, in lieu of undertaking a period of elective study before undertaking a special examination.

(ii) the candidate be required to repeat the course of study and clinical practice and the assessment requirements for all the subjects including the Research Project set out for the Fourth Year Examination in Schedule I.

(iii) the candidate be required to repeat the course of study and clinical practice and the assessment requirements for the subjects set out for the Fourth Year Examination in Schedule I with the variation that the subject 2643 Clinical Skills IVA be undertaken instead of 6915 Research Project.

(g) A candidate who fails the Fifth Year Examination normally will be required to repeat the study and clinical practice and the assessment requirements of the subjects set out for the Fifth Year Examination in Schedule I.
(h) Notwithstanding Clause (g) above, if a candidate has failed both the Fourth Year and the Fifth Year Examination at the first attempt, the Board of Examiners may

(i) withdraw the requirement that the candidate undertake a prescribed revision course of study and clinical practice, in lieu of a period of elective study, and a special examination; and instead

(ii) require the candidate to complete the requirements of the Fourth Year and Fifth Year Examination by undertaking the study and clinical practice and assessment requirements for the subjects
8425 Clinical Science IV/V
4943 Clinical Skills IV/V
and pass the assessment tasks, including examinations, that are prescribed.

(i) A candidate who fails the Final (Sixth Year) Examination will be required to repeat the study, and clinical practice and assessment requirements of all subjects set out for the Examination in Schedule I.

SCHEDULE III: SUBJECT RESULTS NOT TO BE CLASSIFIED

(Made by the Council under Regulation 8(b))
The results of the following subjects will not be classified:
7412 Biomedical Statistics I

6594 Introductory Medicine I
4376 Paediatrics V

SCHEDULE IV: APPROVAL OF ENROLMENT

1. A Candidate for the degrees of Bachelor of Medicine and Bachelor of Surgery is required to enrol for the Examination and the component subjects as set out in Schedule I during an official enrolment period.

2. The following students must have their course of study approved by the Dean or designated nominee at the time of enrolment in the year in question:
(a) students previously enrolled in the course of studies prescribed in these schedules who did not enrol in that course in the immediately preceding year;
(b) students who have been granted, or who are seeking exemption from the requirements of the regulations and schedules under the terms of regulation 10;
(c) students who wish to enrol in any subject or subjects and/or option within any subject, in addition to the course and subjects prescribed in these schedules;
(d) students previously enrolled in other courses or in other faculties and who are enrolling, or who are seeking to enrol, for the first time in subjects prescribed in these schedules.

3. Students wishing to intermit their studies in accordance with the provisions of regulation 1(b) must apply through the Registrar for permission and obtain beforehand the approval of the Dean on behalf of the Faculty for leave of absence for a defined period.

4. Students who have intermitted their studies in the prescribed subjects may be required to resume at such a point in the course and/or to undertake such additional or special program of study as the Dean of the Faculty deems appropriate.

RULES FOR THE ADMISSION OF MEDICAL STUDENTS
TO THE PRACTICE OF THE TEACHING HOSPITALS, HEALTH CENTRES AND THE INSTITUTE OF MEDICAL AND VETERINARY SCIENCE

1. Medical students admitted to the practice of a Teaching Hospital or Health Centre shall be under the control of the Medical Superintendent* in relation to matters of common discipline; the University will otherwise be responsible for matters related to education.

2. No student shall publish the report of any case without the permission of the Hospital Board or Health Centre Management Committee and the Senior Medical Officer under whose care the patient is or has been.

3. Except in the performance of his clinical duties, no student may disclose any information whatsoever concerning a patient without the permission of both the patient and the Senior Medical Officer in charge.

4. No student may communicate directly or indirectly to the Press, radio or television any matter concerning the clinical practice of the Institution to which he is attached.

5. No student may introduce visitors into any Hospital or Health Centre to the practice of which he has been admitted, without the permission of the Medical Superintendent* or his deputy.

6. Students shall pay such fees as are laid down from time to time by the University in conjunction with the Teaching Hospitals or Health Centres. Fees are payable directly to the University; no student will be admitted to a Teaching Hospital or Health Centre until such fees are paid.

7. Students shall discharge the duties assigned to them, and pay for or replace any article damaged or lost or destroyed by them through negligence or misconduct.

8. During any period of residence the student will comply with the directions of the Medical Superintendent* of the Hospital or Health Centre in respect of discipline and general conduct.

9. Subject to rule 10 any student infringing any of these rules or the rules of the Hospital or Health Centre, or otherwise misconducting himself may be suspended or dismissed by the Board of the Hospital or Health Centre from the practice of the Hospital or Health Centre. If he is so dismissed he shall forfeit all payments which may have been made and all rights accruing therefrom.

10. In all instances where a student has been either suspended or dismissed from the practice of the Hospital or Health Centre his case shall be investigated by an Investigation Committee on which there shall be a representative appointed by the Hospital Board, a Senior Consultant Clinical Teacher nominated by the Chairman (or his deputy) of the appropriate Staff Committee of the Hospital or Health Centre concerned, a representative appointed by the University, and the Dean of the Faculty of Medicine (or his deputy). The committee should also normally include a representative

of the Adelaide Medical Students' Society (e.g. a student member of the Faculty of Medicine). The Investigating Committee shall make its recommendation to the Board of the Hospital or Health Centre Management Committee concerned and to the Council of the University for confirmation or otherwise.

These rules apply equally to medical students who use the facilities of the I.M.V.S. where the Director of the Institute has the authority given in these Rules to the Medical Superintendent of a Teaching Hospital, and where the Council of the Institute replaces the Board of the hospital.

*The Medical Director of the Queen Victoria Hospital and Health Centres.

DEGREE OF

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY

SYLLABUSES

Text-books:

The lists of the text-books were correct at the time that this Volume went to press. It is possible however that amendments to these lists will be made before the start of lectures; and, if so, students attending classes will be notified appropriately by the lecturer concerned.

In general, students are expected to have their own copies of text-books; but they are advised to await advice from the lecturer concerned before buying any particular book. Only the prescribed edition of any text-book should be sought.

Reference books:

Although lists of books and journals for reference purposes are regarded as important, details have not been included in this Volume. These will however be issued from time to time by the departments concerned. It is hoped that all books and journals set for reference will be available to be consulted in the Barr Smith Library.

Examinations:

For each subject students may obtain from the department concerned details of the examination in that subject including the relative weights given to the components (e.g. such of the following as are relevant: assessments, semester tests, essays or other written or practical work, final written examinations, *viva voce* examinations).

1870 FIRST-YEAR EXAMINATION

4201 Anatomy IMB

Level: 1.

Duration: Full year.

Pre-requisites: None.

Contact hours: 3 lectures and up to 4 hours of practical work a week.

Content: The subject will deal in a co-ordinated fashion with: an introduction to general body form, methods of anatomical study, a brief outline of anatomy of the body systems, general cytology and tissue histology, the detailed topographical anatomy of the limbs and thorax, the histology of the skeletal, muscular, nervous, cardio-vascular, lymphatic and respiratory systems, an introduction to early embryology, and the embryology of the cardiovascular and respiratory systems.

Assessment: Examinations at end of each semester.

Equipment: A human half-skeleton, dissecting instruments and laboratory coats. Although

the Department will provide microscopes for use during class times, students are encouraged to purchase a microscope of their own for use outside class hours.

Text-books: Moore, K. L, *Clinically oriented anatomy* 2nd edn. (Williams and Wilkins); Cunningham, D. J., *Manual of practical anatomy* Vol. 1 & 2. 15th edn. (O.U.P.); Junqueira, L. C., Carneiro, J. and Kelley, R. O., *Basic histology* 6th edn. (Lange) *or* Cormack, D. H., *Ham's Histology* 9th edn. (Harper & Row); Moore, K. L., *The developing human* (4th ed.) (Saunders) or Langman, J., *Medical embryology* (5th ed.) (Williams and Wilkins).

Atlases (optional): Consult Department for information on suitable publications.

7788 Behavioural Science IM

Level: I.

Duration: Full year.

Pre-requisites: None.

Contact hours: 3 lectures, 1 tutorial, and 1 three-hour practical class a week.

Content: The subject deals with scientific approaches to the understanding of human behaviour in health and disease. With this objective, contributions from general and developmental psychology, psychophysiology, social psychology, sociology, and anthropology are studied.

Assessment: Semester examinations, 32.5% each, 3 practical reports during year, 10% each and 5% for tutorial participation. Pass mark is an aggregate of 50% with the proviso that any student who has failed both examinations will be deemed to have failed the subject. Students may be precluded from sitting for examinations if practical work has not been completed to the satisfaction of the examiners.

Text-book: Winefield, H. R., and Peay, M. Y., *Behavioural science in medicine*, 2nd edn. (1991). Copies available from Dept. Psychiatry.

5847 Biology IM

Level: I.

Duration: Full year.

Pre-requisites: None.

Contact hours: 2 lectures, 1 tutorial and 3 hours of practical work a week. Both day and evening classes will be held.

Content: The subject is an introduction to major biological fields which does not assume previous knowledge. It provides the basis on which later specialized biological and medical studies build. Topics include: cell structure and function; biochemical concepts — respiration, photosynthesis, enzymes; energy flow; membranes; DNA, RNA, protein synthesis; an introduction to bacteria, fungi, autotrophs and chordates; the structure and physiology of vertebrates; major invertebrate phyla; ecology; the nature of evolution, natural selection, the ancestry of man.

Assessment: 2 end of semester examinations, an essay and practical work throughout the year.

Text-book: Curtis, H. and Barnes, N.S., *Biology* 5th edn. (Worth).

7412 Biomedical Statistics I

Level: I.

Duration: Semester I.

Pre-requisites: None.

Contact hours: 10 hours divided equally between lectures and tutorials.

Content: This subject provides an introduction to the following topics: the role of statistics in medicine, the collection and presentation of data, measures of central tendency and

variability, probability and distributions, statistical inference and hypothesis testing, simple linear regression and correlation.

Assessment: Tutorial performance and exercises and a 2-hour written examination at the end of semester.

Text-book: A coursebook will be provided.

9681 Chemistry IM

Level: I.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Year 12 Chemistry.

Contact hours: A course of 35 lectures covering aspects of organic chemistry and 15 lectures on aspects of physical chemistry.

There will be 6 three-hour practical classes and approximately 15 one-hour tutorials associated with the course.

Content: This course is specifically designed to provide the necessary chemistry background for students in the medical faculty.

Assessment: 2½-hour examination on Organic Chemistry at the end of Semester I and 1½-hour examination on Physical Chemistry at the end of Semester II. Satisfactory attendance and performance is required for each of the practicals.

Text-books: Bailey, P. S. and Bailey, C. A., *Organic chemistry* (4th ed.) (Allyn and Bacon). Printed notes will be provided for the Physical Chemistry section.

6594 Introductory Medicine I

Level: I.

Duration: Semester I.

Pre-requisites: None.

Contact hours: 2 hours a week.

Content: This is a multifacetted course run as a series of workshops with the following aims:

1. to introduce the student to the methodology of clinical problem solving involved in the management of a patient.

2. to make the student aware of the relative merits of learning through understanding as opposed to fact-oriented superficial learning.

3. to make the student aware of the extent to which they will require pre-clinical knowledge for patient management.

4. to ensure that all students are competent in cardio-pulmonary resuscitation and have some understanding of elementary first aid.

5. to introduce the student to issues relating to death and dying.

6. to alert the student to modern knowledge about drugs and alcohol and to direct their attention to their future role, as medical practitioners, in dealing with these issues.

Assessment: This will be dependent on satisfactory completion of the cardio-pulmonary resuscitation practical session and the satisfactory write-up of a clinical problem solving case.

3117 Medical Physics I

Level: I.

Duration: Semester II.

Pre-requisites: None.

Contact hours: 2 lectures and 2 hours of practical work a week or equivalent. Tutorials given every two weeks.

Content: The aim of this course is to teach Medical Physics as a relevant course in the medical and dental curriculum. It concentrates therefore on concepts and principles and their applications, not on mathematics or formal derivations. It aims to look at some social issues in a scientific context, such as the after-effects of Chernobyl. It provides a useful background to physiology, anatomy, radiology and anaesthetics. It is taught with the assistance of the Department of Medical Physics of the Royal Adelaide Hospital. The main topics are biomechanics, fluids, solids, diffusion, electricity with applications, sound, optics and radiation. The course aims to bridge the gap between matriculation physics and the applications needed in medical and dental subjects. Therefore, students who have not taken matriculation physics will need to do extra work to cope with the lectures. These students are advised to consult the lecturer as early as possible and obtain a copy of Kane and Sternheim.

Assessment: Based mainly on a written examination, but includes practical or project work.

Text-book: Cameron, J. R., and Skofronick, J. G., *Medical Physics* (Wiley); Kane, J. W. and Sternheim, M. M., *Physics* (Wiley).

2034 SECOND-YEAR EXAMINATION

8946 Anatomy IIMB

Level: II.

Duration: Full year.

Contact hours: 4 lectures and 4 (Semester I) or 5 (Semester II) hours of practical work per week.

Content: The course follows on from 4201 Anatomy IMB in first year and is divided into two quite separate semester parts.

In the first semester the gross anatomy of the abdomen, pelvis and perineum is covered in parallel with the histology of the alimentary, renal, reproductive and endocrine systems and the embryology of the alimentary, renal and reproductive systems. The reproductive cytology, histology and embryology is taught with some general embryological topics as an integrated unit of reproductive biology.

The second semester material includes the gross anatomy of the head and neck, neuroanatomy, the histology of the eye and ear, and some relevant embryology.

Assessment: Examinations at the end of each semester, each being the final examination on the work concerned.

Equipment: As for 4201 Anatomy IMB.

Text-books: Cunningham, D. J., *Manual of practical anatomy* Vols 2 & 3 15th edn. (O.U.P.) and Heimer, L., *The human brain and spinal cord: functional neuroanatomy and dissection guide* (Springer-Verlag); Johnson, M. H. & Everitt, B. J., *Essential reproduction*, 3rd edn (Blackwells, Oxford), as well as texts and optional atlases as for 4201 Anatomy IMB. Reading lists are also provided.

7100 Biochemistry IIM

Level: II.

Duration: Full year.

Contact hours: 3 one-hour lectures a week. A series of tutorials on the clinical applications

of Biochemistry and literature research topics are taken throughout the year and require 3 hours work each week.

Content: Introduction to protein structure and function, mechanism of enzyme action, specialized proteins and their functions, biological membranes, generation and storage of metabolic energy, biosynthesis of macromolecular precursors, integration of metabolism. Systems and methods of molecular biology, genetic analysis in molecular biology, nucleic acids, DNA structures, DNA replication, recombination, mutation and repair, transcription, translation, genetic code, regulation of protein synthesis and gene function in bacteria and their viruses, recombinant DNA technology.

Assessment: At the end of each semester there will be a written examination, duration 3 hours, integrating the lecture material and the clinical tutorials, 80%, and a separate examination on the literature research project, 20%.

Text-book: Stryer, L., *Biochemistry* 3rd edn. (Freeman).

Reference book: Montgomery, R., *Biochemistry: A case orientated approach*, 5th. edn. (Mosby).

5460 Genetics IIM

Level: II.

Duration: Semester I.

Contact hours: 2 lectures and 2 hours of practical/tutorial per week.

Content: This course outlines the principles of human genetics, important in understanding the individual variation seen in both health and disease under the following headings: Mendelian genetics in human pedigrees; cytogenetics; molecular genetics; gene localization; population genetics; genetics and disease; genetic counselling.

Assessment: Written examination 70%, tutorials 10%, oral presentation 5% and written report 15%.

Text-book: Gelehrter, T. D. and Collins, F. S., *Principles of medical genetics* (Williams and Wilkins).

9405 Human Physiology IIMB

Level: II

Duration: Full year.

Contact hours: 3 one-hour lectures, a one-hour tutorial and a three-hour practical session each week.

Content: The basic concepts of both general and systematic physiology are presented during lectures and tutorial sessions. The practical sessions comprise research projects each of which extends over approximately thirteen weeks. Students work in small research teams and design their own projects under staff guidance. The projects are directed at teaching the basic principles of the experimental physiology.

Assessment: Written examinations are held at the end of each semester and total 70% of the subject mark. Project reports comprise the remaining 30%.

Text-books: Lecture and tutorial material is covered by West, J. B., *Physiological basis of medical practice* (Williams & Wilkins), or Guyton, A. C., *Textbook of medical physiology* 7th edn. (Saunders); Sherwood, L., *Human physiology from cells to systems* (West) is a good introductory textbook. The practical session content in terms of experimental design is covered in *Physiology and the scientific method* 1st edn. (Scott and Waterhouse). The recommended statistical reference is *Understanding statistics in the behavioural sciences*, 3rd. edn., Pagans, R. R. (West, 1990).

6408 Medicine in the Community II

Level: II.

Duration: Full year.

Contact hours: 3 hours of lectures and tutorials a week.

Content: This subject deals with some specific aspects of the health system and examines the benefits and limitations of several methods of analysis. It aims to convey an understanding of the political and economic organization of health services, the difficulties for certain groups who lack access to these services, and the main problems thought to be contributing to morbidity and mortality in the community. The two main objectives are: to introduce the Australian health care system, to consider the factors that shape it, and to explore the relationships between practitioners within it; and to study some key conceptual tools for analyzing health and the practice of medicine. Most of the first semester is taken up by "Working in Health Care", which is done in conjunction with students from other health-related courses. Medical students then proceed to a program of lectures and tutorials in health system politics, epidemiology, health economics, and an analysis of the scientific foundations of medicine. Thereafter a set of electives is offered: These vary from year to year, and generally involve a more in-depth analysis of one of the key areas of the overall subject.

Assessment: Tutorial participation, project work and written assignments are assessed. There is a written examination at the end of each semester.

Text-books: Christie, D., Gordon, I. & Heller, R., *Epidemiology: an introductory text for medicine and other health science students* (University of New South Wales Press); Bates, E. & Linder-Pelz, S., *Health care issues* (Allen & Unwin, 1987).

3980 THIRD-YEAR EXAMINATION

8824 Clinical Science and Skills

Level: III.

Duration: Full year.

Contact hours: 1 lecture, 1 demonstration and 1 tutorial a week.

Content: This subject is intended to introduce the student to the skills of medical practice, the scientific study of the processes of disease states and the ethics of medicine. Emphasis will be placed on the acquisition of skills in clinical interviewing and communication as well as those required to elicit and record a clinical history and to perform a physical examination. Clinical data gathered at the bedside is to be interpreted in the context of a scientific understanding of the aetiology, pathophysiology and prognosis of common disease processes, aided where appropriate by information derived from elementary laboratory and other diagnostic investigations. In the study of biomedical ethics, the student will be equipped with the conceptual tools to think clearly about ethical problems and reach sound ethical judgements in a clinical context.

Assessment: Continuous assessment in demonstration and tutorial work, a project in biomedical ethics, a written examination in clinical science and a viva in clinical skills.

9782 Human Physiology IIIMB

Level: III.

Duration: Semester I.

Contact hours: 2 one-hour lectures per week and, with the exception of 1992, 1 three-hour practical session a week for the first half of the semester.

Content: Lecture topics are directed at the integrative aspects of central nervous system function, exercise physiology, haemostasis and the endocrinological aspects of reproductive physiology.

Assessment: The assessment will be by written examination at the end of the semester. Essay topics may be provided in lieu of practical sessions in the first half of the semester and contribute to the overall assessment.

Text-book: As for 9405 Human Physiology IIMB.

6105 Microbiology and Immunology IIIMB

Level: III.

Duration: Full year.

Contact hours: 2 or 3 one-hour lectures per week, and a practical course using basic laboratory techniques.

Content: In Semester I the student is introduced to basic concepts of microbiology and immunology, including: bacteria, fungi, viruses and parasites of medical importance; their isolation, morphology mode of replication and classification; principles of sterilization and disinfection, use of antibiotics and chemotherapeutic agents: the role of micro-organisms in disease, considered as a study of host parasite relationships; epidemiology and hospital cross-infection: principles of immunology and the immune response, including its role in the pathogenesis of infectious disease.
Semester II is concerned with clinical microbiology and immunology. The pathogenesis, laboratory diagnosis, epidemiology and control of common infections are presented, and clinical immunology topics such as transplantation, immune deficiency, allergic and autoimmune diseases are discussed.

Assessment: There will be examinations at the end of each semester.

Text-books: A list of text-books will be issued by the department at the beginning of each year.

6950 Pathology III

Level: III.

Duration: Full year.

Contact hours: 3 lectures and 4 hours of practical work each week.

Content: In the first semester students are introduced to the general principles of Pathology and begin to look at the application of these to some clinical disease states. The nature and causes of disease are first considered, and then follows a full consideration of the inflammatory reaction, including tissue regeneration and repair. Other topics are thrombosis, embolism and infarction, cellular changes and degenerations, the biological effects of radiant energy, the fundamentals of the neoplastic process, haemorrhage and shock, oedema, infiltrations, cardiac and haematological disorders and selected parasitic diseases.
In the second semester, these principles are applied to understanding the mechanisms of production of the clinical features and complications of the important diseases of the major organ systems.
Instruction is provided in lectures, tutorials, mortuary demonstrations and practical classes. Towards the end of the year the students are introduced to the principles of clinical problem solving in a short series of clinico-pathological conferences.

Assessment: An examination at the end of each semester.

Text-books: Rubin, E. and Farber, J., *Pathology* (Lippincott); Wheater, P. R., Burkitt, H. G., Stevens, A. and Lowe, J. S., *Basic histopathology* (Churchill Livingstone).

1494 Pharmacology IIIMB

Level: III.

Duration: Full year.

Contact hours: 39 lectures, 16 hours of tutorials, 14 hours of demonstrations, 20 hours of self-directed learning.

Content: The subject covers (a) the principles of pharmacology; drug:receptor interactions; pharmacokinetics; toxicology; drug development; adverse drug reactions; factors causing variability in drug response; substance abuse; and (b) the mechanisms underlying the various transmitter and local hormone systems and the drugs and drug classes acting through these mechanisms. The course philosophy emphasises self-directed learning.

Text-books: Goodman and Gilman's *The pharmacological basis of therapeutics* (eds. Gilman, A. G., Rall, T. W., Nies, A. S., Taylor, P.) 8th edn., Pergamon Press, 1990 or Katzung, B. G., *Basic and clinical pharmacology*, 4th edn., Prentice Hall International, 1989 or Kalant, H. & Roschlau, W. H. E., *Principles of medical pharmacology*, 5th edn., B. C. Decker Inc., 1989.

9726 Social and Preventive Medicine III

Level: III.

Duration: Semester II.

Contact hours: 2 lectures and 1 tutorial a week.

Content: This subject assumes an understanding of the analytical approaches introduced in 6408. The course looks at critical phases of life, such as infancy and old age; at particular problems in environmental and occupational health; at topics like nutrition, which tend to be neglected but form an important underlying influence on health; and at some of the actual, potential and purported methods of studying and intervening in these problems.

Assessment: Continuous assessment in tutorial and project work and a written examination.

Text-books: The Open University, *Birth to old age* (Open University press); Hetzel, B. and McMichael, T., *The L. S. factor* (Penguin, 1987).

8508 FOURTH-YEAR EXAMINATION

1113 Clinical Science IV

2976 Clinical Skills IV

Level: IV.

Duration: Full year.

Content: The subjects are designed to give the students a balanced introduction to clinical medicine and to integrate the medical sciences with clinical medicine.
The programme will comprise three terms, each of twelve weeks duration, through which groups of students will rotate. In one term students spend six weeks in the University Departments of Medicine and Surgery at either the Royal Adelaide Hospital or The Queen Elizabeth Hospital, in a course designed to analyse the whole diagnostic process, including special diagnostic procedures.
In the remaining terms the students will be attached to clinical units with opportunities to practice the clinical skills learnt in third year. In one term the programme will include a series of teaching sessions, to introduce students to the commoner conditions from which

patients may suffer. This teaching will be based on a series of clinical problems and students will be required to undertake independent study to prepare these topics for presentation.

Text-books: See under 1106 Final (Sixth year) Examination.

8475 Psychiatry IV

Level: IV.

Duration: Full year.

Content: In the fourth year students are assigned to psychiatric units in general hospitals for clinical clerking, the detailed study of patients and families and an overview of the field of general psychiatry.

Text-books: See under 1106 Final (Sixth Year) Examination.

6915 Research Project

Level: IV.

Duration: Full year.

Content: The project aims to develop student skills in assessing the reliability of evidence and the relevance of scientific knowledge, to reach conclusions by observation, experiment and logical analysis and evaluate critically the prevailing knowledge on which current medical practice is based. Students will be required to plan, carry out and write up a specific research project under the supervision of a faculty member. Research projects will be available in a variety of forms. The specified Topic could be epidemiological, clinical or laboratory based research. Clinical projects could be case reports, disease surveys, criteria for diagnosis, natural history including complications, and/or forms of treatment, review of medical services (diagnostic, treatment etc.).

A list of possible Topics will be available in October of the previous year. Students will be able to conduct their project individually or in pairs.

Assessment: A report and oral presentation will be required at the end of the 12 week exercise.

2643 Clinical Skills IVA

Level: IV.

Duration: Full year.

Content: This subject is designed to give a student additional clinical experience in Medicine and Surgery. The programme will involve undertaking clinical attachments in the University departments of Medicine and Surgery at either The Royal Adelaide Hospital or The Queen Elizabeth Hospital in the afternoons of a 12 week clinical term.

Assessment: Clinical skills will be assessed during the term by continuous assessment.

Text-books: See under 2976 Clinical Skills IV.

3192 FIFTH-YEAR EXAMINATION

9691 Clinical Science V

4369 Clinical Skills V

Level: V.

Duration: Full year.

Content: The subjects are designed to continue the clinical skills and clinical science programmes begun in the fourth year. The programme will be conducted over two clinical terms and students will be attached to medical and surgical units. During both terms students will participate in problem-based learning activities designed to integrate the clinical sciences with clinical medicine.

7240 Obstetrics and Gynaecology V

Level: V.

Duration: Full year.

Contact hours & Content: Students are rostered to The Queen Elizabeth Hospital or The Queen Victoria Hospital and the Royal Adelaide Hospital for one clinical term. Students may be rostered to either Lyell McEwin or Modbury Hospitals for part of the term. During this time students undertake clinical attachments in general obstetrics and gynaecology and are rostered to attend special clinics in family planning, colposcopy, infertility and gynaecological oncology. Students reside in hospital for six weeks.

A course of lecture sessions, each of three hours, in the major areas of obstetrics and gynaecology, is given during the fifth year. Formal teaching is carried out by tutorials in obstetrics and gynaecology, including problem based learning in obstetrics, gynaecology and neonatology. The subjects covered are fetal growth and development, antenatal and postnatal problems, the management of the normal neonate and selected neonatal disorders, high risk obstetrics and perinatology, reproductive endocrinology, infertility, malignancy, pelvic infections, family planning, applied pharmacology and problems of the peripubertal and perimenopausal years. A comprehensive seminar on human sexuality is also given.

Assessment: Students are expected to demonstrate competence in the clinical skills: history taking, examination, diagnosis and management during the clinical term (30%). Written assignments during the semester contribute 10%. Theoretical knowledge is assessed during the clinical term (clinical stations viva 15%) and at the end of the year (written 45%). Students may be required to re-sit the clinical examination and pass-fail and distinction vivas are held at the end of the year.

Text-books: Llewellyn-Jones, D. *Fundamentals of obstetrics and gynaecology* Vol. 1 & II, 5th edn. (Faber London, 1990); Beischer, N. A., and Mackay, E. V., *Obstetrics and the newborn* 2nd edn. (Saunders, 1986); Mackay, E. V., Beischer, N. A., Cox, L. W., and Wood, C., *Illustrated textbook of gynaecology* (Saunders, 1983); Symonds, E. M., *Essential obstetrics and gynaecology* (Churchill Livingstone, 1987); Chamberlain, G. Gibbins, C. R. and Dewhurst, J., *Illustrated textbook of obstetrics* (Harper & Row, 1988); Porter, J. F., *The control of human fertility* 2nd edn. (Blackwell Scientific, 1987); Enkin, M., Kerise, M. and Chalmers, I., *A guide to effective care in pregnancy and childbirth* (Oxford University Press, 1989).

4376 Paediatrics V

Level: V.

Duration: Full year.

Contact hours: Students will attend the Adelaide Children's Hospital campus of the Adelaide Medical Centre for Women and Children for a six week period.

Content: The course will include normal childhood growth and development, the child in the family and in the community, preventative health strategies, the child with disability, common minor disorders of childhood, and child and family psychiatry.

Instruction will be by student-led problem solving, supervised tutorials, visits to child health and educational facilities, and clinical experience in the recognition and management of variations and disorders of health in childhood. Neonatology is taught as part of 7240 Obstetrics and Gynaecology V.

Assessment: Assessment will be by:

(a) Assessment by student-led tutorials and problem solving seminars during the six weeks attachment.

(b) Written projects from home and community visits by students.

(c) A written problem solving and essay question examination at the end of the six week attachment.

The marks obtained in Year V will be 40% of the total marks in Paediatrics, and these marks will be included in consideration of the total assessment of performance in Paediatrics which will occur in Year VI.

Text-books: Robinson, M. J., *Practical paediatrics*, 2nd edn (Churchill Livingstone); Lewis, I. C., Oates, R. K., Robinson, M. J., *Consulting with children* (W. B. Saunders/Bailliere Tindall); Freeman, J., Foster, B., *Lecture notes in paediatric orthopaedics and surgery*, available from the Department of Paediatrics; Avery, M. E., First, L. R., *Paediatric medicine* (International edn) (Williams & Wilkins); Vimpani, G., Parry, T., *Community child health: an Australian perspective* (Churchill Livingstone); Kosky, R. J., Eshkevari, H. S., Carr, V. J., *Mental health and illness:* a textbook for students of health sciences (Butterworth-Heinemann, 1991).

8425 Clinical Science IV/V

Level: IV/V.

Duration: Full year.

Content: This subject is designed to strengthen a student's understanding of the clinical sciences and their integration with clinical medicine.

The subject involves a student undertaking attachments to clinical units and participating in the problem based learning programme undertaken through attachments to units of The Royal Adelaide Hospital and The Queen Elizabeth Hospital.

Assessment: By examination and continuous assessment.

Text-books: See under 1113 Clinical Science IV and 9691 Clinical Science V.

4943 Clinical Skills IV/V

Level: IV/V.

Duration: Full year.

Content: The subject is designed to strengthen a student's clinical skills.

The program will involve undertaking clinical attachments in the University departments of Medicine and Surgery at either The Royal Adelaide Hospital or The Queen Elizabeth Hospital and other hospital units.

Assessment: Clinical skills will be assessed during the term by continuous assessment and by clinical vivas.

Text-books: See under 2976 Clinical Skills IV and 4369 Clinical Skills V.

1106 FINAL (SIXTH-YEAR) EXAMINATION

9950 Applied Pathology and Forensic Medicine VI

Level: VI.

Duration: Full year.

Content: This course organised by the Department of Pathology comprises a series of combined presentations by pathologists and clinicians and is orientated towards relating clinical features to laboratory findings in selected diseases. There is also a series of lectures dealing with selected topics in forensic medicine and pathology.

4686 Clinical Competence VI

2434 Medicine and Surgery VI

Level: VI.

Duration: Full year.

Content: Students will spend sixteen weeks under the supervision of the University Departments of Medicine and Surgery and their clinical teachers at The Royal Adelaide Hospital, The Queen Elizabeth Hospital, Modbury Hospital and at other venues. They will undertake periods of internship in general medicine, specialty medicine and surgery, obtaining experience in direct patient care. There will be a minimum of formal teaching. In addition the curriculum provides an eight week elective at the beginning of the year.

Assessment: Assessment is undertaken in two ways. During the year ratings are made of student's performance during the internships. This includes an observed long case. In November, each student is required to sit an examination of clinical competence which consists of a written and practical component. Clinical vivas are held for those students who have failed to satisfy the assessors on the ward or the examiners in the test of clinical competence.

Text-books: The departments of medicine and surgery provide a list of recommended general text books and appropriate reference books.

8958 Community Practice VI

Level: VI.

Duration: Full year.

Contact hours & Content: The four-week course in community practice is designed to provide students with practical learning in illness behaviour, epidemiology of disease and the organisation and evaluation of medical care in the community. This should provide the student with skills to help people in the community to cope with their most common health problems individually and collectively. Particular emphasis is given to the role of the general practitioner as a health educator and counsellor. His role in medico-legal and ethical problems which arise in community practice is discussed.

The programme includes field placements in metropolitan and country general practice, visits to community care resources and evaluation of these learning experiences in tutorials and seminar settings. A one-week community practice workshop enables medical students to work with final-year students from other health care courses. These workshops examine applications of the key community health care principles, focussing on the potential for multiprofessional cooperation, and on the ways in which these principles may be translated into practice.

Assessment: Includes an essay assignment, a social and preventive medicine viva, two patient management interviews and a written paper in November which includes M.C.Q. related to common problems encountered in general practice.

Text-books: Hodgkin, G. K. H., *Towards earlier diagnosis: a guide to general practice* 4th

edn. (Churchill Livingstone); *or* Fry, J., *Common diseases* 3rd edn. (Adis) and Harris, R. D. and Ramsay, A. T., *Health care counselling* (Williams & Wilkins, 1988).

6460 Paediatrics VI

Level: VI.

Duration: Full year.

Contact hours: Students will attend an eight week full-time course based at The Adelaide Children's Hospital campus of the Adelaide Medical Centre for Women and Children.

Content: The course will provide for the study of medical and surgical disorders of childhood. The course will provide practical experience in caring for children with acute and longer term illness. This will include the recognition and care of surgical and orthopaedic disorders in childhood.

Assessment: Assessment of clinical competence in paediatric medicine and paediatric surgery will occur at the end of the eight week attachment. The assessment will include case presentation evaluations and an objective structured clinical examination.
There will also be a paediatric component during the end of year written examinations.

Text-books: See under 4376 Paediatrics V. *Further reading:* Forfar, J. O., Arneil, G. C., *Textbook of paediatrics* (Churchill-Livingstone); Nelson, *Textbook of paediatrics* (W. B. Saunders & Co.); Hutson, J. M., Beasley, S. W., *The surgical examination of children: an illustrated guide* (Heinemann Medical Books); Jones, P. G., Woodward, A. A., *Clinical paediatric surgery* (Blackwell Scientific Publications); Apley, A. G., Solomon, L., *Concise system of orthopaedics and fractures* (Butterworth).

4364 Psychiatry VI

Level: VI.

Duration: Full year.

Content: In the sixth year students will be assigned to psychiatric treatment settings, where they will develop knowledge of assessment techniques and the management of a wide variety of disorders. Students are required to submit an essay on a psychiatric topic of their choice. A list of possible subjects is provided for guidance.

Text-books: Kaplan, H. I., and Sadock, B. J., *Modern synopsis of comprehensive textbook of psychiatry* 5th edn. (Williams and Wilkins); Rowe, C. J., *An outline of psychiatry* 9th edn. (W. C. Brown), Talbott, J. A. et al, *Textbook of psychiatry* (American Psychiatric Press, Washington, 1988).

MEDICAL ETHICS

A short course of lectures on the ethics of the profession.

The relationship of practitioners to one another, to patients, nurses, chemists, friendly societies, the public, advertising, hospitals, the law courts, and the State.

HONOURS DEGREE OF

BACHELOR OF MEDICAL SCIENCE

REGULATIONS

1. There shall be an Honours degree of Bachelor of Medical Science.

2 To qualify for the degree a candidate shall undertake a course of advanced study extending over one academic year, and shall satisfy the examiners in one of the subjects prescribed in the schedules.

3. Before admission to a course of study for the degree a candidate shall have:

(a) passed the Third-Year Examination for the degrees of Bachelor of Medicine and Bachelor of Surgery;

(b) been accepted by the Chairman of the department concerned as a suitable candidate for advanced work in the subject he wishes to pursue; and

(c) completed such pre-requisite work as the Chairman of the department concerned may prescribe.

4. The names of the candidates who qualify for the degree shall be published within the following classes and divisions in each subject:

First Class

Second Class
Division A
Division B

Third Class.

5. A candidate shall not be eligible to present himself for examination unless he has regularly attended the prescribed lectures and has done written and laboratory or other practical work, where required, to the satisfaction of the professors and lecturers concerned.

6. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the degree; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date at the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

7. On the recommendation of the Faculty of Medicine, the Council may accept as a candidate for the degree a person who in a medical course of another institution has passed examinations regarded as equivalent to that specified in section (a) of Regulation 3.

Regulations allowed 12 December, 1963.

Amended: 21 Dec. 1972: 4; 15 Jan. 1976: 1, 2, 3, 6, 7; 4 Feb. 1982: 24 Feb. 1983: 6; 17 Jan. 1985: 4. Awaiting allowance: 2, 6(b).

HONOURS DEGREE OF

BACHELOR OF MEDICAL SCIENCE

SCHEDULES

(Made by the Council under Regulation 6.)

SCHEDULE I: COURSE OF STUDY

1. A course of study for the degree may be undertaken in one of the following:

8110 Honours Anaesthesia and Intensive Care
1739 Honours Anatomy and Histology
8792 Honours Behavioural Science
6777 Honours Biochemistry
9807 Honours Community Medicine
7599 Honours Genetics
5349 Honours Medicine
4408 Honours Microbiology and Immunology
8864 Honours Obstetrics and Gynaecology
5702 Honours Paediatrics
1551 Honours Pathology
3950 Honours Pharmacology
6740 Honours Physiology
9196 Honours Psychiatry
7274 Honours Surgery

2. The course comprises three equally important aspects undertaken concurrently:

(a) *Course of Reading* in selected fields, and the submission of a series of essays associated therewith.

(b) *Experimental work* covering a wide range of techniques.

(c) *The undertaking of a research project* which will be assigned early in the course and on which a thesis must be submitted.

3. The examination for the degree will consist of a written paper or papers, the essays submitted during the year, the thesis on the research project, an oral examination, and a practical examination if required by the examiners.

HONOURS DEGREE OF

BACHELOR OF MEDICAL SCIENCE

SYLLABUSES

Reference books:

Although lists of books and journals for reference purposes are regarded as important, details have not been included in this Volume. These will however be issued from time to time by the departments concerned. It is hoped that all books and journals set for reference will be available to be consulted in the Barr Smith Library.

Examinations:

For each subject students may obtain from the department concerned details of the examination in that subject including the relative weights given to the components (e.g. such of the following as are relevant: assessments, semester or mid-semester, essays or other written or practical work, final written examinations, *viva voce* examinations).

THE HONOURS DEGREE OF BACHELOR OF MEDICAL SCIENCE

8110 Honours Anaesthesia and Intensive Care

1739 Honours Anatomy and Histology

8792 Honours Behavioural Science

6777 Honours Biochemistry

9807 Honours Community Medicine

7599 Honours Genetics

5349 Honours Medicine

4408 Honours Microbiology and Immunology

8864 Honours Obstetrics and Gynaecology

5702 Honours Paediatrics

1551 Honours Pathology

3950 Honours Pharmacology

6740 Honours Physiology

9196 Honours Psychiatry

7274 Honours Surgery

Students requiring further information concerning syllabuses and work required for the Honours degree of Bachelor of Medical Science are advised to consult the Head of the appropriate department as early as possible.

DEGREE OF

BACHELOR OF HEALTH SCIENCES

REGULATIONS

1. There shall be an Ordinary and an Honours degree of Bachelor of Health Sciences. A candidate may obtain either degree or both.

2. The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the degree; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by Council or such other date as the Council may determine.

3. The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

4. Except by the permission of the Faculty, a candidate shall not enrol in any subject for which the pre-requisite studies as prescribed in the syllabus for that subject have not been satisfactorily completed.

5. A candidate shall not be eligible to attend for examination unless the prescribed work has been completed to the satisfaction of the teaching staff concerned. A candidate who is not eligible to attend for examination shall be deemed to have failed the examination.

6. In determining the final result in a subject (or part of a subject) the examiners may take into account a candidate's oral, written, practical and examination work, provided that the candidate has been given adequate notice at the commencement of the teaching of the subject of the way in which work will be taken into account and of its relative importance in the final result.

7. There shall be three classifications of pass in each subject for the Ordinary degree, as follows: Pass with Distinction, Pass with Credit, Pass. If the Pass classification be in two divisions, a pass in the higher division may be prescribed in the syllabuses as a pre-requisite for admission to further studies in that subject or other subjects.

8. A candidate will be permitted to take a supplementary examination in a subject only in circumstances approved by the department administering the subject and consistent with any expressed Council policy.

9. A candidate who fails a subject or who obtains a lower division pass and who desires to take that subject again shall, unless exempted wholly or partially therefrom by the Head of the department concerned, again complete the required work in that subject to the satisfaction of the teaching staff concerned.

10. A candidate who has twice failed the examination in any subject for the Ordinary degree may not enrol for that subject again or for any other subject which in the opinion of the Faculty contains a substantial amount of the same material, except by permission of the Faculty and then only under such conditions as Faculty may prescribe.

11. There shall be three classifications of Pass in the final assessment of any subject for the Honours degree as follows: First Class, Second Class, Third Class. The Second Class classification shall be divided into two divisions as follows: Division A and Division B.

12. A candidate who has passed subjects in other courses of the University or in other educational institutions, may on written application to the Registrar be granted such status

and/or exemption from the requirements of the schedules made under these regulations as the Faculty may determine.

13. If in any year/semester the student enrolment for a particular subject offered by the Faculty is less than the minimum specified by the Faculty, the Faculty shall not be bound to offer that subject.

Regulations allowed 1 March 1990.
Awaiting allowance: 3.

DEGREE OF

BACHELOR OF HEALTH SCIENCES

SCHEDULES

SCHEDULE I: THE ORDINARY DEGREE

1. The course of study for the Ordinary degree shall extend over three years of full-time study or its part-time equivalent.

2. To qualify for the Ordinary degree a candidate shall, subject to the conditions specified in Clauses 3 and 4 below, pass subjects from Schedule II to the value of at least 72 points, which include the following:

(a) Level I subjects to the value of at least 24 points, which must include, unless exempted by the Faculty:
3637 Human Biology I
7183 Public Health I
and a subject or subjects to the value of 6 points from those listed as Science Subjects or Mathematical Sciences Subjects.

(b) Level II subjects to the value of at least 20 points, which must include, unless exempted by the Faculty:
1381 Biology of Disease II
and one other subject to the value of at least 4 points from those listed as Health Sciences Subjects.

(c) Level III subjects to the value of at least 24 points, which must include subjects from those listed as Health Sciences Subjects, to the value of at least 8 points.

(d) the Completion of a major in the field of either health sciences or biological sciences, as follows:
Health Sciences: Level III subjects to the value of 12 points from those listed under this heading in Schedule II.
Biological Sciences: Level III subjects to the value of 12 points from those listed under the heading of Science Subjects in Schedule II.

3. With the permission of the Dean and the Dean of the other Faculty, in lieu of up to 6 points prescribed under clause 2, a candidate may take subjects, from the Schedules of any Faculty, which are not listed in Schedule II, but which are considered appropriate coursework for the degree of Bachelor of Health Sciences.

4. Candidates may be permitted to count towards the degree subjects which have been passed in another degree course, up to a maximum value of 24 points.*

5. No candidate will be permitted to count for the degree any subject together with any other subject which, in the opinion of the Faculty, contains a substantial amount of the same material.

Notes to Clause 2(d)

Health Sciences Field

Although some Level III Health Science subjects do not have pre-requisites, candidates who wish to major in Public Health are advised to take Public Health I and II. When considering this field as a major, candidates should note that many Science subjects at Level III have pre-requisites which may restrict their choice of subjects from other Level III subjects.

* A list of unacceptable combinations of subject and pre-requisite requirements is available from the office of Faculty of Medicine.

Biological Sciences Field

Candidates who wish to select this field as a major should note that all Level III subjects, in this field, have pre-requisite subjects and a major in this field requires careful planning of subject selection, from the first year of the course.

SCHEDULE II: SUBJECTS FOR DEGREE

Note: The points value of subjects is indicated after each title.

LEVEL I

Health Science Subjects

6462 Behavioural Science IS 6
3637 Human Biology I 6
7183 Public Health I 6

Science Subjects

3821 Botany I 3
6878 Chemistry I 6
3811 Chemistry IS 3
9615 General Physics I 6
7740 Genetics & Evolution I 3
9864 Human Anatomy I 6
1591 Medical Physics IS 3
5104 Psychology I 6

Mathematical Science Subjects

9276 Introduction to Computer Science 6
5662 Introduction to Programming and Applications 3
1073 Introduction to Programming and Systems 3
5543 Statistics I 3

Arts Subjects

3291 Australian Politics I 6
9587 Geography I 6
7613 Geography IA: Society and Space 3
4823 Geography IB: Society and the Physical Environment 3
7410 Introduction to Social Anthropology I 6
7743 Logic I 3
9014 Philosophy IA: Introduction to Metaphysics 3
5704 Philosophy IB: Morality, Society and the Individual 3
2657 Political Development in Australia I 6

Economics and Commerce Subjects

2148 Economic Institutions and Policy I 3
8461 Economics I 6

LEVEL II

Health Science Subjects

6578 Biochemistry IIS 8
1381 Biology of Disease II 4
9473 Cells and Tissues II 4
4442 Child Health and Development II 4
4223 Craniofacial Growth and Development II 4
8293 Human Physiology IIS 8
6484 Human Reproductive Biology II 4
5050 Public Health II 8
9454 Socio Economics of Medical Practice II 4

Mathematical Sciences Subjects

4523 Data Analysis 2

Science Subjects

1404 Biochemistry II 8
9828 Comparative Morphology II 4
4863 Genetics II 8
6326 Immunology and Virology II 4
9195 Microbiology II 4
3773 Physiology II 8

Arts Subjects

8195 Aborigines and the State II 4
3964 Anthropology and Sexuality II 4
5581 Geographical Analysis of Population II 4

7634 Biography of Human Dominated Landscape II
6376 Communities, Boundaries and Symbols II 4
8673 Economic Geography II
2650 Political Development in Australia 8
3149 Psychology II 8
1280 Public Policy in Australia II 8
3265 Social Geography II 4
3895 Theories of Practice II 4

Economics and Commerce Subjects
9893 Macroeconomics II 4
8870 Microeconomics II 4

Law Subjects
1826 Australian Legal System* 4
3731 Contract* 4

LEVEL III

Health Sciences Subjects
1761 Human Physiology IIIS 6
3076 Oral Health and Disease III 6
6225 Pathology for Health Science 12
5398 Medical Microbiology and Immunology III 6
8825 Pharmacology IIIS 6
9674 Public Health III 12
7146 Theory of Clinical Procedures and Medical Processes 12
9487 Immunology of Infectious Diseases III 6

Science Subjects

Anatomy and Histology
6900 Comparative Reproductive Biology of Mammals 3
9932 Neuroanatomy and Neuroendocrinology 6 3

Biochemistry
5318 Biochemical Techniques 1
9510 Biochemistry of Control of Gene Expression 2
4762 Biological Structure and Function 2
2123 Molecular Biology of the Gene 2
2893 Recombinant DNA Technology: Practice 1
6927 Recombinant DNA Technology: Theory 1
5317 Research Topics in Biochemistry 2
2492 Selected Topics in Biochemistry 2

Clinical and Experimental Pharmacology
1730 Principles of Pharmacology and Toxicology 6
4574 Systematic Pharmacology 6

Genetics
5482 Cellular and Molecular Genetic Mammals: Practice 1
8615 Cellular and Molecular Genetic Mammals: Theory 1
8723 Cytogenetics 2
3077 Immunogenetics 2
2900 Nuclear/Extranuclear Genetic Compartments: Practice 1
5160 Nuclear/Extranuclear Genetic Compartments: Theory 1
2800 Quantitative Population and Evolutionary Genetics 2
5112 Regulation of Gene Expression: Practice 1
2835 Regulation of Gene Expression: Theory 1

Microbiology and Immunology
9371 Advanced Immunology 3
7335 Advanced Microbiology 3
9570 Host Responses to Infection 3
7546 Mechanisms of Infection 3
2647 Perspectives in Microbiology and Immunology 1

Physiology
2984 Cellular Physiology 3
7288 Exercise Physiology 3
3737 Integrated Human Physiology 3
8546 Neurobiology 3

Arts Subjects

Anthropology

5437 Aborigines and the State III 6

Geography

4840 Aboriginal Australia III 6

9923 Geographical Information Systems III 6

Politics

9796 Public Policy in Australia III 12

Psychology

3170 Psychological Research Methodology III 4
8267 Animal Behaviour III 2
2196 Environmental Psychology III 2
1131 Human Decision Processes III 2
7196 Intelligence III 2

Economics Subjects

4367 Applied Economics III 4
2100 Economic Theory III 8

Law Subjects

9046 Aborigines and the Law 3
9844 Conservation and Heritage Law 3
8433 Constitutional Law 6
8580 Criminal Law 6
7272 Environmental Planning and Protection Law 3

8047 Communities, Boundaries and Symbols III 6

8388 Equity in Cities: A Comparative Perspective III 6
1150 Regional Development III 6
1453 Rural Social Geography III 6

4770 Neuroscience in Psychology III 2
9703 Psychology of Motivation III 2
8659 Social Psychology III 2
7324 Studies in Personality III 2
5673 The Philosophy and Psychology of Consciousness III 2

7981 Public Finance III 4

9622 Income Maintenance 3
7730 Land use Planning Law 3
9159 Legal History 6
8821 Property 6
9365 Torts 6

NOTE (not forming part of the schedules):
* *Studies in Law within the Degree of Bachelor of Health Science*
Candidates who have successfully completed subjects of the value of 24 points at Level I of the Bachelor of Health Science degree may apply for admission to the course for the degree of LL.B. Applications for admission to the LL.B. must be made through SATAC by mid-October of the year during which the Level I subjects are completed. Except with the permission of the Dean of the Faculty of Law or a nominee, 1826 Australian Legal System must be undertaken concurrently with the Law subject 3731 Contract. These two subjects are pre-requisites for each of the third year Law subjects list in Schedule II. Students will remain candidates for the degree of B. Health Sc. and may present for the degree B. Health Sc. the Law subjects listed in Schedule II subject to the provisions of Schedule I. Students must complete all the requirements for the B. Health Sc. before they can obtain their LL.B. degree.
See also the Schedules of the LL.B. degree and see, in particular, the Introductory Notes to the LL.B. Syllabuses.

SCHEDULE III: THE HONOURS DEGREE

1. A candidate may, subject to approval by the Head of the department concerned, proceed to the Honours degree usually in a field in which the candidate has majored in the degree of Bachelor of Health Sciences or its equivalent.

2. A course of study for the degree may be undertaken in one of the following:
   9364 Honours Health Sciences
   2113 Honours Biological Sciences

3. The course comprises three equally important aspects undertaken concurrently:
   (a) Course of reading in selected fields, and the submission of a series of essays associated therewith.
   (b) Experimental or scholarly work covering a wide range of techniques.

(c) The undertaking of a research project which will be assigned early in the course and on which a thesis must be submitted.

4. The examination for the degree will consist of a written paper or papers, the essays submitted during the year, the thesis on the research project, an oral examination, and a practical examination if required by the examiners.

5. A candidate may, subject to the approval of the Faculty in each case, proceed to the Honours degree in a subject taught in a department in another faculty. Candidates must consult the Head of the department concerned and apply, in writing, to the Registrar before 30 November in the preceding year for admission to the Honours course.

6.A candidate for the Honours degree in any subject shall not begin final-year Honours work in that subject until he or she has qualified for the Ordinary degree of Bachelor of Health Sciences, or has qualified for a degree regarded by the Faculty of Medicine as equivalent, and has completed such pre-requisite subjects (if any) as may be prescribed in the syllabus.

7. When, in the opinion of the Faculty of Medicine, special circumstances exist, the Council, on the recommendation of the Faculty in each case, may vary the provisions of clauses 1, 2 and 3 above.

DEGREE OF

BACHELOR OF HEALTH SCIENCES

SYLLABUSES

Text-books:

The lists of the text-books were correct at the time that this Volume went to press. It is possible however that amendments to these lists will be made before the start of lectures; and, if so, students attending classes will be notified appropriately by the lecturer concerned.

In general, students are expected to have their own copies of text-books; but they are advised to await advice from the lecturer concerned before buying any particular book. Only the prescribed edition of any text-book should be sought.

Reference books:

Although lists of books and journals for reference purposes are regarded as important, details have not been included in this Volume. These will however be issued from time to time by the departments concerned. It is hoped that all books and journals set for reference will be available to be consulted in the Barr Smith Library.

Examinations:

For each subject students may obtain from the department concerned details of the examination in that subject including the relative weights given to the components (e.g. such of the following as are relevant: assessments, semester tests, essays or other written or practical work, final written examinations, *viva voce* examinations).

7183 Public Health I

Level: I.

Points value: 6.

Duration: Full year.

Pre-requisites: Nil.

Contact hours: 2 lectures and 1 tutorial per week.

Content: This course gives a broad overview of public health in Australia and critically examines basic concepts of health and illness in society. The disciplines that help shape public health will be introduced; these include: the history and politics of health, public health law, health economics, sociology and anthropology, and epidemiology. In addition, as a grounding for the entire degree, the history and philosophy of science and its methods will be introduced.

Assessment: Students will be advised of the combination of assessment modes at the beginning of the course.

Text-books: Students will be advised of the text at the beginning of the course.

3637 Human Biology I

Level: I.

Points value: 6.

Duration: Full year.

Pre-requisites: Nil.

Contact hours: 3 lectures and 3 hours practical work/tutorial per week.

Content: The aim of this course is to give an holistic overview of the biology of the human species. The course will have two rather different segments. Firstly, a descriptive and functional account of the populations of cells that make up the human body will be given together with their specializations, functions, and control mechanisms. After an initial description of the component parts of a typical unspecialized cell, the various tissue and organ systems of the healthy body will be detailed. Skeletal, muscular, digestive, neural, excretory and endocrine organ systems will be dealt with and the structure and function of the vascular system given, together with a basic outline of haematology, followed by some of the concepts underlying immunology and microbiology.

The later part of the course will examine how the human species has evolved and fits into the present day environment. The basic concepts underlying Darwinian and neoDarwinian evolution will be given followed by the physical anthropological aspects of the evolution of Hominoid species in Africa and, subsequently, Asia. Basic principles of genetics will be presented and some of the biological aspects underlying human variation given. There will be a series of lectures on reproduction starting with the development of sex cells, followed by a brief discourse on how a fertilized egg develops first into an embryo and then a foetus. Finally the exponential increase of the human population will be detailed together with modern man's impact, and dependence, upon the natural environment.

Assessment: By written examination. Practical work and performance in tutorials will be taken into account.

Text-book: Tortora, G. J. and Anagnostakos, N. P., *Principles of anatomy and physiology*, 6th ed. (Harper and Row).

1381 Biology of Disease II

Level: II.

Points value: 4.

Duration: Semester II.

Pre-requisites: Human Biology I.

Contact hours: 2 lectures a week, 4 hours of practicals and demonstrations.

Content: History of disease, changing patterns of disease, causes of disease, basis for disease classification, body defence mechanisms, methods of study of disease processes, mechanisms of tissue injury, molecular and cellular pathology of tissue injury, local and systemic responses to tissue injury, endocrine and metabolic responses to injury, mutational aspects of disease, disorders of cell growth and differentiation, and derangements of body fluids.

Assessment: Written and practical examinations.

Text-books: Sheldon, H., *Boyd's introduction to the study of diseases* (Lea and Febiger).

4223 Craniofacial Growth and Development II

Level: II.

Points value: 4.

Duration: Semester I.

Pre-requisites: Human Biology I.

Contact hours: 1 lecture and 2 hours practical work/tutorial per week.

Content: The aim of this course is to introduce concepts of craniofacial morphology and growth with particular emphasis on applications in medicine, surgery and dentistry. Introductory sessions cover aspects of evolution of head form and the comparative anatomy of the masticatory system. Theories of craniofacial growth serve to introduce the student to a detailed study of the mechanisms of craniofacial growth and development of dental occlusion. Both normal and pathological growth, as well as genetic considerations are

covered. Clinical aspects of general child growth and its assessment are specifically related to craniofacial growth. Application of growth data in cranio-maxillo-facial surgery and orthodontics is also discussed.
The practical and tutorial component of the subject gives students an opportunity to examine records used in growth surveys and perform statistical analyses. Software packages are used to simulate growth curves on personal computers and to carry out automatic cephalometric analyses on tracings of lateral head radiographs. Students also have the opportunity to examine skeletal material and to explore aspects of the course in more detail. Craniofacial imaging by three-dimensional computer simulation is demonstrated using data from individuals with craniofacial abnormalities.

Assessment: Students will be advised of the combination of assessment modes at the beginning of the course.

Text-books: A teaching manual "Human Growth and Development" is available from the Department of Dentistry. Tanner, J. M., *Foetus into man*, 2nd edn (Castlemead, 1989); Sinclair, D., *Human growth after birth*, 5th edn (Oxford University Press, 1989); Ranly, D. M., *A synopsis of craniofacial growth* (Appleton, 1988).

6484 Human Reproductive Biology II

Level: II.

Points value: 4.

Duration: Semester I.

Pre-requisites: 3637 Human Biology I.

Contact hours: 3 tutorial/lecture hours, 6 practical/project hours per week.

Content: The course aims to confront students with the scientific, social, medical, moral and ethical challenges presented by human population dynamics. Students should gain sufficient understanding of the biology of human reproduction to appreciate present and emerging technologies used in the investigation and management of reproductive function and the social and biological impact of their adoption on a global scale. The moral and ethical implications of such programmes will be discussed.

The course comprises an introduction to human population dynamics in relation to world resources and the necessity for fertility regulation strategies followed by detailed study of the human reproduction process, reproductive pathology and reproductive technologies available for the assessment and management of fertility. A study of the international agencies attempts to implement national and global fertility regulation programmes will be used to provide insight into present social, moral and ethical constraints and their impact on future prospects.

Assessment: Students will be assessed on their tutorial and project reports, contribution to seminar and group discussions and an examination.

Text-book: Austin, C. R. and Short, R. V., *Reproduction in mammals* 2nd edn. (C.V.P.); Johnson, M. and Everitt, B., *Essential reproduction* 3rd edn. (Blackwell Scientific Publishers). References and textbooks covering social, biological, moral and ethical aspects of the topic will be advised.

5050 Public Health II

Level: II.

Points value: 8.

Duration: Full year.

Pre-requisites: 7183 Public Health I.

Contact hours: 2 lectures and 1 tutorial per week.

Content: This subject introduces the population view of health, illness and health care. The curriculum will include the main quantitative techniques, data collection methods and data bases which are pertinent to the understanding of the population view and will include an

introduction to demography, epidemiology and biostatistics, with some comparative material on the statistical methods of the social sciences. Substantial attention is given also to the major outputs from the Australian Census, to the main formal and informal collections of information pertinent to health and disease, and to other social indicators.

Assessment: Students will be advised of the combination of assessment modes at the beginning of the course.

Text-books: Students will be advised of the text at the beginning of the course.

9454 Socioeconomics of Medical Practice II

Level: II.

Points value: 4.

Duration: Semester II.

Pre-requisites: 7183 Public Health I.

Contact hours: 1 lecture and tutorial each week.

Content: The course is designed to provide an overview of such aspects of surgery and medicine which are relevant to the future practicing health and health-related professionals. Topics covered include: socio economics of patient care, cost benefits of medical and diagnostic procedures, interaction of medical practitioners with other health professionals, health care auditing, interpretation of medical literature, obligatory and discretionary procedures.

Assessment: By assignments and final examination.

Text-books: Rutkow, I. N., *Socio-Economics of surgery*, 1989 (The C.V. Mosby Co.).

9674 Public Health III

Level: III.

Points value: 12.

Duration: Full year.

Pre-requisites: 7183 Public Health II.

Contact hours: 2 lectures and 1 tutorial per week.

Content: This subject develops the skills and perspectives of Public Health I and Public Health II by applying quantitative and qualitative approaches to the analysis of a number of diseases of public health importance. The second half of the course provides opportunities for elective study in areas such as mental health, worker health, international health, environmental health, public health ethics or health promotion. Not all of the electives will be offered in every year.

Assessment: Students will be advised of the combination of assessment modes at the beginning of the course.

Text-book: Students will be advised of the text at the beginning of the course.

3076 Oral Health and Disease III

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 1381 Biology of Disease.

Contact hours: 2 lectures and 2 hours practical work/tutorial per week.

Content: This subject introduces the structure, development and functions of the oral tissues, their interrelationships and their relation to other organ systems—in health and disease. The curriculum includes a number of units covering oral mineralized tissues, oral

mucosa and periodontium, salivary glands and saliva, the oral microbiological system, orofacial growth and development, oral motor and sensory systems and oral diagnostic methodology.

The practical component of the subject will introduce laboratory techniques to examine oral cells, tissues and structures using biopsy and light and electron microscopy; collection, handling and analysis or oral fluids; laboratory techniques for examining dental plaque and micro-organisms in the oral cavity; and the use of electronic and electro-optical instruments for measurement and analysis in and around the oral cavity.

Assessment: Students will be advised of the combination of assessment modes at the beginning of the course.

Text-books: Students will be advised of texts at the beginning of the course.

5398 Medical Microbiology and Immunology III

Level: III.

Points value: 6.

Duration: Semester I.

Pre-requisite: 1381 Biology of Disease II.

Contact hours: 2 or 3 lectures and a 2-hour practical or demonstration each week.

Content: The isolation, morphology, physiology and classification of bacteria of medical importance. The principles of sterilization, disinfection and the use of antibiotics and chemotherapeutic agents. The role of micro-organisms in human disease, considered as a study of host-parasite relationships; epidemiology and its relation to hospital cross-infections. An outline of human virus, fungal and parasitic infections. The collection of specimens for bacteriological and viral diagnosis. The principles of immunology as applied to the diagnosis, prophylaxis and therapy of bacterial and virus diseases, transplantation, diseases due to allergy or hypersensitivity and autoimmunity. At all stages, the course is related, whenever possible, to clinical material.

Assessment: To be advised.

Text-books: To be advised.

9487 Immunology of Infectious Diseases III

Level: III.

Points value: 6.

Duration: Semester II.

Pre-requisite: 5398 Medical Microbiology and Immunology III.

Contact hours: 2 lectures, 1 tutorial and 10 hours of practical work each week, in the form of mini-projects.

Content: This subject examines the various immunological mechanisms involved in interactions of vertebrate hosts with pathogenic organisms including viruses, bacteria and protozoan and metazoan parasites and the related, immunological aspects of host responses to foreign tissues and tumours. These include the systemic cellular and humoral mechanisms of immunity to infectious agents and tissues; local immunity at mucosal surfaces; comparison of defense mechanisms against intracellular and extracellular bacterial pathogens; defense strategies against superficial and systemic viral infections; the role of immune mechanisms in active, chronic and latent viral infections; emergence of new virus diseases; viruses and neoplastic disease; immunosuppressive effects and immune invasion; immunopathological reactions; current strategies and possible new approaches for the production of vaccines and for vaccination.

Assessment: To be advised.

Text-books: To be advised.

Other syllabus descriptions

Candidates should note that syllabus descriptions for the following Health Science subjects can be found in the syllabus for the M.B., B.S. degree as indicated.

Health Sciences Subjects	Equivalent M.B.B.S. Subject
LEVEL I	
6462 Behavioural Science IS	7788 Behavioural Science IM
3811 Chemistry IS	9681 Chemistry IM
1591 Medical Physics IS	3117 Medical Physics I
LEVEL II	
6578 Biochemistry IIS	7100 Biochemistry IIM
8293 Human Physiology IIS	9405 Human Physiology IIMB
LEVEL III	
1761 Human Physiology IIIS	9782 Human Physiology IIIMB
8825 Pharmacology IIIS	1494 Pharmacology IIIMB

GRADUATE DIPLOMA IN CLINICAL SCIENCE

REGULATIONS, SCHEDULES AND SYLLABUSES

For regulations, schedules and syllabuses of the Graduate Diploma in Clinical Science, *see* Calendar of the University for 1978, Volume II, pages 929-932.

DEGREE OF

MASTER OF CLINICAL SCIENCE

REGULATIONS

1. There shall be a degree of Master of Clinical Science.

2. The Faculty may accept as a candidate for the degree a person who has been admitted to the degrees of Bachelor of Medicine and Bachelor of Surgery of the University of Adelaide, or degrees accepted by the Faculty as equivalent, and who has either:

(a) qualified for the award of the Graduate Diploma in Clinical Science; *or*

(b) holds qualifications acceptable to the Faculty *in lieu* of the Graduate Diploma.

3. To qualify for the degree a candidate shall:

(a) undertake a programme of research for a period of not less than one year and not more than two years from the date of his/her candidature in the case of a full-time candidate, or four years in the case of a part-time candidate;

(b) submit a satisfactory dissertation thereon.

4. The Faculty will appoint a supervisor to guide the candidate in his work.

5. The candidate shall lodge with the Registrar three copies of his dissertation which shall be prepared in accordance with directions given to candidates from time to time.*

6. On submission or re-submission of the dissertation the Faculty shall nominate examiners who may recommend that it:

(a) be accepted, with or without conditions; *or*

(b) be accepted, with or without conditions, subject to satisfactory oral examinations; *or*

(c) be sent back to the candidate for revision; *or*

(d) be rejected.

7. A candidate who fulfils the requirements of these regulations may, on the recommendation of the Faculty, be admitted to the degree of Master of Clinical Science.

8. A candidate's progress shall be reviewed by the Faculty annually. If in the opinion of the Faculty of Medicine a candidate is not making satisfactory progress the Faculty may, with the consent of the Council, withdraw its approval of his candidature and the candidate shall cease to be enrolled for the degree.

Regulations allowed 15 January, 1976.

Amended 1 March 1984: 3.

*Published in "Guidelines on Higher Degrees by Research and Specifications for Thesis": *see* Contents.

GRADUATE DIPLOMA IN OCCUPATIONAL HEALTH

Note: Postgraduate tuition fees may apply to this course.

REGULATIONS

1. There shall be a Graduate Diploma in Occupational Health.

2. (a) The Faculty of Medicine may accept as a candidate for the Graduate Diploma any person who has qualified for a degree of the University of Adelaide or of another institution accepted for the purpose by the University.

(b) Subject to the approval of the Council the Faculty of Medicine may, in special cases and subject to such conditions as it may see fit to impose in each case, accept as a candidate for the Graduate Diploma a person who does not meet the requirements specified in Regulation 2(a) if it is satisfied that he or she is likely to be able satisfactorily to undertake work for the Graduate Diploma.

3. The Faculty of Medicine may require an applicant to complete such preliminary work as it may prescribe before being accepted as a candidate for the Graduate Diploma.

4. To qualify for the Graduate Diploma a candidate shall satisfactorily complete a course of study and a dissertation on a subject approved by the Faculty of Medicine.

5. (a) The Council, after receipt of advice from the Faculty of Medicine, shall from time to time prescribe schedules defining:

(i) the subjects of study for the Graduate Diploma; and
(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates; and
(iii) the requirements of the dissertation component of the work for the Graduate Diploma.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval of the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

6. Except with the permission of the Faculty, the subjects of study and the dissertation shall be completed in not more than one year of full-time study or two years of part-time study.

7. (a) A candidate who withdraws from all of the subjects in which he or she is enrolled in any one year or who fails to re-enrol after being enrolled in the previous year may only re-enrol in a subsequent year with the approval of the Faculty, and under such conditions as the Faculty may impose in each case.

(b) A candidate proceeding with the dissertation whose work is interrupted for a period of time may be granted an intermission of candidature by the Dean on behalf of the Faculty. If such an application is approved the maximum period specified in regulation 6 will be adjusted accordingly by adding the length of the intermission.

8. If in the opinion of the Faculty of Medicine a candidate for the Graduate Diploma is not making satisfactory progress, the Faculty may, with the consent of the Council, terminate the candidature and the candidate shall cease to be enrolled for the Graduate Diploma.

9. A candidate may at any time apply to the Faculty for status under these regulations or the schedules made in accordance with regulation 5, and may be granted such status, and upon such conditions, as the Council on the advice of the Faculty determines.

10. On completion of the dissertation the candidate shall lodge with the Registrar three copies of the dissertation prepared in accordance with directions given to candidates from

time to time. No material presented for any other Graduate Diploma within this or any other institution shall be submitted.

11. The Faculty shall appoint two examiners for each dissertation.

12. A candidate who fulfils the requirements of these regulations shall be qualified for admission to the Graduate Diploma in Occupational Health.

Regulations allowed 1 March 1990.
Awaiting allowance: 5(b).

GRADUATE DIPLOMA IN OCCUPATIONAL HEALTH

SCHEDULES

SUBJECTS OF STUDY AND DISSERTATION REQUIREMENTS

1. To qualify for the Graduate Diploma the candidate shall complete satisfactorily:

(a) Compulsory Studies (5)
3103 Principles of Occupational and Public Health
1563 Occupational Safety Practice
5672 Occupational Hygiene & Ergonomics
6187 Industrial Toxicology
6287 Introduction to Epidemiology and Biostatistics

(b) Elective Studies (2)

Two to be chosen from the following subjects:
4742 Advanced Occupational Hygiene
*7259 Principles of Prevention
*8026 Epidemiological Research Methods
*4762 Prevention in Practice
*7258 Ethical Issues in Public Health
*4286 Biostatistics

(c) Dissertation
6369 Graduate Diploma in Occupational Health Dissertation

2. A passing grade in any of the subjects shall be awarded as a non-graded pass.

3. A candidate's enrolment in subjects of study must be approved by the Dean (or nominee) at enrolment each year.

4. For the purposes of the dissertation the candidate shall pursue an approved research topic on a subject of relevance to occupational health or occupational safety under the control of the University and under the general guidance of one or more supervisors appointed by the Faculty of Medicine. At least one supervisor shall be a member of the academic staff of a Department of the Faculty of Medicine.

5. The examiners appointed under Regulation 11 may recommend that, subject to the candidate completing the requirements of Schedule 1(a) and 1(b) satisfactorily:

(a) the candidate shall be awarded the Graduate Diploma; or
(b) the candidate shall be awarded the Graduate Diploma but that minor amendments be made to the dissertation; or
(c) the candidate shall be awarded the Graduate Diploma subject to,
  (i) specified amendments being made to the dissertation; or
  (ii) satisfactory performance in an oral or written examination; or
(d) the candidate shall not be awarded the Graduate Diploma but shall be permitted to re-submit the treatise in a revised form; or
(e) the candidate shall not be awarded the Graduate Diploma.

* from the Master of Public Health course.

6. A student who has completed part of the requirements for the degree of Master of Public Health in the University may with the approval of the Faculty, be admitted to candidature for the Graduate Diploma in Occupational Health, with such credit as the Faculty determines, subject to the student discontinuing candidature for the degree of Master of Public Health.

GRADUATE DIPLOMA IN OCCUPATIONAL HEALTH

SYLLABUSES

Subjects of Study:

As indicated in Schedule I candidates will be required to complete seven subjects, each of 26 contact hours, and a treatise. It is envisaged that each subject will involve two contact hours per week each for one semester. Detailed time-tables will be issued at the beginning of each academic year.

Pre-requisites: None.

Text-books: A reading list of recommended journal articles and text-books will be issued by the co-ordinating lecturer for each subject and will be available from the Department of Community Medicine at the beginning of the year.

Assessment: For each subject of study there will be a written examination at the conclusion. In addition candidates will be expected to prepare tutorial assignments or papers for presentation.

Weighting of subjects: Each course subject shall have a weighting of about 10% of the total. The dissertation shall have a weighting of 22% of the total.

COMPULSORY SUBJECTS

3103 Principles of Occupational and Public Health

Duration: Semester I.

Content: This subject will consider ways in which the occupational and general environments affect health, and in which the general concerns of public health apply to the world of work. It aims to develop a critical, historically-informed attitude toward occupational health and safety issues drawing on the insights of sociology, politics and economics, as well as of epidemiology and biostatistics. Attention will be given to the broad social and political context in which occupational laws, standards and practice have evolved since the Industrial Revolution up to the present. Methods of surveillance and measurements of toxic substances will be examined, using case studies of particular occupational and environmental hazards.

6287 Introduction to Epidemiology and Biostatistics

Duration: Semester I.

Content: This subject will provide students with basic skills in epidemiological design and analysis, and will consider the application of epidemiology and biostatistics to occupational health. At the end of the subject, the student will also have a basic understanding of the range of techniques used in biostatistics including their broad assumptions and limitations. The subject will involve a combination of lectures, tutorials and practical exercises. Students will critically examine research protocols with a view to detecting flaws in research designs.

5672 Occupational Hygiene & Ergonomics

Duration: Semester II.

Content: This subject is an introduction to practical occupational hygiene and ergonomics. There is broad coverage of chemical and physical hazards and of technologies for evaluation and control. Topics include noise, vibration, thermal stress, shift work, biohazards and toxic chemicals. There will be discussion of exposure standards and the interpretation of hygiene data. There will also be an overview of ergonomics, including consideration of work-station and process design; displays and information systems; biomechanics; anthropometry; and psychological aspects.

6187 Industrial Toxicology

Duration: Semester I.

Content: The unit focuses on chemical hazards in the workplace. It includes an overview of the principles of toxicology; the use of toxicity tests and other data to characterise a chemical's acute, chronic, systemic and local toxic effects, with specific emphasis on carcinogenicity, mutagenicity, neurotoxicity and reproductive toxicity. The compilation of material safety data sheets, the basis for setting and monitoring exposure limits, and the problem of estimating risk are discussed.

1563 Occupational Health and Safety Practice

Duration: Semester II.

Content: This subject will focus on practical occupational health and safety issues. A prime concern will be with workers' compensation and rehabilitation; attention will be given to the evolution of the current system in South Australia, and associated problems in relation to common causes of occupational morbidity. There will also be tutorial-type sessions in which consideration will be given to specific occupational health problems: analysis of cause-effect relationships, practical problems in minimising health risks, and the management issues within companies involved in addressing the problems. As well as "conventional" occupational health issues, there will be consideration of related contemporary issues such as smoking in the workplace, alcohol and industry, and worksite health promotion. The course will include some industrial visits.

ELECTIVE SUBJECTS

4742 Advanced Occupational Hygiene

Duration: Semester I.

This elective deals with advanced topics in the areas of hazard evaluation and control. There will be practical coverage of industrial ventilation, confined space operations, noise propagation and control, ionizing radiation and laboratory analytical methods. The programme includes field visits to illustrate environmental monitoring and control technologies.

7259 Principles of Prevention

Duration: Semester II.

This subject examines the theoretical framework which supports work in preventive medicine and health promotion. Topics include the potential for preventing major causes of ill-health, the political and cultural context of prevention, consideration of social science

research methods, an ntroduction to behaviour modification theory and practice, a review of social channels which may be used to influence behaviour, screening (general theory and specific applications) and prevention through primary health care.

8026 Epidemiological Research Methods

Duration: Semester II.

This subject concentrates on conceptual and practical issues encountered by students in the design and implementation of epidemiological research. (Students will be required to develop and present a research protocol for class discussion.) Theoretical material as it relates to carrying out such research will include the definition and control of bias and confounding in observational studies, implications of sampling, the analysis of research impact of interventions on the community, techniques of surveillance, and screening. Common pitfalls in epidemiological and statistical reasoning will be examined, and attention will be paid to research design, proposal writing, data presentation, and critical reading of the research literature.

Pre-requisite: Completion of an Introductory course in Epidemiology.

4672 Prevention in Practice

Duration: Semester I.

This subject deals with the practical application of principles for disease prevention and health promotion in developed countries, using a population-based and social perspective on reducing risks to health. It includes what has been learned about the effects of community-wide campaigns and specific intervention programmes; how environmental, social and legislative changes may be used to reduce levels of risk exposure, and to influence consumer choices relevant to health; the magnitude of changes which may be achieved using different intervention methods; accounts of the behavioural and social processes presumed to be activated by health promotion programmes; and approaches to evaluation. Areas covered include: cigarette smoking, nutrition, and exercise; public participation and self-help; child and adolescent health; women's health; Aboriginal health; the elderly; and the use of general practice, community health services, and hospitals for health promotion.

7258 Ethical Issues in Public Health

Duration: Semester II.

This subject consists of two sections. About 40% of the time is devoted to an examination of theoretical questions, including the bases for ethical argument in a pluralist society, the moral foundations of public policy and the justification of social demands for individuals to conform to policy. The second, larger, part of the subject includes a critique of the ethical implications of the public health movement and of particular policies. This second part attends to questions such as environmentalism, resource distribution in an ageing population, ethical dilemmas in primary care and occupational health and ethical problems in epidemiology.

4286 Biostatistics

Duration: Semester II.

This subject is designed to suit students requiring a high degree of self-sufficiency in the collection, analysis and interpretation of data. The topics include survey sampling methods, analysis of categorical data, non-parametric statistical methods, multivariate linear modelling and survival analysis. A central feature of the subject is instruction in the use of statistical packages on computers. Emphasis is placed on the practical application of statistical skills to real data sets and the rational interpretation of results, especially results generated by statistical packages.

ELECTIVES AVAILABLE AT THE UNIVERSITY OF SOUTH AUSTRALIA

02187 Management of Occupational Health and Safety IG

[Enrolment at the University of South Australia.]

Duration: Semester I.

Content: This subject will give an introduction to current thinking on accident phenomena and its value in the planning, organising and control of workplace hazards. It will cover the history of occupational health and safety management, theoretical models of planning, organisation and control, and of injury causation, and techniques of accident investigation. Consideration will also be given to the roles of managers and others, and appropriate structures and organisation for achieving occupational health and safety objectives.

02190 Occupational Health and Safety Law

[Enrolment at the University of South Australia.]

Duration: Semester II.

Content: This subject introduces the following aspects of the law relating to occupational health and safety; interpretation of statutes and delegated legislation; safety and workers' compensation laws; the industrial relations context of occupational health and safety; occupational health and safety and employment (contractual basis, implied terms, discipline, reinstatement and enforcement); employers' liability for damage; and comparative occupational health and safety law.

02746 Ergonomics

[Enrolment at the University of South Australia.]

Duration: Semester II.

Content: The aim of this unit is to give an understanding of ergonomics and human factors in the design of workplaces. Subjects include sensory processes, information processes and decision-making; man-machine interaction, repetitive work tasks and manual handling tasks; the physical work environment, including lighting, noise, vibration, heat and cold; the psychology of work; and the implementation of ergonomic strategies.

DISSERTATION

6369 Graduate Diploma in Occupational Health Dissertation

Duration: Semester I or II.

The dissertation should report on the critical study or analysis of an occupational health or safety research question. The dissertation will normally be based on information collected specifically for this study, although this is not an essential requirement. The use of scientific method and of a critical analysis of the research questions is required. No minimum length is prescribed, but as a general guide, a length of 10,000 to 15,000 words might be expected.

GRADUATE DIPLOMA IN PSYCHOTHERAPY

Note: Postgraduate tuition fees may apply to this course.

REGULATIONS

1. There shall be a postgraduate Graduate Diploma in Psychotherapy.

2. A candidate for admission to the course for the diploma shall have qualified for admission to the degrees of Bachelor of Medicine and Bachelor of Surgery of the University, or to a corresponding degree or degrees of another university accepted for the purpose by the University.

3. To qualify for the Graduate Diploma a candidate shall:

(a) satisfactorily complete a course of part-time study extending over two years; and

(b) submit evidence that subsequently to qualifying for the award of the degree or degrees referred to in Regulation 2 hereof he has undergone in a hospital, practical clinical training in psychotherapy deemed satisfactory by the Faculty, for a period of not less than two years.

4. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the degree; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval of the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

5. A candidate who has twice failed to pass the examination may not enrol for the diploma again except by special permission of the Faculty and then only under such conditions as the Faculty may prescribe.

6. For the purpose of this regulation a candidate who is refused permission to sit for examination, or who fails, without a reason accepted by the Dean as adequate, to attend all or part of an annual examination (or supplementary examination if granted) after having enrolled for at least two terms in that year, shall be deemed to have failed to pass the examination.

7. A candidate who complies with the foregoing conditions and satisfies the examiners shall be awarded the Graduate Diploma in Psychotherapy.

Regulations allowed 15 January, 1976; 24 Feb. 1983: 4. 1 March 1990; diploma to graduate diploma.
Awaiting allowance: 4(b).

GRADUATE DIPLOMA IN PSYCHOTHERAPY

SCHEDULES

(Prescribed by the Council under Regulation 4.)

SCHEDULE I: COURSE OF STUDY

A candidate for the Graduate Diploma in Psychotherapy shall regularly attend lectures, complete such written, practical and tutorial work as may be prescribed, and pass examinations in:

1. **8019 Individual Psychotherapy.**
2. **3605 Cognitive Behavioural Psychotherapy**
3. **3607 Evaluative Techniques in Psychotherapy.**
4. **5034 Marital and Family Therapy.**
5. **6717 Group and Milieu Therapy.**

GRADUATE DIPLOMA IN PSYCHOTHERAPY

SYLLABUSES

Text-books:

Details of required books will be provided at the beginning of the course: students are expected to procure the latest edition of all text-books prescribed.

Examinations:

Details of the method of examination in specific subjects may be obtained from the Department of Psychiatry: the methods will include continuous assessment of practical work, assessments of presentation of subjects in seminars, and written work.

GRADUATE DIPLOMA IN PSYCHOTHERAPY

The course is intended for graduates in Medicine, to provide systematic experience in a variety of treatment methods in psychotherapy; to foster a critical appraisal of indications for, limitations of, and evaluation of, such treatment methods. It is expected that the students will hold a concurrent clinical appointment. The timetable is devised so as to provide for the hospital commitments of students.

The course extends over two years of part-time study. It includes lectures, demonstrations, seminars and practical work on specific subjects as listed below.

Assessment: Assessments will be on the basis of the presentation of clinical material, presentation of subjects in seminars, and essays:

The subjects of study are:

1. 8019 Individual Psychotherapy.
2. 3605 Cognitive Behavioural Psychotherapy.
3. 3607 Evaluative Techniques in Psychotherapy.
4. 5034 Marital and Family Therapy.
5. 6717 Group and Milieu Therapy.

8019 Individual Psychotherapy

Duration: Full year.

Content: Theoretical seminars will be conducted concurrently with supervisory seminars, as well as practical work (in individual psychotherapy with a selected patient or patients) in the student's own time. The course will include review of therapy, and provision will be made for evaluation of treatment. A written record of treatment progress will be required, and this will provide part of the assessment of the student.

Topics will include: the nature of the psychotherapeutic process; historical review of major theoretical systems of psychotherapy; criteria for selection for individual psychotherapy; limitations of individual psychotherapy; common factors in differing modes of individual psychotherapy; the place of short-term versus long-term therapy; psychotherapy in specific syndromes (e.g. psychosomatic disorders and psychotic states).

3605 Cognitive Behavioural Psychotherapy

Duration: Semester I or II.

Content: The course will include demonstrations of specific techniques, and opportunities for acquisition of skills in these techniques.

Topics will include: the relationship between behaviour therapy and individual psychotherapy; the theoretical bases of behavioural approaches to treatment; specific indications for behavioural techniques; the place of adjunctive drug therapy.

3607 Evaluative Techniques in Psychotherapy

Duration: Full year.

Content: Lectures and seminars will be interspersed throughout the course (two sessions per semester) in order that the evaluative techniques may be applied to the particular psychotherapeutic method under study for that semester.

Topics will include: methodological issues in establishing criteria for "change" in psychotherapy; patient/therapist variables affecting outcome; spontaneous remission of symptoms; the limitations of measurement; evaluation with specific treatment methods.

5034 Marital and Family Therapy

Duration: Semester I or II.

Contact hours: 1 session of 1½ hours a week, as well as practical work (family assessment with selected patients) in the students' own time. Such work will be reviewed and provision made for evaluation of such treatment.

Content: Topics will include: models of marital and family interaction; indications for, scope of, and limitations of marital therapy, problems with the adolescent in family therapy; family therapy and child psychiatry.

6717 Group and Milieu Therapy

Duration: Semester I or II.

Contact hours: A session each week for lecture/seminar material, in addition to 1 session a week for direct observation and discussion of group therapy techniques.

Content: Topics will include: theoretical bases of group therapy approaches; "closed" and "open" groups; integration of group therapy in ward administration; criteria for selection for group therapy; indications for, scope of, and limitations of group therapy; techniques of leadership and facilitation of group processes.

DEGREE OF

MASTER OF MEDICAL SCIENCE

REGULATIONS

1. There shall be a degree of Master of Medical Science.

2. The Faculty of Medicine may accept as a candidate for the degree a person who has qualified for:

(a) the degrees of Bachelor of Medicine and Bachelor of Surgery of The University of Adelaide; or

(b) the Honours degree of Bachelor of Medical Science or Bachelor of Health Sciences or Bachelor of Science or Bachelor of Science in Dentistry of The University of Adelaide, at First or Second Class standard; or

(c) a degree of another institution accepted for the purpose by the University.

3. Subject to the approval of the Board of Graduate Studies and subject to such conditions as it may see fit to impose in each case, the Faculty may accept as a candidate for the degree a person who does not meet the requirements specified in Regulation 2, if it is satisfied of the person's fitness to undertake work for the degree.

4. The Council, after receipt of advice from the Faculty, may from time to time prescribe schedules defining the course of study and research for the degree and procedures for the examination of candidates.

5. (a) Every candidate shall undertake an approved program of study and research, and shall submit a thesis embodying the results of that study and research, and may submit also, in support of the thesis, other relevant material.

(b) A candidate shall proceed to the degree by full-time study or, provided that the Faculty is satisfied that the candidate has adequate time to pursue supervised research under the control of the University, by part-time study.

(c) Except in circumstances approved by the Faculty, the work for the degree shall be completed and the thesis submitted:

(i) in not less than one year nor more than two years of full-time study;

(ii) in not less than two years and not more than four years of part-time study.

6. The Faculty shall appoint one or more supervisors to guide the candidate's research.

7. The Faculty may review the progress of a candidate at any time and if the candidate's progress is unsatisfactory, the Faculty may, with the consent of the Council, terminate the candidature.

8. On completion of the thesis the candidate shall lodge with the Registrar three copies of the thesis prepared in accordance with directions given to candidates from time to time.

9. The Faculty shall appoint two examiners of the thesis, at least one of whom shall be external to the University.

Regulations awaiting allowance.

DEGREE OF

MASTER OF PUBLIC HEALTH

REGULATIONS

1. There shall be a degree of Master of Public Health.

2. (a) The Faculty of Medicine may accept as a candidate for the degree any person who has qualified for a degree of the University of Adelaide or of another university.

(b) Subject to the approval of the Board of Graduate Studies acting with authority wittingly devolved to it by Council the Faculty of Medicine may in special cases and subject to such conditions as it may see fit to impose in each case, accept as a candidate for the degree a person who does not meet the requirements specified in Regulation 2(a) if it is satisfied that he or she is likely to be able satisfactorily to undertake work for the degree.

3. The Faculty of Medicine may require an applicant to complete such preliminary work as it may prescribe before being accepted as a candidate for the degree.

4. To qualify for the degree a candidate shall:

(i) satisfy examiners in subjects of study as prescribed in the schedules; and

(ii) present a satisfactory thesis on a subject approved by the Faculty of Medicine. The thesis shall give the results of original research or of an investigation on which the candidate has been engaged.

With the prior permission of the Faculty two or more candidates may submit a joint thesis. In the light of their assessment of each candidate's contribution and quality of work the examiners, to be appointed pursuant to Regulation 10, may recommend for each candidate:

(i) That their thesis be accepted;

(ii) that their thesis be not accepted; or

(iii) that one or more of the candidates be required to submit additional individual work or to contribute to a revision of their joint thesis.

If the examiners do not consider the joint thesis acceptable for the purposes of provision (i) they may nevertheless in special circumstances, having regard to the individual work and contribution of any one or more of the candidates, recommend that the work and contribution of such one or more of such candidates complies with the requirements of provision (i) to enable that one candidate or those several candidates to be treated as complying with the requirements of this Regulation.

5. (a) The Council, after receipt of advice from the Faculty of Medicine, shall from time to time prescribe schedules defining:

(i) the subjects of study for the degree; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of Department or Heads of Departments concerned and submitted to the Faculty of Medicine and the Executive Committee of the Education Committee for approval, except that Heads of Departments may approve minor changes to previously approved syllabuses.

6. Except with the permission of the Faculty, the subjects of study and the thesis shall be completed in not more than two years of full-time study or four years of part-time study.

7. (a) A candidate who withdraws from all of the subjects in which he or she is enrolled in any one year or who fails to re-enrol after being enrolled in the previous year may only re-

enrol in a subsequent year with the approval of the Faculty, and under such conditions as the Faculty may impose in each case.

(b) A candidate proceeding with the thesis whose work is interrupted for a period of time may be granted an intermission of candidature by the Dean on behalf of the Faculty. If such an application is approved the maximum period specified in regulation 6 will be adjusted accordingly by adding the length of the intermission.

8. If in the opinion of the Faculty of Medicine a candidate for the degree is not making satisfactory progress, the Faculty may, with the consent of the Council, terminate the candidature and the candidate shall cease to be enrolled for the degree.

9. On completion of the thesis the candidate shall lodge with the Registrar three copies of the thesis prepared in accordance with directions given to candidates from time to time. No thesis or material presented for any other degree within this or any other institution shall be submitted.

10. The Faculty shall appoint two examiners for each thesis, of whom at least one shall be external to the University.

11. A candidate who fulfils the requirements of these regulations shall be qualified for admission to the degree of Master of Public Health.

Regulations allowed 29 May, 1986.
21 Feb . 1991: 2.

DEGREE OF

MASTER OF PUBLIC HEALTH

SCHEDULES

SUBJECTS OF STUDY AND THESIS REQUIREMENTS

1. Unless exempted therefrom by the Faculty of medicine, every candidate for the degree shall complete the following components:

(a) COMPULSORY PUBLIC HEALTH STUDIES (5)

6635 Introduction to Epidemiology
3001 Introduction to Occupational and Environmental Health
7259 Principles of Prevention
1292 Public Health Policy
9162 Research Methods and Biostatistics

(b) ELECTIVE PUBLIC HEALTH STUDIES*

Four to be chosen from the following:

1011 Public Health Biology
8026 Epidemiological Research Methods
4672 Prevention in Practice
3945 Health Services Organization
5672 Occupational Hygiene & Ergonomics
6187 Industrial Toxicology
1563 Occupational Health and Safety Practice
7258 Ethical Issues in Public Health
4286 Biostatistics
4041 Primary Health Care
4463 Public Health Policy and the Aged
6100 Dental Public Health
5546 Public Health Law
2836 Public Health Studies

(c) MASTER OF PUBLIC HEALTH THESIS

2. Candidates who pass in any of the subjects shall be awarded a non-graded pass.

3. The Faculty of medicine may grant such status in any subject as it may determine up to a maximum of four subjects.

4. A candidate's enrolment in subjects of study must be approved by the Dean (or nominee) at enrolment each year.

5. The candidate shall pursue an approved research topic on a subject of relevance to environmental, public or community health under the control of the University and under the general guidance of one or more supervisors appointed by the Faculty of Medicine. At least one supervisor shall be a member of the academic staff of a Department of the Faculty of Medicine.

6. The examiners appointed under Regulation 10 may recommend that:

(a) the candidate shall be awarded the degree; or

(b) the candidate shall be awarded the degree but that minor amendments be made to the thesis; or

(c) the candidate shall be awarded the degree subject to,

(i) specified amendments being made to the thesis, or

(ii) satisfactory performance in an oral or written examination; or

(d) the candidate shall not be awarded the degree but shall be permitted to re-submit the thesis in a revised form; or

(e) the candidate shall not be awarded the degree.

***Students may also be permitted to enrol in electives offered by Flinders University: *see* syllabuses.**

DEGREE OF

MASTER OF PUBLIC HEALTH

SYLLABUSES

Subjects of Study:

As indicated in Schedule I twenty subjects of 26 hours will be offered of which each candidate will be required to complete nine, five of which are compulsory. Detailed time-tables will be issued at the beginning of each academic year. All candidates are advised to discuss their choice of electives with the co-ordinating lecturer.

Text-books

A reading list of recommended journal articles and text-books will be issued by the co-ordinating lecturer for each subject and will be available from the Department of Community Medicine at the beginning of the year.

Assessment:

For each subject of study there will be a written examination at the conclusion. In addition candidates will be expected to prepare tutorial assignments or papers for presentation.

COMPULSORY PUBLIC HEALTH STUDIES

6635 Introduction to Epidemiology

Duration: Semester I or II.

Content: This subject provides students with basic skills in epidemiological research design and analysis, with particular emphasis on the nature and methods of observational epidemiology. At the end of the subject students should grasp (and hence be able to apply in unfamiliar settings) basic concepts in epidemiology, have an understanding of the broad research strategies applied in the discipline, and be able to critically assess literature in the public domain which employs epidemiological methods. The subject involves a combination of lectures, tutorials and practical exercises. Students undertake some exercises with a view to detecting flaws in research designs.

9162 Research Methods and Biostatistics

Duration: Semester I.

Content: This core unit is divided into two parts: Introduction to Public Health Research and Introduction to Biostatistics. The first part looks at the framework of research in the public health arena, the nature of enquiry, demography and the basic approaches to research. Indicators of the Australian population's health, surveillance and information systems, and strategies for evaluating policies and intervention are considered. Specific research methods, both qualitative and quantitative, are discussed. The second part of the course introduces Biostatistics as a means of summarizing sets of data, coping with the variability of individuals within populations, and making decisions in the face of uncertainty. Applications of statistical methodology to public health research will be emphasized.

3001 Introduction to Occupational and Environmental Health

Duration: Semester II.

Content: This subject focuses on environmental hazards, and the way in which they impinge on the workforce and the general population. There will be an introduction to key disciplines (toxicology, industrial hygiene and environmental measurement) in which hazards are measured and managed. Consideration will be given to the way in which hazards interact with each other and with host factors in the causation of disease, and to the role of epidemiological research in identifying and measuring the relationship between hazards and disease. Use will be made of the concepts of risk (including hazard identification, risk assessment and risk management) in the management of occupational and environmental health problems. There will also be an introduction to the legislative responses (standards, laws and regulations) enacted to control occupational and environmental hazards.

7259 Principles of Prevention

Duration: Semester II.

Content: This subject examines the theoretical framework which supports work in preventive medicine and health promotion. Topics include the potential of preventing major causes of ill-health, the political and cultural context of prevention, an introduction to behaviour modification theory and practice, an introduction to formal critical analysis, a review of social channels which may be used to influence behaviour, and prevention through primary health care.

1292 Public Health Policy

Duration: Semester I.

Content: This subject aims to help students analyse the health system with skills formed by the traditions of sociology, politics and economics. It aims to develop a critical, historically informed attitude toward the acquisition of knowledge and the evaluation of evidence about health institutions and their roles. Attention will be given also to the broad social and political context in which health policy is formed and implemented, and to the value assumptions implicit in policy. This analytical approach will be applied in case studies of current issues in public health policy.

ELECTIVE PUBLIC HEALTH STUDIES

1011 Public Health Biology

Duration: Semester II.

Content: The aim of this course is to examine the impact of environmental and social factors on the pathogenesis of human disease. An overview of the causes, tissue changes and laboratory manifestations of diseases of public health importance will be provided. The course will consist of a series of lectures and seminars which scans the biology and pathology of infection, immunity, cell injury and repair mechanisms, tissue degeneration and aberrations of tissue growth and tumours with an ecological perspective on causation.

8026 Epidemiological Research Methods

Duration: Semester II.

Content: This subject concentrates on conceptual and practical issues encountered by

students in the design and implementation of epidemiological research. (Students will be required to develop and present a research protocol for class discussion.) Theoretical material as it relates to carrying out such research will include the definition and control of bias and confounding in observational studies, implications of sampling, the analysis of research impact of interventions on the community, techniques of surveillance, and screening. Common pitfalls in epidemiological and statistical reasoning will be examined, and attention will be paid to research design, proposal writing, data presentation, and critical reading of the research literature.

Pre-requisite: Completion of an introductory epidemiology course.

4672 Prevention in Practice

Duration: Semester I.

Content: In this subject, two or three of the major areas of disease prevention and health promotion are examined in depth. These areas may be drawn from infectious disease prevention, cardiovascular and cancer risk, worksite interventions, adolescent health or other areas in which there is current active practice in Australia. For each area selected, there will be consideration of prevalence data and the social context of the problem, intervention strategies and the evidence for their effectiveness, and how outcomes of interventions may be evaluated.

3945 Health Services Organization

Duration: Semester I.

Content: This subject will analyze the organization, finance and administration of the Australian health system. The emphasis will be on the provision of public health, primary care and preventive services, but hospitals and other institutions will also be considered. There will be a review of the forces which have been critical in shaping the structure of these services. The professional and technical context of health service provision will be examined in the light of fundamental organizational and economic principles. Comparison will be made with institutions and practices in other O.E.C.D. countries.

5672 Occupational Hygiene & Ergonomics

Duration: Semester II.

Content: This subject is an introduction to practical occupational hygiene and ergonomics. There is broad coverage of chemical and physical hazards and of technologies for evaluation and control. Topics include noise, vibration, thermal stress, shift work, biohazards and toxic chemicals. There will be discussion of exposure standards and the interpretation of hygiene data. There will also be an overview of ergonomics, including consideration of work-station and process design; displays and information systems; biomechanics; anthropometry; and psychological aspects.

6187 Industrial Toxicology

Duration: Semester I.

Content: The unit focuses on chemical hazards in the workplace. It includes an overview of the principles of toxicology; the use of toxicity tests and other data to characterise a chemical's acute, chronic, systemic and local toxic effects, with specific emphasis on carcinogenicity, mutagenicity, neurotoxicity and reproductive toxicity. The compilation of material safety data sheets, the basis for setting and monitoring exposure limits, and the problem of estimating risk are discussed.

1563 Occupational Health and Safety Practice

Duration: Semester II.

Content: This subject will focus on practical occupational health and safety issues. A prime concern will be with workers' compensation and rehabilitation; attention will be given to the evolution of the current system in South Australia, and associated problems in relation to common causes of occupational morbidity. There will also be tutorial-type sessions in which consideration will be given to specific occupational health problems: analysis of cause-effect relationships, practical problems in minimising health risks, and the management issues within companies involved in addressing the problems. As well as "conventional" occupational health issues, there will be consideration of related contemporary issues such as smoking in the workplace, alcohol and industry, and worksite health promotion. The course will include some industrial visits.

7258 Ethical Issues in Public Health

Duration: Semester II.

Content: This subject consists of two sections. About 40% of the time is devoted to an examination of theoretical questions, including the bases for ethical argument in a pluralist society, the moral foundations of public policy and the justification of social demands for individuals to conform to policy. The second, larger part of the subject, includes a critique of the ethical implications of the public health movement and of particular policies. This second part attends to questions such as environmentalism, resource distribution in an ageing population, ethical dilemmas in primary care, and ethical problems in epidemiology.

4286 Biostatistics

Duration: Semester II.

Content: This subject is designed to suit students requiring a high degree of self-sufficiency in the collection, analysis and interpretation of data. The topics will include survey sampling methods, analysis of categorical data, non-parametric statistical methods, multivariate linear modelling and survival analysis. A central feature of the subject will be instruction in the use of statistical packages on computers. Emphasis will be placed on the practical application of statistical skills to real data sets and the rational interpretation of results, especially results generated by statistical packages.

4041 Primary Health Care

Duration: Semester I.

Content: This subject will critically examine the concept of primary health care as a component and instrument of "health for all by the year 2000". The role of traditional and non-traditional healers will be examined across a broad range of cultures and the history of primary health care in Australia will be discussed including evolution to the present state of a privately organized general practitioner workforce and a publicly funded community health network. Elements of present structure will be considered in some detail, including the provision of episodic and continuing care to families and defined populations, the inputs required to train practitioners from various professional groups to deal with undifferentiated illness and the individual and group counselling skills needed to ensure the public health needs and expectations of the community are appropriately met by a mix of public and private primary health care practice.

4463 Public Health Policy and the Aged

Duration: Semester I.

Content: This subject explores the implications for the health care system of the change in demography and epidemiology that has accompanied a falling birth rate and a rising life expectancy. Issues to be examined include the prevention of disability, care of the confused

elderly, housing policies and the elderly, nursing home needs, domiciliary support services, geriatric assessment units, preparation for retirement, pensions and health, health promotion in the elderly, hospice care. Students will become familiar with a range of research and program evaluation into geriatrics and gerontology in Australia and with the various initiatives being undertaken to address the health and social needs of elderly South Australians.

6100 Dental Public Health

Duration: Semester II.

Content: This subject is designed to suit students requiring specific understanding of dental public health. The subject will focus on (a) the assessment of various oral disease levels and related problems, identification of prevention and control measures, selection and implementation of appropriate measures and evaluation of the results; and (b) the structure of existing dental care programmes, the coverage of the community and integration and organization of all types of dental resources including the supply, distribution and utilization of dental personnel, facilities and funds.

2836 Public Health Studies

Duration: Semester I or II.

Content: This subject enables students to develop an individualised reading course with an academic staff member in a field of significant public interest. It is not a specific preparation for thesis work. The details of the course will be arranged by negotiation between individual students and appropriate teachers within the department although co-operative arrangements may be organised with other departments or public health agencies. A written plan of study will be developed in consultation with a staff member including the criteria for formal assessment which may include a seminar presentation.

5546 Public Health Law

Duration: Semester II.

Content: A series of classes cover the major elements of public health law, the general theories about law and its development in contexts that are important for public health. There will be a detailed analysis of the law relating to the main public health areas, including disease control, environmental health, occupational health, epidemiology, public health litigation and legislation, drug and alcohol controls and health promotion.

ELECTIVES AVAILABLE AT FLINDERS UNIVERSITY

Introductory Note:

Prospective Master of Public Health students should note that Flinders University teaches 93401 Maternal and Child Health, 93402 School and Community Health, and 93403 Child Development as part of the postgraduate diploma in Community Child Health.(For details see Volume II of the Calendar of The Flinders University of South Australia.) Adelaide students may be permitted to enrol in these subjects for credit to their Adelaide Master of Public Health degree. Such students need to obtain approval in writing from the Registrar and must comply with Flinders University enrolment procedures.

The three electives provide a social and developmental framework for understanding and analysing the major contemporary determinants of child health, and will examine community responses through programs and services which aim to address current child health needs.

Prerequisites:

The postgraduate course in community Child Health at Flinders University is designed for medical practitioners who have a minimum of twelve months approved postgraduate experience in child health. Although there are no formal prerequisites for these elective subjects, candidates are advised to discuss their choice of electives with the co-ordinating lecturer.

Contact hours:

Each elective lasts for an academic term and comprises an initial full-time week of seminars and agency visits followed by programmed readings, assignments and an open-book examination.

Students are expected to arrange a placement in a relevant community agency for the equivalent of one day per week for an academic term to familiarise themselves with the kinds of problems encountered and the agencies' philosophy and approaches to management.

Assessment:

There are two assignments of 1500-2000 words and one essay of between 2500 and 3000 words to be completed during the course of each elective. Each of these components is worth 25% of the marks. A three-hour open book examination worth 25% of the marks is held at the end of the elective term.

93401 Maternal and Child Health

[Enrolment at The Flinders University of South Australia].

This subject focuses on the perinatal period, infancy and early childhood. Issues explored include family development and structure in Australia, primary and secondary preventive health services and health behaviour patterns in parents and children, indices of health including perinatal epidemiology and morbidity patterns in young children, with particular emphasis on some of the major contemporary health and behavioural problems in this age group, such as child abuse, adolescent pregnancy, growth and nutritional problems and injuries. Alternative strategies, such as community development, to meeting health needs are also explored.

Text-books: Wallace, H. M. *et al.* eds. *Maternal and child health practices,* 2nd ed. (Wiley, 1982); Lindzey, G. and Aronson E. *Handbook of social psychology,* 2nd ed., vol. 2 (Addison-Wesley, 1969).

93402 School and Community Health

[Enrolment at The Flinders University of South Australia].

This subject examines health issues in the older child and early adolescent in the context of the school and the community. Areas considered include the role of health professionals in other service systems and the dynamics of multidisciplinary teams, health screening and education in schools. The role of physicians in the diagnosis and management of learning disorders will be examined. The implications of current normalisation policies for disabled children in schools will be explored. Major health issues in adolescents such as risk-taking behaviour, sexually transmitted diseases, substance abuse, suicide, depression, and eating disorders, will be discussed.

Text-books: Nader, P. R. *Options for school health* (Aspen Systems Corp., 1978); Lindzey, G. and Aronson E. *Handbook of social psychology,* 2nd ed., vol. 2 (Addison-Wesley, 1969).

93403 Child Development

[Enrolment at The Flinders University of South Australia]

Contemporary child health issues are best explored within a social and developmental

framework. This subject aims to provide a comprehensive understanding of the various theories of human development and an overview of developmental neurology. Developmental and behavioural problems affecting children will be examined within this context. The theoretical and research basis for the variety of service responses to these needs, such as screening, parent counselling, and early invention programmes, will be evaluated.

Text-books: Accardo, P. J. & Capute A. J. *The pediatrician and the developmentally delayed child* (University Park Pr., 1979); Lindzey, G. and Aronson E. *Handbook of social psychology,* 2nd ed., vol. 2 (Addison-Wesley, 1969).

DEGREE OF

MASTER OF SURGERY

REGULATIONS

1. The following persons may be accepted as candidates for the degree of Master of Surgery:

(a) Bachelors of Surgery of the University of Adelaide;

(b) Graduates in surgery of another university who hold a degree which is accepted by the Council on the recommendation of the Faculty of Medicine as equivalent to the degree of Bachelor of Surgery of the University of Adelaide.

No person may be awarded the degree of Master of Surgery until three years have elapsed since becoming qualified to receive the degree by virtue of which that person qualified for acceptance as a candidate for the degree of Master of Surgery.

2. Except by special permission of the Faculty of Medicine, every candidate shall give at least two semesters' notice of intended candidature, and shall indicate in general terms the subject of the research work or investigation on which it is proposed to submit a thesis. The Faculty of Medicine may, if it considers it desirable, nominate a department under whose aegis the candidate will be required to undertake work and appoint a supervisor or supervisors to whom the candidate will be responsible for the preparation and presentation of the thesis.

3. A candidate for the degree shall submit: (a) evidence satisfactory to the Faculty of Medicine of having had special training in surgery including at least two years' such training in a teaching hospital recognised by the Faculty for the purpose; (b) a thesis embodying the results of original work relevant to the science or art of surgery or both; and (c) such other published papers in support of the candidature as may be thought fit.

4. Unless the Faculty shall otherwise determine, a candidate for the degree shall pursue his/her approved course of study for a period of not more than three years from the date of his/her candidature.

5. To qualify for award of the degree the thesis must make a contribution to surgical knowledge.

6. A candidate's thesis must include: (a) a declaration by the candidate indicating clearly the extent (if any) to which the candidate is indebted for any portion of the work to any other person, and stating that the thesis does not contain any material which has been accepted for the award of any other degree in any university; (b) a statement of the nature of the problem investigated; (c) a review of the relevant scientific and historical background; (d) a detailed account of the methods of investigation employed, the results obtained, and their interpretation.

7. On completion of the work the candidate shall lodge with the Registrar three copies of the thesis prepared in accordance with directions given to candidates from time to time.*

The Faculty of Medicine, if it approves the subject of the work submitted, shall nominate examiners, of whom at least one shall be an external examiner.

A candidate may be required to undergo an oral examination in the subject-matter of the thesis and in any other subject-matter cognate thereto.

8. After hearing the reports of the examiners the Faculty shall determine whether or not an oral examination is necessary, and may then recommend (a) that the degree be awarded, or (b) that the degree be awarded on satisfactory completion of an oral examination, or (c) that the thesis be returned to the candidate for revision, or (d) that the degree be not awarded.

Regulations allowed: 24 Feb. 1983.
Amended 1 March 1984: 4, re-numbering 5-8.
*Published in "Guidelines on Higher Degrees by Research and Specifications for Thesis": *see* Contents.

DEGREE OF

DOCTOR OF MEDICINE

REGULATIONS

1. The following persons may be accepted as candidates for the degree of Doctor of Medicine:

(a) Bachelors of Medicine of the University of Adelaide;

(b) Graduates in medicine of another university who hold a degree which is accepted by the Council on the recommendation of the Faculty of Medicine as equivalent to the degree of Bachelor of Medicine of the University of Adelaide.

2. No person may be awarded the degree of Doctor of Medicine until three years have elapsed since he became qualified to receive the degree specified in Regulation 1 of these regulations. He may proceed to the degree either by completing a period of research and presenting a satisfactory thesis thereon, or by the submission of previously published work.

3. No thesis or other work presented for the degree may include material which has been accepted for any other degree or qualification of any university or institution. The degree shall not be awarded unless the thesis or work submitted contain an account of original work by the candidate for the degree amounting to a substantial contribution to medical knowledge.

4. When he submits his thesis or other work, a candidate shall:

(a) submit therewith a declaration that the thesis or work is his own composition;

(b) indicate wherein he considers the thesis or work to advance medical knowledge or practice:

(c) furnish a history of the progress of medical knowledge in the subjects of the thesis or work;

(d) indicate clearly and fully, by appropriate references, the extent to which he is indebted for any portion of his work to any other person.

Regulations governing admission to the degree by thesis.

5. A person who wishes to proceed to the degree of Doctor of Medicine by thesis shall make written application to the Registrar for enrolment as a candidate. The applicant shall include a brief statement of the topic upon which he proposes, upon the completion of a period of research, to submit a thesis.

6. A person accepted as a candidate shall conduct or continue research in the field of study approved by the Faculty of Medicine (hereinafter referred to as the Faculty). The Faculty will normally appoint a supervisor or supervisors and will nominate a department or departments under whose aegis the research will be carried out. Unless the Faculty shall otherwise determine, a candidate for the degree shall pursue his/her approved course of study for a period of not less than two years and not more than four years from the date of his/her candidature in the case of a full-time candidate or eight years in the case of part-time and external candidates.

7. The Faculty may permit a candidate to pursue his research at such place or places outside the University as it thinks fit.

8. A candidate shall give the Registrar one month's notice in writing of his intention to submit his thesis and shall give particulars of any other work which he desires to submit in support of his thesis. The Faculty may permit the submission of such work if in its opinion it may conveniently be examined along with the thesis.

9. The candidate shall lodge with the Registrar three copies of the work prepared in accordance with the directions* given in sub-paragraph (b) of clause 2B of Chapter XXV of

the Statutes. If the work is accepted for the degree the Registrar shall transmit two of the copies to the University Library.

10. The faculty shall nominate examiners of the thesis of whom at least one shall be an external examiner. The Faculty may require the candidate to submit himself for examination upon the subject of his thesis and matters related thereto.

11. After the examiners' reports have been considered the Faculty may recommend that the candidate:

(a) be awarded the degree; or

(b) be awarded the degree on the satisfactory completion of an examination on the subject of his thesis and matters related thereto; or

(c) be not awarded the degree, but be allowed to revise and re-submit his thesis (within such period as the Faculty may allow); or

(d) be not awarded the degree and be not allowed to re-submit his thesis.

Regulations concerning admission to the degree by previously published work.

12. Any person who satisfies the requirements of Regulation 1 hereof may seek the permission of the Faculty to submit, as evidence that he is a fit and proper person to receive the degree, work or papers previously published by him.

13. Any person who seeks the permission of the Faculty under Regulation 12 hereof shall apply in writing to the Registrar giving particulars of the work which he proposes to submit together with a *curriculum vitae*. The Faculty shall refer the matter to a committee which shall enquire into it and make recommendations to the Faculty. The Faculty may refuse to grant the permission sought or it may, if it entertains serious doubts about the suitability of the work which the applicant proposes to submit, advise his of its doubts and request him to reconsider his application.

14. The candidate shall lodge with the Registrar three copies of the work prepared in accordance with the directions* given in clause 2B of Chapter XXV of the Statutes. If the work is accepted for the degree the Registrar shall transmit two of the copies to the University Library.

15. The Faculty shall nominate examiners of the work of whom at least one shall be an external examiner. The Faculty may require the candidate to submit himself for examination upon the subject of his work and matters related thereto.

16. After the examiners' reports have been considered the Faculty may recommend that the candidate:

(a) be awarded the degree; or

(b) be awarded the degree on the satisfactory completion of an examination on the subject of his work and matters related thereto; or

(c) be not awarded the degree.

17. Notwithstanding the provisions of the preceding regulations, the Council may, on the recommendation of the Faculty, admit to the degree any person other than a member of the staff of the University. Any such recommendation shall be accompanied by evidence that the person has made an original and substantial contribution to knowledge.

Regulations allowed 21 December 1967.

Amended: 15 Jan. 1976: 17; 8 Feb. 1979: 6; 4 Feb. 1982: 5, 8, 9, 13, 14; 1 March 1984: 3, 6.

*Published in "Guidelines on Higher Degrees by Research and Specifications for Thesis": *see* Contents.

FACULTY OF SCIENCE

REGULATIONS, SCHEDULES AND SYLLABUSES

Master of Science in Petroleum Geology and Geophysics (M.Sc.(Petrol. G. & G.))

Doctor of Philosophy (Ph.D.)

Regulations and Schedules: under "Board of Graduate Studies" — *see* Contents.

Doctor of Science in the Faculty of Science (D.Sc.)

DEGREE OF

BACHELOR OF SCIENCE

IN THE FACULTY OF SCIENCE INCLUDING BACHELOR OF SCIENCE (JURISPRUDENCE)

REGULATIONS

1. (a) There shall be an Ordinary degree of Bachelor of Science and an Ordinary degree of Bachelor of Science (Jurisprudence). A candidate may obtain only one of these degrees.

(b) There shall be an Honours degree of Bachelor of Science.

(c) A candidate may obtain an Ordinary degree, an Honours degree or both.

2. The course of study for the Ordinary degree shall extend over three years of full-time study or the equivalent and that for the Honours degree over one additional year.

3. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the degree; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

(c) Schedules made and syllabuses approved by the Council shall be published in the next edition of the University Calendar.

4. (a) Except by permission of the Faculty, a candidate shall not be admitted to the class in any subject for which the prerequisite studies as prescribed in the syllabus for that subject have not been satisfactorily completed.

(b) Exemption from any part of the course on the first occasion on which a candidate takes a subject will be granted only in special cases and on grounds approved by the Faculty.

5. (a) Examinations in any subject shall be held in accordance with the provisions of the relevant schedule made under these regulations.

(b) A candidate shall not be eligible to attend for examination unless written and laboratory or other practical work, where required, has been done to the satisfaction of the teaching staff concerned.

(c) In determining a candidate's final result in a subject the assessors may take into account oral, written, practical or examination work, provided that the candidate has been given notice at the beginning of the course of the way in which the work will be taken into account and of its relative importance in the final result.

(d) A candidate will be permitted to take a supplementary examination in a subject only in circumstances approved by the department administering such subject, consistent with any expressed Council policy and then only if the candidate's previous work in the subject has been such as to indicate a reasonable chance of passing the supplementary examination.

6. There shall be three classifications of pass in any subject for the Ordinary degree, as follows: Pass with Distinction, Pass with Credit, Pass. The names of the candidates in each of the classifications shall be published in accordance with the provisions of the relevant schedule made under the regulations. If the list of candidates who pass be published in two divisions, a pass in the higher division may be prescribed in the appropriate syllabuses as

prerequisite for admission to another subject. A candidate with a lower division pass who wishes to gain a higher division pass shall be allowed to repeat the course, subject to the provisions of regulation 7. In addition there shall be a pass classification of Conceded Pass and limits on its application and the number of such passes that may be presented for the degree shall be prescribed in the schedules.

7. (a) A candidate who fails to pass in a subject or who obtains a lower division pass and who desires to take the subject again shall, unless exempted wholly or partially therefrom by the Head of Department concerned, do written and laboratory or other work in that subject to the satisfaction of the teaching staff concerned.

(b) A candidate who has twice failed to obtain a Division I pass or higher in the examination in any subject shall not enrol for the subject again, or for any other subject which in the opinion of the Faculty contains a substantial amount of the same material, except by permission of the Faculty and under such conditions as the Faculty may prescribe. For the purpose of this clause a candidate who fails to receive permission to sit for or does not attend the examination in any subject after having attended substantially the full course of instruction in it, shall be deemed to have failed to pass the examination. A candidate who obtains a higher division pass only after being granted permission to enrol for the third time shall not take a subject for which that higher division pass is a prerequisite, save in exceptional circumstances and with the permission of the Faculty.

8. (a) A candidate who has passed subjects in other faculties or universities or elsewhere, may on written application to the Registrar be granted such exemption from these regulations and from schedules made under them as the council on the recommendation of the Faculty may determine.

(b) A graduate in another faculty or from another tertiary institution, who wishes to proceed to the degree of Bachelor of Science in the Faculty of Science and to count towards that degree subjects which have already been presented for another degree may do so, subject to the following conditions:

(i) the graduate shall present a range of subjects which fulfils the requirements of the relevant schedule made under regulation 3, and

(ii) the graduate shall present subjects, satisfying the level three subject and the major in a science discipline requirements of the relevant schedule, which have not been presented for any other degree and which, in the opinion of the Faculty, do not contain a substantial amount of the same material as subjects which have been presented for any other degree.

(c) Persons who have completed other qualifications, and graduates in other faculties, who wish to proceed to the degree of Bachelor of Science (Jurisprudence) may be granted such credit towards that degree as is allowed under the relevant schedule.

9. (a) There shall be the following classifications for the Honours degree and the names of successful candidates in each subject shall be published within each classification:

First Class

Second Class
Division A
Division B
Third Class

(b) A candidate who fails to obtain one of the foregoing classifications at the first attempt shall not be permitted to present again for the examination.

10. A graduate who has obtained the Honours degree of Bachelor of Arts, or the Honours degree of Bachelor of Science in the Faculty of Mathematical Sciences, may not proceed to the Honours degree of Bachelor of Science in the Faculty of Science in the same subject.

11. Applications for approval under clauses 4(a), 4(b), 7(a), 7(b) or 8 shall be submitted in writing to the Registrar.

12. If in any year/semester student enrolment for a particular subject offered by the Faculty is less than the minimum specified by the Faculty that subject may not be offered.

Regulations allowed 17 December, 1970.

Amended: 21 Dec. 1972: 3, 6, 8, 10; 15 Jan. 1976: 3; 23 Dec.1976: 5; 31 Jan. 1980: 7; 4 Feb. 1982: 3, 5, 7, 8, 11; 24 Feb. 1983: 2, 3, 8; 17 Jan. 1985: 3, 4, 5, 7(a), 9(a); 20 Jul. 1989: 3, 4, 5, 6, 7, 8, 9, 12.
21 Feb. 1991: 1(a), 1(b), 1(c), 8(b), 8(c). Awaiting allowance: 3(b).

DEGREE OF

BACHELOR OF SCIENCE

IN THE FACULTY OF SCIENCE INCLUDING BACHELOR OF SCIENCE (JURISPRUDENCE)

SCHEDULES

(Made by the Council under Regulation 3)

Four Schedules are hereby made, as follows:

Schedule I: The Ordinary Degree of Bachelor of Science.

Schedule II: The Ordinary Degree of Bachelor of Science (Jurisprudence).

Schedule III: Subjects of study.

Schedule IV: The Honours Degree.

NOTE: Syllabuses of subjects for the degree of B.Sc. in the Faculty of Science and B.Sc. (Jur.) are published below, immediately after these Schedules. For syllabuses of subjects taught for other degrees and diplomas see the table of subjects at the end of the volume.

Notwithstanding the schedules and syllabuses published in this volume, a number of subjects listed may not be offered in 1992.

The availability of all subjects is conditional upon the availability of staff and facilities.

SCHEDULE I : THE ORDINARY DEGREE OF BACHELOR OF SCIENCE

1. The course of study for the Ordinary degree shall extend over three years of full-time study or the equivalent.

2. To qualify for the Ordinary degree a candidate shall, subject to the conditions and modifications specified under Clauses 3, 4 and 5 below, pass subjects from Schedule III to the value of at least 70 points which satisfy the following requirements:

(a) A candidate shall present passes in Level I subjects to the value of not more than 30 points.

(b) A candidate shall present passes in Level III subjects to the value of at least 24 points.

(c) A candidate shall complete a major in a science discipline as set out in Clause 6 below.

3. (a) A candidate may, as part of the requirements of Clause 2(a), present passes in Level I subjects in the Schedules of any other Faculty of the University up to a maximum of 6 points.

(b) A candidate will be permitted to present passes in Law subjects of at least the equivalent value in lieu of a maximum of 6 points at Level I.**

4. No candidate will be permitted to count for the degree any subject together with any other subject which, in the opinion of the Faculty, contains a substantial amount of the same material; and no subject may be counted twice towards the degree. No candidate may present the same section of a subject in more than one subject for the degree or present the same subject towards more than one major.*

5. There may be a pass classification of "Conceded Pass" for a Level II or III subject of not more than 3 points but a candidate may only present subjects for which this result has been obtained up to a value of 6 points.

* A list of unacceptable combinations of subjects is available from the Faculty of Science Office.

** For entry to Law subjects see the Notes to the B.Sc.(Jur.).

6. To complete a major in a Science discipline a candidate shall present Level III subjects, for which a result of Pass, Pass with Credit or Pass with Distinction has been obtained, which satisfy one of the following criteria:

Science Discipline	Major requirements
Anatomy & Histology	Subjects offered by the Department of Anatomy & Histology to the value of at least 9 points.
Biochemistry	Subjects offered by the Department of Biochemistry to the value of at least 9 points which include: 6927 Recombinant DNA Technology: Theory 2893 Recombinant DNA Technology: Practice 5317 Research Topics in Biochemistry
Biotechnology	Subjects offered by the Department of Biochemistry to the value of at least 9 points including the following: 2123 Molecular Biology of the Gene 6927 Recombinant DNA Technology: Theory 2893 Recombinant DNA Technology: Practice 4762 Protein Structure and Function 2529 Basic Biotechnology 9510 Biochemistry of Control of Gene Expression
Botany	Subjects offered by the Department of Botany to the value of at least 9 points.
Chemistry	Chemistry subjects offered by the Departments of Physical and Inorganic Chemistry or Organic Chemistry to the value of at least 9 points, which may include subjects offered in each of the two individual Departments with a value of at least 3 points. A major in Chemistry is distinct from a major in either Physical and Inorganic Chemistry or Organic Chemistry, but a student may not count a major in both Chemistry and in either of Physical and Inorganic Chemistry or Organic Chemistry.
Environmental Biology	Environmental Biology subjects offered by the Departments of Botany and Zoology to the value of at least 9 points which include at least one from 7839 Aquatic Plant Biology, 6327 Ecosystem Modelling for Environmental Biologists, 8318 Rangelands Ecology and 2819 Seminars in Environmental Biology and at least one from 5224 Comparative and Environmental Physiology, 8896 Freshwater Ecology and 9035 Marine Ecology. Other subjects offered by the two Departments may be considered with the approval of the Heads of the two Departments.
Genetics	Subjects offered by the Department of Genetics to the value of at least 9 points.
Geology	Subjects to the value of at least 9 points from the following subjects offered by the Department of Geology & Geophysics: 4332 Igneous and Metamorphic Petrology 8037 Stratigraphy and General Palaeontology 1789 Tectonics and Geological Mapping 1293 Structural Geology and Exploration Geophysics 4016 Petroleum Geochemistry and Sedimentology
Geophysics	Subjects to the value of at least 9 points, comprising 6 points for the following two subjects offered by the Department of Geology and Geophysics:

Science Discipline	Major requirements
	1293 Structural Geology and Exploration Geophysics 9769 Theoretical Geophysics and at least 3 points made up of two subjects from either the Department of Applied Mathematics or the Department of Physics and Mathematical Physics or one subject from the Department of Geology & Geophysics.
Microbiology & Immunology	Subjects offered by the Department of Microbiology & Immunology to the value of at least 9 points.
Organic Chemistry	Subjects offered by the Department of Organic Chemistry to the value of at least 9 points.
Pharmacology	Subjects offered by the Department of Clinical & Experimental Pharmacology to the value of at least 9 points.
Physical & Inorganic Chemistry	Subjects offered by the Department of Physical & Inorganic Chemistry to the value of at least 9 points.
Physiology	Subjects offered by the Department of Physiology to the value of at least 9 points.
Physics-Experimental	Subjects offered by the Department of Physics and Mathematical Physics to the value of at least 9 points which include: 2838 Experimental Physics & Electronics and two of the following: 4964 Quantum Mechanics 5547 Statistical Mechanics 6849 Electromagnetism
Physics-Theoretical	Subjects offered by the Department of Physics & Mathematical Physics to the value of at least 9 points including three of the following: 4964 Quantum Mechanics 5547 Statistical Mechanics 4324 Mathematical Methods 7099 Advanced Dynamics 7633 Relativity and Classical Field Theory 1067 Advanced Quantum Mechanics.
Psychology	Subjects offered by the Department of Psychology to the value of at least 9 points which include: 1759 Psychological Research Methodology III.
Zoology	Subjects offered by the Department of Zoology to the value of at least 9 points.

7. A student who has completed two years of the Chemical Engineering course or three years of either the Electrical & Electronic Engineering or Computer Systems Engineering course for the degree of Bachelor of Engineering may qualify for the degree of Bachelor of Science by completing the requirements of Clauses 2(b) and 2(c) above.

8. Candidates who commenced their course of study for the degree prior to 1989 may qualify for the degree by fulfilling the requirements of the regulations and schedules in force prior to 1989, with such modifications as the Faculty may deem necessary to take account of changes to subjects from 1989 onwards.

Alternatively, candidates may complete their courses of study under present regulations and schedules, with such modifications as the Faculty may deem necessary to ensure that

subjects validly passed under previous regulations and schedules may be counted under the present schedules. For the purposes of this clause the following equivalences will be used:

Subjects in schedules prior to 1989	Equivalent point values
First year subject	6 points at Level I
First year half-subject	3 points at Level I
Second year subject	8 points at Level II
Second year half subject	4 points at Level II
Third year subject	12 points at Level III
Third year double subject	24 points at Level III
Paelaeontology III	4 points at Level III

A candidate who has prior to 1989 passed component options or units of a third year subject, which have not been presented in a subject, shall be granted unspecified status on the following basis:

Single option/unit	2 points at Level III
Double option/unit	4 points at Level III
Triple option	6 points at Level III

Where the syllabus of a unit or option which was passed prior to 1989 significantly overlaps the syllabus of a subject to be undertaken in 1989 or a later year, the Faculty of Science shall grant such exemption from the requirement of the latter subject as is practicable.

9. When in the opinion of the Faculty, special circumstances exist, the Council, on the recommendation of the Faculty in each case, may vary any of the provisions of clauses 1-8 above.

NOTES (not forming part of the Schedules):

1. *Pattern of study*

Provided that they comply with the pre-requisites for each subject, students may select their own combinations of subjects at each level. Full-time students are advised to take, at each of Levels I, II and III, subjects with an aggregate points value of 24 points.

2. *Work required to complete an Adelaide degree* (policy of the Faculty of Science).

i) graduates in another Faculty who wish to qualify for the Ordinary degree of Bachelor of Science and to count towards that degree subjects which have already been presented for another degree may do so, providing that the subjects presented fulfil the requirements of Clause 2 above, and include a major in a science discipline and Level III subjects to the value of at least 24 points which have not been presented for any other degree.

ii) students coming from other institutions and wishing to obtain an Adelaide degree, are required as a minimum to complete Level III subjects from Schedule III with an aggregate points value of 24 including a major in a science discipline.

iii) with special permission of the Faculty, a student who has completed most of the degree at the University of Adelaide including Level III subjects with an aggregate points value of 12 and a major in a science discipline may be permitted to complete the requirements for the degree at another institution. All applications must be made in writing to the Registrar.

SCHEDULE II: THE ORDINARY DEGREE OF BACHELOR OF SCIENCE (JURISPRUDENCE)

1. To qualify for the Ordinary degree of Bachelor of Science (Jurisprudence) a candidate, unless otherwise allowed by the Schedules, must satisfy the requirements of Clauses 2 and 3 below.

2. A candidate shall pass subjects to the value of at least 52 points from those listed in Schedule III which shall include:
(a) Level I subjects to the value of not more than 24 points.
(b) Level III subjects to the value of not less than 12 points.
(c) A major in a Science discipline as set out in Clause 6 of Schedule I.

3. (a) A candidate shall present the two Law subjects 1826 Australian Legal System and 3731 Contract.
(b) A candidate shall present Law subjects with an aggregate points value of at least 12 points chosen from the following:

8433 Constitutional Law	6	9844 Conservation and Heritage Law	3
9365 Torts	6	7730 Land-Use Planning Law	3
8580 Criminal Law	6	4771 Media Law	3
8821 Property	6	7522 Criminal Investigation	3
7272 Environmental Planning and Protection Law	3	1901 Criminology	3

4. Credit towards the degree of Bachelor of Science (Jurisprudence) on account of previous studies in Law will be determined by the Faculty of Science in accordance with Faculty policy, subject to the requirement of these Schedules and to the following provisions:
(a) Law subjects presented for Clause 3(a) will count as 8 points at Level II, and
(b) Law subjects presented for Clause 3(b) will count as 12 points at Level III.

5. Credit towards the degree of Bachelor of Science (Jurisprudence) on account of studies prior to 1989 in subjects presented for Clauses 2(a) and 2(b) of these Schedules will be determined in accordance with Clause 8 of Schedule I.

6. Persons who have completed other qualifications, and graduates in other Faculties who wish to proceed to the degree of Bachelor of Science (Jurisprudence) and to count towards that degree appropriate subjects which they have already presented for another qualification may do so subject to the following conditions:
(a) They shall present a range of subjects which fulfils the requirements of Clause 2 and 3 above;
(b) They shall present subjects, satisfying the level three subject and the major in a science discipline requirements of Clauses 2(b) and 2(c) which have not been presented for any other degree and which, in the opinion of the Faculty, do not contain a substantial amount of the same material as subjects which have been presented for any other degree.

7. No candidate will be permitted to count for the degree any subject together with any other subject which, in the opinion of the Faculty, contains a substantial amount of the same material; and no subject may be counted twice towards the degree.

8. There may be a pass classification of "Conceded Pass" for a Level II or III subject of not more than 3 points but a candidate may only present subjects for which this result has been obtained up to a value of 3 points.

9. When in the opinion of the Faculty, special circumstances exist, the Council, on the recommendation of the Faculty in each case, may vary the provisions of Clauses 1-8 above.

NOTES (Not forming part of the Schedules [B.Sc.(Jur.)])
1. The B.Sc. (Jurisprudence) is designed to serve two purposes:
(a) it allows students to incorporate in a Science degree a range of law studies including subjects at third year level;
(b) it is the route for students to take if they wish to obtain Science and Law degrees in a minimum time of five years (with some overload).

2. Students who have successfully completed 24 points at Level I of the B.Sc. degree may be eligible for admission to Law Studies; applications for admission to Law Studies may be made through S.A.T.A.C. by mid-October of the year during which they complete their Level I subjects. If admitted to Law Studies, students will be able to present some Law subjects towards their B.Sc.(Jur.). Except with the permission of the Dean of the Faculty of Law or a nominee, 1826 Australian Legal System must be undertaken concurrently with the Law subject 3731 Contract. These two subjects are pre-requisites for each of the subjects listed in Clause 3(b) above. Students remain enrolled for the B.Sc. degree while taking these subjects. Students must complete all the requirements for the B.Sc.(Jur.) before they can obtain their LL.B. degree.

3. For students wishing to take the Degree of Bachelor of Science (Jurisprudence), the change of enrolment from Bachelor of Science to Bachelor of Science (Jurisprudence) normally takes place in the year following completion of the subjects 1826 Australian Legal System and 3731 Contract. No special application is needed, but students are required to

have the transfer of enrolment endorsed on their enrolment form by a Course Adviser for the Faculty of Science and by the Course Adviser for the Faculty of Law.

4. *Pattern of Study*

Full-time students will normally take their subjects according to the following scheme, which involves some overload in second year and possibly in third year.

First year

Level I subjects to the value of 24 points, from those listed in Schedule III.

Second year

Level II subjects to the value of 16 points from those listed in Schedule III *plus* 1826 Australian Legal System and 3731 Contract.

Third year

Level III subjects to the value of 12 points from those listed in Schedule III including a major in a Science discipline *plus* Law subjects to the value of 12 points from those listed in clause 3(b) above with the advice of the Law Course Adviser.

5. *Advice from the Faculty of Law*

Before enrolment in the Law subjects in the third year of the above scheme, students should consult the Law Course Adviser. This is particularly important for students who wish to proceed to the LL.B. degree. Although Law subjects in the third year as above to the value of 12 points are sufficient for the purposes of the degree of B.Sc. (Jurisprudence), completion of the LL.B. degree in minimum time involves some additional overload in the third year.

6. *Credit on account of previous studies in the University of Adelaide* (Policy of the Faculty of Science)

(a) Candidates who hold an LL.B. degree and hold no other degree will be given status for Clause 3 of this Schedule.

(b) Candidates who hold an LL.B. degree and also hold a degree in a Faculty other than Law will be given status for Clause 3 of this Schedule and may, in addition, be granted credit for the purposes of Clause 2 on account of appropriate studies for the non-Law degree. Such candidates will be required as a minimum to complete Level III subjects from Schedule III to the value of 12 points including a major in a Science discipline.

(c) Candidates may also be granted credit towards the degree of B.Sc. (Jurisprudence) on account of studies not presented for a degree.

7. *Credit on account of Law subjects passed prior to 1987* (Policy of the Faculty of Science).

(a) Candidates who have completed their LL.B. shall be granted credit in 8 points at Level II and 12 points at Level III;

(b) Candidates who have not completed their LL.B. shall be granted credit towards the B.Sc.(Jur.) as follows:

(i) candidates who have passed Elements of Law and Constitutional Law I shall be deemed to have passed Australian Legal System and be granted 4 points at Level II;

(ii) candidates who have passed Contract for the LL.B. shall be deemed to have passed Contract for the B.Sc.(Jur.) and be granted 4 points at Level II;

(iii) credit to the value of a maximum of 12 points at Level III for the Law subjects listed in Clause 3(b) of Schedule II of the B.Sc.(Jur.) shall be granted in equivalent Law subjects passed prior to 1987 with the points value of those Law subjects being determined by the value attributed to them in the current LL.B. schedules (Schedule I, Clause I(b)(ii) and Clause 6).

8. *Credit on account of studies in other Institutions* (Policy of the Faculty of Science).

With special permission of the Faculty, candidates may be permitted to take equivalent subjects at another institution for credit to the Adelaide degree of B.Sc. (Jurisprudence). Candidates may also be granted credit towards the Adelaide degree on account of work already completed at another institution but not presented for another degree or award. The minimum requirements for such candidates is that all Level III subjects required by Clauses 2 and 3 of Schedule II (that is, Level III Science subjects to the value of 12 points, and the Law subjects indicated in Clause 3(b) to the value of 12 points) should have been taken at the University of Adelaide. Approval of credit as above for the purposes of the degree of B.Sc. (Jurisprudence) does not imply acceptability for the later purposes of the

LL.B. degree, and candidates wishing to proceed to the LL.B. degree should therefore consult the Law Course Adviser.

SCHEDULE III: SUBJECTS OF STUDY

Note: The points value of subjects is indicated after each subject title.

LEVEL I

SCIENCE SUBJECTS

Full year subjects

3174	Biology I	6	9864	Human Anatomy I	6
6878	Chemistry I	6	3643	Physics I	6
9615	General Physics I	6	5104	Psychology I	6
2136	Geology I	6			

Semester subjects

4145	Astronomy I	3	7940	Genetics and Evolution I	3
3821	Botany I	3	3482	Introduction to Physical Geography I	3
9624	Evolution, Dinosaurs and Greenhouse Earth I	3			

MATHEMATICAL AND COMPUTER SCIENCES SUBJECTS

3617	Mathematics IM*	6	4357	Mathematics IH*	3

All Level I Mathematical and Computer Sciences subjects listed under Schedule II of the degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences.

LEVEL II

SCIENCE SUBJECTS

Full year subjects

1404	Biochemistry II	8	3204	Physical and Inorganic Chemistry II	8
3673	Botany II	8	2653	Physics II	8
6106	Chemistry II#	8	3773	Physiology II	8
9653	Chemistry IIE	8	3149	Psychology II	8
4863	Genetics II	8	3472	Zoology II	8
1893	Organic Chemistry II	8			

Semester Subjects

9835	Australian Landscape Evolution IIS***	4	1443	Environmental Geology II	4
9473	Cells and Tissues II	4	2559	Geophysics and Geodynamic Geology II	4
6725	Chemical Geology II	4	1995	Historical Geology and Palaeobiology II	4
9600	Classical Fields and Mathematical Methods II	2	6326	Immunology and Virology II	4
2656	Classical Mechanics II	2	6051	Introductory Quantum Mechanics and Applications II	2
9828	Comparative Morphology II	4	9195	Microbiology II	4
7404	Data Processing in the Geological Sciences II	4	8159	Structural Geomorphology IIS**	4
3418	Electromagnetism and Relativity II	2			

* For syllabus details see under B.Sc. degree in the Faculty of Mathematical and Computer Sciences.

** Available in even years only.

*** Available in odd years only.

Not offered in 1992.

MATHEMATICAL SCIENCES SUBJECTS

1016 Differential Equations and Fourier Series E*	2
4569 Laplace Transforms and Probability and Statistical Methods*	2
1642 Linear Programming and Numerical Analysis*	2
2187 Vector Analysis and Complex Analysis*	2

All Level II Mathematical and Computer Sciences subjects listed under Schedule II of the degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences.

LEVEL III

SCIENCE SUBJECTS

Anatomy & Histology

6900	Comparative Reproductive Biology of Mammals	3	
9646	Head and Neck and Neuroanatomy	6	
9932	Neuroanatomy and Neuroendocrinology	3	
5045	Special Sense Organs		3
7997	Topics and Techniques in Cytology		3

Biochemistry

2529	Basic Biotechnology	2	
9510	Biochemistry of Control of Gene Expression	2	
3090	Molecular Biology of the Cell	2	
2123	Molecular Biology of the Gene	2	
4762	Protein Structure and Function	2	
2893	Recombinant DNA Technology: Practice		1
6927	Recombinant DNA Technology: Theory		1
5317	Research Topics in Biochemistry		2

Botany

7839	Aquatic Plant Biology	3	
6836	Biochemistry of Plants	2	
6327	Ecosystem Modelling for Environmental Biologists	2	
8515	Plant Nutrition	2	
8318	Rangelands Ecology		3
2819	Seminars in Environmental Biology		1
3488	The Evolution of the Australian Flora		3

Clinical & Experimental Pharmacology

1730	Principles of Pharmacology and Toxicology	6
4574	Systematic Pharmacology	6

Crop Protection

8987	Biology of Insects (Science)	3	
9718	Ecological Biochemistry (Science)	3	
3310	Insect Behaviour (Science)***	3	
8931	Mycology (Science)**		3
6865	Population Ecology of Insects (Science)**		3

* For syllabus details see under B.E. degree in the Faculty of Engineering.

** Available in even years only.

*** Available in odd years only.

Genetics

5482 Cellular & Molecular Genetics of Mammals: Practice 1
8615 Cellular & Molecular Genetics of Mammals: Theory 1
8723 Cytogenetics 2
3077 Immunogenetics 2
7206 Nuclear/Extranuclear Genetic Compartments 2
2800 Quantitative, Population and Evolutionary Genetics 2
5112 Regulation of Gene Expression: Practice 1
2835 Regulation of Gene Expression: Theory 1

Geology & Geophysics

7242 Australian Landscape Evolution IIIS# 3
9709 Geochemistry, Geochronology, Mineralogy, Diagenesis 3
4332 Igneous and Metamorphic Petrology 3
7015 Magmatic and Hydrothermal Ore Deposits 3
5043 Palaeontology and Macroevolution 3
4016 Petroleum Geochemistry and Sedimentology 3
7072 Remote Sensing (S) 3
8037 Stratigraphy and General Palaeontology 3
1293 Structural Geology and Exploration Geophysics 3
6722 Structural Geomorphology IIIS 3
1037 Supergene Ore Deposits and Geostatistics 3
1789 Tectonics and Geological Mapping 3
9769 Theoretical Geophysics 3

Microbiology & Immunology

9371 Advanced Immunology 3
7335 Advanced Microbiology 3
9570 Host Responses to Infection 3
7546 Mechanisms of Infection 3
2647 Perspectives in Microbiology and Immunology 1

Organic Chemistry

1115 Heterocyclic Chemistry and Natural Products 3
4265 Mechanism and Synthesis A 3
6009 Mechanism and Synthesis B 3
5084 Spectroscopy and Physical Organic Chemistry 3

Physical & Inorganic Chemistry

6386 Metal Complexes and Analytical Chemistry 3
8090 Organometallics and Inorganic Reaction Mechanisms 3
8934 Physical Chemistry 6

Physics and Mathematical Physics

7099 Advanced Dynamics 2
1067 Advanced Quantum Mechanics 2
6852 Astrophysics 2
1982 Atmospheric and Environmental Physics 2
2396 Atomic and Nuclear Physics 2
6849 Electromagnetism 2
2838 Experimental Physics & Electronics 4
9116 Laboratory Physics 2
4324 Mathematical Methods 2
1384 Optics 2
4964 Quantum Mechanics 2
7633 Relativity and Classical Field Theory 2
4736 Solid State Physics 2
5547 Statistical Mechanics 2

Physiology

2984 Cellular Physiology 3
7288 Exercise Physiology 3
3737 Integrated Human Physiology# 3
8546 Neurobiology 3

Not offered in 1992.

Psychology

8267	Animal Behaviour III	2
2196	Environmental Psychology III	2
1131	Human Decision Processes III	2
7196	Intelligence III	2
8779	Metapsychology III	2
4770	Neuroscience in Psychology III	2
3170	Psychological Research Methodology III	4
9703	Psychology of Motivation III	2
8659	Social Psychology III	2
7324	Studies in Personality III	2
5673	The Philosophy and Psychology of Consciousness III	2

Soil Science

2330	Pedology III	3
4777	Soil Biology and Biochemistry (Sc.)	3

Zoology

5224	Comparative and Environmental Physiology	3
5464	Evolution, Systematics and Biogeography	3
8896	Freshwater Ecology	3
9035	Marine Ecology	3
1427	Research Methods in Zoology	3

MATHEMATICAL AND COMPUTER SCIENCES SUBJECTS

All Level III Mathematical and Computer Sciences subjects listed under Schedule II of the degree of Bachelor of Science in the Faculty of Mathematical and Computer Sciences, excluding those listed above.

SCHEDULE IV: THE HONOURS DEGREE

1. A candidate may, subject to approval by the Head of the department concerned, proceed to the Honours degree in one of the following subjects:

1739	Honours Anatomy and Histology	5844	Honours Petroleum Geology and Geophysics
6777	Honours Biochemistry	3950	Honours Pharmacology
4392	Honours Botany	3845	Honours Physical and Inorganic Chemistry
7530	Honours Environmental Biology	1285	Honours Physics
7599	Honours Genetics	6740	Honours Physiology
5280	Honours Geology	4702	Honours Psychology
5483	Honours Geophysics	4873	Honours Rangeland Science and Management (S)
4408	Honours Microbiology and Immunology	5417	Honours Zoology
5724	Honours Mathematical Physics		
1343	Honours Organic Chemistry		

2. A candidate may, subject to the approval of the Faculty in each case, proceed to the Honours degree in a subject taught in a department in another faculty. Such candidates must consult the Head of the department concerned and apply, in writing, to the Registrar before 30 November in the preceding year for admission to the Honours course.

3. A candidate for the Honours degree in any subject shall not begin final-year Honours work in that subject until he or she has qualified for the Ordinary degree of Bachelor of Science in either the Faculty of Science or the Faculty of Mathematical and Computer Sciences or the Ordinary degree of Bachelor of Science (Jurisprudence), or has qualified for a degree regarded by the Faculty of Science as equivalent, and has completed such pre-requisite subjects (if any) as may be prescribed in the syllabus.

4. The work of the Honours course must be completed in one year of full-time study,

provided that, on the recommendation of the Head of Department of Psychology, the Faculty may permit a candidate to complete the work for the Honours degree in Psychology over two years, but no more, under such conditions as it may determine.

5. When, in the opinion of the Faculty of Science, special circumstances exist, the Council, on the recommendation of the Faculty in each case, may vary the provisions of clauses 1 to 4 above.

DEGREE OF

BACHELOR OF SCIENCE

IN THE FACULTY OF SCIENCE

SYLLABUSES

PREREQUISITE SUBJECT REQUIREMENTS:

Regulation 4(a) of the degree of Bachelor of Science sets out the requirement that a student may not undertake a subject for which the prerequisite subject requirements have not been satisfied. Although the Faculty of Science is reluctant to waive the prerequisite requirements of a subject it is recognized that there can be situations where it is appropriate. Accordingly if a student has sound academic reasons for a waiver of the requirement he or she should apply to the Faculty of Science through the Head of the Department which offers the subject concerned.

Text-books:

The lists of the text-books were correct at the time that this Volume went to press. It is possible however that amendments to these lists will be made before the start of lectures; and, if so, students attending classes will be notified appropriately by the lecturer concerned.

In general, students are expected to have their own copies of text-books; but they are advised to await advice from the lecturer concerned before buying any particular book. Only the prescribed edition of any text-book should be bought.

Reference books:

Although lists of books and journals for reference purposes are regarded as important, details have not been included in this Volume. These will however be issued from time to time by the departments concerned. It is hoped that all books and journals set for reference will be available to be consulted in the Barr Smith Library.

Examinations:

For each subject students may obtain from the department concerned details of the examination in that subject including the relative weights given to the components (e.g. such of the following as are relevant: assessments, semester tests, essays or other written or practical work, final written examinations, *viva voce* examinations).

ANATOMY AND HISTOLOGY

Anatomy is the study of biological structure ranging from the naked-eye level (gross anatomy) to the microscopic details of the tissues (histology) and cells (cytology) of an organism. It also includes development of the mature form (embryology). In these subjects the main emphasis is on human anatomy, but comparisons with other vertebrates, especially mammals, are made in some areas.

9864 Human Anatomy I is intended for those who require a detailed knowledge of gross

anatomy from their degree. Students wanting only a more general anatomical coverage than provided in 9864 Human Anatomy I proceed to the Level II single semester subjects 9473 Cells and Tissues II and 9828 Comparative Morphology II from a Level I background of Biology. These subjects also provide complementary extension of coverage for those who have undertaken 9864 Human Anatomy I. At Level III four single semester subjects are offered as well as the full-year subject 9646 Head and Neck and Neuroanatomy for those who want to complete the detailed gross anatomy coverage commenced in 9864 Human Anatomy I.

No prior biological knowledge is necessary for 9864 Human Anatomy I. 3174 Biology I must be taken by students wishing to do Anatomy subjects at Level II. Suitable complementary subjects are 6878 Chemistry I, 9615 General Physics I, 7940 Genetics and Evolution I, 5104 Psychology I, 3773 Physiology II, 1404 Biochemistry II, 9195 Microbiology II and 6326 Immunology and Virology II, 3472 Zoology II and Level III subjects in Physiology and Pharmacology.

9864 Human Anatomy I and 9646 Head and Neck and Neuroanatomy, have some teaching sessions in common with University of South Australia students. Classes and examinations may be held at times consistent with the University of South Australia academic calendar rather than that of the University of Adelaide.

LEVEL I

9864 Human Anatomy I

Level: 1.

Points value: 6.

Duration: Full year.

Pre-requisites: None.

Quota: Selection based largely on academic merit.

Contact hours: 3 lectures (4 for part of Semester I) and 3 hours of practical work a week.

Content: Introductory Anatomy: 9 lectures early in the year dealing with the general anatomy of the musculoskeletal, nervous and vascular systems.

Gross Anatomy: 2 lectures per week on the gross anatomy of the limbs and trunk, given throughout the year. Functional aspects of anatomy are emphasised. 3 hours of practical work a week includes dissection of the limbs and trunk. Tutorial-demonstrations are held in conjunction with dissections. Prosected specimens of some regions are used as demonstration material and for self-directed learning.

Embryology: A course of about 21 lectures on embryology, including general embryology and the organogenesis of the systems covered in the gross anatomy section.

Assessment: End of semester examinations.

Text-books: Gross Anatomy: Moore, K. L. *Clinically oriented anatomy* 2nd edn. (Williams and Wilkins) *or* Snell, R. S. *Clinical anatomy for medical students* 2nd edn. (Little, Brown and Co.); Romanes, G. J., *Cunningham's manual of practical anatomy* vols. 1 & 2, 15th edn. (Oxford).

Embryology: Langman, J., *Medical embryology* 5th edn. (Williams and Wilkins) *or* Moore, K. L. *The developing human* 4th edn. (Saunders).

LEVEL II

9473 Cells and Tissues II

Level: II.

Points value: 4.

Duration: Semester I.

Pre-requisites: 3174 Biology I (Div. I) or an acceptable equivalent.

Assumed knowledge: 6878 Chemistry I.

Contact hours: 3 lectures and 6 hours of tutorial/practical work a week.

Content: This course considers structure and function of cells and tissues of the mammalian body. The initial part of the subject concentrates on the ultrastructural characteristics of organelles in a typical mammalian cell. Subsequently cellular organization in various tissues and organ systems is presented, stressing how these relate to function. The arrangement of the various cell populations, their specializations in shape and form, together with secretory products and extracellular materials are all presented. Much of the material is based on structures in the human, but that from other mammalian species is also considered.

Practicals illustrate the material covered in lectures. Students will become familiar with the structure of the various tissues and organ systems of the body using prepared histological slides. In addition students are exposed to various histochemical techniques and different types of microscopy including scanning and transmission electron microscopy. A practical manual, which provides guidelines and problem-solving exercises, is supplied to each student at the beginning of the course. Concepts are reinforced by demonstration material and in weekly tutorial sessions.

Assessment: Tutorials, short test during semester, a histochemical assignment, and a major theoretical and practical final examination.

Text-books: Junquiera et. al. *Basic histology* 6th edn. Recommended histology atlas, *either* Wheater et al. Functional histology 2nd edn. *or* Gartner and Hiatt, Colour atlas of histology.

9828 Comparative Morphology II

Level: II.

Points value: 4.

Duration: Semester II.

Pre-requisites: 3174 Biology I (Div. I) or an acceptable equivalent.

Contact hours: 3 lectures and 6 hours of tutorial/practical work.

Content: This subject deals particularly with the gross functional anatomy of the mammalian body, including that of the human and other primates. Emphasis is given to comparisons with submammalian vertebrates, especially where this is helpful in the understanding of evolution of mammalian features. Principles and mechanisms of evolution are also considered. Practical classes involve dissection and study of a variety of vertebrate material, and include tours to the Zoological Gardens, the South Australian Museum and museums in the Departments of Anatomy and Zoology.

The nervous and reproductive systems are treated fairly superficially as they are dealt with in depth in Third Year anatomy subjects.

Assessment: End of semester examination which includes practical work.

Text-book: Kent, G. C., *Comparative anatomy of the vertebrates* (Times Mirror/Mosby).

LEVEL III

6900 Comparative Reproductive Biology of Mammals

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 9473 Cells and Tissues II (Div. I) or an acceptable equivalent.

Contact hours: 2 lectures and 5 hours of tutorial/practical work a week.

Content: This subject covers a comparative study of mammalian reproductive biological processes with emphasis on the diversity and evolution of various reproductive mechanisms in the three major groups of mammals (monotremes, marsupials and eutherians). The first few lectures cover the development of the gonads, gonadal ducts, and external genitalia together with the associated changes that occur with the evolution of oviparity and viviparity. Subsequently the functional morphology, and dynamics of production, of the male and female gametes is considered together with changes that occur in the spermatozoa during transit of the excurrent ducts. The cell biology of fertilization and early embryonic development is then given, followed by the macro-morphological and cellular processes of implantation and placentation in various mammalian groups. Some consideration of the maternal adaptive changes during pregnancy, together with the processes of parturition and lactation in mammals, are then presented. Finally the biological principles underlying the contraceptive technology in the human species are covered.

Practicals include study of gametes, gonads, gonadal ducts, and external genitalia in the major vertebrate groups using a range of macroscopic and microscopic techniques. A morphological examination of early embryos from both marsupials and eutherians, and the macro- and microstructure of various placental types is also undertaken. Students will gain experience in a variety of light and electron microscopic procedures.

Assessment: End of semester examination and seminar.

Text-books: Johnson, M. H. and Everitt, B. J., *Essential reproduction* 3rd edn. (1988); Austin, C. R. and Short, R. V., *Reproduction in mammals* 2nd edn. Vol. I and II (1982).

9646 Head and Neck and Neuroanatomy

Level: III.

Points value: 6.

Duration: Full year.

Pre-requisites: 9864 Human Anatomy I or an acceptable equivalent.

Contact hours: 2 lectures and 2 hours of tutorial/practical work a week, plus essay/project work.

Content: The major part of the subject deals with the regional gross anatomy of the head, neck and vertebral region, and the functional anatomy of the central nervous system. Additionally students undertake in-depth study of three special topics, involving reading, practical work and essays, in the areas of comparative anatomy of the skull and of the central nervous system, and functional anatomy of the vertebral column.

Assessment: End of semester examinations, and essays.

Text-books: Moore, K. L., *Clinically oriented anatomy* 2nd ed. (Williams and Wilkins) *or* Snell, R. S. *Clinical anatomy for medical students* 2nd edn. (Little Brown and Co.); Cunningham, D. J. *Manual of practical anatomy* 15th edn. vol. 3 (O.U.P.) and Noback, C. R., Strominger, N. L., and Demarest, R. J., *The nervous system: introduction and review* 4th edn. (McGraw-Hill); *or* Gilman, S., and Winans, S. S., *Essentials of clinical neuroanatomy and neurophysiology* 6th edn. (F. A. Davis Coy).

9932 Neuroanatomy and Neuroendocrinology

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 9473 Cells and Tissues II (Div. I) or an acceptable equivalent.

Contact hours: 2 lectures and 3 hours of tutorial/practical work a week, plus essay/project work.

Content: This subject deals with the structure and development of the human central

nervous system, with emphasis on particular aspects of special functional and clinical importance. The neuroanatomy component focuses on the main functional subdivisions of the nervous system (e.g. proprioception, pain, limbic system, visual and auditory mechanisms), while neuroendocrinology examines the hypothalamic and related regions of the brain and their role in endocrine regulation. A separate project is also included involving study of comparative morphology and evolution of the central nervous system in vertebrates. Practical classes include dissection and study of human and other vertebrate brains, study of sections and of selected microscopic preparations.

Assessment: End of semester examination.

Text-books: Noback, C. R., Strominger, N. L., and Demarest, R. J., *The nervous system: introduction and review* 4th edn. (McGraw-Hill); or Gilman, S., and Winans, S. S., *Essentials of clinical neuroanatomy and neurophysiology* 6th edn. (F. A. Davis Coy).

5045 Special Sense Organs

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 9473 Cells and Tissues II (Div. I) or an acceptable equivalent.

Contact hours: 2 lectures and 5 hours of tutorial/practical work a week.

Content: This subject presents a comparative study of the structure and function of organs of special sense of invertebrates and vertebrates, including man. The segment on eyes and vision considers the nature of the stimulus in different environments and the strategies developed by animals for its perception. Extraretinal photoreception, including the pineal complex, and infrared sensitivity are studied. Mechanoreception, and orientation and communication by sound are considered with special reference to the ears of aquatic and terrestrial animals. Invertebrate chemoreceptors and the olfactory and vomeronasal systems of vertebrates are studied.

Practicals include minor experimental projects which are undertaken in small groups to provide experience in scientific method.

Assessment: Practical work 10%, project report 20%, seminar 10% and final written examination 60%.

Text-books: No textbook is required, but suitable reading material will be provided during the course.

7997 Topics and Techniques in Cytology

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 9473 Cells and Tissues II (Div. I) or an acceptable equivalent.

Contact hours: 2 lectures and 5 hours of tutorial/practical work a week.

Content: This subject presents a wide coverage of the techniques used in morphological studies of cells, including various methods of light and electron microscopy, tissue preparation and histochemistry, tissue culture, and stereology. Principles, theory and application are emphasized rather than acquisition of technical expertise. A number of special topics in cytology are studied and used as practical examples of the application of some of the techniques presented.

Assessment: End of semester examination and students' practical notebook also taken into account.

Text-books: No textbooks, references given to relevant reading.

HONOURS LEVEL

1739 Honours Anatomy and Histology

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisite: A major in Anatomy and Histology at a standard satisfactory to the Department. Students who have taken other Biological majors may also be considered.

Requirements: An intending candidate should consult the Head of the Department of Anatomy and Histology near the end of the year preceding the Honours year, and give full attendance for an academic year to a special course of study and participate in laboratory research work under the supervision of Staff members of the Department. A course of reading, suggested by the Department of Anatomy and Histology, should be commenced during the long vacation prior to the Honours year.

ANIMAL SCIENCES

HONOURS LEVEL

2737 Honours Animal Sciences (B.Sc.)

This subject is available under the provisions of Clause 2 of Schedule IV: The Honours Degree of the degree of Bachelor of Science.

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: A credit or higher standard pass in appropriate Level III subjects offered by a Science Department.

Requirements: A candidate will be required to pass such examinations on the chosen subject of study as may be prescribed by the Head of Department, and to submit a thesis reporting research work undertaken during the year under the supervision of one or more members of academic staff.

A candidate may also be required to attend lectures and pass examinations in related subjects.

Intending candidates should consult the Head of the Department and potential supervisors before 30 November in the final year of studies for the Ordinary degree of Bachelor of Science and should be prepared to begin studies in the Department on or about 1 February.

BIOCHEMISTRY

Biochemistry is the study of the molecular structure and chemical processes of living things, from micro-organisms to the cells and tissues of animals and plants.

A Level II subject is offered in general metabolic biochemistry and molecular biology. In Level III subjects there is an emphasis on molecular biology of gene action, on the molecular biology of animal development and on the application of the principles of molecular biology in biotechnology — the major research interests of the Department.

In order to major in Biochemistry it is necessary to complete Level III subjects to the value of at least 9 points which include 6927 Recombinant DNA Technology: Theory, 2893 Recombinant DNA Technology: Practice, 5317 Research Topics in Biochemistry.

In order to major in Biotechnology it is necessary to complete Level III subjects to the value of at least 9 points including the following: 2123 Molecular Biology of the Gene; 6927 Recombinant DNA Technology: Theory; 2893 Recombinant DNA Technology: Practice; 4762 Protein Structure and Function; 2529 Basic Biotechnology; 9510 Biochemistry of Control of Gene Expression.

Several other disciplines are complimentary to the Biochemistry subjects at Levels II and III and include the Chemistry subjects, Microbiology and Genetics.

LEVEL II

1404 Biochemistry II.

Level: II.

Points value: 8.

Duration: Full year.

Pre-requisites: 6878 Chemistry I (Div. I) or an acceptable equivalent (students wishing to apply for a waiver must make a request in writing to the Head of Department).

Contact hours: 3 lectures, and 6 hours of practical and tutorial work a week.

Content: Introduction to protein structure and function, mechanism of enzyme action, specialized proteins and their functions, biological membranes, generation and storage of metabolic energy, biosynthesis of macromolecular presursors, integration of metabolism. Systems and methods of molecular biology, genetic analysis in molecular biology, nucleic acids, DNA structures, DNA replication, recombination, mutation and repair, transcription, translation, genetic code, regulation of protein synthesis and gene function in bacteria and their viruses, recombinant DNA technology.

Assessment: 3 hour written examination on lecture material at the end of each semester 70%; practical component and tutorial material 30%.

Text-books: Stryer, L., *Biochemistry* 3rd edn (Freeman) and an additional text to be advised.

LEVEL III

2529 Basic Biotechnology

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 1404 Biochemistry II (Division I) or acceptable equivalent; 2893 Recombinant DNA Technology: Practice; 6927 Recombinant DNA Technology: Theory; 2123 Molecular

Biology of the Gene; 4762 Protein Structure and Function; 9195 Microbiology II and 6326 Immunology and Virology II or by arrangement with the Head of Department.

Co-requisite: 9510 Biochemistry of Control of Gene Expression.

Contact hours: 1 lecture per week and 6 tutorials per Semester. Full week workshop in mid-semester break.

Content: Advanced lectures and tutorials on application of gene technology to biotechnology including industrial, medical, commercial and legal issues. Tutorials involve site visits to selected biotechnology establishments and preparation of reports on specific application of gene technology principles for practical purposes. Laboratory work will illustrate applied gene technology.

Assessment: 3-hour written examination on lectures, tutorials and practical work.

9510 Biochemistry of Control of Gene Expression

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 1404 Biochemistry II (Division I) or an acceptable equivalent.

Contact hours: 2 lectures and 1 tutorial a week.

Content: A course on the eukaryotic genome, the structure of chromosomes and chromatin, regulation of eukaryotic gene expression and its role in the control of embryogenesis.

Assessment: 3 hour written examination on lecture and tutorial materials.

Text-book: To be advised.

3090 Molecular Biology of the Cell

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisite: 1404 Biochemistry II (Division 1) or acceptable equivalent.

Assumed knowledge: 4762 Protein Structure and Function.

Contact hours: 2 lectures and 1 tutorial a week.

Content: A course on cell structure and function covering molecular aspects of cell adhesion, the cell cycle, and signal transduction in development and cancer.

Assessment: 3-hour written examination on lecture and tutorial material.

Text-book: To be advised.

2123 Molecular Biology of the Gene

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 1404 Biochemistry II (Division I) or an acceptable equivalent.

Contact hours: 2 lectures and 1 tutorial a week.

Content: A course on the mechanism of DNA replication, control of its initiation and termination, transcription and translation update, regulatory strategies in prokaryotic gene expression, the yeast cell as *E. coli* of the eukaryotic world.

Assessment: 3 hour written examination on lecture and tutorial material.

Text-book: To be advised.

4762 Protein Structure and Function

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 1404 Biochemistry II (Division I) or an acceptable equivalent.

Contact hours: 2 lectures and 1 tutorial a week.

Content: A course on protein structure and function: primary structure analysis, protein folding, approaches to secondary, tertiary and quaternary structure determination; the relationships of structure to function in catalysis, in immune and structural roles and in endocrine regulation of growth and development, the cytoskeleton and molecular motors.

Assessment: 3 hour written examination on lecture and tutorial material.

Text-book: To be advised.

2893 Recombinant DNA Technology: Practice

Level: III.

Points value: 1.

Duration: Semester I.

Pre-requisites: 1404 Biochemistry II (Division I) or an acceptable equivalent.

Co-requisites: 6927 Recombinant DNA Technology: Theory

Contact hours: 4 hours of practical work a week.

Content: A laboratory course introducing the basic techniques of genetic engineering.

Assessment: Laboratory performance 50% and a written report 50%.

Text-books: To be advised.

6927 Recombinant DNA Technology: Theory

Level: III.

Points value: 1.

Duration: Semester I.

Pre-requisites: 1404 Biochemistry II (Division I) or an acceptable equivalent.

Contact hours: 1 lecture a week and 6 tutorials.

Content: An introduction to genetic engineering covering theory behind the basic techniques of gene manipulation for both prokaryotes and eukaryotes.

Assessment: 1½ hour written examination on lecture and tutorial material.

Text-books: To be advised.

5317 Research Topics in Biochemistry

Level: III.

Points value: 2.

Duration: Semester II.

Assumed knowledge: 2123 Molecular Biology of the Gene; 9510 Biochemistry of Control of Gene Expression.

Pre-requisites: 4762 Protein Structure and Function; 2893 Recombinant DNA Technology: Practice; 6927 Recombinant DNA Technology: Theory.

Contact hours: Two 4 hour sessions of practical work a week.

Content: A laboratory course on research topics set by the departmental staff.

Assessment: Essay topic 30% and Laboratory assessment 70%.

HONOURS LEVEL

6777 Honours Biochemistry

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: Appropriate Level III subjects offered by the Department of Biochemistry at a standard satisfactory to the Department.

Requirements: Candidates are required to give their full time to a special course of study and experimental work in the Department of Biochemistry. Candidates will normally be expected to start the course on the first Monday of February, but this can be altered in special circumstances by arrangement with the Professor of Biochemistry.

The work includes participation in a series of lecture-symposia on topics of modern biochemistry; participation in research seminars, and the performance of research work under the supervision of one or more members of the Biochemistry Department staff. Early in the year the student will report on the aim, significance and approach of his research topic. During the course the candidate may present and defend an original proposition on science and submit the results of his research in the form of a thesis, which will also contain a literature review surrounding his research topic.

BOTANY

Botany, or Plant Science, is one of the core biological disciplines. It includes a wide range of studies from cell biology, biochemistry and genetics to the physiology, taxonomy and ecology of the great diversity of plant life in the sea, in fresh water and on land. Because plants, animals and micro-organisms interact in complex and subtle ways, the study of Botany has close links with other biological disciplines.

3174 Biology I is an integrated Level I subject offered jointly by the Departments of Botany and Zoology which forms the basis for a range of more specialized subjects at Level II. The Botany Department also offers a single semester subject, 3821 Botany I, which provides a more detailed introduction to plant science and extends some of the botanical topics introduced in 3174 Biology I. It is designed to be taken in conjunction with 3174 Biology I.

At Level III there are several single semester-length subjects which are closely related to the research interests of staff and may lead on to Honours or post-graduate study in Botany.

The logical sequence of study leading to a major in Botany is 3174 Biology I, 3673 Botany II and at least three Level III Botany subjects. 3821 Botany I, while not a pre-requisite for 3673 Botany II, is desirable. A combination of selected Level III Botany and Zoology subjects may also be taken to make up a major in Environmental Biology. For entry to the Botany Honours course a credit in Botany subjects at Level III is normally required. Environmental Biology Honours requires credit standard in subjects that can be presented for the major in Environmental Biology.

6878 Chemistry I is strongly recommended and 5543 Statistics I may be valuable. The combination 3821 Botany I plus 7940 Genetics and Evolution I allows exposure to a wider range of biological science at Level I for students intending to concentrate in this area. For

those particularly interested in field work and environmental studies, 2136 Geology I is a valuable complementary subject.

Field work is an important feature of botanical research, and excursions will be held either at weekends or in the mid-semester breaks.

LEVEL I

3174 Biology I

Level: I.

Points value: 6.

Duration: Full year.

Pre-requisites: None.

Contact hours: 3 lectures, 1 tutorial and 3 hours of practical work a week.

Content: The subject introduces the major fields of biology and is the major pre-requisite for further studies in the biological sciences. It does not assume previous biological knowledge. Topics include: cells structure and function; biochemical concepts — respiration, photosynthesis, enzymes, energy flow; membranes, DNA, RNA, protein synthesis; introductory genetics; plant biology, including germination, growth, transport systems; plant diversity and evolution; the structure and physiology of vertebrates; major invertebrate phyla; ecology; evolution including natural selection, the origin of species, human evolution.

Assessment: End of semester examinations; laboratory practical work and an essay.

Text-book: Curtis, H. and Barnes, N. S., *Biology*, 5th edn. (Worth).

3821 Botany I

Level: I.

Points value: 3.

Duration: Semester I.

Pre-requisites: None.

Contact hours: 2 lectures and 4 hours of practical work a week, plus 4 half days (or equivalent) of field work.

Content: There are three sections: (1) The diversity, evolutionary relationships and ecology of marine benthic algae, seagrasses and mangroves, including discussion of their economic importance and current problems such as coastal pollution, red tides and the loss of benthic habitat. (2) The diversity, evolutionary relationships, importance and ecology of the lower plants (fungi, lichen, mosses, ferns and conifers). (3) Terrestrial plants and their environments covering aspects of soils, plant nutrients, growth, responses to stimuli and issues relating to conservation and the greenhouse effect.

Three unifying themes are common to each section: (i) The interaction of plants with their environment. (ii) The diversity of the plant kingdom. (iii) Ecological principles and environmental issues in plant biology.

Assessment: Examination and practical work.

Text-book: Weier, T. E., Stocking, C. R., Barbour, M. G. and Rost, T. L. *Botany* 6th edn. (Wiley) or Curtis, H. and Barnes, N. S., *Biology*, 5th edn. (Worth).

LEVEL II

3673 Botany II

Level: II.

Points value: 8.

Duration: Full year.

Pre-requisites: 3174 Biology I (Div. I).

Assumed knowledge: 6878 Chemistry I.

Contact hours: 3 lectures and 6 hours of practical work a week plus 9 hours plant project and 5 or 6 day ecology camp.

Content: The subject deals mainly with the biology of flowering plants. The first semester covers Structure and Function. It begins with an examination of basic structure, leading on to an in-depth look at the functioning of these organisms, including plant biochemistry and physiology, plant nutrition, growth and development. Included in both sections will be practical introductions to the use of micro-computers in plant biology. The second semester covers Systematics and Ecology, in the context of the Australian environment. This includes the principles and practice of ecology and practical identification of the S.A. flora and is highlighted by a field camp to south-eastern S.A. in the mid second semester break. Also included is an introduction to general principles of taxonomy, including numerical methods, evolution and reproductive biology.

Assessment: Practical write-ups, quizzes, herbarium project and written examinations.

Text-books: Salisbury, F. B., and Ross, C. *Plant physiology* 3rd edn. (Wadsworth). *Ecology, Evolution and Taxonomy of the Angiosperms:* Textbook requirement/references will be given during the course.

LEVEL III

7839 Aquatic Plant Biology

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 3673 Botany II (Div. I).

Contact hours: 2 lectures and the equivalent of 5 hours of practical work a week including a 5-day field trip.

Content: The aim of this subject is to provide a theoretical and practical understanding of aquatic plant communities which can be used for the rational management of aquatic resources. The course draws examples from both marine and freshwater habitats, which include the phytoplankton, marine macro-algae, and the flora of wet-lands. Fieldwork is an essential part of the course, with excursions to coastal areas, wet-lands in the south-east, and an analysis of land use and water quality in the Adelaide Hills.

Assessment: Written examination 60% and practical reports 40%.

Text-books: Reynolds, C. S. *The ecology of freshwater phytoplankton* (C.U.P., 1984); Clayton, M. N. and King, R. J. (eds.), *Biology of marine plants* (Longman Cheshire, 1990).

6327 Ecosystem Modelling for Environmental Biologists

Level: III.

Points value: 2.

Duration: Summer Semester **(February).**

Pre-requisites: Botany II or Zoology II or Genetics II or a suitable background in mathematics or computing at the discretion of the Head of department.

Contact hours: 3 weeks intensive course including 16 lectures and 48 hours practical work during February.

Content: The course comprises a series of lectures, computing workshops and self study exercises covering the design and development of ecosystem models. These exercises will provide the student with a methodology for the development of their own models and discuss the ultimate relationship between models and the data upon which they are based. The course will involve a critical analysis of existing ecosystem models such as those for global carbon balance or primary productivity. Students will be required to develop a computer model using data from published sources. This development will involve library research to obtain appropriate data, the development of a working model and analysis of its robustness or sensitivity with respect to the underlying data and assumptions.

Assessment: Assessment will be based on examination (40%), a seminar (30%) and a written report (30%).

Text-books: To be advised.

8515 Plant Nutrition

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 3673 Botany II (Div. I).

Contact hours: 2 lectures and the equivalent of 5 hours of practical work per week for 8 weeks, possibly including fieldwork.

Content: The uptake of nutrients into plants and their movement within the plant will be studied, from molecular mechanisms to ecological consequences. Aspects of particular interest which will be investigated include the mechanism and energetics of trans-membrane transport in algae, fungi and higher plants; potential differences and action potentials; regulation of cytoplasmic pH and Ca^{2+}; uptake by intact roots and how this is influenced by soil micro-organisms, in particular mycorrhizal fungi; the redistribution of nutrients such as N within the plant; resistance mechanisms to drought and salinity.

Assessment: Examination and practical reports.

6836 Biochemistry of Plants

Level: III.

Points value: 2.

Duration: Semester II.

Assumed knowledge: 3673 Botany II (Div. I).

Contact hours: 2 hours of lectures and 5 hours of practical per week.

Content: The course will cover aspects of cellular biochemistry especially with respect to organelles (chloroplasts, mitochondria and microbodies); their interactions and biogenesis. Topics to be covered include carbohydrate and lipid metabolisms, respiration, photosynthesis, photorespiration, bio-energetics, organelle transport and molecular biology of organelle biogenesis.

Assessment: Examination and practical reports.

Text-books: Anderson, J. W. and Beadnall, J. *Molecular activities of plant cells* (Blackwells).

8318 Rangelands Ecology

Level: III.

Points value: 3.

Duration: Summer Semester **(January).**

Pre-requisites: 3673 Botany II (Div. I).

Contact hours: 12 days fieldwork and 2 weeks in Department during January.

Content: A subject in ecology emphasising the study of the interactions between grazing animals and vegetation in arid areas, the principles involved, and their application to management practices. The stock herbivore used for study purposes is the merino sheep, the feral herbivore the European rabbit, and the main vegetation-type chenopod shrubland with Acacia overstorey.

Assessment: 2½ hour written examination usually comprising 60% of the total mark. Practical is assessed by project reports.

Text-books: A specialized multiple-copy and general library is made available.

2819 Seminars in Environmental Biology

Level: III.

Points value: 1.

Duration: Semester I.

Pre-requisites: Botany II or Zoology II.

Contact hours: 3 hour seminar/tutorial a week.

Content: Each student will be asked to research a topic, prepare a seminar paper (3-5000 words), present the paper before the class, and lead/contribute to a following discussion. Some part of the overall assessment will relate also to the contributions to discussions made by individuals over the semester; the major component of assessment will be the seminar paper.

The topics for discussion will be chosen to integrate with other Environmental Biology subjects and to explore topics not covered by them. Possible topics include: Environmental impact assessment and policies. Applications of remote sensing in ecology, Value of research in resource management, Greenhouse Effect. The ozone layer, Problems in National Park management in S.A., The Gaia hypothesis, Endangered species etc.

Assessment: Seminar paper.

3488 The Evolution of the Australian Flora.

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 3673 Botany II (Div. I).

Contact hours: 2 lectures and 5 hours of practical work a week, plus 2 days of field work.

Content: Australia's unique position as the only continent to have a 40+ million year old macrofossil record of its rainforest flora provides the central theme for this course. In this context a combination of palaeo and extant ecological approaches are used to interpret the environmental aspects of the evolution of the Australian flora, while its diversity is considered using modern systematic approaches and by tracing the evolution of selected flowering plant families (e.g. Proteaceae). Topics additional to this central theme include advanced angiosperm reproductive biology and systematic studies of selected non-flowering plant groups. Practical work includes climatic interpretation of forest litter signatures, computer based plant identification, and plant photography using x-ray and ultra-violet techniques.

Assessment: Practical assignments and examination.

HONOURS LEVEL

4392 Honours Botany

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: A satisfactory, usually credit, standard in appropriate Botany Level III subjects to the value of 9 points offered by the Department or special permission of the Head of the Department.

Requirements: Candidates are expected to acquire a more detailed knowledge than is required for the Ordinary degree. They are required to give seminars and write essays. In addition, candidates are expected to study more deeply one branch of Botany, to carry out research in this field and to present the results in a written thesis. Approximately one fifth of the total course is flexible and candidates choose, with approval, between additional project work and courses.

Candidates should consult the Head of the Department and potential supervisors during the final year of the Ordinary degree course. The Honours course runs for 40 weeks, either from February to November or from August to June of the following year.

7530 Honours Environmental Biology

Syllabus: For syllabus see under Zoology in the Faculty of Science.

4873 Honours Rangeland Science and Management S

Level: Honours.

Duration: Full year.

Pre-requisites: A satisfactory, usually credit standard in appropriate Level III subjects to the value of 9 points including 8318 Rangelands Ecology, or special permission of the course co-ordinators.

Requirements: Candidates are expected to acquire a more detailed knowledge of rangeland science and management than is required for the Ordinary degree. Candidates are expected to study deeply in one branch of rangelands science and management. Candidates are required to carry out research in this field, to present the results in written thesis. Approximately two-fifths of the total course is flexible and candidates choose, with approval, between additional project work, essays, and course work.

Candidates should consult a Co-ordinator of the program and potential supervisors during the final year of the Ordinary degree course. The Honours course commences at the beginning of February, or at the beginning of second semester.

CHEMISTRY

Chemistry is a central science concerned with the preparation, properties and reactions of compounds, and is taught by the Departments of Physical and Inorganic Chemistry and Organic Chemistry.

6878 Chemistry I provides an introduction to the main branches of chemistry. The principal Level II subjects are 3204 Physical and Inorganic Chemistry II and 1893 Organic Chemistry

II. At Level III, the Chemistry Departments offer a range of more specialised subjects. Majors in either Organic Chemistry, Physical and Inorganic Chemistry or both, are possible.

Those intending to make a career in chemistry would expect to obtain a B.Sc. degree with a major in at least one of Organic Chemistry or Physical and Inorganic Chemistry, and often in both.

For students intending to major in other areas, specialised chemistry subjects are available: 9681 Chemistry IM (for the degree of M.B., B.S.); 9089 Organic Chemistry ID (for the degree of B.D.S.); 7422 Chemistry IHE (for Civil and Mechanical Engineering students, degree of B.E.); 9653 Chemistry IIE (a Level II subject for Chemical Engineering students, degree of B.E., and for Science students, degree of B.Sc.).

A number of subjects in the Faculty of Science are in some way complementary to a programme in chemistry. Useful Level I subjects are 3643 Physics I, 9786 Mathematics I, 3174 Biology I and 2136 Geology I. Useful Level II subjects are more dependent on a student's particular chemical interests.

LEVEL I

6878 Chemistry I

Level: I.

Points value: 6.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Year 12 Chemistry and Physics. Present experience shows that students who have not achieved a Tertiary Entrance (adjusted) score of at least 14 (formerly a scaled score of at least 70) in Year 12 Chemistry frequently have difficulty with this subject. Students who have achieved a Tertiary Entrance (adjusted) score of at least 14 (formerly a scaled score of at least 70) in Year 12 Physics and in *either* Mathematics IS *or* Mathematics I and II will be greatly advantaged.

Contact hours: 3 lectures, 1 tutorial and 3 hours of practical work a week.

Content: General Chemistry: Structure and bonding — thermochemistry, the gaseous state, molecular shapes, electronic theories for chemical bonding, and intermolecular forces. Physical Chemistry — phase changes, properties of solutions, chemical kinetics, chemical equilibrium, thermodynamics, and electrochemistry.

Inorganic Chemistry: the chemistry of the main group and first-row transition elements with reference to halides, oxides, hydrides, co-ordination complexes and simple organometallic compounds.

Organic Chemistry: an introduction to the properties, reactions (including mechanisms) and syntheses of representative organic compounds.

Assessment: End of semester examinations—a minimum standard in each is needed to achieve a Div. I pass. Laboratory work assessed during practical classes comprises 20% of the total marks for the subject.

Text-books: Brown, W. H., *Introduction to organic chemistry* 4th edn. (Wadsworth); Chang, R., *Chemistry* 4th edn. (McGraw-Hill).

LEVEL II

6106 Chemistry II

Availability: Not offered in 1992.

Level: II.

Points value: 8.

Duration: Full year.

Pre-requisites: 6878 Chemistry I (Div. I) or an acceptable equivalent.

Assumed knowledge: Level I Mathematics subject.

Contact hours: 3 lectures, 1 tutorial and 6 hours of practical work a week.

Content: The principles of organic, inorganic and physical chemistry; group transformations and synthetic methods in organic chemistry, application of spectroscopic techniques. Thermodynamics, spectroscopy, bonding, structure and reactions of inorganic compounds and chemical kinetics.

Assessment: End of semester examinations. Practical work contributes 20% to the final assessment and is evaluated during the laboratory sessions.

Text-books: Atkins, P. W., *Physical chemistry,* 4th edn. (Oxford).

9653 Chemistry IIE

Availability: For Chemical Engineering and B.Sc. (Faculty of Science) students only.

Level: II.

Points value: 8.

Duration: Full year.

Pre-requisites: 6878 Chemistry I (Div. I) or an acceptable equivalent.

Assumed knowledge: A basic mathematical proficiency such as would be gained from undertaking a Level I Mathematical Sciences subject.

Contact hours: 60 hours of lectures, 20 hours of tutorials and 108 hours of practical work in the Departments of Organic Chemistry and Physical and Inorganic Chemistry. 26 hours of lectures, 26 hours of tutorials and 36 hours of practice and project sessions in the Department of Chemical Engineering.

Content: Physical and Organic Chemistry (Semesters I and II). This component deals with thermodynamics, surface chemistry, chemical kinetics, physical organic chemistry, group transformations and synthetic methods in organic chemistry, application of spectroscopic techniques, and aspects of polymer chemistry and of catalysis.

Thermodynamics (Semester II). Topics in chemical engineering, thermodynamics: thermodynamics of real substances; heat, work and engines; refrigeration and liquefaction; process analysis; phase equilibria and multicomponent systems; equilibria in chemically reacting systems.

Assessment: End of semester examinations on lecture content. A component (20%) for the practical work continuously assessed will be included in the final assessment.

Text-books: Atkins, P. W., *Physical chemistry* 4th edn. (Oxford); McMurry, J. *Organic chemistry* 2nd edn. (Brooks/Cole); Smith, J. M. and Van Ness, H. C. *Introduction to chemical engineering and thermodynamics* 4th edn. (McGraw-Hill).

1893 Organic Chemistry II

Level: II.

Points value: 8.

Duration: Full year.

Pre-requisites: 6878 Chemistry I (Div. I) or an acceptable equivalent.

Contact hours: 3 lectures, 1 tutorial and 6 hours of practical work a week.

Content: An introduction to the physical and theoretical aspects of Organic Chemistry and of the synthesis, properties and reactions of compounds belonging to the major families of aliphatic and aromatic compounds.

Assessment: 2 semester examinations, 100 marks each, practical work (continuously assessed), 70 marks and tutorials (continuously assessed), 30 marks.

Text-book: McMurry, J., *Organic chemistry* 2nd edn. (Brooks/Cole).

3204 Physical and Inorganic Chemistry II

Level: II.

Points value: 8.

Duration: Full year.

Pre-requisites: 6878 Chemistry I (Div. I) or an acceptable equivalent.

Assumed knowledge: A Level I Mathematics subject.

Contact hours: 3 lectures, 1 tutorial and 6 hours of practical work a week.

Content: This subject deals with thermodynamics and surface chemistry, redox chemistry, chemical kinetics, chemical spectroscopy, structure and bonding, reactions and synthesis of inorganic compounds, electrochemistry, and solid state chemistry. A more detailed syllabus is available from the Department during the enrolment period.

The laboratory work is designed to illustrate and link in with the lecture course and also to introduce essential experimental techniques.

Assessment: End of semester written examinations. Practical work, which contributes 20% to the final assessment, is evaluated during laboratory sessions.

Text-books: Atkins, P. W., *Physical chemistry* 4th edn. (Oxford); Shriver, D. F., Atkins, P. W. and Langford, C. H., *Inorganic chemistry* (O.U.P.)

LEVEL III ORGANIC CHEMISTRY

1115 Heterocyclic Chemistry and Natural Products

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 1893 Organic Chemistry II (Div. I) or an acceptable equivalent.

Contact hours: 2 lectures and 6 hours of practical work a week.

Content: The chemistry of heterocyclic compounds with emphasis on those of biological significance; the chemistry of representative natural products; bio-organic chemistry; stereochemistry and conformations of natural products; biosynthesis.

Assessment: Final examination including a component for practical work 25%.

4265 Mechanism and Synthesis A

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 1893 Organic Chemistry II (Div. I) or an acceptable equivalent.

Contact hours: 2 lectures and 6 hours of practical work a week.

Content: Theoretical aspects and synthetic applications of pericyclic reactions, organic free radicals, carbanions, general synthetic methods, selective reactions and protecting groups; stereochemistry and asymmetric synthesis.

Assessment: Final examination including a component for practical work 25%.

6009 Mechanism and Synthesis B

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 1893 Organic Chemistry II (Div. I) or an acceptable equivalent.

Contact hours: 2 lectures and 6 hours of practical work a week.

Content: The chemistry of carbocations, carbenes and nitrenes. Application of organometallic chemistry to organic synthesis. The chemistry of metal ammonia reductions. Wittig reagents and sulphur ylides. An overview of synthetic strategy including the design and control of stereochemistry in the synthesis of complex molecules.

Assessment: Final examination including a component for practical work 25%.

5084 Spectroscopy and Physical Organic Chemistry

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 1893 Organic Chemistry II (Div. I) or an acceptable equivalent.

Contact hours: 2 lectures and 6 hours of practical work a week.

Content: Theory and applications in organic chemistry of nuclear magnetic resonance and mass spectrometry; thermodynamics and kinetics of organic systems; conformational analysis; medium effects; structure-activity relationships; isotope effects.

Assessment: Final examination including a component for practical work 25%.

Text-book: Williams, D. H., and Fleming, I., *Spectroscopic methods in organic chemistry* 4th edn. (McGraw-Hill).

LEVEL III PHYSICAL & INORGANIC CHEMISTRY

Students who commenced Level III subjects in Physics and Inorganic Chemistry prior to 1991 may complete their subjects by taking the appropriate portions of the subjects 8934 Physical Chemistry, 8090 Organometallics and Inorganic Reaction Mechanisms, 6386 Metal Complexes and Analytical Chemistry. Such students are advised to contact the Department as early as possible, preferably before the enrolment period.

6386 Metal Complexes and Analytical Chemistry

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 3204 Physical and Inorganic Chemistry II (Div. I) or acceptable equivalent.

Contact hours: 2 lectures and 6 hours of practical work a week.

Content: Bonding in metal complexes, spectra and magnetic properties. Energetics of the formation of complexes in solution, species and equilibria.

Sampling, statistics and standards in analytical chemistry. Optical, electrochemical and X-ray methods of analysis. Separations and chromatography. Applications in mining and manufacturing and environmental science.

Assessment: Final theory examination 75%, practical and/or assignments during semester 25%.

Text-books: Metal Complexes — reading lists will be issued; Analytical Chemistry — Skoog, D. A., *Principles of instrument analysis* (Saunders).

8090 Organometallics and Inorganic Reaction Mechanisms

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 3204 Physical and Inorganic Chemistry II (Div. I) or acceptable equivalent.

Contact hours: 2 lectures and 6 hours of practical work a week.

Content: Chemistry of complexes containing carbon-metal bonds, including bonding, synthesis and reactions. Industrially important processes catalysed by transition metals. Polyatomic clusters and metal-directed reactions.

Typical reactions at metal and non-metal centres including bioinorganic and excited state processes. Solvent and ligand exchange, substitutions and thermal and photochemical electron transfer processes.

Assessment: Final theory examination 80%, practical and/or assignments during semester 20%.

Text-books: Reading and reference lists will be issued.

8934 Physical Chemistry

Level: III.

Points value: 6.

Duration: Full year.

Pre-requisites: 3204 Physical and Inorganic Chemistry II (Div. I) or an acceptable equivalent.

Contact hours: 2 lectures and 6 hours of practical work a week.

Content: The basis of quantum chemistry. Molecular spectra of diatomic and polyatomic molecules, including vibrational and electronic spectra. Nuclear magnetic resonance spectra of proton and carbon-13 nuclei. Statistical thermodynamics, partition functions and thermodynamic properties. Equilibrium and transport properties of electrolyte solutions. Electrode processes. Absolute reaction rate theory. Physical chemistry of synthetic and natural polymers.

Assessment: Final theory examination 80%, practical and/or assignments during semesters 20%.

Text-books: Statistical thermodynamics — Atkins, P. W., *Physical chemistry* 4th edn. (Oxford); Spectroscopy — Banwell, C. N., *Fundamentals of molecular spectoscopy* 3rd edn. (McGraw-Hill). Reading lists will be issued for other topics.

HONOURS LEVEL

1343 Honours Organic Chemistry

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: A major in Organic Chemistry at a standard satisfactory to the Department.

Requirements: Candidates are required to devote their full time to a special course of study and experimental work in the Organic Chemistry Department. The course will normally commence in the first week of February.

The work will include a course of lectures and tutorials on advanced organic chemistry, attendance at a series of seminars and research colloquia, and the investigation of a research problem under the personal guidance and supervision of one or more members of the staff of the Organic Chemistry Department. Candidates will be required to take written examinations and to present a thesis embodying the results of their research work.

Intending Honours candidates should consult the Head of Organic Chemistry during the preceding year.

3845 Honours Physical and Inorganic Chemistry

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: Major in Physical and Inorganic Chemistry at an academic standard satisfactory to the Head of the Department together with subjects in any of the Departments of Organic Chemistry, Biochemistry, Mathematics, Mathematical Physics. Geology or Physics, or such other third-year subjects as may be approved by the Head of the Department of Physical and Inorganic Chemistry. Subject to the approval of the Head of the Department of Physical and Inorganic Chemistry in each case, a student may proceed to Honours in Physical and Inorganic Chemistry if he or she has taken a first degree programme which has not included a major in Physical and Inorganic Chemistry.

Requirements: The Honours programme consists of lecture courses in advanced Physical and Inorganic Chemistry. In addition, each student will be assigned a research problem which he or she will investigate under the personal guidance of a member of staff of the Department of Physical and Inorganic Chemistry. The performance of each student will be assessed on the basis of written and oral examinations and the student's written report of the research investigation.

CROP PROTECTION

LEVEL III

8987 Biology of Insects (Science)

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 3472 Zoology II. Students without such qualification must obtain permission of the Head of Department before enrolling.

Contact hours: 2 lectures, 4 hours practical work a week, plus additional project work.

Content: After a brief review covering the internal anatomy of insects and the processes involved in metamorphosis, excretion and reproduction, a number of specific topics will be explored in more detail, including: morphological and biological characteristics of the major insect orders; life histories of selected pest and beneficial species; sociality, caste formation and nest building in termites; sound production — methods and functions; feeding mechanisms; adaptations and biology of vertebrate ectoparasites; insects as disease vectors of plants and animals; production and function of silk in insects and arachnids; mimicry and defensive adaptations; sociality and parasitism in the Hymenoptera. The practical component will examine collecting techniques; identification of adult insects to family level; identification of immature stages and feeding damage. A requirement of the subject is the presentation of a well-curated insect collection.

Assessment: Details at first lecture.

Text-books: Details at first lecture.

9718 Ecological Biochemistry (Science)

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 1404 Biochemistry II or 3673 Botany II or 3472 Zoology II. Students without such qualification must obtain permission of the Head of Department before enrolling.

Content: Evolution of defence strategies of plants to insect and pathogen attack. Physical and chemical barriers to penetration and metabolic changes associated with the pathogenic state. Allelopathy. Manipulation of natural defences into agronomically important crops as environmentally sensitive protection mechanisms. The influence of secondary plant metabolites (non-protein amino acids, polyphenols, cyanogenic glucosides, terpenes) on the exploitation of plants by pathogens and herbivores, including man.

Assessment: Details at first lecture.

Text-books: Details at first lecture.

3310 Insect Behaviour (Science)

Availability: Odd years only.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 3472 Zoology II (Div. I) or an acceptable equivalent.

Contact hours: 2 lectures and 4 hours of practical work a week, plus project work.

Content: This subject will take an evolutionary perspective on animal behaviour using insects as examples. Topics will include nervous co-ordinating mechanisms, genetics and development of behaviour, orientation and movement, behavioural ecology, mating and reproduction, communication, and social systems of insects.

Assessment: Written examination 60%, practicals and project 40%.

Text-books: Text-books and research papers will be available in the Waite Institute and Barr Smith Libraries.

4755 Mycology (Science)

Availability: Even years only.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 3673 Botany II. Students without such qualifications must obtain permission of the Head of Department before enrolling.

Contact hours: 2 lectures and 4 hours practical work a week.

Content: Aspects of the biology of fungi, including classification, ecology, physiology, genetics and molecular biology, will be covered. Emphasis will be placed on fungi that are pathogens of economically important crops. Fungi of importance in industry, biotechnology and medicine will also be considered.

Assessment: Final examination and practical books examined.

Text-books: Text-books and research papers indicated during subject.

6865 Population Ecology of Insects (Science)

Availability: Even years only.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 5543 Statistics I and 3472 Zoology II or an acceptable equivalent.

Contact hours: 2 lectures and 4 hours of practical work a week, plus project work.

Content: This subject covers the following aspects of the population ecology of insects:—rates of increase of populations; the ecological significance of diapause; population aspects of dispersal; the influence of weather, resources, mates and natural enemies on the population dynamics of insects; concepts of population stability, regulation and resilience.

Assessment: By written examination and practical books; details to be given at the start of the course.

Text-books: References to text books and journals will be made during the course.

HONOURS LEVEL

4921 Honours Crop Protection (Entomology, Plant Pathology and Weed Science)

This subject is available under the provisions of clause 2 of Schedule IV: The Honours Degree of the degree of Bachelor of Science.

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: A credit or higher standard in at least two appropriate Level III subjects offered by a Science Department.

Requirements: A candidate will be required to submit a thesis and deliver a seminar reporting research work undertaken during the year under the supervision of one or more members of the academic staff and to pass such examinations on the chosen subject of study as may be prescribed by the Head of the Department. A candidate may also be required to attend lectures and pass examinations in related subjects.

Intending candidates should consult the Head of the Department and potential supervisors during the final year of studies for the Ordinary degree of Bachelor of Science and should be prepared to begin studies in early February.

Assessment: Details of assessment will be provided at the start of the course.

Text-books: Candidates will be advised by the Head of the Department.

GENETICS

Genetics is the study of inheritance and variation in all forms of life from viruses to mammals. It is concerned with the nature of the genetic material, its replication, transmission, organization, function and its role in development and evolution.

7940 Genetics and Evolution I and 3174 Biology I are companion subjects. The Department

offers one Level II subject and eight Level III subjects which reflect the research interests of the academic staff.

To study Genetics students are expected to include 3174 Biology I and 7940 Genetics and Evolution at Level 1, and 5543 Statistics I is a highly desirable extra subject. 4863 Genetics II is the usual course for entry to Level III subjects and elementary Chemistry is a considerable asset to any modern biologist. Botany, Biochemistry, Microbiology and Zoology all make excellent complementary subjects at Levels II and III, and many other combinations including other biological, agricultural and mathematical disciplines are appropriate. Honours students are normally expected to have majored in Genetics in their B.Sc. degree.

LEVEL I

7940 Genetics and Evolution I

Level: I.

Points value: 3.

Duration: Semester II.

Pre-requisites: None.

Assumed knowledge: It will be assumed that students are taking, or have completed 3174 Biology I.

Contact hours: 3 lectures, 1 tutorial and 2 hours of practical tutorial work a week.

Content: Heredity and variation; Genes and chromosomes; Linkage; Chromosomes and evolution; Properties of genetic material and molecular organisation of chromosomes; Genetics of bacteria and viruses; Gene manipulation; Population genetics and evolution; Human diseases; Applications of molecular genetics. The course aims to provide Science Faculty students and any others interested, with a basic knowledge of classical and molecular genetics and evolution.

Assessment: Examination, written assignments and practical class reports.

Text-book: Hartl, D. L., Freifelder, D. and Snyder, L. A., *Basic genetics* 1st or 2nd edn. (Jones and Bartlett, 1988).

LEVEL II

4863 Genetics II

Level: II.

Points value: 8.

Duration: Full year.

Pre-requisites: 7740 Genetics and Human Variation I (Div. I) before 1989; 7940 Genetics and Evolution I (Div I) or 3174 Biology I (Credit) or acceptable equivalent.

Contact hours: 3 lectures, 1 two hour tutorial, and 4 hours of practical work a week.

Content: The genetic material. Information transfer and the genetic code. The chromosome theory of heredity. Mendelian inheritance. Linkage. Recombination systems in micro-organisms. Gene regulation. Recombinant DNA technology. Differentiation. Population genetics and evolution. Chromosomal variation. Somatic cell genetics. Quantitative inheritance. Inbreeding. Immunogenetics. Breeding systems. Cytoplasmic systems. Speciation and molecular evolution.

Assessment: Examinations, written assignments and practical class reports.

Text-book: Suzuki, D. T., Griffiths, A. J. F., Miller, J. H., and Lewontin, R. C., *An introduction to genetic analysis*, 4th edn., Freeman, W. H. & Co., New York (1989).

LEVEL III

5482 Cellular & Molecular Genetics of Mammals: Practice

Level: III.

Points value: 1.

Duration: Semester II.

Pre-requisites: 4863 Genetics II (Div. I) or an acceptable equivalent.

Co-requisites: 8615 Cellular & Molecular Genetics of Mammals: Theory

Contact hours: 4 hours of practical work a week.

Content: Practical classes involve mini research projects, which are planned by student groups and written up in the form of scientific paper. Project topics vary from year to year, but are usually concerned with aspects of mammalian biochemical/molecular/population genetics.

Assessment: Research report, contribution in laboratory and written assignments.

8615 Cellular & Molecular Genetics of Mammals: Theory

Level: III.

Points value: 1.

Duration: Semester II.

Pre-requisites: 4863 Genetics II (Div. I) or an acceptable equivalent.

Contact hours: 1 lecture a week.

Content: The application of cell culture techniques to mammalian genetic analyses; somatic cell hybridization and chromosome mapping; towards human molecular map; chromosome maps *vs.* linkage maps; comparative gene mapping and the evolution of genome organization and its evolutionary implications; cloned genes, DNA polymorphisms and inherited disease; molecular genetics of specific mammalian genes including the haemoglobins.

Assessment: Examination and written assignments.

8723 Cytogenetics

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 4863 Genetics II (Div. I) or an acceptable equivalent.

Contact hours: 1 lecture and 4 hours of practical work a week.

Content: This subject comprises a course of lectures and associated practicals which include a *Drosophila* cytogenetics project. The lectures consider the structure and function of eukaryotic chromosomes and particular topics include chromosomes and evolution, chromosomes and differentiation, and chromosomes and recombination.

Assessment: Examination, written assignments and laboratory work.

3077 Immunogenetics

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 4863 Genetics II (Div. I) or an acceptable equivalent.

Assumed knowledge: 3174 Biology I.

Contact hours: 1 lecture and 2 hours of tutorials a week.

Content: Histocompatibility differences in Man and other species; linkage relationships and disease associations; the structure and function of the immunoglobulins and the immunoglobulin genes.

Assessment: Examination, written assignments and participation in tutorials.

7206 Nuclear/Extranuclear Genetic Compartments

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 4863 Genetics II (Div. I) or an acceptable equivalent.

Assumed knowledge: 3174 Biology I.

Contact hours: 1 lecture and 4 hours of practical work a week.

Content: Organization of DNA in prokaryotic organisms and in nuclear, mitochondrial and chloroplast genetic compartments of eukaryotes; extrachromosomal heredity in eukaryotes; the functions of mitochondrial DNA and chloroplast DNA and the dependence of these sub-organellar systems on nuclear encoded genes; the molecular nature of nuclear involvement in sub-organellar biogenesis; movement of proteins through membranes.

Assessment: Examination, written assignments, reports and laboratory work.

2800 Quantitative, Population and Evolutionary Genetics

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 4863 Genetics II (Div. I) or an acceptable equivalent.

Assumed knowledge: 5543 Statistics I.

Contact hours: 1 lecture and 2 hours of tutorials a week.

Content: This subject deals with a wide range of topics in quantitative, population and evolutionary genetics. Topics discussed may include the following: the effects of random mating, inbreeding, random drift, assortative mating, mutation and selection (including kin and sexual selection) on genetic variation and evolution in sexually reproducing populations. Tutorials will involve the use of microcomputers in the analysis of family and population genetical data, the estimation of genetic parameters and an introduction to experimental design in quantitative genetical studies.

Assessment: Examination, written assignments and participation in tutorials.

5112 Regulation of Gene Expression: Practice

Level: III.

Points value: 1.

Duration: Semester I.

Pre-requisites: 4863 Genetics II (Div. I) or an acceptable equivalent.

Co-requisites: 2835 Regulation of Gene Expression: Theory.

Contact hours: 4 hours of practical work a week.

Content: A series of practical experiments using *Escherichia coli*, yeasts and filamentous fungi to demonstrate modern methods for the study of gene regulation.

Assessment: Written report, laboratory work, and essay.

2835 Regulation of Gene Expression: Theory

Level: III.

Points value: 1.

Duration: Semester I.

Pre-requisites: 4863 Genetics II (Div. I) or an acceptable equivalent.

Contact hours: 1 lecture a week.

Content: Mechanisms of regulating gene expression in prokaryotes and in eukaryotes will be examined. Examples of transcriptional, translational and recombinational regulation will be discussed, with emphasis on gene regulation and differentiation in yeasts and filamentous fungi.

Assessment: Examination.

HONOURS LEVEL

7599 Honours Genetics

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: A satisfactory standard in 6023 Genetics III (prior to 1989) or appropriate Level III subjects offered by the Department of Genetics or special permission of the Head of the Department of Genetics.

Requirements: Candidates are required to give their full attendance for one academic year to a special course of study in the Department of Genetics. Each candidate will have a prescribed reading list and a research investigation to be carried out under the supervision of a member of staff. The course will include participation in seminars and discussions on advanced topics and the writing of essays and literature reviews. Candidates will be required to take a written examination and to present a thesis embodying the results of their research work.

Intending Honours candidates should consult the Head of the Department during the previous year so that they can be advised on suitable reading for the Long Vacation.

GEOLOGY AND GEOPHYSICS

The heart of the earth sciences is the fact that this planet has a four-billion-year history which can be extracted from the rocks of its crust. Geology in its broadest sense draws at the same time on the physical, biological and numerical sciences, and it is basic to the problems of our finite resources, our finite planetary environment, and our place in the solar system.

2136 Geology I is the principal subject offered by the Department of Geology and Geophysics to students considering a career in the earth sciences. 3482 Introduction to Physical Geography I (Semester I) and 9624 Evolution, Dinosaurs and Greenhouse Earth I (Semester II) are also offered as single Semester Level I science subjects. None of these subjects has pre-requisites.

The Department offers six semester-length Level II science subjects each year (geomorphological subjects are offered in alternate years). They have been designed with three aims: (i) They cover the wide range of scientific disciplines that constitute modern

earth sciences. (ii) They prepare students for a career in this field. (iii) They demonstrate to students with primary interests in the physical, mathematical, biological or environmental fields how their interests can be applied in earth science. Students should check the pre-requisites and knowledge assumed for the six Level II subjects and are always encouraged to seek advice in the Department.

At Level III there are twelve subjects (with geomorphological subjects offered in alternate years). Pedology III is also available and details can be found under Soil Science. Different combinations of subjects lead to different Honours programmes.

Information booklets on each of the years of the course are available from the departmental office.

The Department offers the following service subjects: 5683 Earth Science I, Faculty of Agriculture and Natural Resource Sciences; 3732 Geology IHE, Faculty of Engineering; 3944 Hydrocarbon Reservoirs Elective, (B.E. Chem., Level IV) Faculty of Engineering.

A Programme of Education in Geology and Geophysics with Industrial Co-operation (EGGIC)

The Department offers a programme whereby students enrolled for the third-year of the B.Sc. in the Faculty of Science, who have achieved an award credit level in the work of the first and second years *and* a credit level in 6725 Chemical Geology II, 2559 Geophysics and Geodynamic Geology II, 1995 Historical Geology and Palaeobiology II, and/or 9835 Australian Landscape Evolution IIS or 8159 Structural Geomorphology IIS, can apply to enrol in a co-operative programme with industry. The student would be a full-time paid employee in industry for 4-5 months of each of the following two years. Thus the student would be in full-time study in Semester I of Year 3, full-time work in Semester II of Year 3 and again in Semester I of Year 4. The degree of B.Sc. would be completed by full-time study in Semester II of Year 4.

Each work period in Year 3 and 4 involve a project agreed to jointly by the Department of Geology and Geophysics and the employer. A written report must be prepared on each project and approved by both the employer and the Department. The performance of each student will be monitored by a committee within the Department. Unsatisfactory work reports or course grades may result in the student leave the EGGIC programme.

LEVEL I

9624 Evolution, Dinosaurs and Greenhouse Earth I

Level: I.

Points value: 3.

Duration: Semester II.

Pre-requisites: None.

Contact hours: 2 lectures, 3 hours tutorials/practical per week; 2 excursions.

Content: This course addresses various topics, some controversial, in the necessary perspective of a planet which has been alive for four billion years. It will refer to some basic and essential geological and biological concepts but requires no background in science. The enquiry will be holistic and interdisciplinary. Topics include: Icehouses and greenhouses: how has the earth kept itself moist and pleasant for so long? Earth and its biosphere: they need each other. Geological time: rock of ages or the age of rocks? Why does our planet have a history? The first animals: fossils in the Flinders Ranges. Life in ancient seas: South Australian limestones. Organic evolution as a grand unifying theory. The world in the age of the dinosaurs: how different from today's? Catastrophes and extinctions: earthly or ET? Continental drift and Noah's Ark: Australia's marsupial cargo. The evolution of humankind: were we inevitable?

Assessment: Written examination 60%, performance during Semester 40%.

References: To be advised.

2136 Geology I

Level: I.

Points value: 6.

Duration: Full Year.

Pre-requisites: None.

Contact hours: 3 lectures and 3 hours of practical work a week. 6 tutorials, 2 full days and 2 half-days field work, and a week-end camp.

Content: Semester IA — **Our lively planet:** Spaceship Earth has one interactive environmental system comprising the geosphere, hydrosphere, biosphere and atmosphere. The geological time scale. From weathering to sedimentation in humid, arid and glacial environments. Planetary processes on Earth, Moon and Mars. Rivers, deltas, coasts and continental shelves. Coral reefs and limestones, ancient and modern. Salt formations.

Semester IB — **Life on Earth:** The biosphere interacts with the rocks, water and air of the Earth's skin. The evolution of life is responsible for fossil fuels, climatic change and the fossil record. The first three billion years. The last half billion years. Atmospheres and oceans; icehouses and greenhouses. Extinctions, cycles and catastrophes.

Semester IIA — **Turbulent interior:** The unification of observations through modelling to derive models of Earth's structure and crustal dynamics. Earth shells from geophysics and geochemistry. Dynamics of the lithosphere: plate tectonics and continental drift. Mountains, magmas and metamorphism. Practical applications of geology to the needs and problems of human society.

Semester IIB — **Exploiting the Earth:** Our resources are finite and nonrenewable. Only a person operating on the shrivelled time scales of politics, economics and business could speak of a "glut" of oil, of supply exceeding demand. Informed public debate on the problems of locating and exploiting natural resources needs some grasp of the science of how they got here as workable concentrates and of how we find them — the science of geology. Fossil fuels. Metals and materials. Water and the environment. Economic geology of Australia.

Assessment: End of semester theory examinations 50%, 3 practical examinations, an essay, a rock and mineral collection, laboratory work and field excursions (attendance and report) 50% — all of which is compulsory and non-redeemable. A pass in the subject requires a minimum of 40% in each of the theory and the practical sections.

Text-books: Skinner, B. J. and Porter, S. C., *Physical geology* (Wiley); Craig, J. R., Vaughan, D. J. and Skinner, B. J., *Resources of the earth* (Prentice-Hall). Other texts and references to be advised.

3482 Introduction To Physical Geography I

Level: I.

Points value: 3.

Duration: Semester I.

Pre-requisites: None.

Contact hours: 2 lectures, 3 hours tutorial/practical work per week, plus 1 full day of field work.

Content: The purpose of this subject is to analyse and explain the physical geography of the Earth's surface. Emphasis will be given to the study of various geomorphological processes and to their implications.

Topics discussed will include the origin, structure and evolution of planet Earth and its Moon; major relief features such as continents and ocean basins; the significance of earthquakes and volcanos, as explained by the unifying theory of plate tectonics; generalised climatic patterns and the effect of solar, orbital, and other factors on ancient

climates; the role of geological, climatic and biological factors in weathering and soil formation, erosion and deposition; the interplay of internal and external forces in the production of landforms and landscapes; climatic, cyclic and time-dependent models of landscape evolution.

Assessment: One written examination, plus essays, tutorial and practical exercises, field excursion.

Reference: Skinner, B.J. & Porter, S., Physical geology (Wiley).

LEVEL II

Six subjects are offered at Level II in 1992, as follows:
Semester One: 6725 Chemical Geology II*; 7404 Data Processing in the Geological Sciences II; 8159 Structural Geomorphology IIS.

Semester Two: 2559 Geophysics & Geodynamic Geology II*; 1995 Historical Geology & Palaeobiology II*; 1443 Environmental Geology II.

There is a seven-day field mapping camp held during the mid-semester break in Semester II, during which students learn geology at a greatly accelerated rate. The camp is compulsory for all students doing two or more of the subjects marked (*).

9835 Australian Landscape Evolution IIS

Availability: Odd years only.

Level: II.

Points value: 4.

Duration: Semester I.

Pre-requisites: 2136 Geology I (Div. I) *or* 3482 Introduction to Physical Geography I.

Restriction: 4532 Australian Landscape Evolution IIA *or* Origins of Landforms in Australia II, 7300 Australian Landscape Evolution IIIA *or* Evolution of Landforms in Australia III, 7242 Australian Landscape Evolution IIIS *or* Australian Landscape Evolution III.

Contact hours: 2 lectures, 3 tutorial/practical hours per week, 4 days in field.

Content: The course is concerned with the development of the Australian landscape. Various models of landscape evolution are analysed and matched against the realities resulting from the interplay of internal and external forces through time. Various types of planation surface (epigene, etch, exhumed) are identified in the landscape, and the implications of the widely preserved Mesozoic, early Cainozoic and later Cainozoic surfaces and cycles are discussed. The viability of denudation chronology as a framework for geomorphological studies is examined, as is the significance of forms related to late Cainozoic climatic changes.

Assessment: Written examination, 2 essays, 3 tutorial papers, practical exercises, field work.

References: Thornbury, W. D., *Principles of geomorphology* (Wiley); Twidale, C. R., *Analysis of landforms* (Wiley); Jeans, D. N., *Australia: a geography. Vol I The natural environment* (Sydney University Press); Bowen, D. Q., *Quaternary geology* (Pergamon).

6725 Chemical Geology II

Level: II.

Points value: 4.

Duration: Semester I.

Pre-requisites: 2136 Geology I (Div. I) *or* an acceptable equivalent.

Assumed knowledge: Year 12 science.

Contact hours: 3 lectures, 6 hours practical work per week.

Content: The materials of geology: the nature and origin of igneous and metamorphic rocks

and minerals. The principles of crystallography, optics and geochemistry are applied to the recognition and genesis of igneous and metamorphic rocks and to the formation and growth of minerals in general. The course introduces the techniques of extracting geological information from igneous and metamorphic assemblages.

Assessment: Weekly exercises 30%, written examinations 70%.

References: Ehlers, E. G. and Blatt, H., *Petrology: igneous, sedimentary and metamorphic* (Freeman); Heinrich, E. W., *Microscopic identification of minerals* (McGraw-Hill).

7404 Data Processing in the Geological Sciences II

Level: II.

Points value: 4.

Duration: Semester I.

Assumed knowledge: Year 12 Mathematics I & II or IS.

Contact hours: 3 lectures, 6 hours practical per week.

Content: Mathematical geology: applications of mathematical geology—statistics, linear programming, discounted cash flow—to geological problems.

Computing: introduction to personal computers and their applications in geology.

Assessment: Weekly exercises 20%, written examination 80%.

References: To be advised.

1443 Environmental Geology II

Level: II.

Points value: 4.

Duration: Semester II.

Pre-requisites: Either 2136 Geology I, *or* 3732 Geology IHE, *or* 5339 Geology IW; *or* 6878 Chemistry I, 3643 Physics I, *or* 3174 Biology I, *or* an acceptable equivalent.

Contact hours: 3 lectures, 6 hours practicals per week including field work, essays and a seminar.

Content: This course deals with various global processes, resources, and environmental hazards, and focuses on the increasing role of human activity on our planet. Topics to be examined include earth chemistry, pollution, the nature and movement of groundwaters and surface waters, human interference in river dynamics, soil movement, erosion and degradation, salinization, coastal erosion, environmental impacts of mining, nuclear energy, and general waste disposal problems. Global perspectives also involve the natural interactions of the biosphere, hydrosphere and geosphere, the history of climatic and sea level changes, the frequency and distribution of earthquakes, volcanic and landslide hazards.

Assessment: Written examination 60%, practicals, essay, seminar 40%.

Text-book: Montgomery, C. W. (2nd edn., 1989), *Environmental geology* (Wm C. Brown, Dubuque, Iowa).

References: To be advised.

2559 Geophysics and Geodynamic Geology II

Level: II.

Points value: 4.

Duration: Semester II.

Pre-requisites: 2136 Geology I (Div. I) *or* an acceptable equivalent.

Contact hours: 3 lectures, 6 hours practical per week.

Content: Structural geology: introduction to fractures (faults, joints, veins), folds and fold geometry, rock fabrics (foliations and lineations). Rock mechanics: theoretical aspects of stress, strain and rheology including experimental deformation. Geophysics: principles of geophysical exploration methods including magnetic, gravity, electrical, seismic and well logging. Geodynamics and tectonics: introduction to the large-scale dynamic processes that govern continental drift, mountain building and the generation of the oceanic lithosphere. Geostatistics: basic statistics — probability distributions, hypothesis testing, linear regression — applied to geological problems.

Assessment: Weekly exercises 20%, written examination 80%.

References: Hobbs, B. E. and Others, *An outline of structural geology* (Freeman). Other references to be advised.

1995 Historical Geology and Palaeobiology II

Level: II.

Points value: 4.

Duration: Semester II.

Pre-requisite: 2136 Geology I (Div. I) *or* a credit in 3174 Biology I.

Contact hours: 3 lectures, 6 hours practical per week.

Content: Sedimentary rocks and processes, especially among sandstones and carbonates. Ancient depositional environments, facies changes, tectonic and palaeoclimatic imprints on sediments. Abundance, molecular composition and stratigraphic distribution of organic matter in the rock record. The significance of invertebrate fossil skeletons in the record of the rocks. The meaning of fossil diversity and its patterns in earth history. Time in geology. The broad patterns of South Australian stratigraphy.

Assessment: Weekly exercises 20%, written examinations 80%.

References: Ehlers, E. G. and Blatt, H., *Petrology: igneous, sedimentary and metamorphic* (Freeman); Clarkson, E. N. K., *Invertebrate palaeontology and evolution* 2nd edn. (Allen & Unwin). Other references to be supplied.

8159 Structural Geomorphology IIS

Availability: Even years only.

Level: II.

Points value: 4.

Duration: Semester I.

Pre-requisites: 2136 Geology I (Div. I) *or* 3482 Introduction to Physical Geology I or an acceptable equivalent.

Restriction: 4556 Structural Geomorphology II or IIA, 5722 Structural Geomorphology III or IIIA, 6722 Structural Geomorphology IIIS.

Contact hours: 2 lectures and 3 hours tutorial/practical per week, plus 4 days field work.

Content: The form of the landsurface varies with the structure of the underlying crust, with the processes responsible for shaping the surface and with variations in structure and process in time. This course is concerned primarily with the first of these variables. Topics considered include the earth's major relief, volcanos, and the effects of joints, faults, folds and rock type on land for development. Examples are taken from a global canvas but particular attention is devoted to the Mt Lofty Ranges, the Flinders Ranges and Eyre Peninsula, each of which not only illustrates aspects of structural geomorphology but also offers opportunities for considering the total development of landforms and the methods used to analyse and explain geomorphological problems.

Assessment: Written examination, 2 essays, 3 tutorial papers, practical exercises, field work.

References: Thornbury, W. D., *Principles of geomorphology (Wiley); Twidale, C. R., Analysis*

of landforms (Wiley); Gerrard, A. J., *Rocks and landforms* (Unwin Hyman); Twidale, C. R., *Granite landforms* (Elsevier).

LEVEL III

7242 Australian Landscape Evolution IIIS

Availability: Odd years only.

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 8159 Structural Geomorphology IIS, or an acceptable equivalent.

Restriction: 9835 Australian Landscape Evolution IIS *or* Landscape Evolution in Australia II, 4532 Australian Landscape Evolution IIA *or* Origins of Landforms in Australia II, 7300 Australian Landscape Evolution IIIA *or* Evolution of Landforms in Australia III.

Contact hours: 2 lectures, 3 hours tutorial/practical per week, 3 days in the field.

Content: The course is concerned with the development of the Australian landscape. Various models of landscape evolution are analysed and matched against the realities resulting from the interplay of internal and external forces through time. Various types of planation surface (epigene, etch, exhumed) are identified in the landscape, and the implications of the widely preserved Mesozoic, early Cainozoic and later Cainozoic surfaces and cycles are discussed. The viability of denudation chronology as a framework for geomorphological studies is examined, as is the significance of forms related to late Cainozoic climatic changes.

Assessment: Written examination, 2 essays, 3 tutorial papers, practical exercises, field work.

References: Thornbury, W. D., *Principles of geomorphology* (Wiley); Twidale, C. R., *Analysis of landforms* (Wiley); Jeans, D. N., *Australia: a geography, Vol. I The natural environment* (Sydney University Press); Bowen, D. Q., *Quaternary geology* (Pergamon).

9709 Geochemistry, Geochronology, Mineralogy, Diagenesis

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 6725 Chemical Geology and Thermodynamics II or an acceptable equivalent.

Contact hours: 2 lectures, 5 hours practical per week.

Content: Geochemistry: The paths of trace elements in relation to major elements in geological environments are followed. The patterns thus derived allow us to develop insights into the history of igneous rock systems. Geochronology: We discuss constraints on the use of naturally occurring radioactive decay schemes as clocks to estimate the numerical ages of rocks, to fingerprint magma sources and to date other events in earth history, from the very old to the very young. Mineralogy: Minerals are the basic building blocks of all rocks. An overview is presented of the chemistry, structure and paragenesis of some important silicate and non-silicate mineral groups. Practical work will introduce modern methods of mineral determination and characterization. Diagenesis: Why are siliclastics and carbonates sometimes hard and sometimes soft? Fluid inclusion microthermometry, cathodoluminescence and fluorescence microscopy help us to unravel the history of rock hardening.

Assessment: Theory examination 70%, practical and essay 30%.

References: Faure, G., *Principles and applications of geochemistry* (Maxwell MacMillan Int.); Mason, B. and Moore, B., *Principles of geochemistry* 4th edn. (Wiley); Faure, G., *Principles of isotope geology* 2nd edn. (Wiley); Klein, C. and Hurlbut, C. S., Jr., *Manual of mineralogy*

(Wiley); Berry, L. C., Mason, B. and Dietrich, R. V., *Mineralogy* (Freeman); Battey, M. H., *Mineralogy for students*, 2nd. edn. (Longmans).

4332 Igneous and Metamorphic Petrology

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 6725 Chemical Geology and Thermodynamics II.

Contact hours: 2 lectures and 5 hours of practical work a week, plus 2 days of field work.

Content: A study of the theoretical background to the origin of igneous and metamorphic rocks illustrated by reference to case histories. Topics include; elementary thermodynamics, phase diagrams, fluid dynamics, crust and mantle heat flow and tectonic modelling, volcanology, the study of metamorphic and melting reactions in the crust and mantle, the geochemical characteristics of igneous rocks and the role of igneous activity in the geochemical evolution of the earth.

Assessment: Theory examination as well as assessment of practical work both in class and by practical examination.

Text-books: Cox, K.G. et al. *The interpretation of igneous rocks* (Allen and Unwin); Barker, D.S. *Igneous rocks* (Prentice-Hall); Heinrich, E.W., *Microscopic identification of minerals* (McGraw-Hill); Deer, W.A., et al. *An introduction to the rock-forming minerals* (Longmans); Powell, R. *Equilibrium thermodynamics in Petrology: an introduction* (Harper and Row).

7105 Magmatic and Hydrothermal Ore Deposits

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 6725 Chemical Geology and Thermodynamics II or an acceptable equivalent.

Contact hours: 2 lectures per week (6 weeks), 5 hours practical per week (6 weeks), 7 days field excursion.

Content: Geology and genetic models of magmatic and hydrothermal ore deposits. (a) Deposits associated with mafic and ultramafic igneous rocks, (b) Carbonatites and felsic igneous rocks, (c) Epithermal deposits, (d) Volcanogenic and sediment hosted deposits, (e) Mississippi Valley type deposits (f) Metamorphic mineral deposits. A field excursion will examine the geology of several mineral deposits in their regional geological context.

Assessment: Ore deposits examination (30%); ore deposits practical (20%); field excursion examination (30%); field excursion seminar (20%).

References: Evans, A. M., *An introduction to ore geology* (Blackwell Scientific Publications); Craig, J. R. and Vaughan, D. J., *Ore microscopy and ore petrography* (Wiley).

5043 Palaeontology and Macroevolution

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 3174 Biology I, *or* 1995 Historical Geology and Palaeobiology II *or* an acceptable equivalent.

Contact hours: 2 lectures and 5 hours of practical work a week.

Content: Systematic studies of selected invertebrate phyla represented in the fossil record, their palaeoecology and distribution; study of one major group of fossil vertebrates. Lectures and practicals are integrated.

Evolution: Study of evolution and the fossil record will bear on such matters as evolutionary radiation and extinction and its causes, the episodic or possibly cyclic nature of the fossil record, and strategies for assessing the impact of environmental change on evolutionary overturn.

References: Clarkson, E.N.K., *Invertebrate palaeontology and evolution,* 2nd edn. (Allen and Unwin); Colbert, E.H., *Evolution of the vertebrates,* 3rd edn. (Wiley); Levinton, J.S., *Genetics, palaeontology and macroevolution* (Cambridge); Hoffman, A., *Arguments on evolution: a paleontologist's perspective* (Oxford).

4016 Petroleum Geochemistry and Sedimentology

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 1995 Historical Geology and Palaeobiology II or an acceptable equivalent.

Contact hours: 2 lectures, 5 hours practical per week.

Content: This course studies the deposition of sedimentary sequences, their alteration with time and depth and the nature of their contained fluids. Included are: environments, sequences and diagenesis of clastic rocks; environments, sequences and diagenesis of carbonates; sources, deposition and preservation of hydrocarbons and their geochemical analysis and signatures; wireline logging, petrophysics, formation evaluation, determination of formation fluids.

Assessment: Written examination 60%, practical exercises 30%, essay 10%.

References: Walker, R. G. (ed.), *Facies models* (Geoscience Canada); North, F. K., *Petroleum geology* (Allen & Unwin); Waples, D. W., *Geochemistry in petroleum exploration* (Reidel).

7072 Remote Sensing (S)

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: Level II science to a value of 16 points, or an acceptable equivalent.

Restriction: 7198 Remote Sensing III, 4289 Remote Sensing IIIA.

Contact hours: 2 lectures and 3 hours of practical work per week.

Content: Remote sensing is concerned with interpretation of detailed information about the Earth's surface gathered by space and airborne platforms using various scanning systems.

This subject examines both the principles and applications of remote sensing. The principles of remote sensing include the interaction of electromagnetic radiation with the earth's surface and the measurement of this radiation by a range of sensors. It will focus on the spectral aspects of earth objects: rocks, soils, vegetation and water and the way spectral data can be used to identify and characterise those objects and monitor changes over time. This data base is relevant to geological, botanical and soil-science inventorization and environmental science. Information is extracted using digital image processing which includes correction, enhancement and classification of the digital data. (Workshops are used to give "hands-on" experience with the basics of digital image processing and application to specific projects). Applications of remote sensing to atmospheric monitoring, geological mapping and air pollution will be discussed.

Additional applications will examine the spectral features observed in geological materials, soils and vegetation using high dimension data, including the application of remote sensing to geology and exploration for mineral deposits and petroleum. The applications deal with two aspects of the Earth's surface. 1.) Structural features which are not apparent from

aerial photography due to scale factors and wavelength restrictions, and 2.) narrow wavelength features due to soil chemistry and soil mineralogy.

Assessment: Written examination 50%, practical exercises 50%.

References: Harrison, B. A. and Jupp, D. L. B., *Introduction to remotely sensed data* (C.S.I.R.O.); Curran, P. R., *Principles of remote sensing* (Longman); Drury, S. A., *Image interpretation in geology* (Allen & Unwin); Jensen, J. R., *Introducing digital image process* (Prentice-Hall); Lo, C. P., *Applied remote sensing* (Longman); Richards, J. A., *Remote sensing digital image analysis: an introduction* (Springer-Verlag); Swain, P. H. and Davis, S. M., *Remote sensing; the quantitative approach*; Townshend, J. R. G., *Terrain analysis and remote sensing* (Allen & Unwin).

8037 Stratigraphy and General Palaeontology

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 1995 Historical Geology and Palaeobiology II *or* an acceptable equivalent.

Contact hours: 2 lectures and 5 hours of practical work a week, plus a day in the field.

Content: Stratigraphy: Stratigraphic principles and methods will be covered and a segment of the course will be devoted to the analysis of subsurface stratigraphy by means of lithological data in conjunction with downhole methods. Studies on genetic units will include applications to petroleum reservoir, source and seal rocks.

General palaeontology: An overview of the history of life, evolution, and relationships between life forms and the environment from the early Precambrian to the Recent.

Micropalaeontology: Study of skeletonized forms that are particularly important in biostratigraphy and biofacies analysis, in petroleum geology and as exemplars of a good fossil record; studied groups include foraminifera, conodonts and palynomorphs.

Assessment: 3 hour written examination 60%, practical exercises and essays 40%.

References: All students should obtain the chart: van Eysinga, F. W. B., *Geological time table* 4th edn. (Elsevier); Raup, D. M. and Stanley, S. M., *Principles of palaeontology* 2nd edn. (Freeman); Bignot, G., *Elements of micropalaeontology* (Graham and Trotman); Prothero, D. R., *Interpreting the stratigraphic record* (Freeman); Stanley, S. M., *Earth and life through time* (Freeman).

1293 Structural Geology and Exploration Geophysics

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 2559 Geophysics and Geodynamic Geology II or an acceptable equivalent.

Contact hours: 2 lectures, 5 hours practical per week, plus 1 day of fieldwork.

Content: The nature and interpretation of geological structures, and processes of deformation. Specifically included are stress, strain and rheology, strain analysis, shear zones, simple and multiple folding and its geometric analysis, fracturing and faulting in contractional, extensional, and wrench regimes. Field studies are included.

Principles of the conducting and interpretation of gravity, magnetic, electrical, electromagnetic, reflection and refraction seismic and radiometric surveys used for petroleum and mineral exploration.

Assessment: Written examinations 67%, practical work 33%.

References: Telford, M. W. and others, *Applied geophysics* (Cambridge U.P.); Hobbs, B. E. and others, *An outline of structural geology* (Wiley).

6722 Structural Geomorphology IIIS

Availability: Offered in even years.

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 3482 Introduction to Physical Geography I *or* 9835 Australian Landscape Evolution IIS, or an acceptable equivalent.

Restriction: 8159 Structural Geomorphology IIS, 4556 Structural Geomorphology II or IIA, 5722 Structural Geomorphology III or IIIA.

Contact hours: 2 lectures, 5 hours tutorial/practical per week and 4 days field work.

Content: The form of the landsurface varies with the structure of the underlying crust, with the processes responsible for shaping the surface and with variations in structure and process in time. This course is concerned primarily with the first of these variables. Topics considered include the earth's major relief, volcanos, and the effects of joints, faults, folds and rock type on land for development. Examples are taken from a global canvas but particular attention is devoted to the Mt Lofty Ranges, the Flinders Ranges and Eyre Peninsula, each of which not only illustrates aspects of structural geomorphology but also offers opportunities for considering the total development of landforms and the methods used to analyse and explain geomorphological problems.

Assessment: Written examination, 2 essays, 3 tutorial papers, practical exercises, field work.

References: Thornbury, W. D., *Principles of geomorphology* (Wiley); Twidale, C. R., *Analysis of landforms* (Wiley); Gerrard, A. J., *Rocks and landforms* (Unwin Hyman); Twidale, C. R., *Granite landforms* (Elsevier); Skinner, B. J. and Porter, S. C., *Physical geology* (Wiley).

1037 Supergene Ore Deposits and Geostatistics

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: Any one of 6725 Chemical Geology II, 7404 Data Processing in the Geological Sciences II, 2559 Geophysics and Geodynamic Geology II, 1995 Historical Geology and Palaeobiology II, or an acceptable equivalent.

Assumed knowledge: Year 12 Maths IS.

Contact hours: 2 lectures, 5 hours practical per week.

Content: Mineral deposits formed close to the Earth's surface: placers of Au, Pt, Sn, W, Ti and diamonds; evaporites, marine (Na, K, Ca, Mg, Cl, SO_4) and continental (B, Li); bauxites (Al), Fe-laterites, Ni-laterites; Precambrian iron ores; Phanerozoic iron ores; manganese deposits in lacustrine and oceanic milieu; uranium deposits of sandstone and unconformity type; sedimentary base metal deposits. Geostatistics: Estimation of mining blocks on the basis of fragmentary samples; semivariogram; estimation variance; dispersion variance; kriging; selective mining.

Assessment: Written examination 70%, practical assignments 30%.

Text-book: Brooker, P. I., *A geostatistical primer* (World Scientific).

References: Gilbert, J. M. and Park, C. F. Jr., *The geology of ore deposits* (Freeman). Others to be advised.

1789 Tectonics and Geological Mapping

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: Any one of 2559 Geophysics and Geodynamic Geology II, 6725 Chemical Geology and Thermodynamics II, 1995 Historical Geology and Palaeobiology II, or an acceptable equivalent.

Contact hours: 2 lectures a week (9 weeks), 8 day mapping camp and 1 day excursion.

Content: Structure, thermal character and rheology of the continental and oceanic lithosphere; kinematics of deforming continental lithosphere; interplay of tectonic factors and melting on the geochemical differentiation of the earth through its history; tectonic environments of ore deposits; formation of sedimentary basins and patterns of sedimentation within them. The mapping excursion will normally emphasise elucidation of the structure of strongly deformed metamorphic terrains.

Assessment: 3 hour written examination 50%, and report and map for major excursion 50%.

Text-books: Text and papers as set by individual lecturers.

9769 Theoretical Geophysics

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I or an acceptable equivalent.

Assumed knowledge: 2136 Geology I, 3643 Physics I, Level II Applied Mathematics subjects or an acceptable equivalent.

Contact hours: 2 lectures and 5 hours of practical work a week.

Content: Potential theory, gravity effect of simple geometrical shapes, enhancement of anomalies, regional removal, second derivative, analytic continuation, frequency analysis, excess mass, Poisson's relationship, inversion, marquart algorithm.

Seismic wave theory, elasticity, seismic velocity in rocks, wave equations, surface and body waves, energy loss and dispersion in wave propagation, reflection, refraction, diffraction.

Assessment: 3 hour examination 70%, practical assignments 30%.

Text-books: Telford, W. M. et al., *Applied geophysics* (C.U.P.).

HONOURS LEVEL

5280 Honours Geology

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: Students proceeding to Honours in Geology usually will have passed a minimum of three of the subjects: 8037 Stratigraphy and General Palaeontology, 1293 Structural Geology and Exploration Geophysics, 4016 Petroleum Geochemistry and Sedimentology, 4332 Igneous and Metamorphic Petrology and 1789 Tectonics and Geological Mapping at a level acceptable to the Head. In addition it is recommended that students should have as broad a knowledge as possible in the other third year subjects offered by the Department of Geology and Geophysics.

Students with biological backgrounds wishing to pursue Honours based on a palaeontological topic may hold a good pass or better in 5043 Palaeontology and Macroevolution in lieu of one of the subjects listed. Admission is with permission of the Head of Geology and Geophysics. Students wishing to study Geomorphology at Honours Level should consult the Head of Geology and Geophysics.

Requirements: Candidates will be required to attend several courses from a number which will be given in specialised fields of geology and economic geology including tectonics, stratigraphy, structure, geophysics, geochemistry and palaeontology. In addition, candidates

will undertake supervised individual projects involving one or more of these fields. Special courses of reading and laboratory studies will be laid down and each candidate will be required to give all the time not required for lectures or in the field to work in the laboratory. Candidates may be required to satisfy the examiners that they have a reading knowledge of French, German or Russian. They will also be required to contribute to a series of seminars.

An interstate field excursion is held early in the year. See fee requirement under Information for Students, Section 5.

Intending Honours students must apply, before the end of the year preceding that in which they wish to enrol, to the Head of Geology and Geophysics or nominee for approval of their proposed courses of study.

5483 Honours Geophysics

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: Passes satisfactory to the Head of Geology and Geophysics in 1293 Structural Geology and Exploration Geophysics, 9769 Theoretical Geophysics and, in addition at least one of the other third-year subjects offered by the Department of Geology and Geophysics, or third-year subjects offered by the Departments of Applied Mathematics or Physics. Students with a different background of third-year courses may be accepted at the discretion of the Head of Geology and Geophysics or nominee.

Requirements: Candidates will be required to attend several courses from a number which will be given in specialised fields of geology, economic geology, mathematics and physics. Honours students may, after consultation with the Head or nominee, also be required to take some level III subjects in the Departments of Geology and Geophysics, Applied Mathematics or Physics, which they did not take in third year. In addition, candidates will undertake supervised individual projects: possible topics should be discussed with the Professor of Geophysics before the end of the preceding year. Special courses of reading and laboratory studies will be laid down and each candidate will be required to give all the time not required for lectures or in the field to work in the laboratory. Candidates may be required to satisfy the examiners that they have a reading knowledge of French, German or Russian. They will also be required to contribute to a series of seminars.

Intending Honours students must apply, before the end of the year preceding that in which they wish to enrol, to the Head of Geology and Geophysics or nominee for approval of their proposed courses of study.

5844 Honours Petroleum Geology and Geophysics

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: Geology students intending to do Honours in Petroleum Geology and Geophysics should have passes to the satisfaction of the Head of Department in the subjects 8037 Stratigraphy and General Palaeontology, 1293 Structural Geology and Exploration Geophysics, 4016 Petroleum Geochemistry and Sedimentology and 1789 Tectonics and Geological Mapping.

Geophysics students intending to do Honours in Petroleum Geology and Geophysics are advised to include in their third year enrolments the subjects 1293 Structural Geology and Exploration Geophysics, 4016 Petroleum Geochemistry and Sedimentology, 9769 Theoretical Geophysics, 8037 Stratigraphy and General Palaeontology.

Students intending to do Honours in Petroleum Geology and Geophysics and who have satisfactory passes in their year subjects in Geology and/or Geophysics alone, or in combination with third year subjects in Applied Mathematics, Physical and Inorganic

Chemistry, Organic Chemistry, Physics, Botany, Zoology or Geography may be accepted at the discretion of the Head of Geology and Geophysics.

Requirements: The subject comprises lectures, workshops and fieldwork in the Department and on-the-job training in the petroleum industry. Each candidate will undertake a supervised individual project of research into some aspect of petroleum science. In connection with this project, each candidate will undertake an eight to twelve week placement with a relevant company or organisation as arranged by the Department of Geology and Geophysics in two periods May-June and August-September. Students are required to undertake two periods, each of 7 to 8 weeks, of formal coursework.

The first period of formal coursework, taught in conjunction with the Master's degree subject 6657 Petroleum Geology and Geophysics I in February-April, concentrates on background instruction in the areas of basin analysis and sedimentology, and there are additional components dealing with the methods of gathering, interpreting and applying data of importance in petroleum exploration.

The second period, taught in conjunction with 5532 Petroleum Geology and Geophysics II in June-August, provides students with basic skills in the use of seismic data for stratigraphic, structural and petroleum detection purposes. It also treats the broader aspects of applied palaeontology and national and international case studies of petroleum occurrence. A field camp to study actual rock relationships and further thesis-related on-the-job training are also included.

On the basis of the nature of their previous studies, some students may be required or permitted to substitute alternative studies for parts of the two components of coursework or to take additional studies. Specialised programmes for this purpose may be arranged in consultation with the Head of the Department of Geology and Geophysics.

Examinations are held at the end of each period of formal coursework. In addition candidates are expected to complete workshop assignments and to write papers and give seminars.

In the final assessment, subject to completion of the work placement, a weighting of 30% is given to each of the two components of coursework and 40% to the project.

Intending Honours students must apply, before the end of the year preceding that in which they wish to enrol, to the Head of Geology and Geophysics or nominee for approval of their proposed courses of study.

HORTICULTURE, VITICULTURE AND OENOLOGY

HONOURS LEVEL

3783 Honours Horticulture, Viticulture and Oenology

This subject is available under the provisions of Clause 2 of Schedule IV: The Honours Degree of the degree of Bachelor of Science.

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: A credit or higher standard pass in appropriate Level III subjects offered by a Science Department.

Requirements: Intending candidates should consult the Head of Department of Horticulture, Viticulture and Oenology and potential supervisors during October of the final year of studies for the Ordinary degree of Bachelor of Science, and should be prepared to

commence studies in the Department on or about 1 February. After consultation, each candidate will be assigned a research project which will be carried out under supervision. The results will be presented in a dissertation at the end of the unit. A candidate may also be required to prepare an essay, attend lectures, pass an examination, and give a seminar.

MICROBIOLOGY AND IMMUNOLOGY

Microbiology is concerned with all aspects of the various groups of microorganisms, including viruses and protozoan and metozoan parasites. Because it encompasses a vast area of knowledge, it is often subdivided into a number of speciality areas which include Bacteriology, Virology, Protozoology, Mycology and Parasitology. Immunology involves a study of host responses to substances that are recognized by the body as foreign or "non-self". Many of the fundamental concepts of immunology were developed by studying natural host reactions to infectious organisms, and knowledge of both microbiology and immunology is necessary for the study of infectious diseases.

LEVEL II

6326 Immunology and Virology II

Level: II.

Points value: 4.

Duration: Semester II.

Pre-requisite: 9195 Microbiology II or acceptable equivalent.

Contact hours: 3 lectures, and 6 hours of practical and tutorial work each week.

Content: The course is designed to provide the basic principles and fundamental concepts of immunological mechanisms whereby vertebrates resist invasion by bacteria and viruses and an understanding of the biology of animal viruses. Topics covered include: the lymphoid system and lymphocyte circulation; antigens, antibodies and their interactions, structure, specificity, cross-reactivity and biological properties; the innate and adaptive mechanisms responsible for resistance to infection; the complement system; the characteristics and function of receptors on cells of the immune system, including the RES; ontogeny of lymphoid cells and their classification into subsets; effects of antigenic stimulation on lymphoid cells which result in humoral or cell-mediated immunity or tolerance; the role of the MHC and requirement for antigen presentation in immune responses; regulation of immune responses; viruses as obligate intracellular parasites; structure, classification and replication of animal viruses and their effects on host cells; acute and persistent virus infections; methods used to detect, study and quantitate viruses.

Assessment: 3 hour written examination of lecture material 70%; laboratory and tutorial performance, written reports of practical work and a 1 1/2 hour written examination related to practical work (including handling of data) 30%.

Text-books: Immunology: Roitt, I., Brostoff, J. and Male, D., *Immunology*, 2nd. edn. (Churchill, Livingstone, 1989); Virology: Dimmock, N.J. and Primrose, S.B., *Introduction to Modern Virology* 3rd edn. (Blackwell Scientific Publications, 1987).

Reference text: White, D.O. & Fenner, F.J., *Medical Virology* 3rd edn. (Academic Press, 1986).

9195 Microbiology II

Level: II.

Points value: 4.

Duration: Semester I.

Pre-requisites: 3174 Biology I *or* an acceptable equivalent.

Assumed knowledge: 6878 Chemistry I *or* an acceptable equivalent.

Contact hours: 3 lectures and 6 hours of practical and tutorial work each week.

Content: This course illustrates that while bacteria share with other forms of life many common features of structure, development and function, they also differ in some fundamental ways. Topics covered include: characteristics and anatomy of bacterial cells and protists; antibiotics; genetic organisation and regulation; mutagenesis and mutations; genetic mechanisms and the biology of plasmids; biology and ecology of various bacteria; bacterial viruses; bacteria in disease.

Assessment: 3 hour written examination of lecture material 70%; laboratory and tutorial performance, written reports of practical work and a 1 1/2 hour written examination related to practical work (including handling of data) 30%.

Text-book: To be advised.

LEVEL III

9371 Advanced Immunology

Level: III

Points value: 3

Duration: Semester I.

Pre-requisites: 9195 Microbiology II and 6326 Immunology and Virology II (Div. I or better), or a suitable equivalent.

Contact hours: 2 lectures, 1 tutorial/seminar each week, and 10 hours of practical work each week for half the Semester.

Content: A detailed examination of the processes and mechanisms involved in immune reactions, with emphasis on immune recognition, cooperation between immunologically active cells and the development of immune reactions. Topics covered include: differentiation and activation of T and B lymphocytes; the function of subsets of T lymphocytes; antigen processing and antigen interaction with T lymphocytes; characteristics and functions of the lymphokines and cytokines which modulate immune responses; mechanisms of immunoregulation, including suppression; lymphocyte traffic through various tissues; the production and use of monoclonal antibodies.

Assessment: 3 hour written examination on lecture material 50%; practical component 20%; performance in tutorials, seminars and a viva 30%.

Text-book: To be advised.

7335 Advanced Microbiology

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 9195 Microbiology II and 6326 Immunology and Virology II (Div. I or better), or a suitable equivalent.

Contact hours: 2 lectures, 1 tutorial/seminar each week and 10 hours practical per week for half the semester.

Content: Examination of structural and functional aspects of bacteria and animal viruses, with emphasis on those which infect humans. The response of bacteria to their environment and the utilization of bacteria and viruses for biotechnology. Particular emphasis is given to the molecular biological approach to these studies. The topics covered include: Molecular architecture and assembly — cell organization, the Gram negative outer membrane, lipopolysaccharide and KDO analogues as antibacterials, peptidoglycan and penicillin binding proteins, protein secretion and excretion, the bacterial genome; Bacterial growth characteristics — regulation of chromosome replication, cell division and growth, sporulation and sigma factors, heat shock proteins, temperature, pH and water effects; Cellular activity — transport systems, regulation of selected operons, motility and chemotaxis; Cellular environment — biological interactions in the rumen, oral cavity and intestinal tract, biodegradation of recalcitrant molecules, extreme environments, thermophiles, halophiles and the industrial use of thermophilic enzymes; Virus structure and replication — virus replication strategies, comparison of DNA and RNA viruses, viral morphogenesis and genetics and antiviral agents.

Assessment: 3 hour written examination on lecture material 50%; practical component 20%; performance in tutorials, seminars and a viva 30%.

Text-books: To be advised.

2529 Basic Biotechnology

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 1404 Biochemistry II (Division I) or acceptable equivalent; 2893 Recombinant DNA Technology: Practice; 6927 Recombinant DNA Technology: Theory; 2123 Molecular Biology of the Gene; 4762 Protein Structure and Function; 9195 Microbiology II and 6326 Immunology and Virology II or by arrangement with the Head of Department.

Co-requisite: 9510 Biochemistry of Control of Gene Expression.

Contact hours: 1 lecture per week and 6 tutorials per Semester. Full week workshop in mid-semester break.

Content: Advanced lectures and tutorials on application of gene technology to biotechnology including industrial, medical, commercial and legal issues. Tutorials involve site visits to selected biotechnology establishments and preparation of reports on specific application of gene technology principles for practical purposes. Laboratory work will illustrate applied gene technology.

Assessment: 3-hour written examination on lectures, tutorials and practical work.

9570 Host Responses to Infection

Level: III

Points value: 3

Duration: Semester II.

Pre-requisites: 7335 Advanced Microbiology and 9371 Advanced Immunology or suitable equivalents.

Contact hours: 2 lectures, 1 tutorial/seminar each week and 10 hours of practical work per week for half the Semester. Practical work will take the form of mini-projects.

Content: This course examines the various immune reactions which occur during interactions of hosts with pathogenic organisms including viruses, bacteria and protozoan and metazoan parasites and the immunological aspects of host responses to foreign tissues and tumours. Topics covered include: systemic cellular and humoral mechanisms of immunity to infectious agents and tissues; local immunity at mucosal surfaces; comparison of intracellular and extracellular bacterial pathogens; defense strategies against superficial

and systemic viral infections; the role of immune mechanisms in active, chronic and latent viral infections; emergence of new virus diseases; viruses and neoplastic disease; immunosuppressive effects and immune invasion; immunopathologic reactions; current strategies and possible new approaches for the production of vaccines and for vaccination.

It is recommended that this course be taken in parallel with the complementary course 7546 Mechanisms of Infection.

Assessment: 3 hour written examination on lecture material 50%, practical component 20%, performance in tutorials, seminars and a viva 30%.

Text-book: To be advised.

7546 Mechanisms of Infection

Level: III

Points value: 3

Duration: Semester II.

Pre-requisites: 7335 Advanced Microbiology and 9371 Advanced Immunology or suitable equivalents.

Contact hours: 2 lectures, 1 tutorial/seminar each week, and 10 hours of practical per week for half the Semester. Practical work will take the form of mini-projects.

Content: This course examines the molecular basis of the interactions of microbes with various hosts, primarily from the point of view of microbes (including viruses and parasites). The roles of microbial factors in these interactions and the response of microbes to environmental pressures are considered. The topics covered include: Pathogenesis of infections of man and animals — establishment of contact with, and colonization of target tissues; pili, fimbriae and adhesins; toxins and their modes of action; invasion and intracellular survival and multiplication; resistance to host defenses; avoidance of host responses, antigenic and phase variations; Extrachromosomal elements and virulence — plasmid encoded virulence properties; transposons, insertion sequences and the evolution of multiple drug resistance; Interactions with plants — tumour formation in plants; nodulation and nitrogen fixation; Insect and parasite pathogens — Bacilli and parasporal bodies; *Xenorhabdus*; Molecular diagnostics — development of rapid diagnostic methods for pathogens.

It is recommended that this course be taken in parallel with the complementary course 9570 Host Responses to Infection.

Assessment: 3 hour written examination on lecture material 50%; practical component 20%; performance in tutorials, seminars and a viva 30%.

Text-book: Mims, C.A. and White, D.O., *Viral Pathogenesis and Immunology* (Blackwell Scientific Publications, 1984) *and* an additional text to be advised.

Reference text: Fields, B.N., *Virology* (Raven Press, N.Y., 1989).

2647 Perspectives in Microbiology and Immunology

Level: III.

Points value: 1.

Duration: Semester II.

Pre-requisites: 9195 Microbiology II and 6326 Immunology and Virology II (Div. I or better) or suitable equivalents.

Contact hours: 1 lecture/tutorial per week.

Content: Research topics in Microbiology and Immunology which provide an insight of some of the recent and significant developments in major disciplines. Recent publications related to the chosen topics will be made available.

Assessment: Performance in the tutorials and an essay.

HONOURS LEVEL

4408 Honours Microbiology and Immunology

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: 7335 Advanced Microbiology, 9371 Advanced Immunology, 7546 Mechanisms of Infection and 9570 Host Responses to Infection at a standard satisfactory to the Department. Performance in all parts of the courses will be taken into account in assessing acceptable students. In exceptional cases, students having passed other, suitable Level III subjects may be considered for entry into Honours.

Requirements: Candidates will normally be expected to start the course in the second week of January, but this may be altered in special circumstances. Candidates are required to devote their full time to a special course of study involving a series of lectures and seminars and a research project under the direction and supervision of one or more staff members. The course of study and project must be in the same general discipline of Microbiology, Virology or Immunology. Examination of a thesis presenting the results of each project undertaken is an essential part of the assessment procedure. Full details of assessment procedures may be obtained from the Department.

Students interested in taking the Honours course should consult the Head of the Department before 30 November in the final year of their studies for the B.Sc. degree.

PHARMACOLOGY

Pharmacology is a subject which examines the actions and uses of drugs, and the experimental and regulatory procedures which are used in the development of new drugs. Two Level III subjects are offered.

LEVEL III

1730 Principles of Pharmacology and Toxicology

Level: III.

Points value: 6.

Duration: Semester I.

Pre-requisites: 9285 Physiology II (Div. I) or an acceptable equivalent.

Assumed knowledge: 6878 Chemistry I.

Contact hours: 4 lectures and 9 hours of practical work a week.

Content: The nature and quantitation of drug action including receptor and cellular mechanisms; the pharmacokinetic principles which determine the intensity, duration and variability of drug effect; the toxicology of therapeutic and environmental chemicals; the development and testing of new drugs. The above concepts will be exemplified by reference to selected and relevant therapeutic drug classes.

Assessment: 3 hour written examination paper 60%, performance in practical classes 40%.

Text-books: Goodman, L. S. and Gilman, A. *The pharmacological basis of therapeutics* (latest edn.) (Macmillan) or Rang, H. P. and Dale, M. M. *Pharmacology* 2nd edn.

(Churchill Livingstone, 1991) or Kalant, H. and Roschlau, W. H. E., *Principles of medical pharmacology*, 5th. edn. (Mosby-Williams & Wilkins, 1989).

4574 Systematic Pharmacology

Level: III.

Points value: 6.

Duration: Semester II.

Pre-requisites: 9285 Physiology II (Div. I) or an acceptable equivalent.

Assumed knowledge: 6878 Chemistry I, 1730 Principles of Pharmacology and Toxicology.

Contact hours: 4 lectures and 9 hours of practical work a week.

Content: The subject aims to survey drug action on and interaction with major physiological systems including the autonomic and central nervous systems, neurotransmitters, cardiovascular, respiratory, endocrine and immune systems. Therapeutic uses of drugs will be considered in each case. Drug effects on behaviour and the relevance of this to drug abuse and drug dependence will be considered.

Assessment: 3 hour written examination paper 60%, performance in practical classes 40%.

Text-books: Goodman, L. S. and Gilman, A. *The pharmacological basis of therapeutics* (latest edn.) (Macmillan) or Rang, H. P. and Dale, M. M. *Pharmacology* 2nd edn. (Churchill Livingstone, 1991) or Kalant, H. and Roschlau, W. H. E., *Principles of medical pharmacology*, 5th. edn. (Mosby-Williams & Wilkins, 1989).

HONOURS LEVEL

3950 Honours Pharmacology

Level: Honours

Points value: 24.

Duration: Full year.

Pre-requisites: 1730 Principles of Pharmacology and Toxicology and 4574 Systematic Pharmacology. Intending candidates should consult the Head of the Department of Clinical and Experimental Pharmacology during the final year of their course.

Requirements: Candidates are required to give their full attendance to a special course of study and experimental work in the pharmacology laboratory, and to participate in a research project under the direction of a member of the academic staff. The results of the research project are to be embodied in a thesis in a form specified by the Head of the Department.

PHYSICS AND MATHEMATICAL PHYSICS

Introductory Notes:

Physics provides a basis for a scientific understanding of the world. Physics may be studied in its own right or because it is crucial to developments in mathematics, engineering, medicine and biology.

For students intending to become professional physicists there is a set of subjects covering three or four years of study. Details of these subjects appear below.

For students intending to major in other areas, ranging from Arts to Engineering,

specialised subjects are available: 3117 Medical Physics I (for the degree of M.B., B.S. and B.D.S.), 2934 Physics, Ideas and Society I (for the degree of B.A., B.Arch.St., B.Ec. and B.Sc. in Science and in Mathematical Sciences), 5599 Physics IHE (for Civil and Mechanical Engineers, degree of B.E.). The subjects 4145 Astronomy I and 2934 Physics, Ideas and Society I are suitable for students with no previous exposure to Physics. The subject 9615 General Physics I assumes previous exposure; it is intended for students who do not wish to proceed with further study in Physics or Engineering, and is orientated towards the Biological Sciences.

The Department of Physics and Mathematical Physics offers Level I, II and III subjects leading to a single major in Physics (Experimental or Theoretical option) or a double major in the Faculty of Science, and a major in Mathematical Physics in the Faculty of Mathematical Sciences.

For students intending to major in any of these options, the recommended course of study is:

Level I: 3643 Physics I and 9786 Mathematics I. Other subjects may include 4145 Astronomy I.

Level II: 2653 Physics II, 2656 Classical Mechanics II, 9600 Classical Fields and Mathematical Methods II, and Level II Mathematical Science subjects including the topics vector calculus, differential equations, Fourier series, and complex analysis. [The semester subjects 3418 Electromagnetism and Relativity II and 6051 Introductory Quantum Mechanics with Applications II are component parts of 2653 Physics II.]

Level III: Students intending to proceed to Honours should take as many as possible of the fourteen Level III subjects offered by the Department, preferably a double major in Physics, consisting of at least 18 points from subjects presented by the Department. Students who might wish to undertake further work in experimental physics are strongly advised to take both 2838 Experimental Physics & Electronics and 9116 Laboratory Physics

A Programme of Education in Physics with Industrial Co-operation.

The Department offers a programme whereby students enrolled for the third-year of the B.Sc. in the Faculty of Science, who have achieved an average credit level in the work of the first and second years *and* a credit level in 2653 Physics II, can apply to enrol in a co-operative programme with industry. The student would be a full-time paid employee in industry for 4-5 months of each of the following two years. Thus the student would be in full-time study in Semester I of Year 3, full-time work in Semester II of Year 3 and again in Semester I of Year 4. The degree of B.Sc. would be completed by full-time study in Semester II of Year 4.

Each work period in Years 3 and 4 involve a project agreed to jointly by the Department of Physics and Mathematical Physics and the employer. A written report must be prepared on each project and approved by both the employer and the Department. The performance of each student will be monitored by a committee within the Department. Unsatisfactory work reports or course grades may result in the student leaving the EPIC programme.

LEVEL I

4145 Astronomy I

Level: I.

Points value: 3.

Duration: Semester I.

Pre-requisites: None.

Assumed knowledge: None.

Contact hours: 3 lectures, 1 tutorial and 3 hours of practical work a week. There will be one evening excursion for observations at a dark site. Evening observing forms a major part of the practical work.

Content: This subject is primarily for students who wish to obtain an overall view of contemporary astronomy and our place in the astronomer's universe. Historical introduction. Modern astronomical instruments. The solar system, structure, dimensions, orbits, theories of origin. Sun-system relations, individual planets, spacecraft results and minor members of the system. Stars, stellar distances, types of stars, variable stars, star clusters, the Milky Way, stellar evolution. Galaxies, galactic distance scale, radioastronomy, space astronomy, cosmology.

Assessment: End of semester examination, practical work and an essay.

Text-book: Friedlander, M. W., *Astronomy* (Prentice-Hall).

9615 General Physics I

Level: I.

Points value: 6.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Year 12 Physics, Year 12 Mathematics IS (or Mathematics I and II).

Contact hours: 3 lectures, 1 tutorial and 3 hours of practical work a week.

Content: This subject is primarily intended for students who do not intend to proceed with further study in physics or engineering.

The main objectives are to present a contemporary view of classical mechanics, electromagnetism, optics and quantum physics and to offer students a glimpse of what is going on in physics today. The emphasis of the course is on physical principles rather than mathematical rigour.

Applications of physical principles in biological systems, astrophysics, sub-atomic physics and modern technology are special features of the course.

Students intending to continue to 2653 Physics II should take the course 3643 Physics I. A student who gains a distinction in General Physics may be permitted to enrol in Physics II with the consent of the Head of the Department.

Assessment: Written examinations, and assignments and practical work.

Text-book: Giancoli, D. C., *Physics*: *Principles with applications* (Prentice-Hall).

Reference Texts: Kane, J. W. and Sternheim, M. M., *Physics SI version* 2nd edn. (Wiley); Marion, J. B. and Hornyak, W. F., *General physics with bioscience essays* 2nd edn. (Wiley); Nave, C. R. and Nave, B. C., *Physics for the health sciences* 3rd edn. (W.B. Saunders); Cromer, A.H., *Physics for the life sciences* 2nd edn. (McGraw-Hill).

3643 Physics I

Level: I.

Points value: 6.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: A good knowledge of Year 12 Physics and Year 12 Mathematics I and II. Assumed concurrent subject: 9786 Mathematics I.

Contact hours: 3 lectures, 1 tutorial and 3 hours of practical work a week.

Content: Classical Mechanics (calculus based): vector kinematics, applications of Newton's laws, gravitation, conservative forces, collisions, statics, rotational motion, non-inertial frames of reference.

Kinetic Theory and Thermodynamics: gas laws, Maxwell-Boltzmann distribution, mean free path, equipartition of energy, reversible processes, entropy, black-body radiation.

Oscillations: simple harmonic motion, damped, forced and natural oscillations.

Electricity and Magnetism: electric field, Coulomb and Gauss laws, electrostatics, capaci-

tance, induced e.m.f., magnetic field, Ampere and Faraday laws, inductance, alternating currents, RCL circuits.

Waves: superposition, wave equation, Fourier analysis, impedance, sound, decibel scale, interference and diffraction, Doppler effect, electromagnetic waves, speed of light.

Relativity: Einstein's postulates, time dilation, length contraction, Lorentz transformations, velocity addition, relativistic momentum and energy.

Quantum Physics: X-rays as waves and photons, Compton effect, pair production, de Broglie waves, uncertainty principle, probability interpretation.

Assessment: Written examinations, and assignments and practical work.

Text-book: Giancoli, D. C. *Physics for science and engineering with modern physics* 2nd edn. (Prentice-Hall).

Reference texts: Ohanian, H. C., *Physics* 2nd extended edn. (Norton); Halliday, D. and Resnick, R., *Physics* 3rd edn. (Wiley); Marion, J. B. and Hornyak, W. F. *Physics for science and engineering* (Holt-Saunders); Sears, F. W., Zemansky, M. W. and Young, H. D., *University Physics* 7th edn. (Addison-Wesley).

LEVEL II

9600 Classical Fields and Mathematical Methods II

Level: II.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 3643 Physics I.

Contact hours: 2 lectures a week and 1 tutorial a fortnight.

Content: Newtonian gravitation, electrostatics, Laplace and Poisson equations, method of images, boundary value problems, use of special functions. Delta-functions, Green's functions, eigenvalue expansions. Fourier transforms, multipole expansions, spherical harmonics. Heat equation.

Assessment: Class exercises, final 2 hour examination.

References: Mackie, A. G., *Boundary value problems* (Oliver and Boyd); Sneddon, I. N., *Elements of partial differential equations* (McGraw-Hill).

2656 Classical Mechanics II

Level: II.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. 1).

Assumed knowledge: 3643 Physics I.

Contact hours: 2 lectures a week and 1 tutorial a fortnight.

Content: Newton's laws, conservation laws. Many particle systems. Rigid bodies. Angular momentum. Moment of inertia tensor. Lagrange's equations. Generalised co-ordinates.

Assessment: Class exercises, final 2 hour examination.

Text-books: Fowles, G. R., *Analytical mechanics* 4th edn. (Holt, Reinhart & Winston) or Arya, A., *Introduction to classical mechanics* (Allyn & Baron, 1990).

3418 Electromagnetism and Relativity II

Level: II.

Points value: 2.

Duration: Semester I.

Pre-requisites: (a) 3643 Physics I (Div. I) and 9786 Mathematics I (Div. I); or

(b) 5945 Physics IE (Div. I) and 9786 Mathematics I (Div. I); or

(c) an acceptable equivalent

Assumed concurrent Subjects: Choice of Level II Mathematical Science subjects to include the topics vector calculus, differential equations, Fourier series, and complex analysis.

Contact hours: 2 lectures a week and 8 tutorials.

Content: Electromagnetism: Electrostatics, electric and magnetic fields in material media, electromagnetic potentials. Maxwell's equations and their solution leading to electromagnetic waves.

Relativity: Four-vectors, Minkowski space-time, Lorentz invariance, four- momentum, kinematics of collisions and conservation laws.

Assessment: Examination and week-end papers.

Text-books: Taylor, E. F., and Wheeler, J. A. *Spacetime physics* (Freeman).

References: French, A. P. *Special Relativity* (Nelson); Feynman, R. P., *Lectures on physics* Vol. II (Addison-Wesley); Marion, J. B. and Hornyak, W. F. *Physics for science and engineering* Pt. 2 (Saunders); Ohanian, H. C., *Physics,* Volume 2 (Norton).

6051 Introductory Quantum Mechanics and Applications II

Level: II.

Points value: 2.

Duration: Semester II.

Assumed knowledge: 3643 Physics I or 5945 Physics IE and the vector calculus and differential equations components of Level II Mathematics subjects.

Contact hours: 2 lectures a week and 8 tutorials.

Content: Wave Mechanics with examples from Atomic, Sub-atomic and Solid State physics. Double slit experiment, De Broglie hypothesis, Heisenberg Uncertainty Principle. Operators. Commutator. Interference of measurements. Polarised light. Wave equation. Probability density and current. Time independent Schrodinger equation. Energy quantisation. Particle in a 1-D box. The 3-D box. Harmonic oscillator in 1-D. Raising and lowering operators. Barrier penetration. Schrodinger equation in 3-D. Angular momentum. The Hydrogen atom. Kronig-Penny model of nucleons. Stern-Gerlach experiment, spin, Pauli matrices. Spin orbit force. Pauli exclusion principle. Many-body wave function.

Assessment: Examination and weekend papers.

Text-books: Gasiorowicz, S., *Quantum physics* (Wiley); French, A. P., and Taylor, E. F., *Introduction to quantum physics* (MIT Press).

Reference: Feynman, R. P. *Lectures on physics* Vol. III.

2653 Physics II

Level: II.

Points value: 8.

Duration: Full year.

Pre-requisites: (a) 3643 Physics I (Div I) and 9786 Mathematics I (Div I); or (b) 5945 Physics IE (Div I) and 9786 Mathematics I (Div I); or (c) and acceptable equivalent.

Assumed concurrent subjects: 2656 Classical Mechanics II and 9600 Classical Fields and

Mathematical Methods II. Choice of Level II Mathematical Science subjects to include the topics vector analysis, differential equations, Fourier series, and complex analysis.

Contact hours: 3 lectures, 1 tutorial and 6 hours of practical work a week.

Content: Electromagnetism: Electrostatics, electric and magnetic fields in material media, electromagnetic potentials. Maxwell's equations and their solution leading to electromagnetic waves.

Relativity: Four-vectors, Minkowski space-time, Lorentz invariance, four-momentum, kinematics of collisions and conservation laws.

Electrical Circuit Theory: D.C. and A.C. Circuits; circuit theorems and network analysis; electrons in solids; solid-state devices.

Optics: Lenses & aberrations; interference; polarisation; crystal optics; optical instruments.

Quantum Mechanics with Applications: Wave Mechanics with examples from Atomic, Subatomic and Solid State physics. Double slit experiment, De Broglie hypothesis, Heisenberg Uncertainty Principle. Operators. Commutator. Interference of measurements. Polarised light. Wave equation. Probability density and current. Time independent Schrodinger equation. Energy quantisation. Particle in a 1-D box. The 3-D box. Harmonic oscillator in 1-D. Raising and lowering operators. Barrier penetration. Schrodinger equation in 3-D. Angular momentum. The Hydrogen atom. Kronig-Penny model of nucleons. Stern-Gerlach experiment, spin, Pauli matrices. Spin orbit force. Pauli exclusion principle. Many-body wave function.

Assessment: End of semester examinations, laboratory work, weekend assignments and essay.

Text-books: As for 3418 Electromagnetism and Relativity II and 6051 Introductory Quantum Mechanics with Applications II plus: Brophy, J. J., *Basic electronics for scientists* (McGraw-Hill); Hecht, E., *Optics* 2nd edn. (Addison-Wesley).

LEVEL III

7099 Advanced Dynamics

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 2656 Classical Mechanics II.

Contact hours: 2 lectures a week and 1 tutorial a fortnight.

Content: Hamilton's principle. Lagrangian mechanics on manifolds. Exterior differential forms and Hamiltonian dynamics. Canonical Transformations and Hamilton-Jacobi theory. Introduction to chaotic motion.

Assessment: Class exercises, 2 hour examination.

Reference texts: V. I. Arnold, *Mathematical methods of classical mechanics* (Springer-Verlag). Percival, I. & Richards, D., *Introduction to dynamics* (Cambridge University Press).

1067 Advanced Quantum Mechanics

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 4964 Quantum Mechanics.

Contact hours: 2 lectures a week and 1 tutorial a fortnight.

Content: Symmetries and conservation laws for many-particle systems. The density matrix. Approximation methods with applications. Non-degenerate and degenerate time-independent perturbation theory. The time-development operator and interaction representation. Time-dependent perturbation theory. Scattering theory and the S-matrix. Absorption and emission of electromagnetic radiation.

Assessment: Class exercises and 2 hour examination.

Reference texts: Sakurai, J.J., *Modern quantum mechanics* (Addison-Wesley); Gottfried, K., *Quantum mechanics* (Benjamin).

6852 Astrophysics

Level: III.

Points value: 2.

Duration: Semester I.

Assumed knowledge: 2653 Physics II.

Contact hours: 2 lectures a week and 1 tutorial a fortnight.

Content: This subject aims to give a broad coverage of present day astronomical ideas with an emphasis on stellar processes. Topics included are: Concepts in Cosmology. The overall structure and content of the Universe. Observational techniques in astronomy: telescopes, detectors, spectral measurements. Distance measurement. The interstellar medium. Solar System. Stellar processes and evolution. End states: white dwarfs, neutron stars, black holes.

Assessment: Class exercises, 2 hour examination.

Text-book: To be advised.

1982 Atmospheric and Environmental Physics

Level: III.

Points value: 2.

Duration: Semester II.

Assumed knowledge: 2653 Physics II.

Contact hours: 2 lectures a week and 1 tutorial a fortnight.

Content: Composition and structure of the Atmosphere; Solar radiation; heat exchange processes; atmosphere in motion, the general circulation; vorticity, wave motion; Air in vertical motion; cloud physics; Planetary boundary layer. Forecasting. Role of ozone, carbon dioxide, minor constituents and aerosols. Monitoring of the environment; energy resources.

Assessment: Marked assignments and 2 hour examination.

Reference texts: McIntosh, D. H. and Thom, A. S., *Essentials of meteorology* (Wykeham); Houghton, J. T., *The physics of atmospheres* (C.U.P.); Australian Bureau of meteorology, *Manual of meteorology* Parts 1 and 2.

2396 Atomic and Nuclear Physics

Level: III.

Points value: 2.

Duration: Semester II.

Assumed knowledge: 4964 Quantum Mechanics; 6849 Electromagnetism.

Contact hours: 2 lectures a week and 1 tutorial a fortnight.

Content: This subject aims to give a broad coverage of the basic ideas of atomic and nuclear structure, including: spectra of one and two electron atoms; transition probabilities and

selection rules; the Hartree method; Hartree-Fock; L-S and j-j coupling; systematics of nuclear sizes, shapes and masses, the shell model; the nucleon-nucleon force. Nuclear stability.

Assessment: Class exercises and 2 hour examination.

Text-books: Cottingham, W. N. and Greenwood, D. A., *An introduction to nuclear physics;* Woodgate, G. K., *Elementary atomic structure* (Oxford).

6849 Electromagnetism

Level: III.

Points value: 2.

Duration: Semester I.

Assumed knowledge: Electromagnetism and Relativity, component of 2653 Physics II.

Contact hours: 2 lectures a week and 1 tutorial a fortnight.

Content: Consistent description of electric and magnetic fields; Potentials; Boundary value methods. Maxwell's equations. Electromagnetic waves in free space. Poyntings's theorem; quantum effects. Propagation of E.M. waves in matter, on transmission lines, and in waveguides; resonant cavities. Propagation, scattering and absorption of E.M. waves in weakly ionized gases; ionospheric propagation. Retarded potentials; Multipole radiation; Radiation from a moving point charge. Relationship to special relativity; Lorentz transformation of fields.

Assessment: Examination and marked exercises.

Text-books: Nayfeh, M. H., and Brussel, M. K., *Electricity and magnetism* (Wiley).

References: Lorrain, P., and Corson, D. *Electromagnetic fields and waves* (Freeman); Purcell, E. M., *Electricity and magnetism* (McGraw-Hill); Barger, V. D., and Olsson, M. G., *Classical electricity and magnetism, a contemporary perspective* (Allyn and Bacon); Feynman, R. P., Leighton, R. B., and Sands, M., *The Feynman lectures on physics* Vol. II, (Addison-Wesley).

2838 Experimental Physics & Electronics

Level: III.

Points value: 4.

Duration: Semester I.

Pre-requisites: 2653 Physics II or an acceptable equivalent.

Contact hours: 9 hours of practical work a week.

Content: Electronics (analogue circuits), laboratory experiments in selected areas including atomic and nuclear physics, optics and electromagnetism.

Assessment: Laboratory notebooks and examination.

References: Bevington, P.R., *Data reduction and error analysis in the physical sciences* (McGraw-Hill).

9116 Laboratory Physics

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 2653 Physics II, or an acceptable equivalent.

Contact hours: 9 hours of practical work a week.

Content: Introduction to workshop practice and one project.

Assessment: Project report and examination.

4324 Mathematical Methods

Level: III.

Points value: 2.

Duration: Semester I.

Co-requisites: 9786 Mathematics I.

Assumed knowledge: 9600 Classical Fields and Mathematical Methods II or equivalent.

Contact hours: 2 lectures a week and 1 tutorial a fortnight.

Content: Review of vector spaces and inner products. Introduction to dual spaces.

Introduction to Hilbert spaces. Self-adjoint and unitary operators. Application to Sturm-Liouville equations.

Distributions as duals of spaces of test functions. Fourier transforms of distributions. Applications to Green's functions.

Cartesian tensors. General co-ordinate transformations and introduction to tensor calculus.

Assessment: Class exercises, 2 hour examination.

1384 Optics

Level: III.

Points value: 2.

Duration: Semester I.

Assumed knowledge: 2653 Physics II.

Contact hours: 2 lectures a week and 1 tutorial a fortnight.

Content: Fresnel and Fraunhofer diffraction, gratings, Fourier methods, Abbe's theory, coherence, spatial filtering, image processing and enhancement, holography and other related topics in modern optics; lasers; non-linear optics, optoelectronics and optical fibres.

Assessment: Examination and marked assignments.

Text-book: Lipson, S.G. and Lipson, H., *Optical physics* 2nd edn. (Cambridge University Press).

4964 Quantum Mechanics

Level: III.

Points value: 2.

Duration: Semester I.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: Introductory Quantum Mechanics with Applications component of 2653 Physics II.

Contact hours: 2 lectures a week and 1 tutorial a fortnight.

Content: Review of principles of quantum mechanics. Dirac bra-ket notation. Particle dynamics; the position and momentum representations. Examples. Harmonic Oscillator and occupation number representation. Rotations and properties of angular momentum. Central forces. Composite systems, identical particles. Elementary approximation methods: truncation of basis, first order perturbation theory, Rayleigh-Ritz variational bound.

Assessment: Class exercises and 2 hour examination.

Text-book: Gasiorowicz, S., *Quantum physics* (Wiley); Merzbacher, E., *Quantum mechanics* (Wiley); Sakurai, J. J., *Modern quantum mechanics* (Addison-Wesley).

7633 Relativity and Classical Field Theory.

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I (Div. I).

Assumed knowledge: 9600 Classical Fields and Mathematical Methods II, 3418 Electromagnetism and Relativity II.

Contact hours: 2 lectures a week and 1 tutorial a fortnight.

Content: Einstein's principle of relativity. Minkowski space, 4-tensors. Relativistic kinematics, Lorentz transformations. Relativistic mechanics. Maxwell's equations in tensor form. Motion of charged particles. Variational principles. Energy-stress tensors. Green's function for the wave equation, Lienard-Wiechert potentials. Radiative reaction.

Assessment: Class exercises, 2 hour examination.

4736 Solid State Physics

Level: III.

Points value: 2.

Duration: Semester II.

Assumed knowledge: 2653 Physics II.

Contact hours: 2 lectures a week and 1 tutorial a fortnight.

Content: Crystal structure, reciprocal lattice, X-ray diffraction. Crystal binding. Lattice vibrations and thermal properties of solids. Free electron gas. Electrons in periodic lattice. Energy bands and semi-conductors. Low temperature physics, superconductivity, liquid Helium. Magnetism.

Assessment: Examination and Marked Assignments.

Text-books: Kittel, C., *Introduction to solid state physics* 5th edn. (Wiley); Mermin, N. W. and Ashcroft, N. D. *Solid state physics* (Holt-Saunders).

5547 Statistical Mechanics

Level: III.

Points value: 2.

Duration: Semester II.

Pre-requisites: 9786 Mathematics I, 3643 Physics I (Div. I).

Contact hours: 2 lectures a week and 1 tutorial a fortnight.

Content: This subject introduces concepts essential for the understanding of both classical and quantum statistical mechanics. Topics covered include the classical thermodynamic laws and their application, postulates of statistical mechanics, statistical interpretation of thermodynamics, microcanonical, canonical and grand canonical ensembles.

The methods of statistical mechanics are then used to develop the statistics for Bose-Einstein, Fermi-Dirac and photon gases. Selected topics from low temperature physics, electrical and thermal properties of matter, and astrophysics will be discussed.

Assessment: 2 hour examination and class exercises.

Text-books: Reif, F., *Fundamentals of statistical and thermal physics* (McGraw-Hill); Mandl, F., *Statistical physics* (Wiley).

HONOURS LEVEL

1285 Honours Physics

Note: Students who are considering taking this subject are advised to see the Head of the Department of Physics and Mathematical Physics as soon as possible, preferably before enrolling for their third year course.

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: The normal prerequisite for Honours Physics is a major in Experimental or Theoretical Physics. The preferred background is a double major in Physics. Any student wishing to take Honours Physics must obtain the approval of the Head of the Department of Physics and Mathematical Physics.

Requirements: It is possible to take an honours degree in either experimental or theoretical physics. The Honours course may include lecture courses on astrophysics, atmospheric physics, atomic and molecular physics, electrodynamics, experimental methods, general relativity, many-body theory, nuclear physics, particle physics, quantum mechanics, quantum field theory, statistical mechanics, solid state physics and unified gauge theories. Each student will also be expected to undertake a substantial experimental or theoretical research project on which a report will be prepared. Full details may be obtained by application to the Head of the Department.

5724 Honours Mathematical Physics

For syllabus see under Faculty of Mathematical Sciences.

PHYSIOLOGY

LEVEL II

3773 Physiology II

Level: II.

Points value: 8.

Duration: Full year.

Quota: May apply.

Pre-requisites: 6878 Chemistry I.

Assumed knowledge: 3174 Biology I, 9615 General Physics I.

Contact hours: 3 lectures, 1 tutorial and 4 hours of practical work a week.

Content: This introductory subject in mammalian physiology describes the co-ordinated function of the various physiological systems which is required to meet the needs of the whole organism. The department conducts a project based practical course. Each project lasts the whole semester and consists of a literature review, experimental work, written report and a poster presentation.

Assessment: Examinations at end of each semester (35% each) and practical assessments (30%).

Text-books: Scott, G. M. and Waterhouse, J. M., *Physiology and the scientific method* (Manchester University Press); and either Sherwood, L., *Human physiology* (West) or Guyton, A. C., *Textbook of medical physiology* (Saunders) *or* West, J. B., *Physiological basis of medical practice* (Williams & Wilkins). The recommended statistical reference is Pagano, R. R., *Understanding statistics in the behaviour sciences*, 3rd. edn. (West, 1990).

LEVEL III

2984 Cellular Physiology

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 3773 Physiology II (Div. 1) or an acceptable equivalent.

Contact hours: 2 lectures, 1 tutorial and 4 hours of practical work a week.

Content: In co-operation with the Department of Obstetrics and Gynaecology. This course is an introduction into several modern fields of cellular and early developmental physiology. Topics covered will include the biophysical basis of nerve and muscle function, ionic channels, information processing at synapses, cellular mechanisms of learning, neurotransmitter and hormone actions on receptors, the physiology of early embryogenesis and developmental cell biology. The tutorials will give opportunities for the students to discuss the most recent and exciting topics of cell biology. The practical course is aimed to provide experience in advanced techniques of computerized data-acquisition and cellular physiology and endocrinology. Practicals will be part of research projects in the Departments.

Assessment: Written and oral report (40%) and a final examination (60%).

Text-books: Darnel, J. E., Lodish, H. F. and Baltimore, D., *Molecular cell biology* 2nd edn. (Scientific American Books, 1990).

7288 Exercise Physiology

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 3773 Physiology II (Div. I) or an acceptable equivalent.

Contact hours: 2 lectures, 1 tutorial and 4 hours of practical work a week.

Content: The principal aim of the subject is to provide a sound scientific basis for understanding most aspects of human exercise performance. The provision of energy, relevant aspects of cardiorespiratory and neuromuscular function, hormonal interactions and the influence of environmental stressors on performance are some of the topics discussed at length. Biochemical, nutritional and psychological aspects of performance, training methodology and adaptations, optimization and assessment of performance, as well as the influence of drugs and other ergogenic aids are also considered in detail.

Assessment: 3 hour written examination (60%), practical reports and research projects (up to 40%). Review essays may also be taken into account.

Text-books: Astrand and Rodahl, *Textbook of work physiology* 3rd edn; Fox, Bowers and Foss, *The physiological basis of physical education and athletics* 4th edn.

3737 Integrated Human Physiology

Availability: Not offered in 1992.

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 3773 Physiology II (Div.1) or an acceptable equivalent.

Contact hours: 2 lectures, 1 tutorial and 4 hours of practical work a week.

Content: The lecture topics will cover a limited number of areas in considerable detail, dealing with the underlying experimental evidence for current views, the significance of this knowledge in health and disease, and the impact of applying this knowledge in society. Topics will be selected from aspects of reproductive physiology and endocrinology, and general systematic physiology. For the practical work, a student will be allocated an individual project for the semester. The projects available are designed to develop student skills in the mastering of contemporary research techniques in physiology.

Assessment: Written examination, project reports and essays.

Text-books: References to specific journal papers and selected sections of various texts will be provided.

8546 Neurobiology

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 3773 Physiology II (Div.1) or an acceptable equivalent.

Contact hours: 2 lectures, 1 tutorial and 4 hours of practical work a week.

Content: The objective of this subject is to acquaint students with the function of the central nervous system, and the methods currently used for investigating its function. The course will consist of lectures and practical exercises; students will be expected to exercise considerable initiative in planning and carrying-out some of the practicals, and in searching the literature.

Assessment: Final written examination (2-hour paper), and evaluation of practical exercises.

Text-books: No formal text is specified, but a reading list will be provided.

HONOURS LEVEL

6740 Honours Physiology

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: A pass at a standard satisfactory to the Head of the Department of Physiology in appropriate Level III subjects offered by the Department of Physiology or acceptable alternative subjects.

Requirements: Candidates are required to participate in study and experimental work of a research character for an entire academic year in the Department of Physiology or in an affiliated area under the general direction of the Head of the Department of Physiology. Research projects to be offered during the Honours year will be posted on the departmental noticeboard during the preceding year. Each project will be supervised by a member of academic staff and a list of general references appropriate to each project provided.

During the course students will be required to deliver a series of one-hour seminars on topics of general relevance to their research project. A thesis must be submitted as part of the assessment procedure and an oral examination may be required.

PLANT SCIENCE

HONOURS LEVEL

7042 Honours Plant Science

This subject is available under the provisions of Clause 2 of Schedule IV: The Honours Degree of the degree of Bachelor of Science.

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: A credit or higher standard in at least two appropriate Level III subjects offered by a Science Department.

Requirements: A candidate will be required to undertake a research project under the supervision of one or more members of academic staff and present seminars and a thesis on the research work undertaken. The research project could be undertaken in one of the following areas: Crop Physiology and Biochemistry, Plant Molecular Biology, Plant Breeding or Agronomy. A candidate may also be required to attend lectures and pass examinations in related subjects.
Intending candidates should consult the Head of the Department of Plant Science and potential supervisors during the final year of the Ordinary degree and be prepared to begin studies in the Department at the beginning of February.

PSYCHOLOGY

5104 Psychology I

Level: I.

Points value: 6.

Quota: Will apply.

Duration: Full year.

Pre-requisites: None.

Assumed knowledge: Qualification for entry into Year 12 Mathematics IS and satisfactory achievement at Year 12 level in a literary subject using English.

Contact hours: 3 lectures, and on average, 1 tutorial and 1 hour of practical work a week.

Content: This subject provides a survey of the main fields of modern experimental psychology, and qualifies the student to take further psychology subjects. The topics that may be covered are biological bases of behaviour, innate behaviour, conditioning, intelligence, personality, cognitive psychology, social psychology, language and elementary descriptive and inferential statistics.

Assessment: End of semester examinations. Marks will also be awarded for other assignments to be completed. To obtain a positive mark for practical reports, attendance at the practical sessions is required.

Text-books: Reading list available in Departmental Subject Handbook.

LEVEL II

3149 Psychology II

Level: II.

Points value: 8.

Quota: May apply.

Duration: Full year.

Pre-requisites: 5104 Psychology I.

Contact hours: 3 lectures and 1 tutorial a week, plus practical work involving analysis and report writing in student's own time.

Content: The subject is oriented towards the controlled study of human and animal behaviour, both individual and social, and is concerned also with the possibilities for the wider application of contemporary psychological theories. Specialised tutorial sequences allow some choice of additional topics.

Assessment: Marks in a range of assessable products including end of semester examinations, tutorial work and practical reports are combined to produce the final score for the subject.

Text-books: Reading list available in Departmental Subject Handbook.

LEVEL III

At the third year level, one subject (3170) will be offered in Psychological Research Methodology (4 points), and a set of subjects (2 points each) to cover a range of topics in psychology which are organized into the following three groups. The range of subjects to be offered in any year will be subject to the availability of staff and other necessary resources.
Group A: 7324 Studies in Personality III, 5673 The Philosophy and Psychology of Consciousness III, 8659 Social Psychology, 8779 Metapsychology III.
Group B: 2196 Environmental Psychology III, 1131 Human Decision Processes III, 7196 Intelligence III.
Group C: 8267 Animal Behaviour III, 4770 Neuroscience in Psychology III, 9703 Psychology of Motivation III.
To qualify for entry into Honours Psychology, it will be necessary to complete the subject Psychological Research Methodology and 4 other subjects in psychology from the list above, with at least one subject chosen from each group, to provide a total value of 12 points.
Students wishing to complete a substantial proportion of their study at the third year level in psychology (to the value of 8 points or more) are advised to undertake the subject Psychological Research Methodology, since the majority of the practicals assume competence in statistical analysis and in the use of the computer-based statistical package at the level provided in that subject. A similar assumption about familiarity with statistical procedures and methodological issues may be made in the presentation of the other material.

Practical Work

All Level III subjects have associated practical work assignments which contribute 25% of the final mark. In the case of Psychological Research Methodology, this consists of workshops and a substantial exercise in statistical computing.
Details about the practical work, including formal contact time, are included in the Third Year Psychology Handbook. It is not possible to stipulate formal contact hours for practical work in the syllabus entries below since this varies among the different practical exercises; in some cases the data-gathering, and in all cases the statistical analyses and the preparation of the reports, are completed in the students' own time. It is assumed that students will either be concurrently enrolled in Psychological Research Methodology, or have completed it (or some equivalent) previously; where this is not the case students may

need to devote additional time to develop competence in the statistical techniques employed.

8267 Animal Behaviour III

Level: III.

Points value: 2.

Quota: May apply.

Duration: Semester I.

Pre-requisites: 3149 Psychology II.

Restriction: 3609 Animal Behaviour prior to 1989.

Contact hours: 1 lecture a week, plus 4 tutorials and practical work.

Content: This subject will proceed from the point reached in the Psychology II section devoted to the topic. The central theme will be the evolution of behaviour in mammals. Primates will receive particular attention but other species will also be treated. Play behaviour, domestication and man-animal contacts will be emphasized. Extensive use will be made of film and it is hoped to organize visits to animal instrumentalities in the Adelaide area.
Approximately 12 film screenings will be arranged in association with the course and a film programme will be available from the Departmental Office during Orientation Week.

Assessment: Final examination and the report of a practical exercise.

Text-books: Reading list available in Departmental Third Year Psychology Handbook.

2196 Environmental Psychology III

Level: III.

Points value: 2.

Quota: May apply.

Duration: Semester I.

Pre-requisites: 3149 Psychology II.

Restriction: 2766 Environmental Psychology prior to 1989.

Contact hours: 1 lecture a week, plus 4 tutorials and practical work.

Content: An introduction to environmental psychology including methods, perception and cognition, stressors, personal space and territoriality, aesthetics, and human-environment interactions.

Assessment: Final examination and the report of a practical exercise.

Text-books: Fisher, Bell and Baum, *Environmental Psychology* 2nd edn. (Holt, Rinehart, Winston, 1984); Students' attention is drawn to the periodicals *Journal of Environmental Psychology*, and *Environment and Behaviour*. (Reading list available in Departmental Third Year Psychology Handbook).

1131 Human Decision Processes III

Level: III.

Points value: 2.

Quota: May apply.

Duration: Semester I.

Pre-requisites: 3149 Psychology II.

Restriction: 7767 Human Information Processing prior to 1989.

Contact hours: 1 lecture a week, plus 4 tutorials and practical work.

Content: An examination of the decision processes employed by individual human beings in everyday life and in the psychological laboratory as well as in applied context (e.g. industrial monitoring, legal decisions, forecasting and medical diagnosis).

Assessment: Final examination and the report of a practical exercise.

Text-books: Kahneman, D., Slovic, P., and Tversky, A., *Judgment under uncertainty: heuristics and biases* (Cambridge University Press, 1982). (Reading list available in Departmental Third Year Psychology Handbook).

7196 Intelligence III

Level: III.

Points value: 2.

Quota: May apply.

Duration: Semester II.

Pre-requisites: 3149 Psychology II.

Restriction: 1508 Intelligence prior to 1989.

Contact hours: 1 lecture a week, plus 4 tutorials and practical work.

Content: This subject reviews recent cognitive analytical approaches to the study of individual differences in intelligence, comparing the psychometric paradigm with various information processing models. Particular emphasis is given to the consequences of mental retardation, brain damage, and ageing for intellectual functioning.

Assessment: Final examination and the report of a practical exercise.

Text-books: Sternberg, R. J. (ed.) *Handbook of human intelligence* (Cambridge University Press, 1982). (Reading list available in Departmental Third Year Psychology Handbook).

8779 Metapsychology III

Level: III.

Points value: 2.

Quota: May apply.

Duration: Semester II.

Pre-requisites: 3149 Psychology II.

Contact hours: 1 lecture a week, plus 6 tutorials.

Content: This subject will treat the psychological enterprise as the object of study, that is the network of individuals, groups and institutions involved in the production, dissemination and application of psychological knowledge claims. Findings from philosophy, history, sociology and psychology itself will be considered in an attempt to extend the understanding of the enterprise. The aim of the course is not to provide final answers, but to assist participants to develop a more critical perspective to the discipline.

Assessment: Final examination and research project.

Text-books: Reading list to be available in the Departmental Third Year Psychology Handbook.

4770 Neuroscience in Psychology III

Level: III.

Points value: 2.

Quota: May apply.

Duration: Semester II.

Pre-requisites: 3149 Psychology II.

Restriction: 8743 Physiological Psychology prior to 1989.

Contact hours: 1 lecture a week, plus 4 tutorials and practical work.

Content: This subject seeks to expose further some of the difficulties of understanding Psychology in brain terms, and to develop an impression of what, in principle, can be achieved by an interchange of ideas between the two disciplines, Psychology and Neuroscience: examining, on the one hand, emotion as a representative psychological construct, and, on the other, a model for the brain's functional organization (the development of which was commenced in Psychology II).
The subject consists, essentially, of three principal components: theoretical contemplations of the "structure" of emotion, and its functional relevance in psychological explanation; research approaches in its various aspects; and the implications of physiological perspectives in a consideration of emotion.

Assessment: Final examination and the report of a practical exercise.

Text-books: Strongman, K. T., *The psychology of emotion* 2nd edn. (Wiley, 1978). (Reading list available in Departmental Third Year Psychology Handbook.)

3170 Psychological Research Methodology III

Level: III.

Points value: 4.

Quota: May apply.

Duration: Full year.

Pre-requisites: 3149 Psychology II.

Restriction: 1759 Methodology and Statistics prior to 1989.

Contact hours: 2 lectures and up to 1 tutorial a week, plus practical work.

Content: This subject will add to the range of statistical significance tests taught in Psychology I and Psychology II a number of more complex techniques. These will include multiple regression, multifactor analysis of variance, planned and post-hoc contrasts, trend analysis and analysis of covariance.
Students will be introduced to the use of statistical software (specifically SPSSX) on the University's computers, and will carry out a range of practical exercises in this area.
A wide range of issues relating to research design will be covered in lectures and tutorials. Topics dealt with will range from the general (e.g. the various concepts of reliability and validity, the logic of inference from data obtained in different ways, the use of quasi experimentation and unobtrustive measures) to the highly specific (e.g. the consideration of the inferences that have been made by specific researchers using particular research designs in particular areas of psychological interest).

Assessment: 2 final examination papers, and exercises in statistics and statistical computing.

Text-books: Reading list available in Departmental Third Year Psychology Handbook.

9703 Psychology of Motivation III

Level: III.

Points value: 2.

Quota: May apply.

Duration: Semester II.

Pre-requisites: 3149 Psychology II.

Restriction: 9205 Motivation prior to 1989.

Contact hours: 1 lecture a week, plus 4 tutorials and practical work.

Content: Motivation will be treated as a core concept in psychology. Motivation refers to the factors that determine the activation, direction and persistence of behaviour. The course of lectures will, with different degrees of emphasis, provide a systematic cover of a

variety of experimental findings on topics directly related to motivation. Examples of topics are eating, drinking, sexual behaviour and intrinsic motives. Lectures and discussions will be based on both animal and human experiments. A survey of prominent theoretical systems will be given. It is intended to present a useful synthesis of physiological and psychological determinants of motivation.

Assessment: Final examination and the report of a practical exercise.

Text-books: Hoyenga, K. B. and Hoyenga, K. T., *Motivational explanations of behaviour* (Brooks-Cole, 1984) or Buck, R., *Human motivation and emotion* (Wiley, 1976); Deci, E. L. (1975) *Intrinsic motivation* (Plenum, 1975). (Reading list available in Departmental Third Year Psychology Handbook.)

8659 Social Psychology III

Level: III.

Points value: 2.

Quota: May apply.

Duration: Semester I.

Pre-requisites: 3149 Psychology II.

Restriction: 6423 Social Psychology and Intergroup Relations III; 4553 Cognition and Affect in Social Relationships III; 8659 Social Psychology and Intergroup Relations III; 8659 Social Psychology III.

Contact hours: 1 lecture a week plus 4 tutorials and practical work.

Content: An expanding body of research within contemporary social psychology has been the study of social cognition. This tradition concerns itself with the way in which individuals and groups attend to, process, interpret, mentally represent and understand complex social information. While this field borrows models and concepts from cognitive psychology, the study of social objects is markedly different from the study of non-social objects. The acquisition and processing of social knowledge requires the consideration of a range of affective, social, cultural and symbolic influences. Concepts predominant within social cognition research includes attribution theory and the concepts of schema, script and prototype. These will be considered along with less mainstream approaches, such as the French tradition of research in social representations theory. A practical exercise will be conducted to illustrate some of the processes central to the study of social cognition.

Assessment: Final examination and report of the practical exercise.

Text-books: Fiske, S. & Taylor, S. (1984) *Social cognition* (Reading, Mass., Addison-Wesley); Forgas, J., (ed.) (1981) *Social cognition: perspectives on everyday understandings* (London, Academic Press); Hewstone, M. (1989) *Causal attribution from cognitive processes to collective beliefs* (Oxford, Basil Blackwell). A more extensive reading list will be provided.

7324 Studies in Personality III

Level: III.

Points value: 2.

Quota: May apply.

Duration: Semester II.

Pre-requisites: 3149 Psychology II.

Restriction: 5202 Personality prior to 1989.

Contact hours: 1 lecture a week, plus 4 tutorials and practical work.

Content: Psychologial studies of personality, including its assessment, development and organisation. One particular theme will be personality in relation to occupational and educational activities and interests.

Assessment: Final examination and the report of a practical exercise.

Text-books: Holland, J. L., *Making vocational choices; a theory of vocational personalities and work environments* 2nd edn. (Prentice-Hall, 1985); Lokan, J. J. and Taylor, K. F. (eds.) *Holland in Australia* (Australian Council for Educational Research, 1986). (Reading list available in Departmental Third Year Psychology Handbook.)

5673 The Philosophy and Psychology of Consciousness III

Level: III.

Points value: 2.

Quota: May apply.

Duration: Semester I.

Pre-requisites: 3149 Psychology II.

Restriction: 1967 The Philosophy and Psychology of Consciousness prior to 1989.

Contact hours: 1 lecture a week, plus 4 tutorials and practical work.

Content: This subject examines the place in Psychology of the phenomena associated with such terms as "consciousness", "awareness" and "experience". Lectures and tutorials deal with the place of these types of concept in an overall scientific programme, considering relevant issues at levels ranging from the philosophical to the physiological. Specific topics covered include the mind-body problem, the feasibility of a reductionist approach, the place of phenomenology and existentialism, and the suggestions of physiologists on the nature of the mechanisms that might underlie consciousness.

Assessment: Final examination and the report of a practical exercise.

Text-books: Reading list available in Departmental Third Year Psychology Handbook.

HONOURS LEVEL

4702 Honours Psychology

Level: Honours.

Points value: 24.

Quota: May apply.

Duration: Full year.

Pre-requisites: Students wishing to enrol in 4702 Honours Psychology must have reached a satisfactory standard in 5104 Psychology I, 3149 Psychology II, and third-year level psychology subjects with a total of at least 12 points value, including the double subject 3170 Psychological Research Methodology III and covering a wide range of content (such as specified in the general rubric to Level III Psychology); or an equivalent sequence of subjects from other degree courses deemed acceptable by the Head of the Department. A satisfactory standard will normally require an overall Credit or Distinction standard in at least one of first, second or third-year assessments of psychology subjects and, in any case, at least a good pass (60% or better) on average for Level III subjects.

Content: Honours in Psychology is a full year's course which will include lectures and discussions on advanced topics. It will also involve the writing of a substantial essay and the presentation of a dissertation embodying the results of, and a survey of the literature relevant to, a research investigation carried out under the supervision of a member of the staff of the Department, or other person nominated by the Department for the purpose.

Assessment: Achievement in the examinations for five half-semester topics provides for approximately half of the assessment of the course; an essay and an empirical research thesis provides for the remainder of the assessment.

SOIL SCIENCE

2330 Pedology III

Level: III.

Points value: 3.

Duration: Semester II.

Assumed knowledge: Geology I.

Contact hours: 2 lectures and 4 hours practical per week and a 6 day field camp.

Content: Geochemistry, mineral weathering and clay formation. Soil genesis and processes. Value, purpose and execution of survey, mapping and classification of soils. Regional and global distribution of soils. Influence of climate, lithology and land form on the origin and development of soils. Practical work related to the above topics will include the description and classification of soil and rock sections under the light microscope, field excursions and a 6 day field camp. The subject provides an understanding of the distribution, classification and properties of soils, and the methods by which they are mapped and assessed for agricultural and engineering use.

Assessment: Written and practical examination at the end of the semester, assessment of practical and field work.

Text-books: No textbooks are recommended for purchase but references will be given throughout the course. Particular reference will be made to the following texts:
Dixon, J. B. & Weed, S. B. *Minerals in soil environments*, 2nd edn. 1989 (Soil Science Society of America); Wilson, M. J. (1987) *A handbook of determinative methods in clay mineralogy* (Blackie); Yariv, S. & Cross, H. *Geochemistry of colloid systems for earth scientists* (Springer-Verlag); Soil Survey Staff (1975) *Soil taxonomy* (United States Department of Agriculture, Soil Conservation Service); Newman, A. C. D. (1987) *Chemistry of clays and clay minerals* (Longman Scientific and Technical); Moore, D. M. & Reynolds, R. C. (1989) *X-Ray differaction and the identification and analysis of clay minerals* (Oxford University Press).

4777 Soil Biology and Biochemistry (Sc.)

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: Botany II (Div. I) or acceptable equivalent.

Contact hours: 2 lectures and 4 hours of practical work (or equivalent) a week.

Content: The subject provides an appreciation of the interactions among plants, microorganisms and animals in the soil. The cycling of carbon, nitrogen, phosphorus and sulphur in soils. The roles played by organisms in the decomposition of organic materials. The soil biomass and enzymes in soils. The biology of the rhizosphere and its relations with the chemical and physical properties of soil. Practical work will consist of laboratory exercises related to the above topics.

Assessment: Examination, essay and practical assignments.

Text-books: Paul, E. A. and Clark, F. E., *Soil microbiology and biochemistry* (Academic Press). Additional reading lists will be distributed.

HONOURS LEVEL

6909 Honours Soil Science

This subject is offered by the Department of Soil Science and is available under the provisions of Clause 2 of Schedule IV: The Honours Degree of the degree of Bachelor of Science.

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: A credit or higher standard pass in appropriate Level III subjects offered by a Science Department.

Requirements: A candidate will be required to pass such examinations on the chosen subject of study as may be prescribed by the Head of Department, and to submit a thesis reporting research work undertaken during the year under the supervision of one or more members of academic staff.

Candidates may also be required to attend lectures and pass examinations in related subjects and to satisfy the Head of the Department that they have a reading knowledge of one or more modern languages other than English.

Intending candidates should consult the Head of the Department and potential supervisors before 30 November in the final year of studies for the Ordinary degree of Bachelor of Science and should be prepared to begin studies in the Department on or about 1 February.

ZOOLOGY

Zoology, the scientific study of animals, is a very broad subject overlapping with a number of other disciplines. Because the department is small, areas of staff expertise are limited but with research strengths in Systematics & Taxonomy, Comparative Physiology and Marine and Freshwater Ecology. Overall these provide for a department that is strong in teaching and research in environmental biology.

3174 Biology I is the Level I subject offered jointly by the Departments of Botany and Zoology. A single semester subject, 7940 Genetics and Evolution I, is a companion course recommended for those intending to major in Zoology. One Level II subject, 3472 Zoology II is offered and there are five subjects at Level III reflecting the research interests of the academic staff. To proceed to Honours Zoology students normally need to achieve a credit in three third level Zoology subjects.

The required sequence of study for a B.Sc. with a major in Zoology and for Honours degrees in Zoology is 3174 Biology I, 3472 Zoology II and at least three and advisably four of the Level III subjects offered by the Department. Students may pursue a major in Environmental Biology by taking designated Level III subjects in Zoology in conjunction with designated subjects in Botany and then proceed to Honours in Environmental Biology if they achieve a credit level in subjects that can be presented for the major.

The Zoology Department believes that knowledge of genetics and molecular biology, chemistry and statistics is basic to modern zoological research and recommends that students intending to proceed to third year should take 7940 Genetics and Evolution I, 6878 Chemistry I and 5543 Statistics I.

LEVEL I

3174 Biology I

Level: I.

Points value: 6.

Duration: Full year.

Pre-requisites: None.

Contact hours: 3 lectures, 1 tutorial and 3 hours of practical work a week.

Content: The subject introduces the major fields of biology and is the major pre-requisite for further studies in the biological sciences. It does not assume previous biological knowledge. Topics include: cells structure and function; biochemical concepts — respiration, photosynthesis, enzymes, energy flow; membranes, DNA, RNA, protein synthesis; introductory genetics; plant biology, including germination, growth, transport systems; plant diversity and evolution; the structure and physiology of vertebrates; major invertebrate phyla; ecology; evolution including natural selection, the origin of species, human evolution.

Assessment: End of semester examinations; laboratory practical work and an essay.

Text-book: Curtis, H. and Barnes, N. S., *Biology*, 5th edn. (Worth).

LEVEL II

3472 Zoology II

Level: II.

Points value: 8.

Duration: Full year.

Pre-requisites: 3174 Biology I (Div. 1) or an acceptable equivalent.

Contact hours: 3 lectures and 6 hours of practical work a week.

Content: The first semester is concerned with the diversity, phylogeny and biology of the invertebrates, including entomology and the biology of parasites, and with the phylogeny and biology of the vertebrates. The second semester is concerned with topics in physiology, namely energetics of organisms, intermediary metabolism, gas exchange, nerves, muscles and sense organs; with the ecology of animal populations including sampling statistics, population growth models, competition and predation; and with evolutionary mechanisms, speciation, and major trends in animal evolution, systematics and biogeography.

Assessment: Two theory and one practical examination; essay; collection of insects; laboratory practical work.

Text-books: Barnes, R. D., *Invertebrate zoology* 5th edn. (Saunders College); Begon, M. et. al., *Ecology: individuals populations and communities* (Blackwell); *Either* Gordon, M. S., *Animal physiology*, 4th edn. (Macmillan) *or* Schmidt-Nielson, K., *Animal physiology* 3rd edn. (Cambridge U.P.); Pough, F. H. et. al., *Vertebrate life* (3rd edn.) (Macmillan).

LEVEL III

5224 Comparative and Environmental Physiology

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 6878 Chemistry I, 3472 Zoology II (Div. 1) or an acceptable equivalent.

Contact hours: 2 lectures, 1 seminar and 4 hours of practical work a week.

Content: This subject covers the intersection between three biological fields - physiology, ecology and behaviour — and examines some of the ways animals are adapted to the environments in which they live. In many cases, these are adaptations to severe environments such as deserts, polar regions, high altitude and deep sea, where nature poses apparently insurmountable problems to survival. Another approach is to look at the physiology of animals with different life styles, including for example, flying birds, swimming fish, warm blooded dinosaurs, air-breathing fish, deep diving seals, burrowing frogs, etc. Another theme is adaptation of vertebrate organ systems for energy efficiency.

Assessment: Quizzes, examinations, seminar and practical work.

Text-books: Either: Gordon, M. S., *Animal physiology; principles and adaptations* 4th edn. (MacMillan), or Schmidt-Nielsen, K., *Animal physiology: adaptation and environment* 4th edn. (Cambridge).

5464 Evolution, Systematics and Biogeography

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 3472 Zoology II (Div. 1) or an acceptable equivalent.

Contact hours: 2 lectures and 5 hours of practical work a week.

Content: This subject explores a wide range of topics concerned with the evolution, systematics and biogeography of vertebrate and invertebrate animals. The characteristics of taxa examined include biological, ecological and morphological features. Topics discussed may include the following. The history, importance and practice of taxonomy; diverse approaches to classification and phylogeny; reproduction, development and growth; the evolution and distribution of southern hemisphere biotas; effects of ecological and geological factors on distribution; islands and the role of systematics and biogeography in conservation; extinction; conservation and climatic change.

Assessment: Examination and practical assignments.

Text-books: A series of key research papers and chapters will be made available on loan.

8896 Freshwater Ecology

Level: III.

Points value: 3.

Duration: Semester II.

Pre-requisites: 3472 Zoology II (Div. 1).

Contact hours: 2 lectures and 5 hours of practical work a week, plus 3 days field work.

Content: An introduction to the ecological characteristics of inland waters (lakes and streams), with emphasis on Australian environments. Topics discussed include the physical and chemical features of lakes, the plant and animal communities of lakes and rivers, physiological adaptations of aquatic animals and the impact of man on inland waters. Environments given particular attention include the River Murray, streams, lakes and reservoirs, salt lakes and ponds.

Assessment: Final examination; practical assessment.

Text-books: Moss, B., *Ecology of freshwaters: man and medium,* 2nd edn. (Blackwell Scientific).

9035 Marine Ecology

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 3472 Zoology II (Div. 1) or an acceptable equivalent.

Assumed knowledge: 5543 Statistics 1 or equivalent.

Contact hours: 2 lectures and 5 hours practical work a week, plus 5 days of fieldwork during the mid-semester break.

Content: Ecology of populations and communities, with emphasis on quantitative and experimental approaches. Specific topics will include the ecology of modular animals, larval ecology, the significance of life-histories, relationships between animals and their resources, marine fouling, environmental impact assessment, marine zooplankton, production and transfers between tropic levels, fish biology, fisheries management and aquaculture. The field camp will include a small project which may be done at another time by any student unable to attend the camp; practical work during semester will involve excursions to local shores, analysis of field samples and data, and use of computer models.

Assessment: Practical reports (including literature review on the project) and examination.

Text-books: Begon, M., *et al., Ecology: Individuals, populations and communities* (Blackwell); Pitcher, T. J. & Hart, P. J. B. *Fisheries ecology* (Croom Helm); Hammond, L. & Synnot, R. (eds)*Australian marine biology* (Longman Cheshire).

1427 Research Methods in Zoology

Level: III.

Points value: 3.

Duration: Semester I.

Pre-requisites: 3472 Zoology II (Div. 1) or an acceptable equivalent.

Assumed knowledge: 5543 Statistics I or equivalent.

Contact hours: 2 lectures and 5 hours of practical work a week.

Content: An introduction to systematic methods of collection, analysis and reporting of field and laboratory data, and basic experimental design.

Lectures will outline the nature of research and the value of experimental methods. A knowledge of basic statistics is assumed and students with no relevant experience may need to undertake additional reading. Experimental design will be emphasized, and the elements of statistical tests particularly analysis of variance will be considered in a biological context. Practical work will complement methods introduced in lectures and will also incorporate an introduction to applications of microcomputers in zoology.

Assessment: Examination; practical assignments.

Text-books: Zar, J. H., 1984 *Biostatistical analysis*, 2nd edn. (Prentice-Hall).

HONOURS LEVEL

5417 Honours Zoology

Level: Honours.

Points value: 24.

Duration: Full year.

Students enrolled in at least three Level III Zoology subjects who wish to take an Honours degree in Zoology should consult the Head of the Department some time during Semester II.

Pre-requisites: As a rule, for entry into Honours Zoology, students must have attained a credit or better in appropriate Level III Zoology subjects to the value of nine points.

Requirements: Candidates are expected to study more deeply one branch of Zoology, to carry out research in this area, and to present the results in a written thesis. They must also complete other assignments, including seminars and essays, as prescribed.

Students normally are expected to begin work in February, and to work full-time at their courses throughout the year. Under special circumstances, by permission of the Head of Department the period of study can commence in Semester II to allow the research project to be pursued over the summer season.

7530 Honours Environmental Biology

Level: Honours.

Points value: 24.

Duration: Full year.

Pre-requisites: Normally, an average Credit standard in Level III subjects to a value of 9 points that can be presented for the major in Environmental Biology.

Environmental Biology Honours is organized jointly by the Departments of Botany and Zoology. Candidates will normally spend some of their time working in each Department. Candidates are expected to study Environmental Biology more deeply and to carry out a research exercise and present the results in a written thesis. They will also write a review on an applied environmental subject and be set a reading list and other assignments. The thesis, review and other assignments will be on topics relevant to environmental science and there will be emphasis on the kinds of communication — written and oral — expected of an environmental scientist.

Interested students should consult the Head of either Department during the final year of the Ordinary degree course. The Honours course normally commences at the beginning of February, but under certain circumstances commencement at the beginning of second semester is possible.

GRADUATE CERTIFICATE IN SCIENCE EDUCATION

REGULATIONS

1. There shall be a Graduate Certificate in Science Education.

2. An applicant for admission to the course of study for the Graduate Certificate shall:

(a) have qualified for a degree in science or mathematics and a Graduate Diploma in Education of the University or hold qualifications from another institution accepted by the University for the purpose.

(b) have completed such other work as may be prescribed in the schedules.

3. Subject to the approval of the Council, the Faculty may, in special cases and subject to such conditions as it may see fit to impose in each case, accept as a candidate for the Graduate Certificate a person who does not satisfy the requirements of Regulation 2 above but who has given evidence satisfactory to the Faculty of fitness to undertake work for the Graduate Certificate.

4. To qualify for the Graduate Certificate a candidate shall satisfactorily complete a course of study and comply with conditions as prescribed in the schedules.

5. Except with the special permission of the Faculty the course for the Graduate Certificate shall be completed in one semester of full-time study or not more than two years of part-time study.

6. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the Graduate Certificate; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

7. In special cases, on written application by the candidate, and on the advice of the Faculty, a candidate may be granted such exemption from the requirements of these regulations as the Council shall determine.

8. If in the opinion of the Faculty a candidate for the Graduate Certificate is not making satisfactory progress, the Faculty may, with the consent of the Council, terminate the candidature and the candidate shall cease to be enrolled for the Graduate Certificate.

Regulations allowed 1 March, 1990.
Awaiting allowance: 6(b).

GRADUATE CERTIFICATE IN SCIENCE EDUCATION

SCHEDULES

SCHEDULE I: SUBJECTS OF STUDY

(Made by the Council under Regulation 6.)

1A. The following shall be the subjects for the **Graduate Certificate in Science Education/ Physics.**

GROUP A
Core Subject (3 points)
6217 Teaching/Learning Physics in the Secondary School
Optional Subjects (1.5 points each)
Educational Measurement and Evaluation
Microprocessors and Computers in Physics Education
Elements of Physics Curriculum Design
Physics Problem Solving
The Role of Practical Work in Physics Education
History and Methodology of Science
Educational Research and the Physics Teacher

GROUP B
Core Subject (3 points)
2398 Concepts of Physics (Science Education)
Optional Subjects (1.5 points each)
Mechanics (Science Education)
Electromagnetism (Science Education)
Electronics (Science Education)
Waves (Science Education)
Atomic and Nuclear Physics (Science Education)
Heat and Thermodynamics (Science Education)
Physics Project (Science Education)

GROUP C
Other science or science education subjects which may be offered from time to time, by this or other institutions, that are approved for the purpose by the Dean (or nominee).
A maximum of one subject from the following list of subjects offered by the Department of Education may be taken in lieu of a core subject or two optional subjects:
1595 Making Sense of the Scientific World
8950 Project (Science Education)
2502 Scientific Revolutions and Education
8671 The Nature of Science and Science Curricula

1B. The following shall be the subjects for the **Graduate Certificate in Science Education/ Chemistry.**

GROUP A
Core subject (3 points)

8132 Teaching/Learning Chemistry in Secondary Schools.

Optional Subjects (1.5 points each)

Educational Measurement and Evaluation
Computers in Chemical Education
Elements of Chemical Curriculum Design
Problem Solving in Chemistry
Practical work in the School Chemical Curriculum
The Methodology of Chemical Science
Educational Research and the Chemistry Teacher

GROUP B
Core Subjects (3 points)

1202 The General Concepts of Chemistry

Optional subjects (1.5 points)

Chemistry of the Environment (Science Education)
From Atoms to Molecules (Science Education)
Electrons and Atoms (Science Education)
Topics in Current Chemistry (Science Education)
Chemistry and Life (Science Education)
Chemical and Physical Change (Science Education)
Chemical Industry in Australia (Science Education)

GROUP C

Other science or science education subjects which may be offered from time to time by this or other institutions, that are approved for the purpose by the Dean (or nominee).

A maximum of one subject from the following list of subjects offered by the Department of Education may be taken in lieu of a core subject or two optional subjects:

1595 Making Sense of the Scientific World
8950 Project (Science Education)
2502 Scientific Revolutions and Education
8671 The Nature of Science and Science Curricula

1C. The following shall be the subjects for the **Graduate Certificate in Science Education/ Biology**:

Subjects (1 points each)

Bioethics and experimental design
Developmental biology and gene regulation
Environmental biology A: Ecology of aquatic systems
Environmental biology B: Animal/Plant relations
Fertilization and reproduction
Genetic engineering and recombinant DNA techniques
Genetics and molecular biology
Immunology
Molecular evolution
Plant breeding and disease resistance
The biology of cancer
The biology of bacteria and viruses

2. The availability of the courses and of particular subjects is conditional on the availability of staff and facilities, and on student demand.

SCHEDULE II: COURSE OF STUDY

1. To qualify for the Graduate Certificate in Science Education/Physics or Chemistry a candidate shall satisfactorily complete subjects from either **Schedule IA** or **Schedule IB** with an aggregate points value of at least 12 satisfying the following requirements:

(a) Unless otherwise permitted by the Faculty, the subjects presented for the Graduate Certificate must include both core subjects, 2 optional subjects from Group A and 2 from Group B. The Faculty may, in appropriate circumstances, allow a candidate to substitute for a core subject, 2 optional subjects from the same group.

(b) The Faculty may, in appropriate circumstances, allow a candidate to substitute one or more Group C subjects for subjects required under (a) above.

2. To qualify for the Graduate Certificate in Science Education/Biology, a candidate shall satisfactorily complete subjects listed in **Schedule IC** to the value of at least 12 points.

3. The subjects presented for the Graduate Certificate shall not include any subject which is, in the opinion of the Faculty, substantially equivalent to another subject presented for the Graduate Certificate or already counted towards another qualification gained by the candidate.

4. Candidates wishing to enrol in subjects for which they do not have the necessary preliminary knowledge may be required to take such bridging studies prior to the commencement of their Graduate Certificate studies as may be deemed appropriate by the Dean (or nominee).

5. To complete a course of study, a candidate, unless exempted by the Faculty, shall:

(a) regularly attend the prescribed lectures, tutorials, workshops and seminars; and

(b) undertake such computing work, practical work, field work and case studies, do such reading, written and oral work and pass such examinations, as the Faculty may prescribe.

6. The syllabus for each subject for the Graduate Certificate shall specify whether passes shall be non-graded or whether there shall be three classifications of pass: Pass with Distinction, Pass with Credit, and Pass.

7. Each candidate's course of study must be approved by the Dean (or nominee) at enrolment each year.

8. When, in the opinion of the Faculty, special circumstances exist, the Council, on the recommendation of the Faculty, may vary the provisions of clauses 1 to 5 above.

GRADUATE CERTIFICATE IN SCIENCE EDUCATION

SYLLABUSES

PHYSICS

The Department of Physics and Mathematical Physics offers a Graduate Certificate in Science Education which is intended for teachers of physics in secondary schools. The subjects are in two groups. Group A subjects are largely methodological and Group B subjects deal with physics as a discipline. The syllabuses for the core subjects are as follows.

6217 Teaching/Learning Physics in the Secondary School

Availability: Not offered in 1992.

Points value: 3.

Content: This subject introduces teachers to significant knowledge and skills which will assist them to facilitate meaningful learning of physics by their students. Emphasis is placed on teaching and learning strategies and assessment procedures which encourage students to be active participants in the learning process and to accept increasing responsibility for their own learning.

Topics considered include preconceptions that students bring to physics classes and how to identify and modify them, learning through guided experiences, questioning and explanations, group work, the role of language, problem solving, demonstrations and student practical work, gender inclusive teaching strategies, curriculum materials, and assessment.

A teaching/learning sequence developed from the SCIS learning cycle is discussed as a means of integrating a wide range of strategies as an example of a theory of instruction based upon an understanding of how children learn.

References: Fensham, P. ed. *Development and dilemmas in science education* (Falmer Press, 1988); Head, J., *Personal response to science* (C.U.P., 1985); Karplus, R., et. al. *Science teaching and the development of reasoning — physics* (University of California, 1977); Lunetta, V. N. and Novick, S., *Inquiring and problem solving in the physical sciences* (Kendall Hunt, 1982); Nellist, J. and Nicholl, B., *ASE Science teachers handbook* (Hutchinson, 1986); Novak, J. and Gowin, B., *Learning how to learn* (C.U.P., 1984); Osborne, R. and Freyberg, P., *Learning in science* (Heinemann, 1985); Solomon, J., *Teaching children in the laboratory* (Croom Helm, 1980); Warren, J., *The teaching of physics* (Butterworths, 1965); White, R., *Learning science* (Blackwell, 1988); Woolnough, B. and Allsop, T., *Practical work in science* (C.U.P., 1985); Nuffield Curriculum materials for "O" and "A" level.

Selected journal articles from: South Australian science teachers journal; Australian science teachers journal; School science review; The physics teacher; Physics education; American journal of physics; Physics today; Research in science education; Science education; Journal of research in science education; Studies in science education; International journal of science education (formerly the European Journal of Science Education).

2398 Concepts of Physics (Science Education)

Points value: 3.

Duration: Semester II.

Content: This subject provides an overview of the main areas of physics and the concepts

they embody, prior to a study of selected areas in more depth in the optional subjects. Areas examined are mechanics, fluids, heat, waves and sound, electromagnetism, optics, quantum physics and relativity. The emphasis is on a largely qualitative understanding of the phenomena, so as to directly facilitate subsequent verbal classroom explanations, and also to provide a solid basis upon which to build the more quantitative treatment in the optional subjects to follow. Much of the subject is spend on individual readings from the text and subsequent participation in tutorial discussions on the set exercises.

Text-book: Hewitt, P. G., *Conceptual physics* 6th edn. (Scott, Foresman, 1989).

CHEMISTRY

The Department of Physical and Inorganic Chemistry offers a Graduate Certificate in Science Education in Chemistry which is intended for secondary school teachers of chemistry. The subjects are in two groups. The Group A subjects are largely methodological and the Group B subjects deal with chemistry as a discipline.

8132 Teaching/Learning Chemistry in Secondary Schools

Points value: 3.

Duration: Semester I.

Content: The subject is designed to provide the understanding and skills needed to present chemistry to students as a significant and important science.

1202 The General Concepts of Chemistry

Points value: 3.

Duration: Semester II.

Content: A review of the development of chemical and physical ideas and their similarities and differences. What is chemistry? The subject will emphasise the integrated use of concepts and ideas from different aspects of chemical science in providing a qualitative (and where appropriate, a quantitative) interpretation and explanation for chemical phenomena and processes. The subject will be taught largely through tutorial discussions and guided presentations by the students.

Text-book: There is no single suitable text-book, and text material will consist of appropriate journal articles. A reading list will be available in the Course Pamphlet.

BIOLOGY

The Biological Science Departments offer a Graduate Certificate in Science Education/ Biology which is intended for the professional development of teachers of Biology in secondary schools.

The course consists of a number of relatively self-contained educational packages termed **topic modules.** Each topic module aims to highlight a fundamental scientific question in biology, and the various experimental approaches that have been and are currently being

used to investigate the problem. In addition, topic modules will contain, as an integral component, material aimed at assisting teachers with the knowledge and skills needed to present biology as a science of fundamental relevance to everyday life. Topic modules will be related to the Year 11 and Year 12 (Stages I and II) SSABSA Biology Syllabuses, and will be presented by lectures, tutorials and practical classes. Topic modules will vary somewhat from year to year, depending on the availability of staff and the needs of Biology teachers.

Contact hours: Each topic module will require approximately 10 hours contact time comprised of three 1-hour lectures, three 1-hour tutorials and 4 hours of practicals.
In addition there will be a two-day field trip as part of the course.

Content: The content of each topic module is described by its title.

Assessment: Assessment will be based on written assignments.

Texts: The Lecturer will provide a list of appropriate references at the commencement of the course.

GRADUATE DIPLOMA IN PHYSICS

Note: Postgraduate tuition fees may apply to this course.

REGULATIONS

1. There shall be a Graduate Diploma in Physics.

2. Except as provided for in Regulation 3 an applicant for admission to the course of study for the Graduate Diploma shall:

(a) have qualified for a degree of the University or for a degree of another institution accepted for the purpose by the University.

(b) have obtained the approval of the Department of Physics and Mathematical Physics.

3. Subject to the approval of the Council the Faculty may, in special cases and subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for the Graduate Diploma a person who does not qualify for admission to the course under Regulation 2 but has given evidence satisfactory to the Faculty of fitness to undertake work for the Graduate Diploma.

4. To qualify for the Graduate Diploma a candidate shall satisfactorily complete a course of full-time study extending over at least one year or part-time study extending over at least two years.

5. (a) The Council, after receipt of advice from the Faculty, shall from time to time prescribe schedules defining:

(i) the subjects of study for the Graduate Diploma; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

6. A candidate who desires that the examinations which he or she has passed in the University or elsewhere should be counted for the Graduate Diploma in Physics, may on written application be granted such exemption from the requirements of these regulations as the Council shall determine. Otherwise no subject counted for any other award of the University shall be counted as part of the requirement for the Diploma.

7. There shall be three classifications of pass in each subject for the Graduate Diploma: Pass with Distinction, Pass with Credit, and Pass.

8. (a) A candidate shall not be eligible to attend for examination unless the prescribed work has been completed to the satisfaction of the teaching staff concerned.

(b) A candidate who fails to pass in a subject and desires to take the subject again shall again attend lectures and satisfactorily do such written and practical work as the teaching staff concerned may prescribe, unless specifically exempted therefrom after written application to the Registrar for such exemption.

(c) A candidate who has twice failed the examination in any subject or division of a subject may not enrol for that subject again except by special permission to be obtained in writing from the Registrar and then only under such conditions as may be prescribed.

(d) For the purpose of this regulation a candidate who is refused permission to sit for examination, or who, without a reason accepted by the Head of the Department of Physics and Mathematical Physics as adequate, fails to attend all or part of a final examination (or supplementary examination if granted) after remaining enrolled for at least eight teaching weeks of that semester, shall be deemed to have failed the examination.

9. A candidate who complies with the foregoing conditions and satisfies the examiner shall be awarded the Graduate Diploma in Physics.

Regulations allowed 1 March 1990.
Awaiting allowance: 5(b).

GRADUATE DIPLOMA IN PHYSICS

SCHEDULES

(Made by the Council under Regulation 5.)

SCHEDULE I: COURSES OF STUDY

1. A candidate for the diploma shall regularly attend lectures and tutorials, do such written work and practical work as may be prescribed, and pass examinations in a selection of Level III subjects and Honours options* offered by the Department of Physics and Mathematical Physics, or another Department of the University where appropriate, to an aggregate value of at least 16 points.
2. 6089 Diploma Project (Physics): In addition to the coursework each student will be expected to be associated with one of the research groups of the Department and to complete a project chosen in consultation with and supervised by a member of the group. The project has a value of 8 points.

*Notes (not forming part of the Schedules). The Honours options may be chosen from:
Experimental Methods
Advanced Electromagnetism
Quantum Mechanics/Particle Physics
General Relativity
Relativistic Quantum Mechanics and Fields
Advanced Astrophysics
Atomic and Molecular Physics
Advanced Atmospheric Physics
Nuclear and Particle Theory
Statistical Mechanics/Many Body Theory
Gauge Theory
and any other subjects that may be approved by the Dean (or nominee).

The number to be offered in any year will be dependent on staff availability and student demand.

GRADUATE DIPLOMA IN PHYSICS

SYLLABUSES

The Department of Physics and Mathematical Physics offers a Graduate Diploma in Physics which may be taken in one year of full-time study or two or more years of part-time study. The aim of the course is to assist graduates of physics, or graduates in related disciplines, to further their knowledge of physics and to gain familiarity with experimental and computational techniques in areas of current research.

The course comprises coursework subjects to an aggregate value of at least 16 points, and a diploma project, having a value of 8 points.

Coursework options will normally be selected from Level III subjects and Honours subjects offered by the Department, but may also be taken from courses given in other departments, where appropriate. No subject or option counted toward another course may be counted towards the diploma. The course will have a coherent theme. The initial selection of options is made at enrolment time by the student in consultation with the Department, according to the students background, interests, and choice of diploma project.

The diploma project will normally be in the field of one of the research groups in the Department and will involve the student in the work of the group. Emphasis will be placed on gaining practical experience with modern research tools, using the Department's experimental and computing facilities.

Graduates wishing to enrol should consult the Department of Physics and Mathematical Physics for advice and details of the options available. They are requested to commence their enquiries in early December of the year before they plan to enrol, and students may be required to begin their project work in the first week in February. At enrolment time, options are selected in consultation with the Department, and the course must be approved formally by the Head of Department or nominee.

DEGREE OF

MASTER OF SCIENCE

IN THE FACULTY OF SCIENCE

REGULATIONS

1. The following persons may become candidates for the degree of Master of Science in the Faculty of Science (a) Bachelors of Science, (b) Bachelors of Agricultural Science, and (c) others having qualified for a degree, whose academic qualifications are accepted by the Faculty of Science as sufficient:

Provided that, subject to the approval of the Board of Graduate Studies acting with authority wittingly devolved to it by the Council, the Faculty may, in special cases and subject to such conditions (if any) as it may see fit to impose in each case, accept as a candidate for the degree a person who does not hold a degree of a university, but has given evidence satisfactory to the Faculty of his fitness to undertake work for the degree.

1A. Unless an Honours degree of Bachelor of Science or Agricultural Science or a qualification accepted by the Faculty as being equivalent has been obtained, the applicant shall before being admitted as a candidate complete a course of study as prescribed by the Faculty and pass a qualifying examination of an Honours standard. This shall be completed within one year if the study is undertaken on a full-time basis or two years if it is undertaken on a part-time or external basis except where the Faculty grants an extension of time.

2. A candidate who holds the Honours degree of Bachelor of Science or Bachelor of Agricultural Science or its equivalent in a university recognised by the University of Adelaide may proceed to the degree of Master of Science in the Faculty of Science at the expiration of one year from the date of his admission to the Honours degree of Bachelor; no other candidate shall proceed to the degree before the expiration of two years from the date of the beginning of his candidature.

3. To qualify for the degree a candidate shall submit a thesis upon an approved subject and shall adduce sufficient evidence that the thesis is his own work. The thesis shall give the results of original research or of an investigation on which the candidate has been engaged. A candidate may also submit other contributions to science in support of his candidature.

4. A person seeking enrolment as a candidate for the degree shall apply to the Registrar and shall submit as part of his application, a statement of his academic standing, accompanied, in the case of a person who is not a graduate of the University of Adelaide, by acceptable proof of such standing and an outline of the research work or investigation on which he intends to submit a thesis. The Faculty of Science, if it approves the subject of his research, may appoint a supervisor to guide the candidate in his work.

5. A candidate may proceed to the degree by full-time or part-time study, or as an external student. Except by special permission of the Faculty, the work for the degree shall be completed and the thesis submitted:

(i) in the case of a full-time candidate, not less than one year nor more than three years from the date of candidature accepted by the Faculty;

(ii) in the case of a part-time or external candidate, not less than two years nor more than six years from the date of candidature accepted by the Faculty.

6. The Faculty shall appoint a Board of Examiners to report upon the thesis and any supporting papers that the candidate may submit. The Board of Examiners may require any candidate to pass an examination in the branch of science to which his original research or investigation is cognate.

7. A candidate for the degree of Doctor of Philosophy or Doctor of Science whose work is considered by the Faculty, after report by the examiners appointed to adjudicate upon it, not to be of sufficient merit to qualify for the degree of Doctor but of sufficient merit for the degree of Master may be admitted to the degree of Master provided that he is qualified to become a candidate for the degree.

8. On completion of his work a candidate shall lodge with the Registrar three copies of his thesis prepared in accordance with directions given to candidates from time to time.*

9. A candidate's progress shall be reviewed annually by the Faculty under the provisions of clause 4C of Chapter XXV of the Statutes.

10. A candidate who complies with the foregoing conditions and satisfies the Board of Examiners shall on the recommendation of the Faculty of Science be admitted to the degree of Master of Science in the Faculty of Science.

Regulations allowed 7 December, 1939.

Amended: 14 Dec. 1944: 1A, 6; 8 Dec. 1949: 7; 15 Jan. 1959: 1A; 16 Mar. 1961: 8; 4 Apr. 1963: 1; 12 Dec. 1963 1A, 4; 28 Feb. 1974: 1, 1A, 3, 10; 23 Jan. 1975: 9; 15 Jan. 1976: 9; 8 Feb. 1979: 1A; 4 Feb. 1982: 5, 8; 24 Feb. 1983: 1, 2, 3, 4, 5; 24 Mar. 1988: 1A. 21 Feb. 1991: 1. Awaiting allowance: 1.

*Published in "Guidelines on Higher Degrees by Research and Specifications for Thesis": *see* Contents.

DEGREE OF

MASTER OF SCIENCE (MEDICAL AND HEALTH PHYSICS)

REGULATIONS

1. There shall be a degree of Master of Science (Medical and Health Physics).

2. (a) The Faculty of Science may accept as a candidate for the degree any person who has qualified for an Honours degree of Bachelor of Science in Physics of the University of Adelaide or of another institution accepted for the purpose by the University;

(b) The Faculty may accept a candidate who has qualified for an Ordinary degree of Bachelor of Science of the University of Adelaide, or another institution accepted by the University for the purpose, with a major sequence in Physics and appropriate practical experience, but may specify preliminary work to be undertaken by the candidate.

(c) Subject to the approval of the Board of Graduate Studies acting with authority wittingly devolved to it by the Council and subject to such conditions as it may see fit to impose in each case, the Faculty of Science may accept as a candidate for the degree an applicant who does not hold the qualifications specified in Regulation 2(a) or 2(b) but who has given evidence satisfactory to the Faculty of fitness to undertake work for the degree.

3. To qualify for the degree a candidate shall:

(i) satisfy examiners in subjects of study as prescribed in the schedules; and

(ii) present a satisfactory thesis on a subject approved by the Faculty of Science.

4. (a) The Council, after receipt of advice from the Faculty of Science, shall from time to time prescribe schedules defining:

(i) the subjects of study for the degree; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

5. Except with the permission of the Faculty, the subjects of study and the thesis shall be completed:

(i) in not less than three semesters nor more than five semesters of full-time study; or

(ii) in not less than five semesters nor more than eight semesters of part-time study.

6. If in the opinion of the Faculty of Science a candidate for the degree is not making satisfactory progress, the Faculty may, with the consent of the Council, terminate the candidature and the candidate shall cease to be enrolled for the degree.

7. On completion of the thesis the candidate shall lodge with the Registrar two copies of the thesis prepared in accordance with directions given to candidates from time to time. No thesis or material presented for any other degree within this or any other institution shall be submitted.

8. The Faculty shall appoint two examiners for the thesis.

9. A candidate who fulfils the requirements of these regulations shall be qualified for admission to the degree of Master of Science (Medical and Health Physics).

Regulations awaiting allowance.

DEGREE OF

MASTER OF SCIENCE (MEDICAL AND HEALTH PHYSICS)

SCHEDULES

(Made by the Council under Regulation 4).

Note: all subjects are offered subject to enrolments and the availability of staff and resources.

Subjects of Study and Thesis Requirements

1. Unless exempted therefrom by the Faculty of Science every candidate for the degree shall complete units to the value of 36 points from the following components, each of which counts as 4 points, and the project, 1(c), which counts as 12 points:

(a) Coursework, comprising the following *compulsory* subjects:

7799 Applied Nuclear and Radiation Physics
4743 Physical Measurement and Instrumentation
3327 Radiation Biology, Protection and Epidemiology
3570 Anatomy and Physiology P

(b) Coursework comprising two of the following *optional* units:

1264 Non-ionizing Radiations
1451 Radiology Physics
2013 Radiotheraphy Physics
4341 Nuclear Medicine Physics
2203 Environmental, Mining and Health Physics
8866 Laser Physics

(c) A thesis on an approved short research project with clinical or field application.

2. (a) The course shall be a joint course, co-ordinated amongst the three participating institutions: The University of Adelaide, The University of South Australia and The Royal Adelaide Hospital by a Programme Committee which contains a representative from each.

(b) Students enrolled from the University of Adelaide shall be subject to the regulations and schedules of this university and the degree shall be awarded by this university. However, subjects may be given by staff from either University or the Royal Adelaide Hospital.

3. There shall be three classifications of pass in any subject for the degree: Pass with Distinction, Pass with Credit, Pass.

4. The Faculty of Science may grant status in subjects for Honours or postgraduate study undertaken in another course in the University or in another university or tertiary institution.

5. A candidate's enrolment in subjects of study and choice of supervisor or supervisors must be approved by the Head of the Department of Physics and Mathematical Physics (or by the Programme Committee to its co-ordinator) at enrolment each year.

6. The Faculty of Science may require a candidate to undertake additional work needed as background to the compulsory subjects, where a student has not completed an honours degree.

7. The examiners appointed under regulation 9 after interviewing the student, may recommend that:

(a) the thesis be accepted; or

(b) the thesis be not accepted but the candidate be permitted to resubmit it in a revised form; or
(c) the thesis be rejected.

8. In order to satisfy the requirements of the degree a candidate must satisfactorily complete any additional work required under clause 6, pass in each of the compulsory subjects and submit a thesis which is accepted by the Faculty of Science as satisfactory for the purposes of the degree.

DEGREE OF

MASTER OF SCIENCE (MEDICAL AND HEALTH PHYSICS

SYLLABUSES

This vocational degree aims to provide a bridge between the training of a professional physicist and the specialised knowledge and experience required in a clinical or field situation where the physicist is required to interact effectively with medical, technical and health professionals. It will enable the graduate to become productive more quickly, and will provide research training in an appropriate area of specialised interest. As such, it is a useful preliminary to PhD study.

The degree is a coursework degree, with a significant research project. It involves close co-operation with the Royal Adelaide Hospital and University of South Australia through a Programme Committee. Some coursework subjects may not be offered every year. The masters course is open to qualified graduates from either institution who are approved under the separate regulations. The specialized optional units may be offered with the assistance of visiting lecturers.

It is envisaged that the degree can be completed in three semesters of full-time study including a summer semester for the research project. A total of 36 points is required to complete the degree. Separate units normally count 4 points, except for the Research Project, 12 points. Status will be given in subjects taken previously up to 8 points.

It is permissible for students to enrol for individual units for credit without intending to complete the masters degree. Such entry is open to graduates in science, medicine or engineering.

Timetable: Detailed timetables are issued at the beginning of each academic semester.

Text-books: Reading lists are provided by the Department throughout the course.

Assessment: Each subject may be examined immediately after formal instruction has been completed, or continuous assessment may be used. On submission of the thesis on the research project, a panel of examiners will interview the student before awarding a grade. In addition candidates are expected to become conversant with the literature in the project area, to attend seminars and may be called upon to give a seminar on their research projects.

Compulsory Subjects

7799 Applied Nuclear and Radiation Physics

Duration: Semester I.

Assumed knowledge: Level III Physics and Mathematics.

Content: Systematic properties of nuclei, stability, activities, types of decay and decay schemes and radioactive sources, natural backgrounds and the radioactive decay chains. Models of nuclei such as the liquid drop model which leads to the semi-empirical mass formula, shell model and magic numbers and the collective model are discussed. Nuclear reactions and spectroscopy, activation and source preparation, detectors of charged particles, neutrons and gamma rays, accelerators, reactors and meson factories are looked at. Theory of radiation transport (Boltzmann equation), radiation interaction processes and energy losses, range-energy relations, and shielding for electrons, photons, neutrons and heavy particles.

Assessment: Written examination (50%) and assignments (50%).

Text-books: Hobbie, R. K., *Intermediate physics for medicine and biology* (Wiley); Kaplan, I., *Nuclear physics* (Addison Wesley).

4743 Physical Measurement and Instrumentation

Duration: Semester II.

Assumed knowledge: Level III Physics.

Content: General consideration of measurement in a medical environment. Introduction to medical electronics, electrical safety, transducers, sensors, electrocardiogram and intensive care monitoring, medical computing and data processing. Introduction to ionizing and non-ionizing radiation dosimetry, units, dosemeters (ion chambers, solid state detectors, thermoluminescent, chemical and film dosimetry).

Assessment: Assignments and essay (50%), written examination (50%).

Text-books: Martin, A. and Harbison, S. A., *An introduction to radiation protection* 3rd edn. (Chapman and Hall).

3327 Radiation Biology, Protection and Epidemiology

Duration: Semester I or Semester II.

Assumed knowledge: Level I Physics.

Content: Cell biology, radiation genetics, effect of radiation and ultraviolet light on tissues and organs, clinical symptoms, late effects, absorbed dose, LET, RBE, radiation chemistry, genetic doubling doses in animals and man, expectations at low doses (adults vs. embryos), DNA, chromosomal and cellular effects, repair mechanisms and repair-deficient disorders, implications for protection, accidents and emergencies, epidemiological studies, atomic bomb survivors, cancer and background radiation levels, risk factors and risk assessment, preparedness and planning, decontamination, waste-disposal, handling of radioactive sources and X-ray apparatus, statistics, compartmental analysis, acute and chronic exposure, recommendations of ICRP, legislation and codes of practice. Infrared, microwaves and electromagnetic fields.

Assessment: Assignments and essay (50%), written examination (50%).

Text-books: Kiefer, J., *Biological radiation effects* (Springer-Verlag, 1990); Martin, A. and Harbison, S. A., *An introduction to radiation protection* 3rd edn. (Chapman and Hall); Sherwood, L., *Human physiology from cells to systems* (West).

3570 Anatomy and Physiology P

(Taught by University of South Australia, School of Pharmacy and Medical Laboratory Science.)

Duration: Semester II.

Content: Chordate anatomy and physiology: circulatory system, respiratory system, alimentary system, excretory system, skeletal and muscular system, reproductive system, defence system, nervous system, endocrine systems. Developmental biology: basic processes, control mechanisms, human ecology.

Assessment: Written examination.

Text-books: Guyton, A. C., *Textbook of medical physiology* 7th edn. (Saunders); Raven, P. H. and Johnson, G. B., *Biology* 2nd edn. (Mosley College Publishing).

Optional Subjects

2203 Environmental, Mining and Health Physics

Duration: Semester I or Semester II.

Content: The general mechanisms of physical control, e.g., time/distance/shielding, delay and decay, dilute and disperse, concentrate and contain. The general mechanisms of institutional control, regulatory regimes in Australia, ICRP, NHMRC, State regulations, licencing and registration. The ICRP scheme of things, control of quantitative risk, ALARA principle. Radioactivity in the environment, radon emissions, modelling, pathways, monitoring, the concept of critical group, UNSCEAR. Radiation in the workplace, sealed sources, unsealed sources, natural sources in mining and milling, monitoring and control, accidents and emergencies.
Case studies, e.g., uranium mines, rehabilitated and abandoned sites, rare earth plants, radwaste disposal sites.

Assessment: Assignments (50%), written examination (50%).

Text-books and References: Turner, D. B., *Workbook of atmospheric dispersion modelling* (National Technical Information Service, U.S. Dept. Commerce, 1970); Annals of ICRP, UNSCEAR reports, IAEA documents, Commonwealth Codes of Practice.

8866 Laser Physics

Duration: Semester I.

Assumed knowledge: Level III Optics.

Content: Introduction to lasers and non-linear optics, interaction of light with matter, probability of emission and absorption, stimulated emission, Bose-Einstein statistics, coherence. Laser resonators, Fabry-Perot, classification of resonators, graded reflectivity, geometrics, rings, gaussian waves, diffraction, modes. Macroscopic description of gain medium, disperson, rate equations, saturation, broadening, hole-burning, opto-coupling, pulsed lasers, Q-switching, mode-locking, second harmonic generation, holography. Particular lasers and their medical applications, e.g., to surgery, lithotripsy, opthalmology, angioplasty etc.

Assessment: Assignments (50%), examination (50%).

Text-book: Guenther, R., *Modern optics* (Wiley).

1264 Non-ionizing Radiations

Duration: Semester I or Semester II.

Content: Study of UV, ultrasound and electromagnetic waves and their effect on living tissue. Electrostatic fields, electromagnetic wave propagation, energy transfer processes, interaction of static and ELF electric and magnetic fields with biological systems, experimental RF and microwave dosimetry, biological effects of RF and microwave fields, measurement techniques for static, ELF, RF and microwave fields, rationale for exposure standards.

Assessment: Assignments and essay (50%), written examination (50%).

4341 Nuclear Medicine Physics

Duration: Semester I or Semester II.

Content: General overview of image process and perception. Imaging techniques and instrumentation, including scintillation detector, rectilinear scanner and gamma camera. Production and properties of radionuclides, generators and clinical radiochemistry. Static and dynamic imaging, dual photon absorptiometry, SPECT and PET. Theory of image processing and techniques, 3-D reconstruction and rendering.
Non-imaging metabolic techniques (e.g., thyroid uptake), in-vitro studies and instrumen-

tation (e.g., well counters), compartment analysis. Dosimetry of internally-deposited radionuclides (MIRD). Therapeutic techniques using unsealed sources as above.

Assessment: Assignments and essay (50%), written examination (50%).

Text-books: Barrett, H. and Swindell, W., *Radiological imaging — theory of image formation, detection and processing*, Vols. 1 and 2 (Academic Press); Sorenson, J. A. and Phelps, *Physics in nuclear medicine* (Grune and Stratton).

1451 Radiology Physics

Duration: Semester I or Semester II.

Content: General overview of image process and perception. Conventional radiology including diagnostic X-ray machines, image formation and enhancement (basic radiation interaction processes, attenuation, filtration, beam restriction, filters, grids, geometric effects, intensifiers). Photographic properties of X-ray film, X-ray image formation. Special techniques (cinefluorography, mammography, axial tomography, TV techniques, stereoscopy and subtraction techniques). Xeroradiography, computerized tomography and digital techniques. Theory of image processing, 3-D reconstruction and rendering, cost/benefit and risk analysis. Quality assurance.

Assessment: Assignments and essay (50%), written examination (50%).

Text-books: Barrett, H. and Swindell, W., *Radiological imaging — theory of image formation, detection and processing, Vols. 1 and 2 (Academic Press).*

2013 Radiotherapy Physics

Duration: Semester I or Semester II.

Content: Superficial and deep X-ray units, ^{137}Cs and ^{60}Co units, electron accelerators. Electron and photon interactions in biological tissues. Bragg-Gray theory and electronic equilibrium. Depth-dose curves and dose profiles. Primary and scattered radiation. Tissue-air ratios, tissue maximum ratios. Effects of source geometry, collimation and scattering media. Modelling of radiotheraphy beam (equivalent path length, effective tissue air ratios, Batho power law, superposition theory and Monte Carlo modelling). Introduction to treatment planning. Radiotherapy dose meters and instrumentation. Calibration (dosimetry protocols) and quality assurance, beam data acquisition. Clinical radiobiology including tumour control probability, tissue tolerance, modelling and effects of oxygen tension, tumour volume, fractionation and particle LET. Brachytheraphy. Neutron, neutron capture and pion therapy. Dosimetry of internally deposited radionuclides and therapeutic techniques using unsealed sources (^{32}P, ^{131}I and ^{153}Sm).

Assessment: Assignments and essays (50%), written examinations (50%).

Text-books: Johns, H. E. and Cunningham, J., *Physics of radiology* 4th edn. (Charles C. Thomas, Springfield, N.J.); Spiers, F. W., *Radioisotopes in the human body: physical and biological aspects* (Academic Press).

9938 Supervised Research Project

Points value: 12.

Duration: Full year.

Content: This short project affords students the opportunity of applying their coursework and gaining research techniques and experience related to the hospital or field environment. It is essential that the choice of project should reflect the vocational emphasis of the course by having direct clinical or field involvement as well as reflecting the particular interests of the student. Students are responsible for choosing a supervisor who must be approved by the Programme Committee. The project may be taken in co-operation with a public or private organisation interested in radiological protection, in which case a supervisor in the organisation may be appointed. It should aim to be a complete

investigation of a restricted field. It should contain a literature survey and references to the published literature.

Assessment: Thesis (70%), Viva (30%).

DEGREE OF

MASTER OF SCIENCE IN PETROLEUM GEOLOGY AND GEOPHYSICS

REGULATIONS

1. There shall be a degree of Master of Science in Petroleum Geology and Geophysics.

2. (a) The Faculty of Science may accept as a candidate for the degree any person who has qualified for:

(i) an Honours degree of Bachelor of Science with honours in Geology or Geophysics, of the University of Adelaide or of another university; or

(ii) an Ordinary degree of Bachelor of Science of the University of Adelaide or another university with a major sequence of study in Geology or Geophysics, and appropriate practical experience.

(b) Subject to the approval of the Board of Graduate Studies acting with authority wittingly devolved to it by the Council and subject to such conditions as it may see fit to impose in each case, the Faculty of Science may accept as a candidate for the degree a person who does not meet the requirements specified in Regulation 2(a) if it is satisfied that he or she is likely to be able satisfactorily to undertake work for the degree.

3. The Faculty of Science may require a candidate to complete satisfactorily such additional work as it may prescribe.

4. To qualify for the degree a candidate shall:

(i) satisfy examiners in subjects of study as prescribed in the schedules;

(ii) comply with conditions as prescribed in the schedules; and

(iii) present a satisfactory thesis on a subject approved by the Faculty of Science. The thesis shall give the results of original research or of an investigation on which the candidate has been engaged.

5. (a) The Council, after receipt of advice from the Faculty of Science, shall from time to time prescribe schedules defining:

(i) the subjects of study for the degree; and

(ii) the range of subjects to be satisfactorily completed and the examinations to be passed by candidates.

Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

(b) The syllabuses of subjects shall be specified by the Head of each department or centre concerned, subject to endorsement by the Faculty and approval by the Education Committee or such body or officer as it may designate for the purpose. The Head of Department or Centre may approve minor changes to any previously approved syllabus.

6. Except with the permission of the Faculty, the subjects of study and the thesis shall be completed:

(i) in not less than one year nor more than two years of full-time study; or

(ii) in not less than two years nor more than four years of part-time study.

7. A candidate who withdraws from all of the subjects in which he or she is enrolled in any one year or who fails to re-enrol after being enrolled in the previous year may only re-enrol in a subsequent year with the approval of the Faculty, and under such conditions as the Faculty may impose in each case.

(b) A candidate proceeding with the thesis whose work is interrupted for a period of time may be granted an intermission of candidature by the Dean on behalf of the Faculty. If

such an application is approved the maximum period specified in regulation 6 will be adjusted accordingly by adding the length of the intermission.

8. If in the opinion of the Faculty of Science a candidate for the degree is not making satisfactory progress, the Faculty may, with the consent of the Council, terminate the candidature and the candidate shall cease to be enrolled for the degree.

9. On completion of the thesis the candidate shall lodge with the Registrar three copies of the thesis prepared in accordance with directions given to candidates from time to time.* No thesis or material presented for any other degree within this or any other institution shall be submitted.

10. The Faculty shall appoint two examiners who are external to the University for each thesis.

11. A candidate who holds the Honours degree of Bachelor of Science in Honours Petroleum Geology and Geophysics shall surrender the Honours degree before being admitted to the degree of Master of Science in Petroleum Geology and Geophysics.

12. A candidate who fulfils the requirements of these regulations shall be qualified for admission to the degree of Master of Science in Petroleum Geology and Geophysics.

Regulations allowed 12 February, 1987. 21 Feb. 1991: 2. Awaiting allowance: 5(b).

*Published in "Guidelines on Higher Degrees by Research and Specifications for Thesis": *see* Contents.

DEGREE OF

MASTER OF SCIENCE IN PETROLEUM GEOLOGY AND GEOPHYSICS

SCHEDULES

(Made by the Council under Regulation 5.)

Subjects of Study and Thesis Requirements

1. Unless exempted therefrom by the Faculty of Science, every candidate for the degree shall complete the following components.

(a) Coursework, comprising the following subjects:

6657 Petroleum Geology and Geophysics I

5532 Petroleum Geology and Geophysics II

(b) Thesis on approved research project.

(c) Period of placement in industry.

2. There shall be three classifications of pass in any subject for the degree: Pass with Distinction, Pass with Credit, Pass.

3. The Faculty of Science may grant status in either one or two subjects for Honours or postgraduate study undertaken in another course in the University or in another university or tertiary institution.

4. A candidate's enrolment in subjects of study must be approved by the Head of the Department of Geology and Geophysics (or nominee) at enrolment each year.

5. The Faculty of Science may require a candidate to undertake additional work needed as background to the compulsory subjects.

6. A candidate shall pursue an approved research project of relevance to the interests of the Department of Geology and Geophysics in Petroleum Geology or Geophysics under the control of the Department and under the guidance of one or more supervisors appointed by the Faculty of Science. At least one supervisor shall be a member of the academic staff of the Department of Geology and Geophysics. The thesis required under Regulation 4 and Clause 1 (b) above shall embody the results of this research project.

7. In connection with his or her research project a candidate will be required to undertake a six to twelve week placement or an equivalent period of previous work experience with a company or other organisation, of relevance, involved in petroleum exploration, extraction processing and/or research approved by the Head of the Department of Geology and Geophysics (or nominee).

8. The examiners appointed under regulation 10 may recommend that:

(a) the thesis be accepted; or

(b) the thesis be accepted but that minor amendments be made to it; or

(c) the thesis be accepted subject to:

(i) specified amendments being made to it; or

(ii) the candidate satisfactorily undertaking an oral or written examination; or

(d) the thesis be not accepted but the candidate be permitted to re-submit it in a revised form; or

(e) the thesis be rejected.

9. In order to satisfy the requirements of the degree a candidate must satisfactorily complete any additional work required under clause 5, pass in each of the two compulsory

subjects, complete a period of placement as in Clause 7, and submit a thesis which is accepted by the Faculty of Science as satisfactory for the purposes of the degree.

DEGREE OF

MASTER OF SCIENCE IN PETROLEUM GEOLOGY AND GEOPHYSICS

SYLLABUSES

The degree is primarily a research degree, with a significant course-work component. It involves close interaction with the petroleum industry via the work placement programme, the research projects chosen, and the use of visiting lecturers.

Full-time students undertake all their course-work during their first year. The subject Petroleum Geology and Geophysics I is offered over about 7 weeks in the period February-April and followed by a work placement period of about 6 weeks. The subject Petroleum Geology and Geophysics II is taught over about 8 weeks, in June-August and followed by a work placement period of about 6 weeks. The remainder of the first year and the whole of the second year are devoted to the research project and thesis. In the first year about 40% of the student's time is spent on formal course-work, about 25% on the work placement, and the remaining 35% on the research project.

Any additional work required by the Faculty of Science must be satisfactorily completed during the first year of study. Such studies will be arranged in consultation with the Head of the Department of Geology and Geophysics, or nominee.

Students whose previous studies have covered part of the material in the two required subjects may be required or permitted to substitute alternative studies for parts of these subjects. Specialised programmes for this purpose may be arranged in consultation with the Head of the Department of Geology and Geophysics or nominee.

Timetable: Detailed timetables are issued at the beginning of each academic year.

Pre-requisites: The pre-requisites for these subjects are the same as for entry as a candidate.

Textbooks: Reading lists are provided by the Department throughout the course.

Assessment: Each subject is examined immediately after formal instruction has been completed. In addition candidates are expected to complete workshop assignments and to write papers and give seminars.

Coursework Subjects

6657 Petroleum Geology and Geophysics I

This subject comprises lectures, workshops and field work in the department and on-the-job training in the petroleum industry. The coursework is concentrated on background instruction in the areas of basin analysis and sedimentology, and there are additional components dealing with the methods of gathering, interpreting and applying data of importance in petroleum exploration.

5532 Petroleum Geology and Geophysics II

This subject provides students with basic skills in the use of seismic data for stratigraphic, structural and petroleum detection purposes. The subject also treats the broader aspects of applied palaeontology and national and international case studies of petroleum occurrence. A field camp to study actual rock relationships and further thesis-related on-the-job training are also included.

DEGREE OF

DOCTOR OF SCIENCE

IN THE FACULTY OF SCIENCE

REGULATIONS

1. (a) Subject to these regulations a person who has been admitted in the University of Adelaide to an Honours degree of Bachelor or a degree of Master in Science, Agricultural Science, Applied Science or Engineering, or to the degree of Doctor of Philosophy in a field of study approved by the Faculty of Science, may proceed to the degree of Doctor of Science in the Faculty of Science.

(b) On the recommendation of the Faculty of Science the Board of Graduate Studies acting with authority wittingly devolved to it by the Council may accept as a candidate for the degree a person who has been admitted to a degree in the University of Adelaide other than one named in section (a) of this regulation, or who has qualified for a degree of another university or institution of higher education recognised by the University of Adelaide and has had a substantial association with the University; provided that in each case the person concerned has, in the opinion of the Faculty of Science, had an adequate scientific training.

(c) On the recommendation of the Faculty of Science the Council may, in special cases, accept as a candidate for the degree a person who does not hold a degree of a university or institution of higher education, provided that in each case the candidate concerned has a substantial association with the University and has, in the opinion of the Faculty of Science, adequate scientific credentials.

(d) Except where a person has been accepted as a candidate under regulation 1(c), no person shall be accepted as a candidate for the degree of Doctor of Science in the Faculty of Science before the expiration of five years from the date of his original graduation.

2. (a) A person who desires to become a candidate for the degree shall give notice of his intended candidature in writing to the Registrar and with such notice shall furnish particulars of his scientific achievements and of the work which he proposes to submit for the degree.

(b) The Faculty of Science shall appoint a committee to examine the information submitted and to advise the Faculty on whether the Faculty should — (i) allow the applicant to proceed, and approve the subject or subjects of the work to be submitted; *or* (ii) advise the applicant not to submit his work: and the Faculty's decision shall be conveyed to the applicant.

(c) If the Faculty approves the subject or subjects of the work and the candidate proceeds with the submission the Faculty shall nominate examiners of whom one at least shall be an external examiner.

3. (a) To qualify for the degree the candidate shall furnish satisfactory evidence that he has made an original contribution of distinguished merit adding to the knowledge or understanding of any subject with which the Faculty is directly concerned.

(b) The degree shall be awarded primarily on a consideration of such of his published works as a candidate may submit for examination.

(c) The candidate in submitting his published works shall state generally in a preface and specifically in notes the main sources from which his information is derived and the extent to which he has availed himself of the work of others, especially where joint publications are concerned. He may also signify in general terms the portions of his work which he claims as original.

(d) The candidate is required to indicate what part, if any, of the work he has submitted for a degree in this or any other university.

4. The candidate shall lodge with the Registrar three copies of the work prepared in accordance with the directions given in sub-paragraph (b) of clause 2B of Chapter XXV of the Statutes. If the work is accepted for the degree the Registrar will transmit two of the copies to the University Library.

5. A candidate who complies with the foregoing conditions and satisfies the examiners may, on the recommendation of the Faculty of Science, be admitted to the degree of Doctor of Science in the Faculty of Science.

6. Notwithstanding anything contained in the preceding regulations, the Faculty may recommend the award of the degree to any person who is not a member of the staff of the University. Any such recommendation must be accompanied by evidence that the person for whom the award is proposed has made an original and substantial contribution of distinguished merit to the knowledge or understanding of a subject with which the Faculty is directly concerned, of a standard not less than that required by regulation 3.

Regulation allowed 4 November, 1965.

Amended: 28 Feb. 1974: 1, 5; 23 Jan. 1975: 1; 15 Jan. 1976: 6; 4 Feb. 1982: 2, 4; 24 Feb. 1983: 2. 21 Feb. 1991: 1. Awaiting allowance: 1(b).

BOARD OF GRADUATE STUDIES

REGULATIONS AND SCHEDULES OF THE DEGREE

Doctor of Philosophy (Ph.D.)

DEGREE OF

DOCTOR OF PHILOSOPHY

REGULATIONS

1. There shall be a Board of Graduate Studies.

2. The Board shall comprise:

(i) a Dean of Graduate Studies, elected by Education Committee for a three-year term;

(ii) four members of the academic staff elected by Education Committee for two or three year terms;

(iii) two postgraduate students appointed by the Postgraduate Students' Association in accordance with procedures drawn up from time to time and approved by the Council.

3. The Board shall perform the functions required of it under these regulations and such other functions as the Council may from time to time prescribe.

The Degree of Doctor of Philosophy

4. There shall be a degree of Doctor of Philosophy.

5. (a) The Council, after receipt of advice from the Board, shall from time to time prescribe schedules defining the academic standing required for the candidature, the course of study and research for the degree, the condition of candidature and the assessment for the degree.

(b) Such schedules shall become effective from the date of prescription by the Council or such other date as the Council may determine.

6. Except as otherwise prescribed in the schedules, the academic standing required for acceptance as a candidate shall be an Honours degree of Bachelor of at least a IIA Standard or a degree of Master of the University of Adelaide or the equivalent thereof. Applications from students with other qualifications will require the approval of the Board of Graduate Studies.

7. The Board may, in accordance with conditions prescribed in the Schedules, grant credit in the course for the degree of Doctor of Philosophy for research undertaken in another course in the University or in another university or tertiary institution.

8. A candidate may proceed to the degree by full-time study or, if the Head of the Department concerned is satisfied that the candidate has adequate time to pursue supervised research under the control of the University, by half-time study. Except in circumstances approved by the Board, the work for the degree shall be completed and the thesis submitted:

(a) in the case of a full-time candidate, not less than two years and not more than four years from the date of commencement of candidature;

(b) in the case of a half-time candidate, not less than four years and not more than eight years from the date of commencement of candidature.

9. The Board may review the progress of a candidate at any time during the course of candidature and, if the candidate's progress is unsatisfactory, may recommend to the Council that the candidature be terminated.

10. On the completion of the approved course of study and research, a candidate shall submit a thesis embodying the results of that study and research, and may submit also, in support of the thesis, other relevant material. No thesis or material presented for any other degree within this or any other institution shall be so submitted. The Board shall prescribe the form in which the thesis shall be submitted and the number of copies to be submitted.

11. The thesis and any other material submitted shall be assessed by examiners external to the University and in accordance with the schedules. The thesis shall:

(a) display original and critical thought;

(b) be a significant contribution to knowledge;

(c) relate the topic of research to the broader framework of the discipline within which it falls; and

(d) be clearly, accurately and cogently written and be suitably illustrated and documented.

12. After consideration of the reports of the examiners and such other information as it thinks fit, the Board shall determine that:

(a) the candidate shall be awarded the degree; or

(b) The candidate shall be awarded the degree but that minor amendments be made to the thesis; or

(c) The candidate shall be awarded the degree subject to,

(i) specified amendments being made to the thesis, or

(ii) satisfactory performance in an oral or written examination; or

(d)the candidate shall not be awarded the degree but shall be permitted to re-submit the thesis in a revised form; or

(e) the candidate shall be awarded the appropriate degree of Master; or

(f) The candidate shall be awarded the appropriate degree of Master upon making suitable amendments to the thesis; or

(g) The candidate shall not be awarded the degree of Doctor of Philosophy or the degree of Master.

13. Such number of copies of a thesis and any other material on which the degree is awarded shall be deposited in the Barr Smith Library or elsewhere in the University as determined by the Board. Unless otherwise determined by the Board, the copies shall be available for loan and photocopy.

Note:

For the purpose of the Ph.D. regulations, the **Centre for Asian Studies** and the **Research Centre for Women's Studies** are deemed to be departments.

Regulations allowed 21 December, 1967.
Amended: 16 Dec. 1971: 9; 21 Dec. 1972: 2; 15 Jan. 1976: 2, 3, 4, 5, 6, 9, 10; 4 Feb. 1982: 4, 10; 1 March 1984: 1-13.
21 Feb. 1991: 1, 2, 5.

DEGREE OF

DOCTOR OF PHILOSOPHY

SCHEDULES

Guidelines

1. The Council, on the recommendation of the Board, may from time to time approve guidelines or any matters included in the Schedules and may authorise Faculties, Deans of Faculties, Heads of Departments or the Registrar to act in accordance with such guidelines without reference to the Board in each case.

Acceptance

2. A person shall not be enrolled as a candidate for the degree unless:

(a) the applicant's proposed field of study and research is acceptable to the Department(s) responsible for the supervision of the candidate's work.

(b) in the case of a person granted credit under regulation 7, at least one year of full-time study and research, or its equivalent, will still be necessary to complete the work for the degree.

Academic Standing

3. The academic standing required for acceptance as a candidate for the degree is normally an Honours degree of Bachelor (with first or upper second class Honours) or a degree of Master of the University of Adelaide.

4. A person who holds a degree of another University may be accepted as a candidate provided that the course of study undertaken and the academic standard reached are equivalent to those required of a candidate who is a graduate of the University of Adelaide.

5. The Board may accept as a candidate a graduate who does not qualify under clause 3 or 4 but (a) has completed to the satisfaction of the Board at least one year of full-time postgraduate study or research and (b) has passed a qualifying examination of Honours standard prescribed by the appropriate faculty and approved by the Board.

6. The Board may also accept as a candidate for the degree, a person who is seeking enrolment under regulation 7, provided it is satisfied (a) that the person is of such academic standard as would be required of other candidates for the degree and (b) that the person's progress so far has been satisfactory.

Date of Candidature

7. The candidature shall normally date from the month in which the candidate begins the course of study and research for the degree. In the case of a candidate granted credit under regulation 7 the candidature shall normally expire, (i) in the case of a full-time candidate, not less than two years and not more than four years from when the candidate commenced work in the other course, or (ii) in the case of a half-time candidate, not less than four years and not more than eight years from the month the candidate commenced work in the other course. The approval of the Board is required for any different expiry date.

Concise Outline of Research

8. Each candidate shall, not later than six months after the date of commencement of candidature, submit for approval by the relevant Faculty a concise outline of proposed research in such form as the Board may prescribe. Individual Faculties may require

candidates to submit this outline at the time of enrolment (or at some earlier time within the six months limit) if they so desire.

Work for the Degree

9. A candidate shall pursue an approved course of study and research under the control of the University and under the general guidance of one or more supervisors appointed by the University. At least one supervisor shall be a member of the academic staff of the Department of the University in which the candidate is registered.

Annual Review

10. At least once a year, the Head (or nominee) of the relevant Department shall interview the candidate and then, in consultation with the supervisor(s), shall notify the Registrar whether or not the candidate is making satisfactory progress and is fulfilling the conditions laid down.

Absence from the University

11. The Board may permit a candidate to pursue at another university or institution part of the approved course under such conditions as it thinks fit. Normally, candidates will be required to work for at least two years full-time (or equivalent) under the control of the University, but in the case of a candidate enrolled under regulation 7, and in other exceptional circumstances, the Board may approve a reduced period on such conditions as it may determine in each case.

12. The Head of the relevant Department may permit a candidate to spend six months in any one year of the candidature away from the University on work connected with the research for the degree. A period of such absence in excess of six months should normally be approved in advance by the Board.

Intermission of Candidature

13. A candidate whose work is interrupted for a period of time may be granted an intermission of candidature by the Board. If such an application is approved the minimum and maximum periods specified in regulation 8 will be adjusted accordingly by adding the length of the intermission.

Extension of Candidature

14. A candidate may be granted one extension of candidature by the Board of twelve months beyond the maximum period specified in regulation 8, but if the thesis has not been submitted by the end of that period the candidature will be suspended.

Completion of Thesis outside the University

15. A candidate who has completed the equivalent of two years full-time working under the control of the University, who has completed the experimental work (where appropriate) and whose progress is sufficiently well advanced to permit the satisfactory completion of the thesis outside the University, may be granted permission by the Board to complete the writing-up of the thesis outside the University. If such an application is approved the candidate will be allowed either twelve months or until the end of any extension of candidature which has been granted under clause 14 to submit the thesis. If the thesis has not been submitted by the end of that period the candidature will be suspended.

Resumption of Suspended Candidature

16. A candidature which has been suspended will be resumed if a final draft of the thesis which has not departed from the field of study which was being pursued before the candidature was suspended is subsequently submitted to the relevant Department and is

satisfactory to that Department. Approval of the Board is required for resumption of a suspended candidature under any other conditions.

In special circumstances the Board may approve the resumption of a suspended candidature for one period of up to six months prior to the submission of the final draft.

Intention to Submit Thesis

17. A candidate shall notify the Registrar in writing approximately three months before he or she expects to submit the thesis required under regulation 10 of the proposed title and should submit a summary of the thesis at the same time.

Loan or Photocopy of Thesis

18. A candidate who does not wish to allow the thesis to be lent or photo-copied when it is deposited in the Library under regulation 13 shall make written application to the Registrar at the same time as he or she notifies his or her intention to submit. The withholding of such permission and the period of time involved shall be determined by the Board.

Examination of Thesis

19. (a) Candidates shall have the right to submit objections to the appointment of potential examiners. Any such objections should be submitted to the Registrar at the same time as the notification of intention to submit required under clause 17.

(b) The Board shall appoint two examiners who are external to the University, taking account of any objections raised under (a) and the recommendations of the Head of the relevant Department.

(c) The examiners shall be requested to report in such form as the Board prescribes and to recommend one of the alternatives listed in regulation 12.

(d) After consideration of the reports of the examiners, the Board may appoint a third external examiner and/or an external arbitrator.

General

20. When, in the opinion of the Board of Graduate Studies, special circumstances exist, the Council, on the recommendation of the Board of Graduate Studies in each case, may vary any of the provisions of clauses 1-19 above.

Note: (not forming part of the Schedules)

The Ph.D. is not available to external students. The University's understanding of the character and function of this course is that a candidate undertaking it will be part of the University community, drawing from it and contributing to it. Consequently only persons resident within the vicinity of Adelaide during their active candidature so that they are able to readily and frequently attend the University, even if they are pursuing project work in some other approved institution, will be accepted as candidates. It is possible for a candidate to be "away from the University" for legitimate academic reasons and for periods tightly specified in the Regulations and Schedules, but only when such absences are properly approved in advance and under arrangements that ensure the candidate is at all times "under the control of the University". Nothing in the Regulations of Schedules envisages any provision for external candidacy and no exceptions will be entertained.

GUIDELINES ON HIGHER DEGREES BY RESEARCH AND SPECIFICATIONS FOR THESIS

INTRODUCTION

This section sets out procedures to be followed and guidelines on supervision and research for the degree of Doctor of Philosophy and the various Masters degrees by research offered by the University of Adelaide. These degrees are awarded solely on the successful examination of a thesis prepared by the candidate under supervision and embodying the results of a period of research. (Faculties may also apply these guidelines to the research components of those Masters degrees which have an advanced study or coursework component and a research component.)

The following information is intended for use by supervisors and candidates throughout the period of candidature, and will be a useful reference for intending candidates and Heads of Departments and where applicable postgraduate co-ordinators. (It has been recommended that all Departments should appoint a postgraduate co-ordinator to oversee the postgraduate work of the Department.) It should be read in conjunction with the Regulations for the relevant degree(s) which are published in this volume.

1. THE ENROLMENT PROCESS

1.1 The decision to enrol

Several factors must be taken into account by a potential candidate and the Head of the relevant Department before the decision is made to enrol for a higher degree.

(a) Academic

In general, it is necessary to have qualified for the equivalent of an Australian University Honours degree (first or second class). Some Departments require candidates to enrol as a candidate for a Master's degree in the first instance, with the possibility of transferring to a Ph.D. at a later date if progress is deemed to be satisfactory.

(b) Finance

All degrees can be completed on a half-time basis and, in the case of Masters degrees, on a part-time basis (and some externally) so that it is possible to be self-supporting while enrolled. The University and the Commonwealth Government each offers a limited number of postgraduate scholarships annually which cover basic subsistence costs. Details of the scholarships available may be obtained from the Scholarships Officer in the Registrar's Office.

Departments receive research funding which is based (in part) on the number of postgraduate students enrolled in the Department, and the Department can therefore generally be expected to provide equipment and funds for the research to be carried out. In particular, the concise outline of proposed research which every candidate is required to submit must be approved on the basis of both the academic acceptability of the project and the resource implications for the Department and Faculty concerned.

(c) Choice of field of study and supervisor

A person who is contemplating enrolling for a higher degree should discuss the proposed candidature with the Head and members of the relevant Department(s) (including the postgraduate co-ordinator if one has been appointed), and a decision must be made before the commencement of the candidature on the general area of study and the supervisor(s) to be appointed to guide the candidate in the research. Since it is important that the supervisor is active in the general area of research which is chosen, it is clear that the choice of the field of study and supervisor are inter-related and therefore in practice decisions on both matters will often need to be made together.

Guidelines for the supervision of higher degree candidates are outlined in section 2. It is important to bear in mind the role the supervisor will play when the choice of supervisor is being made. In particular, as much care as possible needs to be exercised in matching student and supervisor to ensure that the personalities involved and the general approach to the work are compatible. Intending candidates may therefore find it useful to discuss these issues and the general approach to supervision with potential supervisors at the outset. In any case, clear understandings on issues such as how closely the work is to be supervised, the planned frequency of meetings between supervisors and candidates, the expectation of such meetings and the nature and level of commentary on the various stages of the work should be reached as soon as the supervisor has been appointed.

Where a student is to participate in a team project, the student's specific contribution to the project and the relationship with other participants should be clarified at the outset.

In making decisions on the appointment of supervisors, the Head of the Department should also take into account the distribution of teaching, supervisory and administrative duties and the possibility of absence by the supervisor on leave. It is often appropriate to appoint more than one supervisor.

(d) Concise outline of proposed research

Candidates are required to submit a concise outline of their proposed research on a form available from the Assistant Registrar Graduate Studies within a period of time specified by each Faculty. Some Faculties have specified that the outline must be submitted with the enrolment form and the maximum period specified by any Faculty is six months from the date of candidature. In any event, every effort should be made to make a final decision as early as possible. In making the decision, three main factors should be taken into account:

(i) The Head of Department should ensure that the supervisor(s) are conversant with the literature and methodologies of the research topic.

(ii) The Department (and Faculty) should have the resources available to support the project. Where the project is dependent on resources provided from sources beyond the Department's control (e.g. outside grants or arrangements between other departments) the candidate should be fully informed. A back-up should be created wherever possible and the candidate should be made aware of the nature of the back-up arrangements.

(iii) The Head of Department and supervisor(s) should be confident that given ability and hard work the candidate should be able to complete the project in the time available.

1.2 Enrolment

If further information or clarification of any matter is required before enrolment, it can be obtained from the Registrar's Office through the Scholarships Officer or the Assistant Registrar Graduate Studies.

Enrolment forms are available from the Student Records Office, and should be completed and returned either before or as soon as possible after the date on which work commences for the degree.

1.3 Re-enrolment

Candidates are required to re-enrol each year. Information concerning re-enrolment procedures can be obtained from Assistant Registrar Graduate Studies.

2. SUPERVISION AND THE RESEARCH PROCESS

Candidates are ultimately responsible for their work towards a higher degree. Supervisors are appointed to facilitate this work in both academic and practical respects by providing guidance in all matters relating to the candidature. The function of the supervisor is not to direct the work that the research student should do but rather to provide a trained mind upon which the candidates may test ideas and thus develop their own critical faculties.

Although styles of supervision vary widely, all supervisors have three basic responsibilities:

(i) First, supervisors should be concerned and available to stimulate the candidate's intellectual and research potential by the steady provision of relevant ideas and guidance. They should help candidates to determine appropriate and viable problems/areas for research; direct them to relevant literature; contribute to the critical appraisal of the project and offer advice on satisfactory ways of clearly and concisely conveying the results and implications of the research.

Candidates are expected to be able to comprehend and read and write conversational and non-technical English when they commence. Although it is the candidates' responsibility to ensure that such skills are adequate, supervisors are expected to assess proficiency in English expression within the first year of candidature and where appropriate to direct candidates to the course on English expression given by the Student Counselling Service.

(ii) As well as fulfilling their role in stimulating the research supervisors should provide guidance to ensure good progress. The aim is the successful completion of the higher degree within the period set down for candidature. The erection of appropriate milestones is a valuable exercise to perform at the outset and to review at various stages during the course of the work. Such plans should identify the sequence of predictable components of the task, provide ample allowance for unexpected delays and for review and reassessment. In cases where an ambitious or uncertain project is embarked upon it is advisable to give early consideration to a "fall-back" topic which can serve as an adequate alternative if the original project does not develop profitably. In such cases planning needs to include a date at which a decision between the alternatives can be taken and still allow the successful completion of a thesis within the period of candidature. Methods of achieving stimulation and appraisal of a candidate's work include participation in conferences and seminar presentations.

(iii) Supervisors also have "administrative" responsibilities in relation to their students. They may include supporting them in relations with outside organisations and funding agencies, ensuring appropriate access to Departmental facilities and reminding them of the necessity formally to advise the Registrar of any changes in their candidature (e.g. change of field study, change of supervisor, request for leave to study elsewhere, request for intermission).

Where problems are experienced which cannot be resolved between the candidate and the supervisor(s), alternative courses of action should be discussed with the postgraduate co-ordinator or, where no postgraduate co-ordinator has been appointed, the departmental chairman. The University requires each Department to review the postgraduate work being conducted in that Department. This review must occur at least once per year and involves the Head or postgraduate co-ordinator interviewing each postgraduate student in the Department and discussing progress and problems. These interviews therefore provide one context in which any problems can be resolved.

Where problems are not resolved within the Department to the satisfaction of the candidate, recourse is available through appeal to the Board of Graduate Studies, which is the committee charged with exercising an overview of postgraduate research work*. Advice on such appeals can be obtained from the Assistant Registrar Graduate Studies. It should be noted that if at any stage of the work the Head considers that a candidate's progress has

not been satisfactory, this will be reported to the Registrar for consideration by the Faculty which may recommend to the Council that the candidature should be terminated.

3. COMPLETION

3.1 Planning

Early in the final year of candidature, students in disciplines where writing is an integral part of the research should have completed the first draft of the thesis, while students in other disciplines should have completed their experimental work or basic theoretical study and have analysed data which have been collected.

The actual writing of the thesis is the candidate's responsibility, although the supervisor(s) can be expected to help formulate a plan for the thesis and to provide guidance as to the most satisfactory way of presenting the findings of research in a form which clearly and concisely conveys the results and implications of the research.

A list of useful guides and style manuals for theses may be obtained on request from the Information Services Librarian of the Barr Smith Library.

3.2 Intermissions

If a candidate's work is interrupted for a significant length of time, an application for an intermission of candidature should be made in writing to the Registrar. Such applications should be submitted as early as possible and should set out clearly the grounds for the application and the likely duration of the interruption. If an application is successful the date of expiry of the candidature will be adjusted by adding the period of the intermission.

3.3 Extensions

Sometimes a student may not be able to submit the thesis within the allotted time and in such circumstances it will then be necessary to apply for an extension of candidature.

Applications for extensions should be made in writing to the Registrar approximately three months before the candidature is due to expire, setting out the reasons for the request and the expected date of submission. In the case of the Ph.D., a single extension for a period of twelve months will normally be granted but after that time the candidature will be suspended (see 3.5).*

3.4 Permission to write-up outside the University

Although the normal expectation is that a candidate will complete the writing-up of the thesis within the University (except for those degrees where there is provision for external candidature), it will sometimes happen that a candidate who has completed the experimental work and data collection for the thesis will wish to complete the writing-up process outside the University. In the case of the Ph.D. permission to do this will normally be granted for a period of up to twelve months, after which time the candidature will be suspended (see 3.5).*

3.5 Suspension of candidature*

If a Ph.D. thesis has not been submitted by the prescribed date (i.e. either at the end of a twelve months extension or at the end of the period allowed for writing-up outside the University) the candidature will be suspended. However, there is provision for a thesis to be submitted after this date if a final draft which has not departed from the original field of study is approved by the Head of the relevant Department.

3.6 Notification of intention to submit and approval of examiners

It is important that a candidate notify the Registrar in writing of intention to submit a thesis approximately three months before the expected date of submission, and either include three copies of a summary of the thesis or forward them as soon as possible thereafter. This makes it possible for examiners to be appointed so that there is no delay in the examination process once the thesis has been submitted. Candidates shall have the right to submit objections to the appointment of potential examiners. Any such objections should be submitted to the Registrar at the same time as the notification of intention to submit. Candidates do not have access to the names of examiners who are finally selected.

Once this notification has been received by the Registrar, the Head of the Department concerned will be asked to nominate two examiners. It is expected that the Head will discuss the choice of examiners with both the supervisor and the candidate, but this must be done in such a manner as to ensure that the identity of the examiners who are ultimately chosen by the Head are not revealed to the candidate. In the event of a conflict between the recommendations of the Head and the candidate, the matter will be referred to the appropriate Faculty. If the Faculty endorses the Head's recommendation the Board of Research Studies* will be asked to make the decision.

For the Ph.D., the examiners chosen must be external* to the University and should be familiar with and normally active in the field of research covered by the thesis.

Candidates are expected (see Appendix) to include in the thesis a signed statement that they are willing to make the thesis available for photocopying and loan if it is accepted for the award of the degree. However, there is provision for a candidate to be exempted from this requirement, and requests for such exemption should be made in writing to the Registrar setting out clearly the reasons for the opposition, at the same time as notification is given of intention to submit.

3.7 Submission and examination of the thesis

Three bound copies of the thesis should be lodged with the appropriate Faculty Assistant Registrar. Two of these will be sent to the examiners with a request that they be returned after examination. The examiners are asked to submit a recommendation on whether the degree should be awarded, together with a general report on the thesis. These comments will be made available to the candidate on request, though the identity of the examiner will not be revealed unless the examiner consents.

This examination process usually is completed within three to four months, and if both examiners make favourable recommendations, the candidate is notified that he or she has qualified for the award of the degree within a few days of receipt of the second report. In other cases the process will inevitably take longer, although every effort is made to minimize delays.

If the thesis is accepted for the award of the degree, the Registrar will distribute two copies to the University Library and one to the appropriate University Department for its library. Often however, minor corrections are required to be made to the thesis before this is done, and it is the responsibility of the candidate and supervisor(s) to ensure that this is done promptly. In most cases the corrections are typographical and can be accomplished by pasting an errata sheet into the back of the thesis.

Once candidates have been advised that they have qualified for the award of the degree, they must apply to have it conferred (if they wish) and forms for this purpose are forwarded with the notification of the award.

*This applies to the Ph.D. It also applies to Masters degrees in most but not all faculties. Masters candidates are advised to consult the appropriate set of regulations and/or the Assistant Registrar of the relevant Faculty.

APPENDIX — SPECIFICATIONS FOR THESIS

A1. PREPARATION

The responsibility for the layout of the thesis and selection of the title rests with the candidate after discussion with the supervisor(s), and the completed thesis should be shown to the supervisor(s) before submission.

The thesis should incorporate in the following order:

(i) A title page giving the title of the thesis in full, the name of the candidate, the name of the Department(s) of the University associated with the work and the date (month and year) when submitted for the degree.

(ii) A table of contents.

(iii) An abstract of the thesis in not more than three hundred and fifty words (see 3.6).

(iv) A signed statement to the effect that, (a) the thesis contains no material which has been accepted for the award of any other degree or diploma in any University and that, to the best of the candidate's knowledge and belief, the thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis; and (b) the author consents to the thesis being made available for photocopying and loan if applicable if accepted for the award of the degree (see 3.6).

(v) An acknowledgement of any help given or work carried out by any other person or organisation.

(vi) The main text.

(vii) Appendices (if any).

(viii) Bibliography.

Additional pages or other material not suitable for binding should be placed last and treated as indicated in A4(d).

The thesis title should be limited to 160 characters or less.

A2. TYPING

(a) A thesis should normally be typed on size A4 paper on one side of the paper only with double spacing. Quotations and footnotes may be typed in single spacing. The top copy should always be prepared on bond paper, either from a typewriter, word processor or some other printing device which provides a relatively high quality type face. Work previously published, if submitted, may be in printed form. Other forms of presentation, such as computer output microform and dot matrix printing, may be acceptable if approved by the Librarian after discussion with the supervisor.

Copying of the top copy may be carried out by any copying method which provides a good quality copy. Copies other than those produced via carbon paper at the time of typing the copy should normally be on bond paper. Chemically coated paper will be acceptable for the reproduction of theses only if it is known to provide a high quality original and long-term chemical stability. If copies are produced from electrostatic masters or litho-offset plates, great care should be taken to ensure a clear black image with no smudging.

It is strongly recommended that theses be produced on acid-free paper in order to ensure their long term conservation.

(b) Margins should not be less than 35 mm on the left-hand side and 15 mm on the other three sides to allow for binding and trimming of an acceptable standard.

A3. DIAGRAMS AND FIGURES

The following are general suggestions for normal practice, but they may be varied in special cases with the approval of the Librarian:

(a) Diagrams and figures, etc., should be preferably drawn or photographed on size A4

paper and bound in the appropriate place in the text. If it is necessary to mount photographs the mounting should be on paper somewhat heavier than that of the other pages, and great care should be taken to avoid wrinkling the paper or distorting the shape of the volume.

(b) Figures may be inserted in the appropriate place in the text.

(c) Tables should be inserted in the appropriate place in the text, except that lengthy or bulky tables should appear as an appendix.

(d) Folded diagrams, maps, tables, etc., should read as right-hand pages when open. Supplementary material, such as folded maps and other large folded sheets and primary data on microfiche may be placed in a pocket inside the back cover of the bound thesis.

A4. BINDING

(a) The thesis must be sewn and bound with cloth on stiff covers. (A spring-type or screw-type binder is unacceptable. Stapling and plastic or "perfect" binding without sewing are also unacceptable.)

(b) During binding the edges should be trimmed.

(c) On the spine of the thesis should be given, in gold lettering of suitable size, normally reading from the top to the bottom, the title of the thesis, shortened if necessary, followed by the candidate's surname. Where the width of the spine allows, the lettering may be placed horizontally, with the title of the thesis near the top of the spine and candidate's surname near the middle.

(d) When published papers are submitted they should normally be bound near the back of the thesis as an appendix. In the case of published papers of unusual size it may be desirable to bind them in a separate volume. If they have been bound by the publisher it is desirable to keep them in a special case made and lettered to simulate a bound volume of a thesis.

Supplementary material such as folding maps and other large folded sheets and primary data on microfiche may be placed in a pocket inside the back cover of the bound thesis.

Supplementary material such as microfilm which cannot readily be kept in a pocket should be placed in a special case made and lettered to simulate a bound volume of the thesis.

In view of problems of long term storage stability, presentation of material in a form other than printed copy or microform should not be contemplated without prior consultation with the Librarian.

A supplementary case or additional volume of a thesis should be distinguished by a volume number but should otherwise be uniform with the first part of the thesis in respect to colour, lettering and, as far as possible, size.

SUBJECT INDEX

Titles of subjects:
(a) The Roman numeral normally indicates the level of the subject, e.g. Animal Behaviour III is a third-year subject.
(b) When there are multiple page numbers for a subject and one of those numbers is in **bold**, that page number refers to an entry containing full subject details.