# Faculty of The Sciences 

## Undergraduate Courses 2006

This guide has been designed to summarise the full range of Science courses offered by the Faculty of The Sciences, at UNE. If you are interested in any of these courses and would like further information, please contact the Student Centre. It is not a substitute for The University of New England Handbook. The UNE Handbook may be purchased from The United Campus Bookshops. Cost is approximately $\$ 12.00$ plus postage and handling fee.
The United Campus Bookshops can be contacted either by email armidale@ucb.net.au phone 67723468 or mail The Manager, United Campus Bookshops, The University of New England NSW 2351.

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The information contained in this Guide was correct at the time of printing. Details may be subject to change.

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## Introduction

## The University of New England

The University of New England (UNE) was first established in 1938 as part of The University of Sydney, becoming autonomous in 1954. Internationally recognised as one of the great teaching and research universities, UNE is characterised by a long tradition of academic excellence, a rich history and a setting of environmental beauty. The university city of Armidale is set in the magnificent high plateau country known as New England in northern New South Wales and is renowned as a centre for the arts and education.

With more than 75,000 graduates around the world, UNE is Australia's oldest regional university and most experienced distance education provider. Student to staff ratios at UNE are lower when compared to larger metropolitan universities and students benefit greatly from individual attention and smaller classes.
The University undertakes fundamental and applied research in many disciplines. Its scholars and scientists have established international reputations through their contributions in areas such as rural science, agricultural economics, geology, educational administration, linguistics and archaeology.
Collaborative research with other institutions, such as the CSIRO, has led to many important projects including participation in high profile Cooperative Research Centres. Through its research UNE is able to assist in the economic, social and cultural advancement of Australia and in the advanced training of undergraduate and postgraduate students.
UNE provides a superior study opportunity for students offering high teaching standards in a unique living and learning environment. A wide range of support services are available to students at UNE ensuring a fully-rounded educational and personal experience. Excellent academic support, careers and counselling support, extensive libraries, information technology support and facilities are all part of the educational benefits. The excellent sporting, recreational and oncampus university residential college facilities are among the finest in Australia.

## Faculty of The Sciences

The Faculty of The Sciences is organised into four schools which cover an extraordinarily diverse range of disciplines. The Schools and associated disciplines are listed below. The Faculty engages in some of Australia's leading research that includes involvement in a number of centres which are located at UNE.

The Faculty is also involved in cooperative research ventures with organisations such as CSIRO, NSW Department of Primary Industries, the Queensland Department of Primary Industry and various industry bodies. It operates the National Marine Science Centre (located adjacent to the Solitary Islands Marine Park in Coffs Harbour) in conjunction with Southern Cross University. The Faculty is a core partner in a number of Cooperative Research Centres-cattle and beef quality, poultry, viticulture, weeds management, sheep industry, and cotton.
In keeping with its traditional strengths in agriculturally-based courses, the University maintains four rural properties which provide opportunities for agricultural and environmental sciences teaching and research activities of the Faculty of The Sciences. The University is ideally situated for field work which forms an integral part of many courses, both undergraduate and postgraduate, offered by the Faculty. In addition to the local rural environment, the University is within a day's drive of a range of ages and types of geological formations and vegetation types, including rainforests, acid wetlands, coastal heath and a variety of other pastoral and agricultural systems.
The Faculty provides excellent facilities for teaching and research, with the staff involved in many initiatives. Students benefit from the world class facilities and staff brought together in the CRCs and other research centres listed below associated with the Faculty.

## Boards of Studies of the Faculty of The Sciences:

Computer Science: Computer Science; Mathematics; Statistics
Natural Resources and Environmental Sciences: Botany; Earth Sciences; Ecosystem Management; Environmental Engineering; Zoology
Rural Science and Agriculture: Agronomy and Soil Science; Animal Science
Science: Chemistry; Human Biology; Molecular and Cellular Biology; Physics and Electronics

## Research Centres associated or within the Faculty of The Sciences

Agricultural Business Institute (ABRI); Animal Genetics and Breeding Unit (AGBU); Australian Centre for Agriculture and Law; Cotton Catchment Communities Cooperative Research Centre; Australian Poultry CRC; Australian Sheep Industry CRC; Centre for Animal Health and Welfare; Centre for Behavioural and Physiological Ecology (BPERC); Centre for Bioactive Discovery in Health and Ageing; Centre for Ecological Economics \& Water Policy Research; Centre for Ecology, Evolution and Systematics; Centre for Environmental Dispute Resolution; Centre for Molecular Microbiology; Centre for Neuroscience and Animal Behaviour; Centre for North Coast Aquatic Linkages (NCAL); Centre for Sustainable Farming Systems; CRC for Australian Weeds Management; CRC for Beef Genetic Technologies; CRC for Viticulture; CSIRO Livestock Industries; International Livestock Resource and Information Centre (ILRIC); National Marine Science Centre; and NSW DPI (Armidale Beef Industry Centre).

## Summer Semester

A selected number of units from this Faculty are offered each year in the Summer Semester. The Summer Semester consists of a period of 11 weeks from late November until early February and is open to all students. All Summer Semester units are undertaken by off-campus (distance) study and units are fee-paying only. Students are restricted to a maximum of two units of study in each session. Availability of units is known in September/October each year. Contact Student Centre for Summer Semester Application Form.

## Admission and Enrolment

Applications for admission for the beginning of year intake must be received at the University by the due date as indicated on the Application for Admission form and 31 May, if there is a mid-year intake in 2006. An application kit is available on request from the Student Centre.

Students new to UNE who wish to enrol for on-campus study contact:
Universities Admission Centre (UAC)
UAC,Locked Bag 112
SILVERWATER NSW 2128
Website: www.uac.edu.au
or
Queensland Tertiary Admissions Centre (QTAC)
PO Box 1331
MILTON QLD 4064
Website: www.qtac.edu.au

New students and former UNE students who wish to enrol for off-campus study and Summer Semester units contact:
Student Centre
The University of New England NSW 2351
Website: www.une.edu.au/studentcentre
Email: studentcentre@une.edu.au
Phone: 0267734444
Fax: 0267734400

Students who wish to enrol in the Diploma of Agriculture, Advanced Diploma in Agriculture, Diploma in The
Sciences and the Advanced Diploma in The Sciences for either on-campus or off-campus study contact:
Student Centre
The University of New England NSW 2351
Website: www.une.edu.au/studentcentre
Email: studentcentre@une.edu.au
Phone: 0267734444
Fax: 0267734400

## Course Outlines

## Bachelor of Agriculture

This is an industry-orientated course and provides vocational training with an applied and hands-on education. From the outset students can immerse themselves in practical studies and see the relevance of the subjects they are undertaking. This course was specifically designed to produce agricultural managers with wide practical knowledge and experience but without the specialised research and extension skills provided in the fourth year of the BRurSc.
UNE has an internationally recognised reputation in teaching and research in agriculture. Students have ready access to University farms located close to campus and to a research station at Warialda.

## Entry Requirements

No compulsory prerequisite knowledge is required, but it is assumed that students will have completed Mathematics, Chemistry and preferably Biology to Year 12 level.
For students without the recommended background knowledge, the Faculty offers Foundation Units in Chemistry (CHEM 123 ) and Mathematics (MATH 123). Both are available by off-campus study only.

## Requirements for the Degree

To satisfy degree requirements candidates must complete units comprising at least 144 credit points ( $c \mathrm{c}$ ) in one of the course work programs listed below.

## Group 1 (First Year)

AGRO 100; BIOL 110, 120; CHEM 130; MATH 110; RSNR 110, 120; STAT 100

## Group 2 (Second Year)

AGRO 211, 223; ANSC 200, 300; ECON 223, 225; GENE 210, 251; MM 110, 200; PSIO 210; SOIL 220

## Group 3 (Third Year)

AGEX 310; AGRO 311, 321, 420, 422; ANPR 415, 417, 440; ANUT 300; COTT 300; ECON 326, 333; ENVE 352; HORT 420; MEAT418; PLTY 300, 301; SOIL 431; W00L 412

## Course Work Programs

## Animal Stream

Year One: All units from Group 1
Year Two: AGRO 211, 223; ANSC 200, 300; GENE 251 plus 18 cp from ECON 225, 233; GENE 210; MM 110, 200; PSIO 210

Year Three: AGEX 310; ANUT 300 plus 36 cp from ANPR 415, 417, 440; ECON 333; ENVE 352; GENE 422; MEAT 418; PLTY 300, 301; WOOL 412

## General Stream

Year One: All units from Group 1
Year Two: AGRO 211, 223; ANSC 200; GENE 251; SOIL 220 plus 18 cp from ANSC 300; ECON 223, 225; GENE 210; MM 110, 200

Year Three: AGEX 310; 12 cp from approved ANPR/MEAT/WOOL or AGRO/COTT/SOIL plus 30 cp of any approved units from Group 3

## Plant Stream

Year One: All units from Group 1
Year Two: AGRO 211, 223; ANSC 200; GENE 251; SOIL 220 plus 18 cp from ANSC 300; ECON 223, 225; GENE 210; MM 110, 200

Year Three: AGEX 310; AGRO 311, 321; SOIL 310 plus 24 cp from AGRO 420 or 422; COTT 300; ECON 326, 333; ENVE 352; HORT 420; SOIL 431

## Practical Experience Requirements

All candidates must complete 16 weeks of approved practical experience work.

## Period of Candidature

Full-time study: minimum of three years; maximum of five years
Part-time study: maximum of 10 years

## Bachelor of Computer Science

The BCompSc is designed to prepare students for tomorrow's computing needs. Underpinning the degree are academic and technical staff committed to teaching and research at the highest level in computing science. World class researchers in areas such as parallel processing, multimedia and fractal image compression, knowledge engineering and expert systems ensure that students are prepared today for the developments of the future.
Beginning with foundation subjects such as data structures, object-oriented programming and software engineering, the degree leads on to courses introducing topics of active research, such as networks, parallel processors, and expert systems. Students follow one of a set of course programs. Each program includes a major sequence of study in Computer Science together with specialisation in another subject. Current areas of specialisation offered within this degree are Accountancy, Information Technology, Mathematics and Statistics. Students are able to design programs in other areas such as psychology, financial management, genetics, economics, electronics, etc.

## Entry Requirements

No previous knowledge of computing is required. However, a background in Mathematics at NSW HSC level, or equivalent, is assumed knowledge.
The Faculty does offer a Foundation Unit in Mathematics for students lacking such a background. This unit, MATH 123 is available by off-campus study only.

## Requirements for the Degree

To satisfy degree requirements, candidates must complete one of the course work programs specified below. The program shall comprise units with a total value of at least 144 cp in one of the course work programs below:

## Group 1

AMTH 140; COMP 131, 132, 170

## Group 2

COMP 280, 282, 283, 284, 285, 286, 287, 290, 292

## Group 3

COMP 309, 315, 318, 319, 320, 389, 391, 393, 394, 395

## Group 4

AFM 101, 102, 212, 272, 324, 372; AMTH 142; COMP 100, 160; MATH 101, 102, 110, 170; PMTH 212, 213, 336, 338, 339; STAT 100, 260, 261, 354, 356
Each course work program shall comprise units with a total value of at least 144 cp and shall include:
(i) all units from Group 1; and
(ii) at least 30 cp from Group 2; and
(iii) at least 30 cp from Group 3;
(iv) not more than 54 cps for units from Group 4.

In special circumstances and with the approval of the Course Coordinator of Computer Science, other units available from subjects offered within the University may be substituted for one or more of the prescribed units listed above.

## Course Work Programs

## Accounting

AFM 101, 102; AMTH 140; COMP 100, 131, 132, 170; MATH 170
AFM 212, 272; 36 cp from Group 2
AFM 324, 372; 36 cp from Group 3

## Information Technology

AMTH 140; COMP 100, 131, 132, 160, 170; MATH 110; STAT 100
48 cp from Group 2
48 cp from Group 3

## Mathematics

AMTH 140, 142; COMP 131, 132, 170; MATH 101, 102; STAT 100
PMTH 212, 213, 36 cp from Group 2
12 cp from PMTH 336, 338, 339; 36 cp from Group 3

## Statistics

AMTH 140, 142; COMP 131, 132, 170; MATH 101, 102; STAT 100
PMTH 212; STAT 260, 261; 30 cp from Group 2
STAT 354, 356; 36 cp from Group 3

## Practical Experience Requirements

None prescribed.

## Period of Candidature

Full-time study: minimum of three years; maximum of five years
Part-time study: maximum of 10 years

## Bachelor of Computer Science with Honours (BCompSc(Hons))

Students who achieve a high standard in the BCompSc may proceed to an Honours year. The course requirements differ depending on the area studied, but usually include a research project with thesis, reading assignments and essays. The BCompSc(Hons) degree can lead to further postgraduate study.

## Entry Requirements

Applicants must have completed requirements for award of the BCompSc to be eligible to enrol for Honours. Applicants with appropriate qualifications from other institutions will also be considered.

## Requirements for the Degree

Candidates complete the unit COMP 400. Topics included within this unit are determined following discussions with appropriate academic staff.

## Award of the Degree

The degree will be awarded at one of three levels of Honours: Class I, Class II and Class III. Class II has two divisions: Division 1 and Division 2.
Those candidates awarded the degree at the level of Honours Class I may, if of sufficient distinction, be awarded a University Medal.

## Period of Candidature

Full-time study: maximum of 2 consecutive semesters
Part-time study: maximum of 2 years

## Bachelor of Engineering Technology

Business and industry are becoming increasingly dependent on computers, microelectronics, optical fibre communications and information technology. The development and application of these fields relies heavily on the skills of professional engineering technologists.
The Faculty of The Sciences, in cooperation with NSW TAFE and the JMC Academy, has developed a number of innovative programs which provide alternative pathways to obtaining a University degree. These programs ensure the blend of theoretical knowledge and practical skills required for expertise in many areas of modern technology.
The BEngTech comprises two course work programs: Electronic Engineering Technology offered in association with the NSW TAFE, and Audio Engineering Technology offered in association with the JMC Academy in Sydney.

## Entry Requirements

There are no compulsory prerequisites but a knowledge of Physics and Mathematics to Year 12 level is assumed.

## Requirements for the Degree

To satisfy degree requirements, candidates must complete one of the course work programs specified below. The program shall comprise units with a total value of at least 144 cp .

## Electronics Engineering Technology

Candidates must complete the NSW TAFE Advanced Diploma in Telecommunications Engineering or equivalent plus units to the value of 72 cp as listed below:
COMP 283, 389; ENVE 361; MATH 101, 102; PHYS 121, 122, 211, 212, 311 and 12 cp from AFM 217, 218, 324.

## Audio Engineering Technology

Candidates must have completed the JMC Academy Diploma in Audio Engineering plus units to the value of 48 cp as listed below:

AMTH 140 or MATH 101 or 110; COMP 100 or 131, 132 or 160, 389; ENVE 361; PHYS 121, 211, 311.

## Practical Experience Requirements

None prescribed.

## Period of Candidature

Full-time study: maximum of five years
Part-time study: maximum of 10 years

## Bachelor of Environmental Science

This program is an integral part of regional, rural and national sustainability. It provides an environmental training within a mainstream sciences major. The BEnvSc will produce graduates of high quality, who will be valued for their expertise in basic scientific disciplines and for their ability to apply their knowledge to cross-disciplinary areas, especially those relating to environmental issues. They will have direct application and specialisation in areas such as scientific understanding of the physical and biological processes operating in the environment, the impact of human activities on the physical and biological environment, pollution of the environment and its impact on human and other organisms and remediation strategies for a polluted environment.

## Entry Requirements

No compulsory prerequisite knowledge is required, but it is assumed that students will have completed Mathematics, Chemistry and preferably Physics or Biology at Year 12 level, or equivalent. For students without the recommended background knowledge, the Faculty offers Foundation Units in Mathematics (MATH 123), Chemistry (CHEM 123) and Physics (PHYS 123) by off-campus study only.

## Requirements for the Degree

To qualify for the degree a candidate shall:
(a) complete units with a total value of at least 144 cp as approved by the Course Coordinator and comprising all units from Groups 1, 2 and 3; plus 72 cp from Group 4 of which at least 24 cp must be at 300 or 400 level; or
(b) complete one of the course work programs listed below.

## Group 1

BIOL 110, 120; BIOP 112; CHEM 110 or 130; MATH 110 and STAT 100 or MATH 101 and 102

## Group 2

BOTY 211; ECOL 210; EM 234; EM 251 or ZOOL 230

## Group 3

EM 312, 331

## Group 4

ABAR 303, 243, 258/358, 283/383; AGEX 310; AGRO 321; ANPR 211 or ANSC 200; BCHM 210, 330; BOTY 241/341, 355, 260/360, 270/370; CHEM 120; COMP 100, 160; ECON 329; ECOL 202, 220, 302, 307; EM 311, 351, 422, 423, 433, 425, 453, 454, 455; EM 421 or RSNR 421; ENVE 352, 361, 421, 423, 433, 434, 436; EVOL 211/ 311; GEAR 310; GENE 210, 322; GEOL 110, 120, 205, 207, 303; GEPL 211, 341; MSM 301, 302, 304, 305, 306, 307, 308; NR 331, 411; PDAB 100, 101, 201, 202; RSNR 110, 120; SCI 395 or NR 481; SOIL 220, 310; STAT 200; BIOL 301, 302; WORK 300; Z00L 210, 220, 326, 327, 328

## Course Work Programs

## Biodiversity Conservation

(a) all units from Groups 1, 2 and 3; and
(b) GENE 210, ECOL 202 or 220; EVOL 211/311; EM 453 or 423 plus 48 cp from Group 4 of which at least 24 cp must be at 300 or 400 level.

## Environmental Rehabilitation

(a) all units from Groups 1, 2 and 3; and
(b) ECOL 202 or 220; EM 351; GEOL 110; NR 411; SOIL 220 plus 42 cp from Group 4 of which at least 24 cp must be at 300 or 400 level.

## Geographic Information Science

(a) all units from Groups 1, 2 and 3; and
(b) EM 432, 433; NR 331, 481 plus 48 cp from Group 4 of which at least 24 cp must be at 300 or 400 level or SCI 395.

## Indigenous Land Management

(a) all units from Groups 1, 2 and 3; and
(b) ABAR 303; PDAB 100, 101, 200, 201, 202 plus 36 cp from Group 4 of which at least 24 cp must be at 300 or 400 level.

## Sustainable Ecosystems - Aquatic

(a) all units from Groups 1, 2 and 3; and
(b) GEOL 110; ECOL 202; ENVE 352, 421; ZOOL 210 plus 42 cp from Group 4 of which at least 12 cp must be at 300 or 400 level.

## Sustainable Ecosystems - Marine

(a) all units from Groups 1, 2 and 3; and
(b) ECOL 202; MSM 301, 304, 306, 308; Z00L 210 plus 36 cp from Group 4
(c) with the approval of the Course Coordinator, MSM 302 may be completed in lieu of EM 331 from Group 3.

## Sustainable Ecosystems - Terrestrial

(a) all units from Groups 1, 2 and 3; and
(b) ECOL 202 or 220; EM 311, 422 or 425; EM 421 or RSNR 421; NR 411; SOIL 220 plus 36 cp from Group 4.

## Practical Experience Requirements

None prescribed.

## Period of Candidature

Full-time study: minimum of three years; maximum of five years
Part-time study: maximum of 10 years

## Bachelor of Environmental Science with Honours (BEnvSc(Hons))

A BEnvSc(Hons) degree is available to students who perform well in the BEnvSc. Requirements for the Honours program differ depending on the specialisation but usually includes a thesis, reading assignments and essays. The BEnvSc(Hons) degree can lead to further postgraduate study.

## Entry Requirements

Applicants must have completed requirements for award of the BEnvSc to be eligible to enrol for Honours. Applicants with appropriate qualifications from other institutions will also be considered.

## Requirements for the Degree

Candidates complete a unit ECOL 400. Topics included within this unit are determined following discussions with appropriate academic staff.

## Award of the Degree

The degree will be awarded at one of three levels of Honours: Class I, Class II and Class III. Class II has two divisions: Division 1 and Division 2.
Those candidates awarded the degree at the level of Honours Class I may, if of sufficient distinction, be awarded a University Medal.

## Period of Candidature

Full-time study: maximum of 2 consecutive semesters
Part-time study: maximum of 2 years

## Bachelor of Livestock Science

The new Bachelor of Livestock Science is a four year degree which provides scientific training for a wide range of careers associated with the livestock industries. Essentially agricultural in nature it differs from other degrees in its primary orientation towards Australia's grazing livestock industries. Consequently it places emphasis on the scientific studies of pastures, animal breeding and production and sheep meat and wool, and the practical application of science in the grazing industries.
The course has three specialist streams: Animal breeding and genetics with subject options in quantitative genetics; molecular genetics and/or bioinformatics; Animal health and nutrition, with options in sheep, cattle, dairy.

## Entry Requirements

No compulsory prerequisite knowledge is required, but it is assumed that students will have completed Mathematics, Chemistry and preferably Physics or Biology at Year 12 level, or equivalent. For students without the recommended background knowledge, the Faculty offers Foundation Units in Mathematics (MATH 123), Chemistry (CHEM 123) and Physics (PHYS 123) by off-campus study only.

## Requirements for the Degree

To satisfy requirements all candidates must complete one of the course work programs listed below comprising units with a total value of at least 192 cp .

## Group 1

BIOL 110, 120; CHEM 110, 120, 130; COMP 131, 132; MATH 101, 102, 110; RSNR 110, 120; STAT 100

## Group 2

AGRO 211, 223; ANPR 211; ANUT 221; BIOP 112; BCHM 210, 240; COMP 280, 282, 284, 285; ECON 223, 225; ENVE 352, GENE 210, 351; MM 110, 200; PSIO 210; SOIL 220; STAT 200, 260, 261

## Group 3

AGEX 310; AGRO 311, 321; ANPR 321; AQUA 300; BCHM 310, 320, 330; BINF 350; BOTY 370; COMP 309, 320, 389; ECON 326; EM 311; ENVE 335, 361; GENE 322, 335, 340, 422; MICR 350, 360; PSIO 321, 322, 323, 324, 325; SOIL 310; STAT 300, 354, 356

## Group 4

RSNR 421; AGRO 420, 422, 423; ANPR 415, 417, 420, 440; EM 425, 432, 452, 454, 455; ENVE 434; GENE 500, HORT 420; MEAT 418; NR 411; PLTY 300, 301; PSIO 410; RUSC 490; SOIL 411, 431; WOOL 412, 422, 432, 442, 452, 462. EM 421 or RSNR 421

## Course Work Programs

## Animal Genetics

BIOL 110, 120; CHEM 130; COMP 131, 132; MATH 101, 102; RSNR 120
AGRO 211; BCHM 210; GENE 210, 351 plus 24 cp from Group 2
ANPR 321, 415; BCHM 330; GENE 422 plus 24 cp from Group 3
RUSC 490; GENE 500; RSNR 400 plus 24 cp from Group 4

## Animal Health and Nutrition

BIOL 110, 120; CHEM 110, 120; COMP 131 and 132 or RSNR 110, 120; MATH 110; STAT 100
ANPR 211; ANUT 221; BCHM 210; GENE 210; SOIL 220; STAT 200 plus 12 cp from Group 2
AGRO 321; ANPR 321, 415; PSIO 323, 324 plus 18 cp from Group 3
RSNR 421; RUSC 490; 12 cp from ANPR 415, 417; PLTY 300, 301 plus 24 cp from Group 4

## Sheep and Wool

BIOL 110, 120; CHEM 110, 120; COMP 131 and COMP 132 or RSNR 110, 120; MATH 110; STAT 100, ANPR 211; ANUT 221; BCHM 210; GENE 210; SOIL 220; STAT 200 plus 12 cp from units listed in Group 2.

## Group 2

ANPR 321, 415; W0OL 432, 442 plus 24 cp from Group 3
RSNR 421; 18 cp from; WOOL 412, 422, 432, 442, 452, 462; MEAT 418 plus 12 cp from Group 4

## Practical Experience Requirement

Candidate must complete 24 weeks of approved practical experience work.

## Period of Candidature

Full-time study: minimum of four years; maximum of six years
Part-time study: maximum of 12 years

## Bachelor of Natural Resources

The BNatRes at UNE is by far the oldest of its type in Australia with more than 25 years experience of providing professional training in environmental protection and natural resources management. It has an enviable record of supplying well qualified graduates who readily find employment in both the public and private sectors.
The BNatRes is a program in management which is built on a firm knowledge of the basic and applied sciences. Because of this, graduates are in a position to make truly informed decisions and recommendations on matters of policy affecting the protection, conservation, rehabilitation and management of the nation's environment and its resources.

## Entry Requirements

No compulsory prerequisite knowledge is required, but it is assumed that students will have completed Mathematics, Chemistry and preferably Physics or Biology at Year 12 level, or equivalent. For students without the recommended background knowledge, the Faculty offers Foundation Units in Mathematics (MATH 123), Chemistry (CHEM 123) and Physics (PHYS 123) by off-campus study only.

## Requirements for the Degree

To satisfy requirements for the degree all candidates must complete units to the value of at least 192 cp .

## Group 1 (First Year*-complete 48 cp including RSNR 110 and 120)

BIOL 110 and 120; BIOP 111 or PHYS 121 and 122 or BIOP 111 and 112; CHEM 110 or 130 or 110 and 120; MATH 110 and STAT 100 or MATH 101, 102; RSNR 110, 120

## *Standard First Year Enrolment

BIOL 110 and 120; BIOP 112; CHEM 110 or 130; MATH 110; RSNR 110 and 120; STAT 100

## Group 2 (Second Year-complete ALL units)

BOTY 211; ECOL 210, 220; EM 234, 251; GEOL 110; SOIL 220; STAT 200
Group 3a (Third Year-complete ALL units)
ECON 329; EM 311, 312; ENVE 352, 361; NR 331

## Group 4a (Fourth Year-complete ALL units)

EM 421 or RSNR 421; ENVE 421; NR 411, NR 490 or 491 or two elective units from Groups 3b, 4b

## Groups 3b and 4b (Third and Fourth Years-complete 30 cp)

ABAR 303; AGEX 310; AGRO 223, 311, 321, 422; ARPA 356; BCHM 210, 330; BOTY 360; CHEM 203; ECOL 202, 302, 307;
ECON 326; EM 234, 331, 351, 422, 423, 425, 432, 433, 452, 453, 454, 455; ENVE 432, 433, 434, 436, 481; EVOL 211;
GENE 210, 322; GEOL 205; GEPL 234, 343, 352; HORT 420; MICR 220; NR 481; PHPO 365; PUBP 311, 409; SOIL 310, 411, 431; Z00L 321, 326, 327, 328; or any other unit approved by the Course Coordinator of Natural Resources and Environmental Sciences on the recommendation of the head of the school responsible for the course work program concerned.

## Practical Experience Requirements

Candidates must complete 12 weeks of approved practical experience work.

## Period of Candidature

Full-time study: minimum of four years; maximum of six years
Part-time study: maximum of 12 years

## Bachelor of Natural Resources (University of New England)/Bachelor of Engineering (University of Newcastle)

This double degree program combines The University of New England's Bachelor of Natural Resources with the University of Newcastle's Bachelor of Engineering in Civil or Environmental Engineering courses. Graduates of this unique program will be fully qualified civil or environmental engineers with an excellent background in all aspects of natural resources management.

Under a cooperative arrangement between The University of New England and The University of Newcastle, a program leading to the degrees of BNatRes (UNE) and BE (Civil) or BE (Environmental) (Newcastle) is offered. Candidates take the first two years at The University of New England and must complete specified units from the BNatRes program. Candidates then transfer to the University of Newcastle for a further three years the (for Environmental) or three years at the University of Newcastle and a final semester at UNE (for Civil). Depending on the candidate's academic record, either or both of the degrees may be awarded with Honours.

For all units offered at The University of New England, candidates are bound by the Rules governing the degree of BNatRes while for all units offered at the University of Newcastle, the Rules for the degree of BE (Civil) or BE (Environmental) shall apply.

## Entry Requirements

Entry into this course requires Mathematics Extension 1, Physics and Chemistry at NSW HSC level, or equivalent. The Faculty offers Foundation Units in Chemistry, Mathematics and Physics for students who do not have the recommended background knowledge.

## Requirements for the Double Degree Program

To satisfy requirements of the double degree program candidates must complete units with a total value of at least 138 cp from UNE and all units prescribed by the University of Newcastle in one of the course work programs specified below.

Each program shall include the following units:

## Year One-at UNE

BIOL 110, 120; BIOP 112; CHEM 110; MATH 101, 102; RSNR 110, 120
plus the following:

## Engineering (Environmental)

Year Two-at UNE
AMTH 247; BOTY 211; ECOL 210, 220; EM 251, 311; ENVE 352; SOIL 220

## Year Three—(at Newcastle)

Units prescribed by Newcastle plus ENVE 421 and GEOL 110 off-campus from UNE

## Year Four-(at Newcastle)

Units prescribed by Newcastle plus EM 312 and NR 411 off-campus from UNE

## Year Five-(at Newcastle)

Units prescribed by Newcastle plus EM 421 or RSNR 421 and NRE 405 off-campus from UNE plus one elective unit from either Newcastle or one elective unit off-campus from UNE chosen from Groups 3b and 4b (page 23)

## Engineering (Civil)

Year Two-(at UNE)
AMTH 247; BOTY 211; ECOL 210, 220; EM 311; ENVE 352, 481; SOIL 220;

## Year Three—(at Newcastle)

Units prescribed by Newcastle

## Year Four-(at Newcastle)

Units prescribed by Newcastle plus one elective unit off-campus from UNE chosen from Group 3b and 4b

## Year Five-(at Newcastle)

Units prescribed by Newcastle plus EM 312; ENVE 421 and NRE 405 off-campus from UNE

## Year Six-(one semester at UNE)

NR 411; EM 421 or RSNR 421 plus ENVE 361 or one elective unit from Groups 3b and 4b

## Practical Experience Requirements

Candidates must complete 12 weeks of approved practical experience work.

## Bachelor of Natural Resources/Bachelor of Urban and Regional Planning

This is a new double degree program and graduates will be qualified to practice as planners and natural resources managers. In addition to the natural resources component of the program, students will receive professional training in town planning, urban and environmental design, the human environment and the legal framework for planning and heritage conservation.
Graduates of this double degree program will be awarded the degrees of Bachelor of Natural Resources (or Bachelor of Natural Resources with Honours) and Bachelor of Urban and Regional Planning (or Bachelor of Urban and Regional Planning with Honours).

## Entry Requirements

Entry into this course requires Geography, Economics, Mathematics and either Chemistry or Science at NSW HSC level, or equivalent. Knowledge of Physics and/or Biology would be an advantage. The Faculty offers Foundation Studies in Chemistry, Mathematics and Physics for students who do not have the recommended background knowledge.

## Requirements for the Double Degree Program

Candidates must complete units with a total value of at least 240 cp .

## Group 1 (First Year-complete 48 cp)

BIOL 110 and 120; BIOP 112; CHEM 110 or 130; MATH 110; STAT 100; GEPL 111 and 112 or RSNR 110 and 120
Group 2 (Second Year-complete ALL units)
BOTY 211; ECOL 210, 220; GEOL 110; GEPL 121, 122; SOIL 220; STAT 200

## Group 3 (Third Year-complete ALL units)

EM 234, 251, 312; ENVE 237, 352, 361; GEPL 316; NR 331

## Group 4 (Fourth Year-complete 48 cp)

NR 411; GEPL 320; 18 cp from ECON 329; EM 311, 432; EM 421 or RSNR 421; ENVE 421 or an elective from approved units from the Bachelor of Natural Resources, 18 cp from GEPL 222, 324, 350, 359, 370; GEAR 330

## Group 5 (Final Year-complete ALL units)

ABAR 355; GEPL 301, 302, 307, 345; LS 325; NRPL 405

## Practical Experience Requirements

Candidates must complete 12 weeks of approved practical experience work.

## Period of Candidature

Full-time study: minimum of five years; maximum of eight years
Part-time study: maximum of 12 years

## Bachelor of Rural Science

UNE has established a long tradition of producing high calibre BRurSc graduates. The course provides graduates with a sound knowledge and understanding of the sciences basic to agricultural production leading to an integrated study of soils, crop and pasture production, animal production, agricultural economics and management.
Staff of the Board of Studies of Rural Science are actively involved in many agricultural initiatives and leading-edge research programs. In addition, students benefit from the world class facilities and staff brought together in the various Cooperative Research Centres in which UNE is a major participant.

## Entry Requirements

No compulsory prerequisite knowledge is required, but it is assumed that students will have completed Mathematics, Chemistry and preferably Physics or Biology at Year 12 level, or equivalent. For students without the recommended background knowledge, the Faculty offers Foundation Units in Mathematics (MATH 123), Chemistry (CHEM 123) and Physics (PHYS 123) by off-campus study only.

## Requirements for the Degree

To satisfy requirements all candidates must complete units with a total value of at least 192 cp .
Group 1 (First Year - complete all units)
BIOL 110, 120; CHEM 110, 120; MATH 110; RSNR 110, 120; STAT 100
Group 2 (Second Year - complete all units)

AGRO 211, 223; ANPR 211; BCHM 210, 240; BIOP 112; GENE 210; SOIL 220
Group 3 (Third Year - complete all units)
AGRO 311 or SOIL 310; AGRO 321; ANPR 321; ANUT 221 or AGEX 310; ECON 223; GENE 351; PSIO 210; STAT 200

## Group 4a (Fourth Year - complete all units)

AGRO 311 or SOIL 310; AGSY 410; ANUT 221 or AGEX 310; ENVE 335; RUSC 490 or 12 cp from 4b and 4c

## Group 4b (Fourth Year Elective Units)

AGRO 420 or 422, 423; ANPR 415, 417, 440; COTT 300; ECON 325, 326; GENE 422; HORT 420; MEAT 418; PLTY 300, 301; PSIO 324, 325; 410; SOIL 411, 431; STAT 300; W00L 412, 422

## Group 4c

BCHM 310, 320, 330; BOTY 370; EM 311, 452, 455; ENVE 434; GENE 322, 335; MICR 350, 360; PSIO 321, 322, 323; or any other six credit point unit approved by the Course Coordinator of Rural Science and Agriculture

## Practical Experience Requirements

All candidates must complete 24 weeks of approved practical experience work.

## Period of Candidature

Full-time study: minimum of four years; maximum of six years
Part-time study: maximum of 12 years

## Bachelor of Science

Science aims to understand the world around us and to use that knowledge to improve our quality of life. It is the basis of all technology and provides the information and techniques which we can use to solve problems associated with pollution, health and the environment. It is not necessary on entering university to have firm ideas about an area of specialisation since this will become clear during the course of study. Students who study science at UNE can take advantage of excellent facilities and opportunities for field work.

## Entry Requirements

No compulsory prerequisite knowledge is required, but it is assumed that students will have completed Mathematics, Chemistry and preferably Physics or Biology at Year 12 level, or equivalent. For students without the recommended background knowledge, the Faculty offers Foundation Units in Mathematics (MATH 123), Chemistry (CHEM 123) and Physics (PHYS 123) by off-campus study only.

## Requirements for the Degree

To satisfy degree requirements candidates must complete units with a value of at least 144 cp . Candidates also have the opportunity to complete one of the following prescribed course work programs: Biomedical Science, Biosystematics, Ecology, Horticultural Science, Marine Science and Management or Molecular Biotechnology. Requirements for these programs are set out following the list of units. Alternatively, a candidate who completes at least 24 cp of 300 -level units in a subject can have up to two majors recorded on their transcript of academic record.

## Group 1 (complete at least 36 cp and not more than 60 cp from Group 1-with at least six cp from MATH 101, 102, 110; STAT 100) <br> Group 1a (complete at least 24 cp )

BIOL 110 and 120; BIOP 111, 112; CHEM 110 or 110A, 120 or 120A; GEOL 110, 120; MATH 101 or 101A, 102 or 102A, 110; PHYS 121 or 121A, 122 or 122A; STAT 100

## Group 1b

ABAR 103; AMTH 140, 142; ARPA 102; COMP 131 or 131A, 132 or 132A; GEOL 102; GEPL 111, 112; PSYC 101, 102
Group 1c (complete not more than 12 cp )
CHEM 123; MATH 123; PHIL 101, 102; PHYS 123; RSNR 110, 120; SOCY 321

## Group 2 (complete not more than 24 cp in one subject)

## Group 2a (complete at least 12 cp )

AGRO 211; AMTH 246, 247; ANUT 221; AQUA 200; ASTY 221; BCHM 210 or 210A, 220 or 220A; BOTY 211 or 211A, 241, 260, 270; CHEM 201 or 201A, 202 or 202A, 203, 204 or 204A; COMP 280, 282, 283, 284 or 284A, 285, 286, 287; ECOL 202, 210, 220; EM 234; EVOL 211; GENE 210 or 210A; GEOL 201, 202, 205, 206, 207; MICR 220 or 220A; PHAR 222; PHYS 202, 204 or 204A, 211, 212; PMTH 212 or 212A, 213 or 213A; PSIO 210 or 210A, 220 or 220A; SOIL 220; STAT

200, 260, 261; ZOOL 210, 220, 230

## Group 2b

ABAR 243; ARPA 226, 261, 282; GEAR 200; GEPL 211, 214, 222; PESS 202; PHIL 330; PSYC 200, 201, 204, 206

## Group 3

## Group 3a (complete at least 36 cp )

ABAR 383; AGRO 311, 321, 422; AMTH 346, 348; AQUA 300; ARPA 336, 356, 359, 391; BCHM 310 or 310A, 320, 330 or 330A; BIOL 301 or 301A, 302 or 302A; BIOP 320; BOTY 341, 346, 355 or 355A, 360, 370; CHEM 302 or 302A, 303 or 303A, 305 or 305A, 306, 307 or 307A; COMP 309, 311, 318, 319, 320, 389 or 389A, 394, 395; ECOL 302, 307; EM 331, 351, 423, 432, 433, 452, 453, 454, 455; ENVE 352, 361; EVOL 311; GENE 322, 335, 340 or 340A, 351; GEOL 303, 304, 305, 306, 307, 308; GEPL 316, 324, 330, 341; HORT 420; HUMN 340; MICR 350, 360 or 360A, MSM 301, 302, 303, 304, 305, 306, 307, 308; PHYS 301 or 301A, 302, 304 or 304A, 305, 311 or 311A; PMTH 332 or 332A, 333 or 333A, 335 or 335A, 336, 338, 339; PSIO 321 or 321A, 322, 323 or 323A, 324 or 324A, 325; PSYC 302, 304, 313, 314, 316, 321, 363, 364, 366; SCI 395; SOIL 310; STAT 300, 354, 356, 357; ZOOL 321, 323, 326, 327, 328.

## Group 3b

WORK 300
Students may include up to 54 cp of 100- and 200-level units offered in the University and not listed above with the approval of the Course Coordinator and subject to the student submitting a proposed enrolment program. Once the enrolment program has been approved, it may not be altered without the Course Coordinator's approval.

## Streams and Majors

Course work programs: There are six approved course work programs in the Bachelor of Science which are listed below. Candidates who complete one of these course work programs will have the name of the program entered on their transcript of academic record and testamur, for example Bachelor of Science (Biomedical Science).

Majors: Students are able to choose to complete a major in the Bachelor of Science as an alternative to completing a course work program. In order to complete a major, students must complete at least 24 cp at 300 -level in a subject, for example, GEOL or CHEM or BOTY or ZOOL, etc. The name of the major completed will be recorded on the students transcript of academic record. Students may have up to two majors recorded on their transcript. Students cannot complete an approved course work program and have a major recorded.

## Course Work Programs

## Archaeological Sciences

Year One: ABAR 103; ARPA 102; GEOL 110; CHEM 110, 120; BIOL 110 and 120; STAT 100
Year Two: ABAR 283; ECOL 210; ARPA 226; GEOL 202; EM 234; EVOL 211 plus two units from CHEM 203, 204, BCHM 210; GENE 210; SOIL 220; GEOL 206 or other relevant units approved by the Course Coordinator
Year Three: ARPA 336, 356, 359; EM 433 plus four units from BCHM 330; GEPL 341; GENE 322; SCI 395; WORK 300; ARPA 391; CHEM 302, 303 or other relevant units approved by the Course Coordinator

## Biomedical Science

Year One: BIOL 110, 120; CHEM 110, 120; PSYC 101 and 102 or BIOP 111 and 112; MATH 110 or STAT 100; PHIL 101 or STAT 100

Year Two: BCHM 210, 220; PSIO 210, 220; MICR 220 plus three units to be chosen from those listed under Electives Year Three: BCHM 320; HUMN 340; MICR 350 plus one unit from PSIO 321, 322, 323, 324, 325 and four units to be chosen from those listed under Electives

Electives: Seven units to be completed of which at least two must be at 300-level: BCHM 310, 330; BIOP 111, 112, 320; CHEM 204, 303; GENE 210, 340; MATH 110; MICR 360; PHAR 222; PHIL 101; PSIO 321, 322, 323, 324, 325; PSYC 101, 102, 200, 201, 204, 206, 302, 304, 313, 314, 316, 321, 363, 366; SCI 395; SOCY 321; STAT 100, 200; WORK 300

## Biosystematics

Year One: BIOL 110 and 120; CHEM 110 and 120; GEOL 102; MATH 101 and 102 or MATH 110 and STAT 100; and one unit from PHIL 102, BIOP 111, GEOL 110
Year Two: BCHM 210; BOTY 211; EVOL 211*; ECOL 210; GENE 210; one unit from ZOOL 210, 220, 230 and two units from BOTY 241; ZOOL 210, 220, 230
Year Three: BCHM 330; EVOL 311*; GENE 322; SCI 395; BIOL 301, 302; and two units from BOTY; ECOL; ZOOL; SCI 395; WORK 300 approved by the Course Coordinator

* EVOL 211/311 may be taken in either second or third year


## Ecology

Year One: BIOL 110 and 120; CHEM 110 and 120; MATH 101 and 102 or MATH 110 and STAT 100; BIOP 111, 112 or GEOL 110, 120
Year Two: BOTY 211; ECOL 202, 210, 220; STAT 200; ZOOL 210 or 220 or 230; and two units from BCHM 210; BOTY 241; CHEM 203; EVOL 211; GENE 210; SOIL 220; ZOOL 210, 220, 230
Year Three: ECOL 302 or 307; and six units from ECOL 302 or 307; EM 331, 423, 452, 453, 454; MSM 306;SCI 395; WORK 300; Z00L 327

## Horticultural Science

Year One: BIOL 110 and 120; CHEM 110 and 120; MATH 110 and STAT 100; and two units from BIOP 111, 112; RSNR 110, 120
Year Two: BCHM 210; BOTY 211; GENE 210; SOIL 220; ZOOL 220; and three units from AGRO 211; BCHM 220; BOTY 241; ECOL 210, 220; MICR 220; STAT 200
Year Three: AGRO 311; BOTY 370; HORT 420; and five units from AGRO 321, BCHM 330; ECOL 302 or 307; EM 452 or 455; SOIL 310; SCI 395; WORK 300

## Marine Science and Management

Year One: BIOL 110, 120; CHEM 110, 120; MATH 110 and STAT 100 or MATH 101 and 102; and 12 cp from GEOL 110, 102 or GEPL 111, 112, or any 12 cp from Group 1
Year Two: ZOOL 210, 230; ECOL 210, 202; AQUA 200*; and 18 cp from BCHM 210; CHEM 203; EM 332; EVOL 211; GENE 210; GEOL 205; GEPL 211; MICR 220; STAT 200; Z00L 220
Year Three: At least three units from MSM 301, 302, 303, 304, 305, 306, 307, 308. Two units, other than MSM units, including WORK 300, will be allowed in consultation with the Course Coordinator
*AQUA 200/300 may be taken in either second or third year.

## Molecular Biotechnology

Year One: BIOL 110 and 120; CHEM 110 and 120; STAT 100 and 18 cp from BIOP 111 and 112 and other Group 1 units Year Two: BCHM 210 and 220; GENE 210; MICR 220; with a choice of four units from BOTY, CHEM, PSIO and ZOOL units and BIOP 111 and 112; EVOL 211
Year Three: BCHM 310, 320 and 330; GENE 340; MICR 350 and 360; with a choice of two units from BOTY, CHEM, GENE, PSIO and ZOOL units and BIOL 301, 302, HORT 420; SCI 395; WORK 300
Examples of enrolment programs for the Bachelor of Science are provided on page 28.

## Practical Experience Requirements

None prescribed.

## Period of Candidature

Full-time study: minimum of three years; maximum of five years
Part-time study: maximum of 10 years

## Bachelor of Science with Honours (BSc(Hons))

Students who achieve a high standard in the BSc may proceed to an Honours year. The course requirements differ depending on the area studied, but usually include a research project with thesis, reading assignments and essays. The BSc (Hons) degree can lead to further postgraduate study.
Areas of study include: Archaeology, Agronomy, Animal Science, Biochemistry, Botany, Chemistry, Computer Science, Ecology, Genetics, Geography, Geology, Marine Science and Management, Mathematics, Microbiology, Physiology, Physics, Physiology, Psychology, Soil Science, Statistics, Zoology. The Faculty may approve other areas of study.

## Entry Requirements

Applicants must have completed requirements for award of the BSc to be eligible to enrol for Honours. Applicants with appropriate qualifications from other institutions will also be considered.

## Requirements for the Degree

Candidates complete a unit with the numerical designation 400 in their area of interest and as approved by the relevant head of school. Topics included within this unit are determined following discussions with appropriate academic staff.

## Award of the Degree

The degree will be awarded at one of three levels of Honours: Class I, Class II and Class III. Class II has two divisions: Division 1 and Division 2.

Those candidates awarded the degree at the level of Honours Class I may, if of sufficient distinction, be awarded a University Medal.

## Period of Candidature

Full-time study: maximum of 2 consecutive semesters
Part-time study: maximum of 2 years

## Bachelor of Science (Advanced)

This is an enhanced version of the Bachelor of Science. The course offers students the opportunity to study a range of subjects to an advanced level through extra topics, more challenging laboratory experiments and closer, individual contact with academic staff. Advanced studies are available in Biochemistry, Botany, Biology, Chemistry, Computer Science, Genetics, Mathematics, Microbiology, Physics and Physiology. To remain in this degree program, a student must maintain a high level of performance.

## Requirements for the Degree

To satisfy degree requirements, candidates must complete units to the value of at least 144 cp chosen from those listed for the Bachelor of Science. Of these 144 cp at least 36 cp must be for Advanced units at a grade of at least Distinction. 18 cp must be from Group 3a.

## Bachelor of Science (Advanced) with Honours (BSc(Adv) (Hons))

Students who achieve a high standard in the $\mathrm{BSc}(\mathrm{Adv})$ may proceed to an Honours year. The course requirements differ depending on the area studied, but usually include a research project with thesis, reading assignments and essays. Completion of the $\mathrm{BSc}(\mathrm{Adv})$ (Hons) requires a more extensive thesis with a more in-depth literature review and a research project at a higher level than that expected for the BSc(Hons). The BSc(Adv)(Hons) degree can lead to further postgraduate study.
Areas of study include: Chemistry, Computer Science, Mathematics, Physics. The Faculty may approve other areas of study.

## Entry Requirements

Applicants must have completed requirements for award of the $\mathrm{BSc}(\mathrm{Adv})$ to be eligible to enrol for Honours. Applicants with appropriate qualifications from other institutions will also be considered.

## Requirements for the Degree

Candidates complete a unit with the numerical designation 400 in their area of interest and as approved by the relevant head of school. Topics included within this unit are determined following discussions with appropriate academic staff.

## Award of the Degree

There will be one class of Honours: Class I.
Candidates who do not achieve a sufficiently high standard for the award of Honours at the Advanced level, will be considered for award of the BSc (Hons).
Those candidates awarded the degree at the level of Honours Class I may, if of sufficient distinction, be awarded a University Medal.

## Period of Candidature

Full-time study: maximum of 2 consecutive semesters
Part-time study: maximum of 2 years

## Bachelor of Technology

This course is an example of an innovative cooperation between the Faculty of The Sciences and NSW TAFE to provide alternative pathways for students to obtain a university degree. The Bachelor of Technology is a program which offers five course work streams which articulate from specified NSW TAFE Diplomas. Graduates of these programs will have the practical skills available through TAFE studies and the breadth of knowledge available through university study.

This course has been specifically designed for part-time off-campus study, allowing students to seek employment on the basis of their Diploma and to further their studies towards a Bachelor degree at the same time.

## Requirements for the Degree

To satisfy degree requirements, candidates must complete one of the course work programs specified below. The program shall comprise units with a total value of at least 144 cp .

## Agriculture

Candidates must have completed the NSW TAFE Diploma of Agriculture or equivalent which is equivalent to 72 cp plus a course of study approved by the Course Coordinator of Rural Science and Agriculture comprising 72 cp selected from those units listed for the Bachelor of Agriculture.

## Biological Techniques

Candidates must have completed the NSW TAFE Diploma of Laboratory Technology (Biological-Environmental Testing) or equivalent which is valued at 60 cp plus a course of study approved by the Course Coordinator of Science comprising 84 cp from units in Agronomy and Soil Science, Botany, Ecology, Ecosystem Management, Environmental Science, Genetics, Microbiology, Molecular and Cellular Biology, Nutrition, Physiology and Zoology as listed for the Bachelor of Science. Of the 84 cp at least 36 cp shall be at 300 level.

## Chemical Technology

Candidates must have completed the NSW TAFE Diploma of Laboratory Technology (Process Manufacturing Testing) or equivalent which is valued at 72 cp plus a course of study approved by the Course Coordinator of Science comprising 72 cp selected from units listed for the Bachelor of Science and including at least 48 cp from CHEM 201, 202, 204, 301, $302,303,305,306.307$. Of the 72 cp at least 36 cp must be at 300 level.

## Environmental Technology

Candidates must have completed the NSW TAFE Diploma of Environmental Monitoring and Technology or equivalent which is valued at 72 cp plus a course of study approved by the Course Coordinator for Natural Resources and Environmental Science comprising 72 cp including RSNR 110, 120; ENVE 237, 352, 361; EM 234, 312; NR 331 plus 24 cp from AGEX 310; EM 311, 432, 433; ENVE 335, 421, 423, 436; GEOL 110, 120; SOIL 220; STAT 100 or other units as approved by the Course Coordinator for Natural Resources and Environmental Sciences.

## Horticultural Science

Candidates must have completed the NSW TAFE Advanced Diploma of Horticulture or equivalent which is valued at 66 cp plus a course of study approved by the Course Coordinator of Rural Science and Agriculture comprising 78 cp including the units AGRO 211, 223, 311, 422; BOTY 370; EM 425, 455 or 452; GENE 210; HORT 420; SOIL 220; ZOOL 220; ECON 333 or equivalent.

## Natural Resources Management

Candidates shall have completed the NSW TAFE Diploma of Natural Resources Management or equivalent which is valued at 72 cp and a course of study approved by the Course Coordinator of Natural Resources and Environmental Sciences comprising 72 cp selected from those units listed for the Bachelor of Natural Resources.

## Pathological Techniques

Candidates must have completed the NSW TAFE Diploma of Laboratory Technology (Pathological Testing) or equivalent which is valued at 60 cps and including: BCHM 210, 220; GENE 210; MICR 220; PHAR 222; PSIO 210, 220 and 42 cp drawn from BCHM 310, 320, 330; GENE 340; HUMN 340; MICR 350, 360; PSIO 321, 322, 323, 324, 325. Of the 84 cp at least 36 cp shall be at 300 level.

## Practical Experience Requirements

None prescribed.

## Period of Candidature

Full-time study: maximum of five years
Part-time study: maximum of 10 years

## Bachelor of Agriculture/Bachelor of Laws

The aim of the award is to provide students with a strong academic base in Agriculture, Science and Law including principles and practices of modern rural industries and legal systems and with the opportunities to develop skills in scientific and legal reasoning and inquiring, critical analysis of complex circumstances. It will provide the opportunity, working individually and in teams, to apply these developing skills to current and future problems especially at interfaces of agricultural business, science, economics and law.
The Bachelor of Laws is accredited by the Supreme Court of NSW for admission as a legal practitioner in NSW and this recognition extends to other Australian States and Territories. After completion of academic qualifications in Law, entry to legal practice also requires the completion of practical training requirements which differ in each State.

## Entry Requirements

A Higher School Certificate or equivalent, assumed knowledge of English and Mathematics. Biology and Chemistry are recommended studies.

## Requirements for Double Degree Program

To complete requirements of the double degree program a candidate shall complete at least 240 cp as prescribed below.

## Bachelor of Agriculture Component:

Candidates shall complete units to the value of at least 96 cp and to include at least 16 weeks of approved practical experience.

## Bachelor of Laws Component:

Candidates shall complete units to the value of at least 144 cp .

## Bachelor of Agriculture Component

## Group 1 (complete ALL units)

BIOL 110, BIOL 120, CHEM 110 or CHEM 130, STAT 100, AGRO 211, AGRO 223, ANPR 211, ECON 223, GENE 251, SOIL 220, AGEX 310, AGRO 311, AGRO 321, ANPR 321

## Group 2 (complete two units)

EM 421 or RSNR 421, NR 411, ENVE 421, ANPR 415, HORT 420, or other units as approved by the Course Coordinator for Rural Science and Agriculture

## Bachelor of Laws Component <br> Compulsory (complete ALL units)

LS 100, 200, 220, 160, 210, 231, 232, 240, 281, 282, 320, 351, 355, 371, 372, 480

## Electives (complete eight units)

ELS 378, LS 301, 311, 321, 331, 332, $334,335,336,341,342,345,352,354,357,358,360,361,364,368,370,377$, $378,379,390,399,400,403,453,459,470,471$ and 478

## Study Program

In special circumstances the Coordinators may approve a variation to this program.
Year One: BIOL 110, BIOL 120, CHEM 110 or CHEM 130, STAT 100, LS 100, LS 160, LS 231, LS 232
Year Two: AGRO 211, AGRO 223, ANPR 211, ECON 223, GENE 251, SOIL 220, LS 371, LS 372
Year Three: AGEX 310, AGRO 311, AGRO 321, ANPR 321, LS 120, LS 125 plus two units from EM 421 or RSNR 421, NR 411, ENVE 421, ANPR 415, HORT 420, or other units as approved by the Course Coordinator
Years Four and Five: Law units.

## Practical Experience Requirements

Candidates must complete 16 weeks of approved experience towards the Bachelor of Agriculture component of the double degree program.

## Period of Candidature

Full-time study: maximum of seven years
Part-time study: maximum of 15 years

## Bachelor of Computer Science/Bachelor of Laws

This double degree program consists of units from the BCompSc combined with units from the LLB and students graduate with two degrees-the Bachelor of Computer Science and the Bachelor of Laws. Most students will commence in the BCompSc before starting concurrent study in the LLB program.
The Bachelor of Laws is accredited by the Supreme Court of NSW for admission as a legal practitioner in NSW and this recognition extends to other Australian States and Territories. After completion of academic qualifications in Law, entry to legal practice also requires the completion of practical training requirements which differ in each State.
The Bachelor of Computer Science has been granted Level A accreditation by the Computer Society of Australia.

## Entry Requirements

No previous knowledge of computing is required. However, a background in Mathematics at NSW HSC level, or equivalent, is assumed knowledge.
The Faculty does offer a Foundation Unit in Mathematics for students lacking such a background. This unit, MATH 123 is available by off-campus study only.

## Requirements for Double Degree Program

To complete requirements of the double degree program a candidate shall complete at least 240 cp as prescribed below.

## Bachelor of Computer Science Component:

Candidates shall complete units to the value of at least 96 cp .

## Bachelor of Laws Component:

Candidates shall complete units to the value of at least 144 cp .

## Bachelor of Computer Science Component

## Group 1 (complete ALL units)

AMTH 140; COMP 131, 132, 170

## Group 2 (complete at least five units)

COMP 280, 282, 283, 284, 285, 286, 287, 290, 292

## Group 3 (complete at least five units)

COMP 309, 311, 315, 318, 319, 320, 389, 391, 393, 394, 395

## Bachelor of Laws Component

## Compulsory (complete eight units)

LS 100, 200, 220, 160, 210, 231, 232, 240, 281, 282, 320, 351, 355, 371, 372, 480

## Electives

ELS 378, LS 301, 311, 321, 331, 332, 334, 335, 336, 341, 342, 345, 352, 354, 357, 358, 360, 361, 364, 368, 370, 377, $378,379,390,399,400,403,459,470,471$ and 478

## Practical Experience Requirements

None Prescribed

## Period of Candidature

Full-time study: maximum of seven years
Part-time study: maximum of 15 years

## Bachelor of Environmental Science/Bachelor of Laws

The Bachelor of Laws component comprises a compulsory core of subjects, covering the traditional areas of legal education, for example, introduction to legal systems and methods, constitutional law, contract law, the law of torts, corporations law, etc. Students then complete up to a number of subjects from three possible groupings, which represent different areas of legal education and provide students with a broad experience of areas of legal study.
In the Bachelor of Environmental Science component of the program, students complete a core of prescribed units to ensure a solid scientific base for further study in environmental science. The prescribed component covers topics in biology, chemistry, mathematics and statistics, plant taxonomy, ecology, the evolution, ecology and land-use impacts
of Australian wildlife, vertebrate zoology, resource survey and habitat evaluation, and impact assessment in natural resources management. In addition to completing the prescribed study, students are able to pursue studies in area such as aquatic ecology, Australasian terrestrial ecology, GIS and remote sensing, soil science, agriculture and natural resources in relation to the environment, sustainable resource use and environmental management, park and wildland management, the principles of hydrology, water resources management, environmental technology, vegetation management, etc
The Bachelor of Laws is accredited by the Supreme Court of NSW for admission as a legal practitioner in NSW and Mutual Recognition legislation extends this recognition to other Australian States and Territories. After completion of academic qualifications in Law, entry to legal practice also requires the completion of practical training requirements which differ in each State.

## Entry Requirements

A Higher School Certificate or equivalent, assumed knowledge of English and Mathematics. Biology and Chemistry are recommended studies.

## Requirements for Double Degree Program

To complete requirements of the double degree program a candidate shall complete at least 240 cp as prescribed below.

## Bachelor of Environmental Science Component:

Candidates shall complete units to the value of at least 96 cp .

## Bachelor of Laws Component:

Candidates shall complete units to the value of at least 144 cp .

## Bachelor of Environmental Science Component

Group 1a (complete five units as indicated)
BIOL 110 and 120; CHEM 110 or130; MATH 101 and 102 or MATH 110 and STAT 100

## Group 1b (complete one unit)

BIOP 111, 112; CHEM 120; COMP 100, 160; GEOL 110, 120; PDAB 100, 101; RSNR 110, 120 or any other 100 -level unit offered by the Faculty of The Sciences and approved by the Course Coordinator

Group 2a (complete ALL units)
BOTY 211; ECOL 210; EM 251 or ZOOL 230
Group 2b (complete one unit)
ECOL 202, 220; EM 234; GENE 210; GEOL 207; SOIL 220; ZOOL 220 or any other 200-level unit offered by the Faculty of The Sciences and approved by the Course Coordinator

## Group 3a (complete ALL units)

EM 331, 312

## Group 3b (complete four units)

ECOL 302, 307; EM 311, 351, 422, 423, 425, 453, 454; EM 421 or RSNR421; ENVE 352, 421, 433, 436; GENE 322; MSM 306;
ZOOL 326 or any other 300-level unit offered by the Faculty of The Sciences and approved by the Course Coordinator

## Bachelor of Laws Component

Compulsory (complete eight units)
LS 100, 200, 220, 160, 210, 231, 232, 240, 281, 282, 320, 351, 355, 371, 372, 480

## Electives

ELS 378, LS 301, 311, 321, 331, 332, 334, 335, 336, 341, 342, 345, 352, 354, 357, 358, 360, 361, 364, 368, 370, 377, $378,379,390,399,400,403,459,470,471$ and 478

## Practical Experience Requirements

None prescribed

## Period of Candidature

Full-time study: maximum of seven years
Part-time study: maximum of 15 years

## Bachelor of Science/Bachelor of Laws

This double degree program consists of units from the BSc combined with units from the LLB and students graduate with two degrees-the Bachelor of Science and the Bachelor of Laws. Most students will commence in the BSc before starting concurrent study in the LLB program.
The Bachelor of Laws is accredited by the Supreme Court of NSW for admission as a legal practitioner in NSW and this recognition extends to other Australian States and Territories. After completion of academic qualifications in Law, entry to legal practice also requires the completion of practical training requirements which differ in each State.

## Entry Requirements

No compulsory prerequisite knowledge is required, but it is assumed that students will have completed Mathematics, Chemistry and preferably Physics or Biology at Year 12 level, or equivalent. For students without the recommended background knowledge, the Faculty offers Foundation Units in Mathematics (MATH 123), Chemistry (CHEM 123) and Physics (PHYS 123) by off-campus study only.

## Requirements for Double Degree Program

To satisfy requirements for the double degree program, candidates must complete at least 240 cp as prescribed below.

## Bachelor of Science Component:

Candidates must complete units to the value of at least 96 cp in one of the course work programs listed below.

## Bachelor of Laws Component:

Candidates shall complete units to the value of at least 144 cp .

## Bachelor of Science Component-Course Work Programs

## Biology

36 cp from: BIOL 110, 120; CHEM 110, 120; and MATH 110, STAT 100 or MATH 101, 102; 24 cp at 200 level from BOTY and/or ECOL and/or ZOOL and/or MSM and/or BCHM/MICR and/or PSIO and/or GENE; 36 cp at 300 level from BOTY and/or ECOL and/or ZOOL and/or MSM and/or BCHM/MICR and/or PSIO and/or GENE or other units offered by the Faculty as approved by the Course Coordinator.

## Chemistry

36 cp at 100 level from: CHEM 110, 120; BIOL 110, 120 or PHYS 121, 122; and MATH 110, STAT 100 or MATH 101, 102; 24 cp at 200 level from CHEM 201, 202, 203, 204 or appropriate CHEM/BCHM units; 36 cp at 300 level from CHEM $301,302,303,305,306,307$ and PHYS 301 or appropriate CHEM/BCHM units or other units offered by the Faculty as approved by the Course Coordinator.

## Geology

36 cp at 100 level from: GEOL 110, 120; CHEM 110, 120; and MATH 110, STAT 100 or MATH 101, 102; 24 cp at 200 level from GEOL 201, 205, 206, 207; 36 cp at 300 level from GEOL units or other units offered by the Faculty as approved by the Course Coordinator.

## Mathematics

36 cp at 100 level including AMTH 140, 142; MATH 101, 102 plus 12 cp from Group 1a (see page 14); 24 cp at 200 level from AMTH 246, 247 or STAT 260, 261; PMTH 212, 213; 36 cp at 300 level including 24 cp from PMTH units and 12 cp from AMTH or STAT units or other units offered by the Faculty as approved by the Course Coordinator.

## Physics

36 cp at 100 level including: MATH 101, 102; PHYS 121, 122; CHEM 110, 120 or COMP 131, 132; 24 cp at 200 level including AMTH 246; CHEM 201 or 201A, PHYS 204; PMTH 212; 36 cp at 300 level including PHYS 301, 302, 305; BIOP 320 and two from PMTH 333, 335, 336, 338, 339 or other units as offered by the Faculty as approved by the Course Coordinator.

## Statistics

36 cp at 100 level from MATH 101, 102; AMTH 140, 142; and 12 cp from 100 level units from Group 1a (see page 14); 24 cp at 200 level from PMTH 212, 213; STAT 260, 261; 36 cp at 300 level from STAT 300, 354, 356, 357; and any 12 cp from any 300 -level PMTH units or other units offered by the Faculty as approved by the Course Coordinator.

## Bachelor of Laws Component

Compulsory (complete eight units)
LS 100, 200, 220, 160, 210, 231, 232, 240, 281, 282, 320, 351, 355, 371, 372, 480

## Electives

ELS 378, LS 301, 311, 321, 331, 332, 334, 335, 336, 341, 342, 345, 352, 354, 357, 358, 360, 361, 364, 368, 370, 377, $378,379,390,399,400,403,459,470,471$ and 478

## Practical Experience Requirements

None prescribed

## Period of Candidature

Full-time study: maximum of seven years
Part-time study: maximum of 15 years

## Bachelor of Arts/Bachelor of Science

The combined program offers students the opportunity to study in the area of Arts and Sciences in preparation for a wide range of careers. It offers breadth of learning and multiskilling across disciplines recognising that graduates are required to demonstrate skills in critical analysis, research, communication and technological expertise. Graduates of the program are awarded a Bachelor of Arts/Bachelor of Science.

## Entry Requirements

Students entering this combined course must have any two units of English and are strongly advised to have Chemistry and Mathematics at HSC level, or equivalent. Physics and Biology are useful but not essential. For students without the recommended background knowledge, the Faculty offers Foundation Units in Chemistry, Mathematics and Physics.

## Requirements for the Combined Degree Program

Candidates must complete units counting at least 192 cp comprising 96 cp from the Bachelor of Arts and 96 cp from the Bachelor of Science.

## Bachelor of Arts Component:

Candidates must complete units to the value of 96 cp from subjects (excluding Mathematics) as listed in Rule 3.2. of the Faculty of Arts, Humanities and Social Sciences, and these units must include:
(i) not more than 36 cp at 100 level;
(ii) at least 48 cp , including 18 cp at 300 level in a single subject; and
(iii) at least 12 cp in each of two separate subjects.

## Bachelor of Science Component

## Biology

36 cp at 100 level from BIOL 110, 120; CHEM 110, 120; and MATH 110, STAT 100 or MATH 101, 102; 24 cp at 200 level from BOTY and/or ECOL and/or ZOOL and/or MSM and/or BCHM/MICR and/or PSIO and/or GENE* units; 36 cp at 300 level from BOTY and/or ECOL and/or ZOOL and/or MSM and/or BCHM/MICR and/or PSIO and/or GENE* units.

## Chemistry

36 cp at 100 level from CHEM 110, 120; BIOL 110, 120 or PHYS 121, 122; and MATH 110, STAT 100 or MATH 101, 102; 24 cp at 200 level from CHEM 201, 202, 203, 204 or appropriate CHEM/BCHM units*; 36 cp at 300 level from CHEM 302, 303, 305, 306, 307 and PHYS 301 or appropriate CHEM/BCHM units*.

## Computer Science

36 cp at 100 level from COMP 131, 132; MATH 101, 102; AMTH 140 and either COMP 160 or AMTH 142; 24 cp at 200 level from COMP 280, 282, 283, 284, 285; and 36 cp at 300 level from any COMP unit*.

## Geology

36 cp at 100 level from GEOL 110, 120; CHEM 110, 120; and MATH 110, STAT 100 or MATH 101, $102 ; 24 \mathrm{cp}$ at 200 level from GEOL 201, 205, 206, 207; 36 cp at 300 level from GEOL units*.

## Mathematics

36 cp at 100 level including AMTH 140, 142; MATH 101, 102 plus 12 cp from Group 1a (see page 14); 24 cp at 200 level from AMTH 246, 247 or STAT 260, 261; PMTH 212, 213; 36 cp at 300 level including 24 cp from PMTH units and 12 cp from AMTH or STAT units*.

## Physics

36 cp at 100 level including MATH 101, 102 , PHYS 121, 122; CHEM 110, 120 or COMP 131, 132; 24 cp at 200 level including AMTH 246; CHEM 201; PHYS 204; PMTH 212; 36 cp at 300 level including PHYS 301, 302, 305; BIOP 320; 12 cp from PMTH 333, 335, 336, 338, 339.

## Statistics

36 cp at 100 level from MATH 101, 102; AMTH 140, 142; and 12 cp at 100 -level from Group 1a (see page 14); 24 cp at 200 level from PMTH 212, 213; STAT 260, 261; 36 cp at 300 level from STAT 300, 354, 356, 357; and 12 cp from any 300 level PMTH units*.
*As approved by the Course Coordinator.

## Practical Experience Requirements

None prescribed.

## Period of Candidature

Full-time study: minimum of four years; maximum of six years
Part-time study: maximum of 12 years

## Diploma in Agriculture

Applicants should have a combination of qualifications and relevant work experience in order to enrol for the Diploma. Programs are available in animal health and welfare, applied animal nutrition, cotton production, feedlot management, meat science and technology, poultry production, sustainable grains production and wool production or students can design a general program of study which combines aspects from the available programs.

## Requirements for the Diploma

To satisfy Diploma requirements candidates must complete units to the value of at least 48 cp in one of the course work programs listed below.

## Units Offered for the Diploma

Units offered for the Diploma are: AGEX 310; AGRO 100, 422; ANPR 417, 440; ANSC 200, 300; ANUT 300; AQUA 200; COTT 300, 301, 302, 303; ECON 223; EM 234, 311; GENE 251; GRNS 300, 301, 302, 303; HORT 420; MEAT 418; MM 110, 200;
PLTY 300, 301; RSNR 110, 120; WOOL 412, 422, 432, 442, 452, 462; and with the approval of the Course Coordinator, other units offered within the University may be substituted for one or more of these units.

## Course Work Programs

## Animal Health and Welfare

ANPR 417; ANSC 200, 300 plus five units to be chosen from those units listed in Units Offered for the Diploma.

## Applied Animal Nutrition

ANSC 200, 300; ANUT 300 plus five units to be chosen from those units listed in Units Offered for the Diploma.

## Cotton Production

COTT 300, 301, 302, 303 plus four units to be chosen from those units listed in Units Offered for the Diploma.

## Feedlot Management

ANPR 440; ANSC 200, 300 plus five units to be chosen from those units listed in Units Offered for the Diploma.

## Meat Science and Technology

ANSC 200, 300; MEAT 418 plus five units to be chosen from those units listed in Units Offered for the Diploma.

## Poultry Production

ANSC 200; PLTY 300, 301 plus five units to be chosen from those units listed in Units Offered for the Diploma.

## Sustainable Grains Production

GRNS 300, 301, 302, 303 plus four units to be chosen from those units listed in Units Offered for the Diploma.

## Wool Production

ANSC 200, 300; W00L 412, 422 plus four units to be chosen from those units listed in Units Offered for the Diploma.

## General Agriculture

Eight units to be chosen from those units listed in Units Offered for the Diploma.

## Practical Experience Requirements

None prescribed.

## Period of Candidature

Full-time study: minimum of two semesters
Part-time study: maximum of eight semesters

## Diploma in The Sciences

The Diploma in The Sciences is designed to provide students with a coherent program of study in a range of disciplines in science. Graduates will have a broad scientific background to assist with future employment or to pursue further study. Students are able to articulate from the Diploma to the Advanced Diploma and then on to a Bachelor degree (the actual degree will be dependent on the program of study completed) with credit for study completed towards the Diploma and the Advanced Diploma.
Students have the opportunity to design their own program of study or to complete a program of study in Biomedical Science, Botany, Chemistry, Ecology, Genetics, Information Technology, Molecular Genetics and Biotechnology, Natural Resources Management, Physics, and Zoology. Study is available topics such as plant taxonomy, palaeontology, geology, chemistry, mathematics, statistics, physiology, aquaculture, evolution, marine science, environmental management, sustainable land use, Australian wildlife, plant and animal ecology, computer science, among others.

## Requirements for the Diploma

To satisfy Diploma requirements candidates must complete units to the value of at least 48 cp from one of the course work programs listed below or from units listed for the Bachelor of Computer Science, the Bachelor of Environmental Science, the Bachelor of Natural Resources or the Bachelor of Science. A maximum of 12 cp may be taken at 300 level.

## Course Work Programs

## Biomedical Science

BIOL 110, 120; CHEM 110, 120; BCHM 210, 220, 320, 330; GENE 210, 340; HUMN 340; MICR 220, 350; PHAR 222; PSIO 210, 220, 321, 322, 323, 324, 325, 410; PSYC 101, 102; STAT 100, 200

## Botany

BIOL 110, 120; BOTY 211, 241/341, 260/360, 270/370, 355; CHEM 110, 120; ECOL 202, 210, 220; EVOL 211/311; STAT 100

## Chemistry

CHEM 110, 120, 201, 202, 203, 204, 302, 303, 305, 306, 307; PHYS 301

## Ecology

BIOL 110, 120; BOTY 211, 241/341, 270/370, 355; CHEM 110, 120; ECOL 202, 210, 220, 302, 307; EM 331; STAT 100; ZOOL 210, 220, 230

## Genetics

BIOL 110, 120; CHEM 110 120; BCHM 210, 330; GENE 210, 322, 335, 340, 351, 422; MATH 110; STAT 100, 200

## Information Technology

AMTH 140; COMP 100, 131, 132, 160, 170, 280, 286 and one unit from STAT 100; MATH 110; AFM 101

## Molecular Genetics and Biotechnology

BIOL 110, 120; CHEM 110, 120, 204; BCHM 210, 220, 310, 320, 330; GENE 210, 322, 335, 340; MATH 110; MICR 220, 360; STAT 100

## Natural Resources Management

BIOL 110, 120; BOTY 211; CHEM 130; ECOL 210; EM 234, 251, 311, 312, 332; GEOL 110, 205; RSNR 110, 120; SOIL 220; STAT 100

## Physics

AMTH 140; ASTY 221; COMP 131, 132; MATH 101, 102; PHYS 121, 122, 211, 212, 311

## Zoology

BIOL 110, 120; CHEM 110, 120; EVOL 211/311; GENE 210; STAT 100; ZOOL 210, 220, 230, 321, 326, 327, 328

## Practical Experience Requirements

None prescribed.

## Period of Candidature

Full-time study: minimum of two semesters
Part-time study: maximum of eight semesters

## Advanced Diploma in Agriculture

Applicants should have either completed the Diploma in Agriculture or have a combination of qualifications and relevant work experience in order to enrol for the Advanced Diploma. Students have the opportunity to complete a program in the areas of Plants or Animals or to design a General program. The topics covered include: agriculture, natural resources and the environment; agricultural ecology and crop physiology, animal production and product science; applied animal and plant breeding; soil science, animal nutrition, cotton production, agricultural extension, meat technology, wool production, among others.

## Requirements for the Advanced Diploma

To satisfy Diploma requirements candidates must complete units to the value of at least 72 cp in one of the approved course work programs listed below. A maximum of 24 cp may be taken at 100 level.

## Course Work Programs

## Plant Stream

AGEX 310; AGRO 100, 211, 223, 311, 321; ANSC 200, 300; BIOL 110, 120; CHEM 130; COTT 300; ECON 223; GENE 210, 251; HORT 420; MATH 110; MM 110, 200; RSNR 110, 120; SOIL 220, 431; STAT 100

## Animal Stream

AGEX 310; AGRO 100, 211, 223, 311, 321; ANPR 415, 417, 440; ANSC 200, 300; ANUT 300; BIOL 110, 120; CHEM 130; COTT 300; ECON 223; GENE 210, 251; MATH 110; MEAT 418 or ANPR 420; MM 110, 200; PLTY 300, 301; PSIO 210; RSNR 110, 120; STAT 100

## General Stream

AGEX 310; AGRO 100, 211, 223, 311, 321; ANPR 415, 417, 440; ANSC 200, 300; BIOL 110, 120; CHEM 130; COTT 300; ECON 223; GENE 210, 251; HORT 420; MATH 110; MEAT 418 or ANPR 420; MM 110, 200; RSNR 110, 120; SOIL 220, 431; STAT 100

## Practical Experience Requirements

All candidates must complete eight weeks of approval practical experience work.

## Period of Candidature

Full-time study: minimum of three semesters
Part-time study: maximum of 10 semesters

## Advanced Diploma in The Sciences

The Advanced Diploma in The Sciences is designed to provide students with a coherent program of study in a range of disciplines in science. Graduates will have a broad scientific background to assist with future employment or to pursue further study. Students are able to articulate to a Bachelor degree (the actual degree will be dependent on the program of study completed) with credit for study completed towards the Advanced Diploma.
Students have the opportunity to design their own program of study or to complete a program of study in Biomedical Science, Botany, Chemistry, Ecology, Genetics, Information Technology, Molecular Genetics and Biotechnology, Natural Resources Management, Physics, and Zoology. Study is available in topics such as plant taxonomy, palaeontology, geology, chemistry, mathematics, statistics, physiology, aquaculture, evolution, marine science, environmental management, sustainable land use, Australian wildlife, plant and animal ecology, computer science, among others.
Applicants should have either completed the Diploma in The Sciences or have a combination of qualifications and relevant work experience in order to enrol for the Advanced Diploma.

## Requirements for the Advanced Diploma

To satisfy diploma requirements candidates must complete units to the value of at least at least 72 cp from one of the course work programs listed below or from units listed for the Bachelor of Computer Science, the Bachelor of Environmental Science, the Bachelor of Natural Resources or the Bachelor of Science.

## A maximum of 24 cp may be taken at 100 level.

## Course Work Programs

## Biomedical Science

A candidate shall complete a course of study approved by the Course Coordinator of Science comprising units from BIOL 110, 120; BIOP 111, 112, 320; CHEM 110 120; BCHM 210, 320, 330; GENE 210, 340; HUMN 340; MICR 220, 350; PHAR 222; PSIO 210, 220, 321, 322, 323, 324, 325, 410; PSYC 101, 102; STAT 100, 200

## Botany

A candidate shall complete a course of study approved by the Course Coordinator of Science comprising units from BIOL 110, 120, 301, 302, BOTY 211, 241/341, 260/360, 270/370, 355; CHEM 110, 120; ECOL 202, 210, 220, 302, 307; EVOL 211/311; SCI 395, STAT 100

## Chemistry

A candidate shall complete a course of study approved by the Course Coordinator of Science comprising at least 60 cp from CHEM 110, 120, 201, 202, 203, 204, 302, 303, 305, 306, 307; PHYS 301

## Ecology

A candidate shall complete a course of study approved by the Course Coordinator of Science comprising units from BIOL 110, 120; BOTY 211, 241/341, 260/360, 270/370, 355; CHEM 110, 120; ECOL 202, 210, 220, 302, 307; EM 331, 423, 453, 454; SCI 395, STAT 100; ZOOL 210, 220, 230, 321, 326, 327, 328

## Genetics

A candidate shall complete a course of study approved by the Course Coordinator of Science comprising at least 60 cp from BCHM 210, 330; BIOL 110, 120; CHEM 110 120; GENE 210, 322, 335, 340, 351, 422; MATH 110; STAT 100, 200

## Information Technology

A candidate shall complete the following course of study approved by the Course Coordinator of Computer Science comprising units from AMTH 140; COMP 100 or 160, 131, 132, 170, 280, 282, 283, 284, 285, 286 and one from STAT 100; MATH 110 and AFM 101

## Molecular Genetics and Biotechnology

A candidate shall complete a course of study approved by the Course Coordinator of Science comprising units from BIOL 110, 120; BIOP 111, 112; CHEM 110, 120, 204; BCHM 210, 220, 310, 320, 330; GENE 210, 322, 335, 340; MATH 110; MICR 220, 360; STAT 100

## Natural Resources Management

A candidate shall complete a course of study approved by the Course Coordinator of Natural Resources comprising units from BIOL 110, 120; BOTY 211; CHEM 130; ECOL 210; EM 251, 311, 312, 332, 432; EM 421 or RSNR 421; ENVE 352; GEOL 110, 205; RSNR 110,120; SOIL 220; STAT 100

## Physics

A candidate shall complete a course of study approved by the Course Coordinator of Science comprising units from AMTH 140; ASTY 221; MATH 101, 102; PHYS 121, 122, 211, 212, 311 and at least 12 cps from AMTH 246, 247, 348; COMP 282, 389, 395; STAT 200, 300

## Zoology

A candidate shall complete a course of study approved by the Course Coordinator of Science comprising units from BIOL 110, 120; CHEM 110, 120; ECOL 202, 210, 220; EVOL 211/311; GENE 210, 322; MATH 110; STAT 100; Z00L 210, 220, 230, 321, 326, 327, 328

## Practical Experience Requirements

None prescribed.

## Period of Candidature

Full-time study: minimum of three semesters
Part-time study: maximum of 10 semesters

## Suggested Elective Unit Combinations for the Bachelor of Natural Resources

Soil Conservation
SOIL 310, 411, 421, 431; AGRO 321

Water Resources Management
ENVE 436, 454; EM 454; ECOL 202

Soil and Water Management
ENVE 436, 454; SOIL 310, 431

Catchment Management
AGRO 321; BOTY 360; EM 422, 425, 452; ECOL 302; ENVE 436

## Pollution Control

CHEM 203; ENVE 433, 436; EM 351, 454; GEOL 205

Resource Policy
PUBP 311, 409; GEPL 352

## Vegetation Resources

AGRO 321; EM 332, 425, 432, 433, 452; ECOL 302, 307

Forest Resources Management
EM 331, 332, 351, 422, 432, 433, 425, 452, 454; ECOL 302; SOIL 310

Parks Management
ABAR 303; EM 331, 422, 423, 425, 453; GEPL 343

Wildlife Management
EM 331, 351, 422, 423, 453; Z00L 326

Rangeland Management
SOIL 431; AGRO 321; ANPR 425; ENVE 432; ECOL 302, 307; EM 425

Coastal Zone Management
ZOOL 210; EM 422; GEPL 343; GEOL 205

Land Use Planning
SOIL 411; EM 422, 425, 452

Land Rehabilitation
AGRO 321; SOIL 310, 411, 431; EM 425

## Examples of Enrolment Programs for the Bachelor of Science

## Archaeological Science

Year One: ABAR 103; GEPL 111; CHEM 110 and 120; BIOL 110 and 120; GEOL 110 and 120; STAT 100
Year Two: ARPA 102 and 226; ZOOL 230; GEPL 211; GEOL 102/202; GEOL 206; CHEM 203; ECOL 210; GEAR 200
Year Three: ARPA 343, 382 and 391; ABAR 383; EM 432 plus two other units

## Biochemistry/Biotechnology/Molecular Biology

Year One: BIOL 110 and 120; CHEM 110 and 120 typically with MATH 110 and STAT 100 or MATH 101 and 102; BIOP 111 and 112 or PHYS 121 and 122

Year Two: BCHM 210, 220; GENE 210; MICR 220 with a choice from BOTY; CHEM; PSIO or ZOOL units
Year Three: BCHM 310, 320, 330; MICR 350, 360; GENE 340 with a choice from BOTY; CHEM; PSIO or ZOOL units

## Biochemistry/Chemistry

Year One: BIOL 110 and 120; CHEM 110 and 120, MATH 101 and 102 typically with PHYS 121 and 122 or BIOP 111 and 112

Year Two: BCHM 210, 220; CHEM 201, 202, 203, 204; MICR 220 typically with GENE 210
Year Three: BCHM 310, 320, 330; MICR 360; and a choice of four units from CHEM 301, 302, 303, 305, 306, 307

## Biochemistry/Genetics

Year One: BIOL 110 and 120; CHEM 110 and 120 typically with MATH 110 and STAT 100 or MATH 101 and 102; BIOP 111 and 112 or PHYS 121 and 122

Year Two: BCHM 210, 220; GENE 210; MICR 220 with a choice of units from BOTY, CHEM, PSIO or ZOOL units Year Three: BCHM 310, 320, 330; GENE 322, 335, 340 with a choice of units from BOTY; MICR; CHEM; PSIO or ZOOL units

## Biogeography

Year One: BIOL 110 and 120; MATH 110 and STAT 100; CHEM 110 and 120; GEPL 111 and 112
Year Two: BOTY 211; ECOL 210, 220; GEPL 211, 216; ZOOL 230 typically with ECOL 202; GEPL 224; EVOL 211/311; Z00L 210, 220 and a choice from BOTY 241; CHEM 203; GENE 210; GEPL 214

Year Three: ECOL 302; GEPL 341 typically with BOTY 310; MSM 302, 307; ECOL 307; EM 432; Z00L 321, 323

## Chemistry

Year One: CHEM 110 and 120; PHYS 121 and 122 and MATH 101 and 102 or MATH 110 and STAT 100 and BIOP 111 and 112 typically with BIOL 110 and 120 or COMP 131 and 132 or GEOL 110 and 120 or AMTH 140 and 142
Year Two: CHEM 201, 202, 203, 204 typically with BCHM 210, 220 and a choice from 200-level BOTY units; 200-level COMP units; 200-level GEOL units; 200-level PHYS units; PMTH 212, 213; AMTH 246; 200-level ZOOL units Year Three: CHEM 302, 303, 305, 306, 307; PHYS 301

## Chemistry (Biological Sciences)

Year One: CHEM 110 AND 120; BIOL 110 and 120; MATH 110 and STAT 100 and BIOP 111 and 112 or MATH 101 and 102 and PHYS 121 and 122
Year Two: CHEM 201, 202, 203, 204 typically with BCHM 210, 220 and a choice from 200-level BOTY units; 200-level COMP units; GENE 210; MICR 220; PHAR 222; 200-level PHYS units; PSIO 210, 220; 200-level PMTH units; 200-level ZOOL units

Year Three: CHEM 302, 303, 305, 306, 307 or 300 -level BCHM units and a choice from 300-level MICR units, 300-level PSIO units

## Chemistry (Physical Sciences)

Year One: CHEM 110 and 120; MATH 101 and 102; PHYS 121 and 122 typically with COMP 131 and 132 or GEOL 110 and 120 or AMTH 140 and 142
Year Two: CHEM 201, 202, 203, 204 typically with PMTH 212, 213; PHYS 204 and a choice from 200-level COMP units; 200- level PHYS units; AMTH 247
Year Three: CHEM 302, 303, 305, 306, 307; PHYS 301 and a choice from 300-level PMTH units or 300 -level AMTH units or 300 -level COMP units

## Computer Science

Year One: COMP 131 and 132; MATH 101 and 102; AMTH 140 typically with AMTH 142 and a choice from BIOL 110 and 120; CHEM 110 and 120; GEOL 110 and 120; PHYS 121 and 122
Year Two: COMP 280, 282, 283, 284 typically with AMTH 247; PMTH 212, 213
Year Three: COMP 319, 381, 383, 389 typically with 12 cp of 300-level PMTH; STAT 260, 261 or AMTH 346 or COMP 320

## Computer Science with Electronics

Year One: COMP 131 and 132; MATH 101 and 102; PHYS 121 and 122; AMTH 140 typically with AMTH 142
Year Two: COMP 280, 282, 283, 284; PHYS 211, 212 typically with PMTH 212
Year Three: COMP 319, 383, 389; PHYS 311; PMTH 333, 339; STAT 260, 261

## Ecology (Animal)

Year One: BIOL 110 and 120; MATH 110 and STAT 100; CHEM 110 and 120 typically with COMP 131 and 132 and BIOP 111 and 112
Year Two: BOTY 211; ECOL 210, 220, 202; ZOOL 210, 220, 230 typically with STAT 200; GENE 210 and CHEM 203
Year Three: ECOL 302, 303, 307; ZOOL 326, 327 typically with ECOL 302; EM 331, 423, 453, 454; EVOL 211/311; Z00L 321

## Ecology (Aquatic)

Year One: BIOL 110 and 120 ; MATH 110 and STAT 100; CHEM 110 and 120 typically with GEOL 110 and 120 or GEPL 111 and 112 or BIOP 111 and 112
Year Two: ECOL 210, 220, 202, ZOOL 210, 220 typically with BCHM 210; BOTY 211, 241; GENE 210, ZO0L 230 and a choice from CHEM 203, 204; GEPL 211; MICR 220
Year Three: BOTY 360; EM 454; MSM 306 typically with ECOL 302, 303, 307; ZOOL 321 and a choice from BOTY 310; GENE 322

## Ecology (Insect)

Year One: BIOL 110 and 120; CHEM 110 and 120; MATH 110 and STAT 100 and BIOP 111 and 112 or PHYS 121 and 122 and MATH 101 and 102
Year Two: BOTY 211, 241; ECOL 210, 220; ZOOL 210, 220 typically with BCHM 210; ECOL 202; GENE 210; ZO0L 230 and CHEM 203
Year Three: ECOL 302, 303, 307; Z00L 321 typically with EVOL 211/311

## Ecology (Plant)

Year One: BIOL 110 and 120 ; MATH 110 and STAT 100; CHEM 110 and 120 typically with COMP 131 and 132 or GEOL 110 and 120 or BIOP 111 and 112
Year Two: BOTY 211, 241; ECOL 210, 220, 202; SOIL 211 or 212 typically with BCHM 210; GENE 210 and a choice from CHEM 203; MICR 220; ZOOL 210, 220, 230
Year Three: BOTY 310, ECOL 302, 307 typically with AGRO 311; BOTY 370; GENE 322 and a choice from BCHM 320, BOTY 360; MSM 302, 307; EM 452, 453, 455; MICR 350; ZOOL 321, 322

## Ecology (Terrestrial Vertebrates)

Year One: BIOL 110 and 120; MATH 110 and STAT 100; CHEM 110 and 120 typically with COMP 131 and 132 and a choice from GEOL 110, 120; BIOP 111, 112
Year Two: ECOL 210, 220; PSIO 210, 220; ZOOL 210, 220, 230 typically with BOTY 211; ECOL 202; GENE 210 and CHEM 203
Year Three: ECOL 302, 303; EM 331, 423; ZOOL 326, 327 typically with ECOL 307; EVOL 211/311

## Ecology (Wildlife)

Year One: CHEM 110 and 120; BIOL 110 and 120, MATH 110 and STAT 100 and BIOP 111 and 112 or MATH 101 and 102 and PHYS 121 and 122 and a choice from COMP 131, 132; GEPL 111, 112
Year Two: ECOL 210, 220; BOTY 211; ZOOL 210, 230 and a choice from BOTY 241; GENE 210; PSIO 210; ZOOL 220
Year Three: EM 331, 423 or 453; ECOL 302 and 303; ZOOL 326, 327 and a choice from BOTY 300-level units; EM 300-level units; PSIO 300-level units; ZOOL 300-level units

## Electronics

Year One: PHYS 121 and 122; MATH 101 and 102; AMTH 140 typically with AMTH 142; COMP 131 and 132
Year Two: PHYS 204, 211, 212; PMTH 212; AMTH 246 typically with COMP 283 or other PHYS; MATH or COMP units
Year Three: PHYS 301, 302; PHYS 311; AMTH 347 and a choice from other PHYS; MATH or COMP units

## Genetics (Ecological, Evolutionary, Population)

Year One: BIOL 110 and 120; CHEM 110 and 120 typically with MATH 110 and STAT 100; COMP 131 and 132
Year Two: BCHM 210; ECOL 210 and 220; GENE 210 typically with EVOL 211; STAT 200 and a choice from BCHM; BOTY; ECOL; COMP; MICR; ZOOL 200-level units
Year Three: BCHM 330; GENE 322, 335, 340 typically with EVOL 311; GENE 351; and a choice of ECOL; BOTY; Z00L 300level units

## Genetics (Molecular)

Year One: BIOL 110 and 120; CHEM 110 and 120 typically with MATH 110 and STAT 100; BIOP 111 and 112
Year Two: BCHM 210; GENE 210 typically with BCHM 220; MICR 220; STAT 200 and a choice from EVOL 211; PHAR 222 and BOTY; CHEM; ECOL; PSIO; ZOOL 200-level units
Year Three: BCHM 330; GENE 322, 335, 340 typically with BCHM 310; MICR 360 and a choice from GENE 351 and BCHM; BOTY; ECOL; MICR; PSIO; ZOOL 300-level units

## Genetics (Quantitative)

Year One: BIOL 110 and 120; MATH 110 and STAT 100 (or MATH 101 and 102) typically with CHEM 110 and 120; COMP 131 and 132
Year Two: GENE 210 and a choice from AMTH; BCHM; BOTY; COMP; MICR; PMTH; PSIO; STAT; ZOOL 200-level units Year Three: GENE 322, 335, 351 and a choice from GENE 340 and BCHM; BOTY; COMP; MICR; PMTH; PSIO; STAT; ZOOL 300- level units

## Geography (Physical)

Year One: GEPL 111 and 112 typically with ARPA 102 and ABAR 103; BIOL 110 and 120; GEOL 110 and 120; CHEM 110 and 120
Year Two: GEPL 211, 216 typically with ARPA 256; ECOL 210, 220; GENE 210; GEPL 224; Z00L 230 and a choice from AGRO 211; BOTY 211, 241; GEOP 211
Year Three: GEPL 341; ENVE 352 typically with ECOL 307; EM 434 plus additional units

## Landscape Science

Year One: GEPL 111; CHEM 110 and 120; GEOL 110 and 120; BIOL 110 and 120; STAT 100
Year Two: GEPL 211; SOILS 220; GEOL 205; GEAR 200; ECOL 210; ZOOL 210
Year Three: GEPL 341; ENVE 352; MSM 306, 308; EM 432 and two other units

## Geology

Year One: GEOL 110 and 120; CHEM 110 and 120 and a choice from PHYS 121 and 122 and MATH 101 and 102 or MATH 110
and STAT 100; BIOL 110 and 120; COMP 131 and 132; GEPL 111 and 112
Year Two: GEOL 201, 202, 206, 207; and a choice from CHEM; PHYS; MATH; GEPL 200-level units; ASTY 221
Year Three: GEOL 303, 304, 305, 306, 307, 308 and a choice from EM 234, 432, 433

## Geomorphology

Year One: GEOL 110 and 120; GEPL 111 and 112 typically with CHEM 110 and 120; MATH 110 and STAT 100 or MATH 101 and 102
Year Two: GEPL 211, 216 typically with GEOL 201, 205, 206
Year Three: EM 432, 433; ENVE 352 with GEOL 303; GEPL 324, 341

## Human Evolutionary Biology

Year One: ARPA 102; ABAR 103; CHEM 110 and 120; STAT 100; BIOL 110 and 120; GEOL 110
Year Two: EVOL 211/311; ARPA 226 and 261; ABAR 283; GENE 210; PSIO 210 and 220; Z00L 230
Year Three: ARPA 336 and 391; and six units from GEOL 102/202; PSIO 322, 325; HUMN 340; Z00L 326; GENE 335

## Marine Biology

Year One: BIOL 110 and 120; CHEM 110 and 120; MATH 110 and STAT 100 typically with GEOL 110 and 120 or a choice from other 100-level units
Year Two: ZOOL 210 and 220; ECOL 210, 202; EVOL 211/311 typically with ZOOL 230; GENE 210 and a choice from BCHM 210; CHEM 203
Year Three: MSM 302, 306, 307, 308; ZOOL 321; EM 454 typically with ZOOL 326; 301 and 302

## Mathematics

Year One: AMTH 140 and 142; MATH 101 and 102 typically with COMP 131 and 132 and a choice from BIOL 110 and 120; CHEM 110 and 120; GEOL 110 and 120; PHYS 121 and 122
Year Two: AMTH 246, 247; PMTH 212, 213; STAT 260, 261 typically with 200-level COMP
Year Three: PMTH 332, 333, 335, 338, 339 typically with 300-level AMTH or STAT or COMP; PMTH 336 and 337

## Microbiology/Biochemistry

Year One: BIOL 110 and 120; CHEM 110 and 120 typically with MATH 110 and STAT 100 and BIOP 111 and 112 or PHYS 121 and 122 and MATH 101 and 102
Year Two: BCHM 210, 220; GENE 210; MICR 220 with a choice of units from CHEM, PSIO or ZOOL
Year Three: BCHM 310, 320, 330; MICR 350, 360; GENE 340 and a choice from BOTY, GENE, CHEM, PSIO or ZOOL units

## Microbiology/Genetics

Year One: BIOL 110 and 120; CHEM 110 and 120 typically with MATH 110 and STAT 100; BIOP 111 and 112
Year Two: BCHM 210, 220; GENE 210; MICR 220 typically with STAT 200; CHEM 204; PSIO 210, 220
Year Three: BCHM 320, 330; GENE 322, 351; MICR 350, 360 typically with BCHM 310; GENE 340

## Physiology (Human)

Year One: BIOL 110 and 120; CHEM 110 and 120 typically with PHYS 121 and 122 and MATH 101 and 102 or MATH 110 and STAT 100 and BIOP 111 and 112
Year Two: PSIO 210, 220 typically with BCHM 210, 220; GENE 210; MICR 220; PHAR 222
Year Three: PSIO 321, 322, 323, 324 typically with 300-level BCHM; 300-level MICR

## Physiology/Biochemistry

Year One: BIOL 110 and 120, CHEM 110 and 120 typically with PHYS 121 and 122 and MATH 101 and 102 or MATH 110 and STAT 100 and BIOP 111 and 112
Year Two: BCHM 210, 220; PHAR 222; PSIO 210, 220; ANUT 221 with a choice from GENE, MICR, CHEM or ZOOL units Year Three: BCHM 310, 320, 330; PSIO 321, 322, 323, 324 with a choice from GENE, MICR, CHEM or ZOOL units

## Physiology/Zoology

Year One: BIOL 110 and 120; CHEM 110 and 120 typically with PHYS 121 and 122 and MATH 101 and 102 or MATH 110 and STAT 100 and BIOP 111 and 112
Year Two: BCHM 210, 220; ZOOL 230; PSIO 210, 220 and ANUT 221 typically with GENE 210; PHAR 222; Z00L 210, 220
Year Three: PSIO 321, 322, 323, 324; ZOOL 326 typically with 300-level Z00L

## Plant Pathology

Year One: BIOL 110 and 120; CHEM 110 and 120 typically with MATH 110 and STAT 100 and a choice from COMP 131 and 132; GEOL 110 and 120 or BIOP 111 and 112
Year Two: BOTY 211, 241; MICR 220; ZOOL 220 typically with BCHM 210; GENE 210 and a choice from AGRO 211, BCHM 220, ECOL 210, 220, 202; SOIL 220; Z00L 210
Year Three: BOTY 370; AGRO 311 typically with BCHM 330; HORT 420; MICR 350 and a choice from AGRO 321; BCHM 320; ECOL 302, 307; GENE 322; ZOOL 321

## Plant Physiology

Year One: BIOL 110 and 120; CHEM 110 and 120; PHYS 121 and 122 and MATH 101 and 102 or BIOP 111 and 112 and MATH 110 and STAT 100 and a choice from COMP 131 and 132; GEOL 110 and 120
Year Two: BCHM 210; BOTY 211 typically with BCHM 220; ECOL 210, 220, 202; GENE 210 and a choice from CHEM 203, 204; MICR 220; SOIL 220; ZOOL 230
Year Three: HORT 420 typically with BCHM 320; BOTY 360, 370 and a choice from AGRO 311; ECOL 302, 307; EM 454; GENE 340; MICR 350; ZOOL 323

## Plant Systematics

Year One: BIOL 110 and 120; CHEM 110 and 120 typically with MATH 110 and STAT 100 and a choice from COMP 131 and 132; GEOL 110 and 120; BIOP 111 and 112
Year Two: BOTY 211, 241; ECOL 210, 220 typically with BCHM 210; EVOL 211/311; GENE 210 and a choice from BCHM 220; ZOOL 210, 220, 230
Year Three: BIOL 301, 302; BOTY 360, 370; ECOL 307 typically with ECOL 302; GENE 322; and a choice from BCHM 330; EM 425; GENE 340; HORT 420; SCI 395

## Statistics

Year One: MATH 101 and 102 typically with AMTH 140 and 142; COMP 131 and 132 and a choice from BIOL 110 and 120; CHEM 110 and 120; GEOL 110 and 120; PHYS 121 and 122
Year Two: PMTH 212, 213; STAT 260, 261 typically with AMTH 247; and a choice from 200-level COMP
Year Three: STAT 354, 356, 357 typically with 300 level PMTH and a choice from 300 -level COMP or PMTH or AMTH

## Zoology (General)

Year One: BIOL 110 and 120; MATH 110 and STAT 100 or MATH 101 and 102; CHEM 110 and 120 and a choice from GEOL 110
and 120; PHYS 121 and 122 or BIOP 111 and 112
Year Two: ECOL 210, 220; ZOOL 210, 220, 230 typically with BCHM 210; ECOL 202; GENE 210 and a choice from BOTY 211, 241; CHEM 203; MICR 220; PSIO 210, 220; ANUT 221
Year Three: ZOOL 321, 325, 326, 327, 328; EVOL 211/311; MSM 302, 307 and a choice from BCHM 320; BOTY 310; EM 331, 423, 453, 454; MICR 360; PSIO 321, 322, 323, 324

## Notes

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