# Bachelor of Science

***Students who commenced their program of study prior to 2008 will normally complete their course of study under the provision of the specific Academic Program Rules current at the time of commencement. Student should consult the University of Adelaide Calendar Handbook of Undergraduate Programs 2007.***

***On application to the Faculty, continuing students may be permitted to complete their studies under the current Academic Program Rules, with such modifications and stipulations as the Faculty may deem necessary.***

These Program Rules should be read in conjunction with the University's policies (http://www.adelaide.edu.au/policies).

## 1 Duration of program

The program of study for the degrees shall extend over three years of full-time study or the part-time equivalent.

Note: Students may commence study in February (Semester 1) or July (Semester 2). However, some courses offered in Semester 2 require prerequisite courses offered in Semester 1.

## 2 Admission

### 2.1 Status, exemption and credit transfer - all programs

2.1.1 Exemption from any part of the program on the first occasion on which a candidate takes a course will be granted only in special cases and on grounds approved by the Faculty.

Note: Partial or full exemption/status for some Level I courses may be granted on account of International Baccalaureate studies upon application to the Faculty.

2.1.2 Candidates who have previously passed courses offered in other programs at the University of Adelaide or other recognised tertiary institutions and who wish to count such courses towards their degree may, on written application to the Faculty, be granted status towards such specific degree requirements as the Faculty shall determine, subject to the following conditions:

a Status will normally only be considered for courses passed within the previous ten years. Status may be granted on a course for course basis or on the basis of course for group of courses. Status will be granted only for courses that meet the academic requirements of the award towards which credit is sought.

b The candidate shall present a range of courses that fulfil the requirements of the relevant Academic Program Rules

*and*

c The candidate shall present courses that satisfy the Level III course requirements and the major in a science discipline requirements of the relevant Academic Program Rules, and which have not been presented for any other degree.

## 3 Assessment and examinations

3.1 In determining a candidate's final result in a course the assessors may take into account oral, written, practical or examination work, provided that the candidate has been given notice at the beginning of the course of the way in which the work will be taken into account and of its relative importance in the final result.

3.2 There shall be four classifications of pass in any courses offered by the Faculty of Sciences, as follows: Pass with High Distinction, Pass with Distinction, Pass with Credit, Pass.

3.3 a A candidate who obtains a Pass or higher grade in a course cannot repeat the course.

b A candidate who fails to obtain a Pass or higher grade in a course and who desires to take the course again shall, unless exempted wholly or partially there from by the Head of School concerned, undertake written and laboratory and/or other work in that course to the satisfaction of the teaching staff concerned.

c A candidate who has twice failed to obtain a Pass or higher grade in any course shall not enrol for the course again, or for any other course which in the opinion of the Faculty contains a substantial amount of the same material, except by permission of the Faculty and under such conditions as the Faculty may prescribe.

## 4 Qualification requirements

4.1 To qualify for the degree a candidate shall, subject to the conditions and modifications specified under 4.3 and 4.4 below, pass courses from 4.5 below to the value of 72 units which satisfy the following requirements:

a a candidate shall present passes in Level I courses to the value of not more than 30 units which must include SCIENCE 1100 Principles and Practice of Science I

b a candidate shall present passes in Level III courses to the value of at least 24 units

c a candidate shall complete a major in a science discipline as set out in 4.4 below.

In all cases, a candidate may substitute an appropriate course chosen from Level II to fulfil the requirements of Level I, or from Level III to fulfil the requirements of Level I or II.

4.2 As part of the requirements of 4.1 above, a candidate may, in lieu of Level I or II courses, present passes to the value of 9 units, no more than 6 units at Level I, in courses offered by the Faculty of Humanities and Social Sciences, the Faculty of Engineering, Computer and Mathematical Sciences, and the School of Architecture, Landscape Architecture and Urban Design. Passes in courses offered by other Faculties may also be presented, provided the enrolment is approved both by the Faculty of Sciences and the other School or Faculty.

4.3 Unacceptable combinations of courses

No candidate will be permitted to count towards an award any course, together with any other course, which, in the opinion of the Faculty, contains a substantial amount of the same material, and no course or portion of a course may be counted twice towards an award.

Note: A list of unacceptable combinations of courses is available from the Faculty of Sciences.

4.4 To complete a major in a Science discipline a candidate shall present Level III courses, for which a result of Pass, Pass with Credit, Pass with Distinction or Pass with High Distinction has been obtained. No candidate may present the same course towards more than one major. A major must satisfy one of the following criteria:

**Anatomical Sciences**

At least three of:

ANAT SC 3101 Anthropological & Forensic Anatomy III ..... 3

ANAT SC 3102 Comparative Reproductive Biology of Mammals III ..... 3

ANAT SC 3103 Integrative & Comparative Neuroanatomy III ..... 3

ANAT SC 3104 Structural Cell Biology III ..... 3

**Biochemistry**

BIOCHEM 3000 Molecular & Structural Biology III ..... 6

BIOCHEM 3001 Cancer, Stem Cells & Developmental Biology III ..... 6

**Botany**

ENV BIOL 3006 Research Methods in Environmental Biology III ..... 3

*and at least two of:*

ENV BIOL 3002 Australian Biota: Past, Present and Future III ..... 3

ENV BIOL 3009 Ecophysiology of Plants III ..... 3

PLANTS SC 3500WT Soil and Plant Nutrition ..... 3

**Chemistry**

CHEM 3111 Chemistry III ..... 6

*and at least two of following Chemistry courses*:

CHEM 3211 Heterocyclic Chemistry & Molecular Devices III ..... 3

CHEM 3212 Materials Chemistry III ..... 3

CHEM 3213 Advanced Synthetic Methods III ..... 3

CHEM 3214 Medicinal & Biological Chemistry III ..... 3

CHEM 3530 Environmental & Analytical Chemistry III ..... 3

CHEM 3540 Research Methods in Chemistry III ..... 3

**Chemistry - Double Major**

CHEM 3111 Chemistry III ..... 6

*and at least four of following Chemistry courses*:

CHEM 3213 Advanced Synthetic Methods III ..... 3

CHEM 3211 Heterocyclic Chemistry & Molecular Devices III ..... 3

CHEM 3212 Materials Chemistry III ..... 3

CHEM 3214 Medicinal & Biological Chemistry III ..... 3

CHEM 3530 Environmental & Analytical Chemistry III ..... 3

CHEM 3540 Research Methods in Chemistry III ..... 3

**Ecology**

ENV BIOL 3121 Concepts in Ecology III ..... 3

ENV BIOL 3006 Research Methods in Environmental Biology III ..... 3

*and at least two of*:

ENV BIOL 3004 Freshwater Ecology III ..... 3

ENV BIOL 3008 Conservation & Restoration III ..... 3

ENV BIOL 3010 Marine Ecology III ..... 3

SOIL&WAT 3016WT Soil Ecology and Nutrient Cycling III ..... 3

**Ecology and Spatial Science**

ENV BIOL 3121 Concepts in Ecology III ..... 3

ENV BIOL 3006 Research Methods in Environmental Biology III ..... 3

SOIL&WAT 3010 Remote Sensing III ..... 3

SOIL&WAT 3007WT GIS for Environmental Management III ..... 3

*and at least two of*:

ENV BIOL 3004 Freshwater Ecology III ..... 3

ENV BIOL 3008 Conservation & Restoration III ..... 3

ENV BIOL 3010 Marine Ecology III ..... 3

SOIL&WAT 3016WT Soil Ecology and Nutrient Cycling III ..... 3

**Geology**

GEOLOGY 3013 Tectonics III ..... 3

GEOLOGY 3016 Igneous & Metamorphic Geology III ..... 3

GEOLOGY 3019 Field Geoscience Program III ..... 3

GEOLOGY 3505 Basins, Sediments and Regolith III ..... 3

**Geophysics and Applied Geology**

GEOLOGY 3008 Geophysics III ..... 3

GEOLOGY 3502 Mineral and Energy Resources III ..... 3

GEOLOGY 3500 Exploration Methods III ..... 3

*and*

SOIL&WAT 3010 Remote Sensing III ..... 3

*or*

SOIL&WAT 3007WT GIS for Environmental Management ..... 3

**Genetics**

GENETICS 3111 Genes, Genomes & Molecular Evolution III ..... 6

GENETICS 3211 Genetic Expression & Human and Developmental Genetics III ..... 6

**Microbiology and Immunology**

MICRO 3000 Infection and Immunity IIIA ..... 6

MICRO 3001 Infection and Immunity IIIB ..... 6

**Molecular and Biomedical Science**

Courses to the value of 12 units taken from the courses offered by the disciplines of Biochemistry, Genetics, Microbiology & Immunology, and Physiology. (This major is only available to student wishing to undertake study overseas. Students wishing to take out this major must apply in writing to the Faculty and have their program of study approved prior to commencing study overseas).

**Pharmacology**

PHARM 3010 Pharmacology A III ..... 6

PHARM 3011 Pharmacology B III ..... 6

**Physics**

PHYSICS 3002 Experimental Physics III ..... 3

PHYSICS 3542 Physics III ..... 6

**Experimental and Theoretical Physics**

Courses to the value of at least 18 units, which include:

PHYSICS 3002 Experimental Physics III ..... 3

*and*

PHYSICS 3542 Physics III ..... 6

*and at least one of:*

PHYSICS 3006 Advanced Dynamics and Relativity III ..... 3

*or*

PHYSICS 3544 Quantum Mechanics III ..... 3

Together with additional Physics courses as required:

PHYSICS 3532 Atmospheric & Astrophysics III ..... 3

PHYSICS 3534 Computational Physics III ..... 3

PHYSICS 3540 Optics & Photonics III ..... 3

**Theoretical Physics**

PHYSICS 3542 Physics III ..... 6

*and*

PHYSICS 3006 Advanced Dynamics and Relativity III ..... 3

*or*

PHYSICS 3544 Quantum Mechanics III ..... 3

**Physiology**

PHYSIOL 3000 Advanced Systems Physiology III ..... 6

PHYSIOL 3001 Neurobiology III ..... 6

**Psychology**

PSYCHOL 3020 Doing Research in Psychology: Advanced Research Design, Methods & Analysis ..... 3

*and at least three of following Psychology courses:*

PSYCHOL 3021 Health & Lifespan Developmental Psychology ..... 3

PSYCHOL 3022 Individual Differences, Personality & Assessment ..... 3

PSYCHOL 3023 Perception, Cognition & Neuropsychology ..... 3

PSYCHOL 3024 Psychology in Society: Advanced ..... 3

PSYCHOL 3025 Psychology, Ideas and Action ..... 3

**Soil Science**

SOIL&WAT 3017WT Soil & Water: Management & Conservation III ..... 3

SOIL&WAT 3016WT Soil Ecology & Nutrient Cycling III ..... 3

*and an additional course from the following:*

GEOLOGY 3504 Basins, Sediments and Regoliths III ..... 3

PLANT SC 3500WT Soil and Plant Nutrition III ..... 3

SOIL&WAT 3004WT Environmental Toxicology & Remediation ..... 3

**Zoology**

ENV BIOL 3003 Ecophysiology of Animals III ..... 3

ENV BIOL 3006 Research Methods in Environmental Biology III ..... 3

ENV BIOL 3011 Evolution and Diversity of Insects III ..... 3

ENV BIOL 3122 Evolution and Palaeobiology of Animals III ..... 3

**Notes (not forming part of the Academic Program Rules)**

1 Pattern of study

Commencing students are encouraged to enrol in one of the recommended Foundation Packages that have been developed to ensure appropriate preparation for Level II and III studies. Information on foundation packages is available from the Faculty of Sciences Office or at www.sciences.adelaide.edu.au/current/ However, provided that they comply with the prerequisites for each course, students may select their own combinations of courses at first and subsequent year levels. It is highly recommended that at Level I students take a minimum of 9 units per semester of continuing courses to ensure pathways into Level II science courses. At Level II students are encouraged to take a minimum of 6 units per semester of continuing courses to enable pathways into Level III science courses and the completion of a major.

Full-time students normally take courses with an aggregate value of 24 units at each of levels I, II and III.

2 Work required to complete an Adelaide degree program (policy of the Faculty of Sciences)

a Graduates in another Faculty who wish to qualify for the degree of Bachelor of Science and to count towards that degree courses that have already been presented for another degree may do so, provided that the courses presented fulfil the requirements of 4.1 and 4.2 above, and include a major in a science discipline and Level III courses to the value of at least 24 units that have not been presented for any other degree.

b Students coming from other institutions and wishing to obtain a University of Adelaide degree, are required as a minimum to complete Level III courses from 4.5 with an aggregate units value of 24 including a major in a science discipline.

c With the special permission of the Faculty, a student who has completed most of the degree at the University of Adelaide including Level III courses with an aggregate value of 12 units and a major in a science discipline may be permitted to complete the requirements for the degree at another institution. All applications must be made in writing to the Faculty.

3 Under certain circumstances, and only with prior approval from the Faculty, courses to the value of not more than 6 units selected from the following list may be presented towards the degree of Bachelor of Science in lieu of Level III courses:

AGRONOMY 3026RW Ecology & Management of Rangelands (MY)* ....3

PATHOL 3003 General Pathology IIIHS ....6

PLANT SC 3030AEX/BEX Integrated Weed Management. ....3

Student wishing to present any of these courses towards the B.Sc. must apply in writing to the Faculty Office prior to enrolling in these courses.

*(MY) - taught in the mid-year break

4 A candidate may present up to 48 units of courses not listed in 4.5, but passed under another program offered by the Faculty of Sciences, towards completion of the Bachelor of Science program. Note that the candidate is still required to complete all other qualification requirements specified in 4.1, 4.2, 4.3 and 4.4 to qualify for the degree.

5 A candidate who has completed a major in a Science discipline as defined in 4.4, and also completes courses that fulfil requirements for a major as specified under the rules for the Bachelor of Mathematical and Computer Sciences, shall be awarded that Mathematical and Computer Sciences major in addition to the Science major.

## 4.5 Academic program

### 4.5.1 Level I Sciences

Semester 1

BIOLOGY 1101 Biology I: Molecules, Genes & Cells .... 3

CHEM 1100 Chemistry IA .... 3

CHEM 1101 Foundations of Chemistry IA** .... 3

FOOD SC 1001WT Food, Nutrition and Health I .... 3

GEOLOGY 1103 Earth Systems I .... 3

PHYSICS 1008 Physical Aspects of Nature I .... 3

PHYSICS 1100 Physics IA .... 3

PHYSICS 1101 Physics for the Life & Earth Sciences IA .... 3

PSYCHOL 1000 Psychology IA .... 3

SCIENCE 1100 Principles and Practice of Science I .... 3

Semester 2

BIOLOGY 1201 Biology I: Human Perspectives* .... 3

BIOLOGY 1202 Biology I: Organisms* .... 3

CHEM 1200 Chemistry IB .... 3

CHEM 1201 Foundations of Chemistry IB** .... 3

ENV BIOL 1002 Ecological Issues I .... 3

GEOLOGY 1100 Earth's Interior I .... 3

PHYSICS 1002 Astronomy I .... 3

PHYSICS 1200 Physics IB .... 3

PHYSICS 1201 Physics for the Life & Earth Sciences IB .... 3

PSYCHOL 1001 Psychology IB .... 3

*Only one of BIOLOGY 1201 Biology I: Human Perspectives and BIOLOGY 1202 Biology I: Organisms may be presented towards the B.Sc.

** Students who successfully complete CHEM 1101 Foundations of Chemistry IA and CHEM 1201 Foundations of Chemistry IB and who wish to continue their study of Chemistry at Level II will be required to undertake an additional course, CHEM 1300 Foundations of Chemistry IS, during Summer School (offered for the first time in 2013) before commencing Level II Chemistry studies.

Note: Students will be required to enrol and participate in SCIENCE 1000 Science Mentoring

### 4.5.2 Level I Mathematical & Computer Sciences

COMP SCI 1101 Introduction to Programming ..... 3
COMP SCI 1102 Object Orientated Programming ..... 3
MATHS 1011 Mathematics IA ..... 3
MATHS 1012 Mathematics IB ..... 3
MATHS 1013 Mathematics IMA ..... 3
STATS 1000 Statistical Practice I ..... 3
STATS 1004 Statistical Practice (Life Sciences) I ..... 3
STATS 1005 Statistical Analysis and Modelling I ..... 3

Note: COMP SCI 1003 Internet Computing cannot be presented towards the Bachelor of Science.

4.5.3 Level II Science

Semester 1

ANAT SC 2500 Cells and Tissues II ..... 3
BIOCHEM 2500 Biochemistry II: Molecular and Cell Biology ..... 3
CHEM 2510 Chemistry IIA ..... 3
CHEM 2530 Environmental & Analytical Chemistry II ..... 3
ENV BIOL 2500 Botany II ..... 3
ENV BIOL 2503 Zoology II ..... 3
GENETICS 2510 Genetics IIA ..... 3
GEOLOGY 2500 Sedimentary Geology II ..... 3
GEOLOGY 2501 Structural Geology II ..... 3
MICRO 2500 Microbiology II ..... 3
PHYSICS 2510 Physics IIA ..... 3
PHYSIOL 2510 Human Physiology IIA ..... 3
PSYCHOL 2004 Doing Research in Psychology: Research Design, Methods & Analysis ..... 3
PSYCHOL 2006 Foundations of Perception & Cognition ..... 3
SOIL&WAT 2500WT Soil & Water Resources II ..... 3
SOIL&WAT 2501 Spatial Information and Land Evaluation II ..... 3

Semester 2

ANAT SC 2501 Comparative Anatomy of Body Systems II ..... 3
BIOCHEM 2501 Biochemistry II: Metabolism ..... 3
CHEM 2520 Chemistry IIB ..... 3
CHEM 2540 Medicinal & Biological Chemistry II ..... 3
ENV BIOL 2501 Evolutionary Biology II ..... 3
ENV BIOL 2502 Ecology II ..... 3
GENETICS 2520 Genetics IIB ..... 3
GEOLOGY 2502 Igneous and Metamorphic Geology II ..... 3
GEOLOGY 2503 Landscape Processes and Environments II ..... 3
MICRO 2501 Immunology & Virology II ..... 3
PHYSICS 2520 Physics IIB ..... 3
PHYSICS 2530 Astrophysics II ..... 3
PHYSICS 2532 Classical Physics II ..... 3
PHYSICS 2534 Electromagnetism II ..... 3
PHYSIOL 2520 Human Physiology IIB ..... 3
PSYCHOL 2005 Foundations of Health & Lifespan Developmental Psychology ..... 3
PSYCHOL 2007 Psychology in Society ..... 3

4.5.4 Level II Mathematical & Computer Sciences

All Level II Mathematical and Computer Sciences courses, listed under Academic Program Rule 4.2.2.1 of the degree of Bachelor of Mathematical and Computer Sciences.

4.5.5 Level III Science

Semester 1

ANAT SC 3102 Comparative Reproductive Biology of Mammals III ..... 3
ANAT SC 3103 Integrative and Comparative Neuroanatomy III ..... 3
BIOCHEM 3000 Molecular and Structural Biology III ..... 6
CHEM 3111 Chemistry III ..... 6
CHEM 3530 Environmental & Analytical Chemistry III ..... 3
CHEM 3540 Research Methods in Chemistry III ..... 3
ENV BIOL 3004 Freshwater Ecology III ..... 3
ENV BIOL 3006 Research Methods in Environmental Biology III ..... 3
ENV BIOL 3011 Evolution and Diversity of Insects III ..... 3
ENV BIOL 3121 Concepts in Ecology III ..... 3
ENV BIOL 3002 Australian Biota: Past, Present & Future III ..... 3
GEOLOGY 3013 Tectonics III ..... 3
GEOLOGY 3016 Igneous & Metamorphic Geology III ..... 3
GEOLOGY 3500 Exploration Methods III ..... 3
GEOLOGY 3008 Geophysics III ..... 3
GENETICS 3111 Genes, Genomes and Molecular Evolution III ..... 6
MICRO 3000 Infection and Immunity IIIA ..... 6
PHARM 3010 Pharmacology A III ..... 6
PHYSIOL 3001 Neurobiology III ..... 6
PHYSICS 3006 Advanced Dynamics & Relativity III ..... 3
PHYSICS 3532 Astrophysics & Atmospheric Physics III ..... 3
PHYSICS 3542 Physics III ..... 6
PLANT SC 3131WT Integrated Pest Management III ..... 3
PLANT SC 3200WT Plant Breeding III ..... 3
PSYCHOL 3022 Individual Differences, Personality & Assessment ..... 3
PSYCHOL 3026 Learning and Behaviour ..... 3
PSYCHOL 3027 Psychology, Science and Society ..... 3
SOIL&WAT 3016WT Soil Ecology & Nutrient Cycling III ..... 3
SOIL&WAT 3022WT Soil Management & Conservation III ..... 3

Semester 2

AGRONOMY 3000RW Agroforestry III ..... 3
ANAT SC 3101 Anthropological and Forensic Anatomy III ..... 3
ANAT SC 3104 Structural Cell Biology III ..... 3
BIOCHEM 3001 Cancer, Stem Cells & Developmental Biology III ..... 6
CHEM 3211 Heterocyclic Chemistry and Molecular Devices III ..... 3
CHEM 3212 Materials Chemistry III ..... 3
CHEM 3213 Advanced Synthetic Methods III ..... 3
CHEM 3214 Medicinal and Biological Chemistry III ..... 3
ENV BIOL 3003 Ecophysiology of Animals III ..... 3
ENV BIOL 3008 Conservation & Restoration III ..... 3
ENV BIOL 3009 Ecophysiology of Plants III ..... 3
ENV BIOL 3010 Marine Ecology III ..... 3
ENV BIOL 3012WT Integrated Catchment Management III ..... 3
ENV BIOL 3122 Evolution and Palaeobiology of Animals III ..... 3
GEOLOGY 3502 Mineral and Energy Resources III ..... 3
GEOLOGY 3504 Basins, Sediments and Regolith III ..... 3
GEOLOGY 3019 Field Geoscience Program III ..... 3
GENETICS 3211 Gene Expression & Human and Developmental Genetics III ..... 6
MICRO 3001 Infection and Immunity IIIB ..... 6
PHARM 3011 Pharmacology B III ..... 6
PHYSIOL 3000 Advanced Systems Physiology ..... 6

PHYSICS 3002 Experimental Physics III ..... 3
PHYSICS 3534 Computational Physics III ..... 3
PHYSICS 3540 Optics & Photonics III ..... 3
PHYSICS 3544 Quantum Mechanics III ..... 3
PLANT SC 3500WT Soil and Plant Nutrition III ..... 3
PLANT SC 3009WT Plant Molecular Biology III ..... 6
PSYCHOL 3020 Doing Research in Psychology: Advanced Research Design, Methods & Analysis ..... 3
PSYCHOL 3021 Health & Lifespan Developmental Psychology ..... 3
PSYCHOL 3023 Perception & Cognition ..... 3
SOIL&WAT 3010 Remote Sensing III ..... 3
SOIL&WAT 3017WT Soil & Water: Management & Conservation III ..... 3
Summer semester
SOIL&WAT 3004WT Environmental Toxicology and Remediation III ..... 3
SOIL&WAT 3007WT GIS for Environmental Management III ..... 3
Winter semester
SOIL&WAT 3020WT GIS for Agriculture & Natural Resource Management ..... 3

4.5.6 Level III Mathematical & Computer Sciences

All Level III Mathematical and Computer Sciences courses listed under the Academic Program Rule 4.2.3.1 of the degree of Bachelor of Mathematical and Computer Sciences.

### 4.6 Graduation

Subject to Chapter 89 of the Statutes, candidates who have satisfied the requirements for any award of the University shall be admitted to that award.

## 5 Special circumstances

When in the opinion of the Faculty special circumstances exist, the Council, on the recommendation of the Faculty in each case, may vary any of the provisions of the Academic Program Rules for any particular award.