Program Code

BSC

Program Minimum Units

72

Standard Duration

3 Years

Program Faculty

Faculty of Sciences

AQF Level

07

Academic Year

2020

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

Overview

The Bachelor of Science (Advanced) is designed for high-achieving students who wish to develop their knowledge and understanding of science, with a strong emphasis on research skill development. Students design their own degree from a broad range of study options and have flexibility to select areas of specific interest. In first year, students enrol in a combination of courses that prepare them to follow pathways through to major study areas. In third year, students choose at least one area of science in which to specialise and undertake a research placement. This program provides students with the early opportunity to participate in the academic and research culture of the scientific areas they are most interested in, while still providing the choice and flexibility of a Bachelor of Science. Bachelor of Science (Advanced) students participate in program specific courses that will introduce topics on processes, communication and methods used in science research. Students will also participate in structured research activities and research seminars, normally only available to Honours and postgraduate students. In addition, a semester long research placement and lab attachments will provide breadth of experience. These activities will allow associations with academic staff in major research areas, providing early access to research laboratories/projects that can be further developed for an Honours year and postgraduate study (Masters or PhD).

Students enrolled in this program must maintain a minimum semester GPA of 5.0 throughout their enrolment or will be required to transfer to the Bachelor of Science. Students who have maintained this GPA will automatically be eligible for a place in the Bachelor of Science (Honours) program upon completion of the Bachelor of Science (Advanced).

The Bachelor of Science is an AQF Level 7 program with a standard full-time duration of 3 years.

Conditions

Interruption of program: Students must apply for permission from the Executive Dean or delegate before taking a Leave of Absence. Any extension of the leave without approval will result in the loss of place in the program but an application may be made to be re-admitted to the program subject to the admission procedures in place at the time.

Academic Program Rules for Bachelor of Science (Advanced) (BSc(Adv))

There shall be a Bachelor of Science (Advanced) (BSc(Adv)).

Qualification Requirements
Academic Program

To qualify for the degree of Bachelor of Science (Advanced), the student must complete satisfactorily a program of study consisting of the following requirements with a combined total of not less than 72 units:

1. Core courses to the value of 9 units
2. Elective courses to the value of 63 units, which may include other undergraduate courses offered by the University that are not offered by the Faculty of Sciences up to the value of 9 units in total at levels I and/or II with no more than 6 units at level I.
3. Level I courses not exceeding 30 units
4. Level III Science courses to the value of at least 24 units
5. One major chosen from the following:
    - Biochemistry
    - Bioinformatics
    - Chemistry
    - Ecology
    - Evolutionary Biology
    - Genetics
    - Geology
    - Geophysics
    - Microbiology & Immunology
    - Palaeontology
    - Physics
    - Plant Biology
    - Soil Science
    - Theoretical Physics

or a double major from:

- Chemistry (Double)
- Ecology & Spatial Science
- Experimental & Theoretical Physics
- Geology & Geophysics
- Palaeontology (Evolution)
- Palaeontology (Geology)

Note: A student who has completed a major in a Science discipline and also completes courses that fulfil requirements for a major as specified under the Academic Program Rules for the degree of Bachelor of Mathematical and Computer Sciences, shall be awarded that Mathematical and Computer Sciences major in addition to the Science major.
6. Broadening experience.

Core Courses

To satisfy the requirements for Core Courses students must complete courses to the value of 9 units.

Level I
SCIENCE 1300 Principles & Practice of Research (Advanced) I (3 units)

Level II
SCIENCE 2300 Principles & Practice of Research (Advanced) II (3 units)

Level III
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

Biochemistry Major

To satisfy the requirements for Biochemistry Major students must complete courses to the value of 12 units.

All of the following courses must be completed:
BIOCHEM 3000 Molecular and Structural Biology III (6 units)
BIOCHEM 3520 Cancer, Stem Cells and Development (Theory) III (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

Bioinformatics Major

To satisfy the requirements for Bioinformatics Major students must complete courses to the value of 12 units.

All of the following courses must be completed:
BIOINF 3000 Bioinformatics III (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

and

Courses to the value of 6 units from the following:
BIOINF 3005 Transcriptomics Applications III (3 units)
BIOINF 3010 Genomics Applications III (3 units)
BIOINF 3015 Epigenomics Applications III (3 units)

Chemistry Major

To satisfy the requirements for Chemistry Major students must complete courses to the value of 12 units.

All of the following courses must be completed:
CHEM 3111 Chemistry III (6 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

and

Courses to the value of 3 units from the following:
CHEM 3211 Synthesis of Materials III (3 units)
CHEM 3212 Fundamentals of Materials III (3 units)
CHEM 3213 Advanced Synthetic Methods III (3 units)
CHEM 3214 Medicinal and Biological Chemistry III (3 units)

Ecology Major

To satisfy the requirements for Ecology Major students must complete courses to the value of 12 units.

All of the following courses must be completed:
ENV BIOL 3121 Concepts in Ecology III (3 units)
ENV BIOL 3510 Research Methods in Ecology III (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

and

Courses to the value of 3 units from the following:
ENV BIOL 3004 Freshwater Ecology III (3 units)

ENV BIOL 3010 Marine Ecology III (3 units)
ENV BIOL 3580 Conservation Biology III (3 units)

Evolutionary Biology Major

To satisfy the requirements for Evolutionary Biology Major students must complete courses to the value of 12 units.

All of the following courses must be completed:
ENV BIOL 3011 Evolution and Diversity of Insects III (3 units)
ENV BIOL 3560 Evolution of Australian Biota III (3 units)
ENV BIOL 3535 Research Methods in Evolutionary Biology III (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

Genetics Major

To satisfy the requirements for Genetics Major students must complete courses to the value of 12 units.

All of the following courses must be completed:
GENETICS 3111 Genes, Genomes and Molecular Evolution III (6 units)
GENETICS 3520 Gene Expression & Human & Developmental Genetics (Theory) III (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

Geology Major

To satisfy the requirements for Geology Major students must complete courses to the value of 15 units.

All of the following courses must be completed:
GEOLOGY 3013 Tectonics III (3 units)
GEOLOGY 3016 Igneous and Metamorphic Geology III (3 units)
GEOLOGY 3019 Field Geoscience Program III (3 units)
GEOLOGY 3505 Earth Systems History III (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

Geophysics Major

To satisfy the requirements for Geophysics Major students must complete courses to the value of 15 units.

All of the following courses must be completed:
GEOLOGY 3022 Geophysics IIIA: Potential Fields and Geothermics (3 units)
GEOLOGY 3023 Geophysics IIIB: Electromagnetics and Seismology (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

and

Courses to the value of 6 units from the following:
GEOLOGY 3500 Exploration Methods III (3 units)
GEOLOGY 3502 Mineral and Energy Resources III (3 units)

and
SPATIAL 3007WT GIS for Environmental Management III (3 units)

or
SPATIAL 3010 Earth Observation III (3 units)

Microbiology & Immunology Major

To satisfy the requirements for Microbiology & Immunology Major students must complete courses to the value of 12 units.

All of the following courses must be completed:
MICRO 3000 Infection and Immunity IIIA (6 units)
MICRO 3520 Infection & Immunity B (Theory) III (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

Palaeontology Major

To satisfy the requirements for Palaeontology Major students must complete courses to the value of 15 units.

All of the following courses must be completed:

ENV BIOL 3560 Evolution of Australian Biota III (3 units)
PALAEO 3000 Field Palaeontology III (3 units)
PALAEO 3005 Geochronology, Fossils and Palaeoenvironments III (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

and

Courses to the value of 3 units from the following:
GEOLOGY 3505 Earth Systems History III (3 units)
ENV BIOL 3535 Research Methods in Evolutionary Biology III (3 units)

Physics Major

To satisfy the requirements for Physics Major students must complete courses to the value of 12 units.

All of the following courses must be completed:
PHYSICS 3002 Experimental Physics III (3 units)
PHYSICS 3542 Physics III (6 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

Plant Biology Major

To satisfy the requirements for Plant Biology Major students must complete courses to the value of 12 units.

All of the following courses must be completed:
PLANT SC 3540WT Professional Practice in Plant Biology III (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

and

Courses to the value of 6 units from the following:
PLANT SC 3200WT Plant Breeding III (3 units)
PLANT SC 3510WT Plant Health III (3 units)
PLANT SC 3515WT Plant Biotechnology III (3 units)
PLANT SC 3530WT Food Production in a Future Climate III (3 units)

Soil Science Major

To satisfy the requirements for Soil Science Major students must complete courses to the value of 12 units.

All of the following courses must be completed:
SOIL&WAT 3016WT Soil Ecology and Nutrient Cycling III (3 units)
SOIL&WAT 3017WT Soil & Water: Management & Conservation III (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

and

Courses to the value of 3 units from the following:
GEOLOGY 3505 Earth Systems History III (3 units)
PLANT SC 3505WT Soil and Plant Nutrition III (3 units)
SOIL&WAT 3004WT Environmental Toxicology and Remediation III (3 units)

Theoretical Physics Major

To satisfy the requirements for Theoretical Physics Major students must complete courses to the value of 15 units.

All of the following courses must be completed:
PHYSICS 3006 Advanced Dynamics and Relativity III (3 units)
PHYSICS 3542 Physics III (6 units)
PHYSICS 3544 Quantum Mechanics III (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

Chemistry Double Major

To satisfy the requirements for Chemistry Double Major students must complete courses to the value of 18 units.

All of the following courses must be completed:
CHEM 3111 Chemistry III (6 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

and

Courses to the value of 9 units from the following:
CHEM 3211 Synthesis of Materials III (3 units)
CHEM 3212 Fundamentals of Materials III (3 units)
CHEM 3213 Advanced Synthetic Methods III (3 units)
CHEM 3214 Medicinal and Biological Chemistry III (3 units)
CHEM 3560 Molecular Structure Determination III (6 units)

Ecology & Spatial Science Double Major

To satisfy the requirements for Ecology & Spatial Science Double Major students must complete courses to the value of 18 units.

All of the following courses must be completed:
ENV BIOL 3121 Concepts in Ecology III (3 units)
ENV BIOL 3510 Research Methods in Ecology III (3 units)
SPATIAL 3010 Earth Observation III (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

and

Courses to the value of up to 3 units may be taken from the following:
SPATIAL 3007WT GIS for Environmental Management III (3 units)
SPATIAL 3020WT GIS for Agriculture & Natural Resource III (3 units)

and

Courses to the value of up to 3 units may be taken from the following:
ENV BIOL 3004 Freshwater Ecology III (3 units)
ENV BIOL 3010 Marine Ecology III (3 units)
ENV BIOL 3580 Conservation Biology III (3 units)

Experimental & Theoretical Physics Double Major

To satisfy the requirements for Experimental & Theoretical Physics Double Major students must complete courses to the value of 18 units.

All of the following courses must be completed:
PHYSICS 3002 Experimental Physics III (3 units)
PHYSICS 3006 Advanced Dynamics and Relativity III (3 units)
PHYSICS 3542 Physics III (6 units)
PHYSICS 3544 Quantum Mechanics III (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

Geology & Geophysics Double Major

To satisfy the requirements for Geology & Geophysics Double Major students must complete courses to the value of 21 units.

All of the following courses must be completed:
GEOLOGY 3013 Tectonics III (3 units)
GEOLOGY 3016 Igneous and Metamorphic Geology III (3 units)
GEOLOGY 3019 Field Geoscience Program III (3 units)
GEOLOGY 3022 Geophysics IIIA: Potential Fields and Geothermics (3 units)
GEOLOGY 3023 Geophysics IIIB: Electromagnetics and Seismology (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

and

Courses to the value of 3 units from the following:
GEOLOGY 3500 Exploration Methods III (3 units)
GEOLOGY 3502 Mineral and Energy Resources III (3 units)
GEOLOGY 3505 Earth Systems History III (3 units)

Palaeontology (Evolution) Double Major

To satisfy the requirements for Palaeontology (Evolution) Double Major students must complete courses to the value of 24 units.

All of the following courses must be completed:

ENV BIOL 3011 Evolution and Diversity of Insects III (3 units)
ENV BIOL 3535 Research Methods in Evolutionary Biology III (3 units)
ENV BIOL 3560 Evolution of Australian Biota III (3 units)
ENV BIOL 3590 Evolutionary Biology III (3 units)
GEOLOGY 3505 Earth Systems History III (3 units)
PALAEO 3000 Field Palaeontology III (3 units)
PALAEO 3005 Geochronology, Fossils and Palaeoenvironments III (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

Palaeontology (Geology) Double Major

To satisfy the requirements for Palaeontology (Geology) Double Major students must complete courses to the value of 24 units.

All of the following courses must be completed:
ENV BIOL 3560 Evolution of Australian Biota III (3 units)
GEOLOGY 3013 Tectonics III (3 units)
GEOLOGY 3016 Igneous and Metamorphic Geology III (3 units)
GEOLOGY 3019 Field Geoscience Program III (3 units)
GEOLOGY 3505 Earth Systems History III (3 units)

PALAEO 3000 Field Palaeontology III (3 units)
PALAEO 3005 Geochronology, Fossils and Palaeoenvironments III (3 units)
SCIENCE 3100 Principles & Practice of Research (Advanced) III (3 units)

Science Elective Courses

Level I

Courses to the value of at least 12 units from the following:
BIOLOGY 1001 Fundamentals of Biology (3 units)
BIOLOGY 1101 Biology I: Molecules, Genes and Cells (3 units)
BIOLOGY 1201 Biology I: Human Perspectives (3 units)
BIOLOGY 1202 Biology I: Organisms (3 units)
BIOLOGY 1401 Concepts in Biology (3 units)
CHEM 1100 Chemistry IA (3 units)
CHEM 1101 Foundations of Chemistry IA (3 units)
CHEM 1200 Chemistry IB (3 units)
CHEM 1201 Foundations of Chemistry IB (3 units)
CHEM 1310 Chemistry IA(S) (3 units)
CHEM 1311 Chemistry IB(S) (3 units)
GEOLOGY 1100 Planet Earth (3 units)
GEOLOGY 1103 Building a Habitable Planet (3 units)
PHYSICS 1100 Physics IA (3 units)
PHYSICS 1200 Physics IB (3 units)
SCIENCE 1500 Introductory Data Science - Becoming Smart About Data (3 units)

and

additional elective courses offered by the University that are available to the student
Note:

1. Only one of BIOLOGY 1201 Biology I: Human Perspectives and BIOLOGY 1202 Biology I: Organisms may be presented towards the Bachelor of Science (Advanced).
2. Neither ANAT SC 1102 Human Biology IA nor ANAT SC 1103 Human Biology 1B may be presented towards the Bachelor of Science (Advanced).

Level II

Courses to the value of at least 12 units from the following:
AGRIC 2510WT Agricultural Genetics II (3 units)
BIOCHEM 2500 Biochemistry II: Molecular and Cell Biology (3 units)
BIOCHEM 2501 Biochemistry II: Metabolism (3 units)
CHEM 2545 Organic Chemistry II (3 units)
CHEM 2550 Physical and Inorganic Chemistry II (3 units)
ENV BIOL 2500 Botany II (3 units)
ENV BIOL 2501 Evolutionary Biology II (3 units)
ENV BIOL 2502 Ecology II (3 units)
ENV BIOL 2503 Zoology II (3 units)
ENV BIOL 2510 Plant Identification II (3 units)
GENETICS 2510 Genetics IIA: Foundation of Genetics (3 units)
GENETICS 2520 Genetics IIB: Function and Diversity of Genomes (3 units)
GEOLOGY 2500 Sedimentary Geology II (3 units)
GEOLOGY 2501 Structural Geology II (3 units)
GEOLOGY 2502 Igneous and Metamorphic Geology II (3 units)
GEOLOGY 2505 Geochemistry II (3 units)
MICRO 2500 Microbiology II (3 units)
MICRO 2501 Immunology & Virology II (3 units)

PHYSICS 2510 Physics IIA (3 units)
PHYSICS 2520 Physics IIB (3 units)
PHYSICS 2530 Astrophysics II (3 units)
PHYSICS 2532 Classical Physics II (3 units)
PHYSICS 2534 Electromagnetism II (3 units)
PLANT SC 2510WT Foundations in Plant Science II (3 units)
SOIL&WAT 2500 Soil and Water Resources II (3 units)
SPATIAL 2501 Spatial Information and Land Evaluation II (3 units)

and

additional elective courses offered by the University that are available to the student.

Level III
BIOCHEM 3000 Molecular and Structural Biology III (6 units)
BIOCHEM 3001 Cancer, Stem Cells & Development III (6 units)
BIOINF 3000 Bioinformatics III (3 units)
BIOINF 3005 Transcriptomics Applications III (3 units)
BIOINF 3010 Genomics Applications III (3 units)
BIOINF 3015 Epigenomics Applications III (3 units)
CHEM 3111 Chemistry III (6 units)
CHEM 3560 Molecular Structure Determination III (6 units)
CHEM 3211 Synthesis of Materials III (3 units)
CHEM 3212 Fundamentals of Materials III (3 units)
CHEM 3213 Advanced Synthetic Methods III (3 units)
CHEM 3214 Medicinal and Biological Chemistry III (3 units)
ENV BIOL 3004 Freshwater Ecology III (3 units)
ENV BIOL 3009 Ecophysiology of Plants III (3 units)
ENV BIOL 3010 Marine Ecology III (3 units)
ENV BIOL 3011 Evolution and Diversity of Insects III (3 units)
ENV BIOL 3121 Concepts in Ecology III (3 units)
ENV BIOL 3510 Research Methods in Ecology III (3 units)
ENV BIOL 3535 Research Methods in Evolutionary Biology III (3 units)
ENV BIOL 3560 Evolution of Australian Biota III (3 units)
ENV BIOL 3580 Conservation Biology III (3 units)
ENV BIOL 3590 Evolutionary Biology III (3 units)
GENETICS 3111 Genes, Genomes and Molecular Evolution III (6 units)
GENETICS 3211 Gene Expression & Human & Developmental Genetics III (6 units)
GEOLOGY 3013 Tectonics III (3 units)
GEOLOGY 3016 Igneous and Metamorphic Geology III (3 units)
GEOLOGY 3019 Field Geoscience Program III (3 units)
GEOLOGY 3022 Geophysics IIIA: Potential Fields and Geothermics (3 units)
GEOLOGY 3023 Geophysics IIIB: Electromagnetics and Seismology (3 units)
GEOLOGY 3500 Exploration Methods III (3 units)
GEOLOGY 3502 Mineral and Energy Resources III (3 units)
GEOLOGY 3505 Earth Systems History III (3 units)
MICRO 3000 Infection and Immunity IIIA (6 units)
MICRO 3001 Infection and Immunity IIIB (6 units)
PALAEO 3000 Field Palaeontology III (3 units)
PALAEO 3005 Geochronology, Fossils and Palaeoenvironments III (3 units)
PHYSICS 3002 Experimental Physics III (3 units)
PHYSICS 3006 Advanced Dynamics and Relativity III (3 units)
PHYSICS 3532 Atmospheric and Astrophysics III (3 units)
PHYSICS 3534 Computational Physics III (3 units)
PHYSICS 3540 Optics and Photonics III (3 units)
PHYSICS 3542 Physics III (6 units)
PHYSICS 3544 Quantum Mechanics III (3 units)
PLANT SC 3200WT Plant Breeding III (3 units)
PLANT SC 3505WT Soil and Plant Nutrition III (3 units)

PLANT SC 3510WT Plant Health III (3 units)
PLANT SC 3515WT Plant Biotechnology III (3 units)
PLANT SC 3530WT Food Production in a Future Climate III (3 units)
SCIENCE 3200 Communicating Science III (3 units)
SCIENCE 3500 Science International Study Tour (3 units)
SCIENCE 3510 Science International Study Tour B (3 units)
SCIENCE 3550 International Experience III (3 units)
SCIENCE 3700 Science Internship (3 units)
SOIL&WAT 3004WT Environmental Toxicology and Remediation III (3 units)
SOIL&WAT 3016WT Soil Ecology and Nutrient Cycling III (3 units)
SOIL&WAT 3017WT Soil & Water: Management & Conservation III (3 units)
SPATIAL 3007WT GIS for Environmental Management III (3 units)
SPATIAL 3010 Earth Observation III (3 units)
SPATIAL 3020WT GIS for Agriculture & Natural Resource III (3 units)

Elective courses in Mathematical and Computer Sciences

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

Level II

All Level II Mathematical and Computer Sciences courses, in the disciplines of Applied Mathematics, Computer Science, Mathematical Sciences, Pure Mathematics and Statistics as listed in the Bachelor of Mathematical and Computer Sciences.

Level III

All Level III Mathematical and Computer Sciences courses, in the disciplines of Applied Mathematics, Computer Science, Mathematical Sciences, Pure Mathematics and Statistics as listed in the Bachelor of Mathematical and Computer Sciences except for MATHS 3015 Communication Skills III and MATHS 3020 Advanced Mathematical Perspectives III

Broadening experience

The broadening experience requirement can be met by any of the following:

Study abroad or exchange

or

Courses to the value of at least 3 units from the following:
SCIENCE 2550 International Experience II (3 units)
SCIENCE 2700 Science Internship (3 units)
SCIENCE 3200 Communicating Science III (3 units)
SCIENCE 3500 Science International Study Tour (3 units)
SCIENCE 3510 Science International Study Tour B (3 units)
SCIENCE 3550 International Experience III (3 units)
SCIENCE 3700 Science Internship (3 units)

or

courses outside the major area of study.

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