

Bachelor of Mathematics/Bachelor of Science



Commencing in Semester 1 2019



Studying at Callaghan

This Program Plan is an enrolment guide to ensure you are on track to graduate. If at any time you wish to vary from this program plan seek prior advice from your [Program Advisor](#) to ensure you remain on track.



Semester 1

Year 1	MATH1210 ^ Mathematical Discovery 1 or MATH1110 ^ Mathematics for Engineering, Science and Technology 1	B MATH PROGRAMMING DIRECTED COURSE 1000 LEVEL	SCIE1001 Professional Scientific Thinking	SCIE1002 Multidisciplinary Laboratories
Year 2	MATH2310 ^ Calculus of Science and Engineering	SCIE2001 Professional Employment Skills	SCIENCE MAJOR ^	ELECTIVE or MATH2340 Linearity and Continuity
Year 3	MATH MAJOR 2000 level	SCIENCE MAJOR	SCIE3001A Transdisciplinary Capstone: Planning and Implementing	SCIENCE MAJOR
Year 4	MATH MAJOR 3000 level	MATH MAJOR 3000 level	SCIENCE MAJOR	SCIENCE MAJOR

Semester 2

MATH1800 Mathematical Modelling	STAT2010 Fundamentals of Statistics	MATH1220 ^ Mathematical Discovery 2 or MATH1120 ^ Mathematics for Engineering, Science and Technology 2	SCIENCE MAJOR ^
MATH2320 Linear Algebra	SCIE2002 Interdisciplinary Challenges	SCIENCE MAJOR ^	SCIENCE MAJOR
SCIENCE MAJOR	MATH MAJOR 2000 level	SCIE3001B Transdisciplinary Capstone: Implementing and Communicating	SCIENCE MAJOR
MATH MAJOR 3000 level	MATH MAJOR 3000 level	SCIENCE MAJOR	SCIENCE MAJOR

Program Plan Key: = Core = Science Major = Mathematics Major = Standard Pathway = Alternate Pathway = Directed = Electives

Science Majors available in Pathway B: Animal Biology – Chemistry – Climate, Water and Soils – Conservation and Ecological Sciences – Environmental Remediation – Geology – Integrated Geography – Marine, Coastal and Ecological Sciences – Physics – Plant Biology – Psychology

^ **Physics Major** – [MATH1210](#) or [MATH1110](#), [MATH1220](#) or [MATH1120](#) and [MATH2310](#) are part of the **Physics Major**. Students completing the **Physics Major** will complete an additional 30 units of electives.

To be eligible to graduate make sure you have completed 320 units (10 units = 1 course unless otherwise specified) which meet the following criteria:

- ✓ Core courses - 100 units.
- ✓ A 10 unit Bachelor of Mathematics programming directed course.
- ✓ Mathematics Major - 80 units, with a minimum of 40 units at 3000 level. 20 units of core will count toward the Mathematics Major.
- ✓ Standard Pathway - 20 units. Students who have obtained a Band 4 in HSC NSW Extension 1, or have completed NSW HSC Extension 2, or equivalent should complete the Standard Pathway. For further information please see [Enrolling in Maths](#) OR
- ✓ Alternate Pathway - 30 units. Students who have obtained a Band 5 in NSW HSC Mathematics, or have completed NSW HSC Extension 1, or equivalent should complete the Alternate Pathway. For further information please see [Enrolling in Maths](#).
- ✓ Science Major – 120 units (see Pathway B for Major sequences for individual requirements).
- ✓ Electives – 10 units for Standard pathway students, or zero units for Alternate Pathway students. Visit the [Course Handbook](#) to see a list of available Electives.
- ✓ The duration of this program is 4 years full time (40 units per semester) or part time equivalent.
- ✓ The maximum time to complete this program is 10 years.



Some courses have assumed knowledge and/or requisites, please refer to the individual [Course Handbook](#).

The [Program Handbook](#) has valuable information on program structure and requirements, if you are intending on studying part time or varying from this program plan please seek prior advice from your [Program Advisor](#).

See the
next page
for a list of
Major
pathways

Bachelor of Mathematics Directed Courses

Complete **10 units** from the following Directed courses:

[ENGG1003](#) Introduction to Procedural Programming

[INFT1004](#) Introduction to Programming

[SENG1110](#) Object Oriented Programming

Bachelor of Mathematics Major Sequences

A Major is an area of study that you wish to focus on in your program. A course will count towards your Major if it is listed as a compulsory or directed course under the relevant major in the [Program Handbook](#). In each major you must complete 80 units, including 20 units of core courses.

Majors Courses (Core and Compulsory Courses listed in **ORANGE**)

Subject to change - Please refer to the program handbook for up to date information.

Applied Mathematics Major	<p>Core courses that count towards Major</p> <p>MATH1800 Mathematical Modelling STAT2010 Fundamentals of Statistics</p> <p>Compulsory Courses</p> <p>MATH2330 Analysis MATH2800 Differential Equations</p> <p>Directed Courses</p> <p>Students must complete 40 units of 3000 level Directed courses, including <u>at least one</u> of MATH3840 or MATH3850.</p> <p>MATH3700 Advanced Differential Equations MATH3800 Optimisation MATH3820 Numerical Methods MATH3840 Optimisation in Business and Industry MATH3850 Industrial Project</p>
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Majors Courses (Core and Compulsory Courses listed in **ORANGE**)

Pure Mathematics Major	<p>Core courses that count towards Major</p> <p>MATH2310 Calculus of Science and Engineering MATH2320 Linear Algebra</p> <p>Compulsory Courses</p> <p>MATH2330 Analysis</p> <p>Directed Courses</p> <p>Students must complete 10 units of 2000 level Directed Courses</p> <p>MATH2600 Introduction to Modern Mathematical Computation MATH2800 Differential Equations</p> <p>Students must complete 40 units of 3000 level Directed Courses, including <u>at least one</u> of MATH3120 or MATH3170.</p> <p>MATH3010 MATH3120 Algebra MATH3170 Number Theory MATH3180 Topology MATH3205 Fourier Analysis MATH3242 Complex Analysis MATH3510 Combinatorics and Graph Theory MATH3700 Advanced Differential Equations MATH3820 Numerical Methods</p>
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Bachelor of Mathematics Major Sequences continued

A Major is an area of study that you wish to focus on in your program. A course will count towards your Major if it is listed as a compulsory or directed course under the relevant major in the [Program Handbook](#). In each major you must complete 80 units, including 20 units of core courses.

Majors Courses (Core and Compulsory Courses listed in **ORANGE**)

Subject to change - Please refer to the program handbook for up to date information.

Statistics Major Core courses that count towards Major

[MATH1800](#) Mathematical Modelling
[STAT2010](#) Fundamentals of Statistics

Compulsory Courses

[STAT2000](#) Applied Statistics and Research Methods
[STAT2020](#) Predictive Analytics
[STAT3010](#) Statistical Inference

Directed Courses

Students must complete 30 units of Directed Courses.

[STAT3030](#) Generalised Linear Models
[STAT3040](#) Time Series Analysis
[STAT3100](#) Systems Thinking for an Integrated Workforce
[STAT3120](#) Applied Bayesian Methods
[STAT3170](#) Surveys and Experiments

Majors Courses (Core and Compulsory Courses listed in **ORANGE**)

Studies In
Mathematics
And Statistics
Major
(SMS)

Core courses that count towards Major

[MATH2310](#) Calculus of Science and Engineering
[MATH2320](#) Linear Algebra

Directed Courses

Students must complete 20 units of 2000 level Directed Courses, including at least one of MATH2330, MATH2730 or STAT2000.

[MATH2330](#) Analysis
[MATH2600](#) Introduction to Modern Mathematical Computation
[MATH2800](#) Differential Equations
[STAT2000](#) Applied Statistics and Research Methods
[STAT2020](#) Predictive Analytics

Students must complete 40 units of 3000 level Directed Courses, including at least one MATH3120, MATH3170, MATH3840 and MATH3850.

[MATH3120](#) Algebra
[MATH3170](#) Number Theory
[MATH3180](#) Topology
[MATH3205](#) Fourier Analysis
[MATH3210](#) Directed Studies in Mathematics
[MATH3242](#) Complex Analysis
[MATH3400](#) Research Topics in Mathematics
[MATH3510](#) Combinatorics and Graph Theory
[MATH3700](#) Advanced Differential Equations
[MATH3800](#) Optimisation
[MATH3820](#) Numerical Methods
[MATH3840](#) Optimisation in Business and Industry
[MATH3850](#) Industrial Project
[STAT3010](#) Statistical Inference
[STAT3030](#) Generalised Linear Models
[STAT3040](#) Time Series Analysis
[STAT3100](#) Systems Thinking for an Integrated Workforce
[STAT3120](#) Applied Bayesian Methods
[STAT3170](#) Surveys and Experiments
[STAT3990](#) Topics in Statistics

Bachelor of Science Majors

A Major is an area of study that you wish to focus on in your program. You must complete at least 90 units in your Major. A course will count towards your Major if it is listed as a compulsory or directed course under the relevant Major in the [handbook](#).

Majors	Courses (Compulsory Courses listed in ORANGE)	Majors	Courses (Compulsory Courses listed in ORANGE)
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Subject to change - Please refer to the program handbook for up to date information.

Biology Major

Animal Biology

- [BIOL1001](#) Molecules, Cells and Organisms
- [BIOL1002](#) Organisms to Ecosystems
- [BIOL2001](#) Molecular Laboratory Skills for Biological Sciences
- [BIOL2002](#) Laboratory Skills in Biological Systems
- [BIOL2010](#) Biochemistry
- [BIOL2020](#) Animal Physiology and Development
- [BIOL2050](#) Molecular Genetics
- [BIOL2090](#) Microbial Biology
- [BIOL3001](#) Advanced Laboratory Skills in Biological Sciences
- [BIOL3020](#) Reproductive Physiology and Development
- [BIOL3090](#) Molecular Biology
- [BIOL3100](#) Microbiology

Biology Major

Plant Biology

- [BIOL1001](#) Molecules, Cells and Organisms
- [BIOL1002](#) Organisms to Ecosystems
- [BIOL2001](#) Molecular Laboratory Skills for Biological Sciences
- [BIOL2002](#) Laboratory Skills in Biological Systems
- [BIOL2010](#) Biochemistry
- [BIOL2050](#) Molecular Genetics
- [BIOL2090](#) Microbial Biology
- [BIOL2220](#) Plant Cell Development
- [BIOL3001](#) Advanced Laboratory Skills in Biological Sciences
- [BIOL3100](#) Microbiology
- [BIOL3310](#) Plant Cell & Molecular Biology
- [BIOL3330](#) Plant Development and Physiology

Chemistry Major

Chemistry

- [CHEM1010](#) Introductory Chemistry I
- [CHEM1020](#) Introductory Chemistry II
- [CHEM2110](#) Analytical Chemistry
- [CHEM2210](#) Inorganic Chemistry
- [CHEM2310](#) Organic Chemistry
- [CHEM2410](#) Physical Chemistry
- 3000 level Chemistry Directed Course (60 units)

Earth Science Major

Climate, Water and Soils

- [GEOS1040](#) Earth's Dynamic Systems
- [GEOS1050](#) Earth Processes and Products
- [GEOS2050](#) River Basin Processes
- [GEOS2060](#) Soil Properties and Processes
- [GEOS2080](#) Earth Science Field Course
- [GEOS2161](#) Spatial Science
- [ENVS3007](#) Environmental Remediation
- [GEOS3220](#) Coastal Environments and Processes
- [GEOS3250](#) Advanced Spatial Science
- [GEOS3340](#) Resource Management and Climate Change
- 2000 level Climate, Water and Soils Directed Course (10 units)
- 3000 level Climate Water and Soils Directed Course (10 units)

Bachelor of Science Major Sequences Continued.

A major is an area of study that you wish to focus on in your program. You must complete at least 90 units in your major. A course will count towards your major if it is listed as a compulsory or directed course under the relevant major in the [handbook](#).

Majors	Courses (Compulsory Courses listed in ORANGE)	Majors	Courses (Compulsory Courses listed in ORANGE)
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Subject to change - Please refer to the program handbook for up to date information.

Earth Science Major Geology	GEOS1040 Earth's Dynamic Systems GEOS1050 Earth Processes and Products GEOS2080 Earth Science Field Course GEOS2170 Optical Mineralogy and Igneous Petrology GEOS2190 Structural Geology GEOS2200 Earth's Sedimentary Rocks & Environments GEOS3110 Igneous Petrology and Crustal Evolution GEOS3160 Geology of Coalfields and Fuels GEOS3170 Resource and Exploration Geology GEOS3330 Tectonics 2000 level Geology Directed Course (10 Units) 3000 level Geology Directed Course (10 Units)	Environmental Science Major Biodiversity, Conservation and Ecological Sciences	ENVS1001 Environmental Science Concepts & Methods ENVS1003 Environmental Values and Ethics MARI1000 Issues in the Marine Environment ENVS2009 Catchment and Water Resource Management ENVS3003 Conservation Biology ENVS3004 Ecotoxicology ENVS3005 Animal Behaviour MARI3330 Marine Fisheries Biology and Management 2000 level Biodiversity, Conservation and Ecological Science Directed Course (20 Units) 3000 level Biodiversity, Conservation and Ecological Science Directed Course (20 Units)
Environmental Science Major Environmental Remediation	CHEM1010 Introductory Chemistry I CHEM1020 Introductory Chemistry II GEOS1040 Earth's Dynamic Systems GEOS1050 Earth Processes and Products CHEM2110 Analytical Chemistry CHEM2610 Environmental Chemistry I GEOS2050 River Basin Processes GEOS2161 Spatial Science CHEM3110 Instrumental Chemical Analysis ENVS3004 Ecotoxicology ENVS3007 Environmental Remediation 3000 level Environmental Remediation Directed Course (10 Units)	Environmental Science Major Marine, Coastal and Ecological Sciences	MARI1000 Issues in the Marine Environment ENVS2009 Catchment and Water Resource Management MARI2300 Marine Biology MARI2320 Marine Ecology ENVS3004 Ecotoxicology MARI3300 Integrated Coastal Ecosystems MARI3320 Ecological Methodology MARI3330 Marine Fisheries Biology and Management 1000 level Marine, Coastal and Ecological Sciences Directed Course (10 Units) 3000 level Marine, Coastal and Ecological Sciences Directed Course (30 Units)

Bachelor of Science Major Sequences Continued.

A major is an area of study that you wish to focus on in your program. You must complete at least 90 units in your major. A course will count towards your major if it is listed as a compulsory or directed course under the relevant major in the [handbook](#).

Majors	Courses (Compulsory Courses listed in ORANGE)	Majors	Courses (Compulsory Courses listed in ORANGE)
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Subject to change - Please refer to the program handbook for up to date information.

Geography Major Integrated Geography
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GEOG1020 Introduction to Human Geography GEOS1040 Earth's Dynamic Systems GEOS2161 Spatial Science GEOS3250 Advanced Spatial Science 2000 level Environmental Remediation Directed Course (30 Units) 3000 level Environmental Remediation Directed Course (50 Units)

Physics Major Physics

PHYS1210 Advanced Physics I PHYS1220 Advanced Physics II MATH2310 Calculus of Science and Engineering PHYS2111 Classical Physics I PHYS2112 Classical Physics 2 PHYS2211 Modern Physics 1 PHYS3111 Biophysics PHYS3112 Photonics PHYS3211 Quantum Information Science 1000 level Physics Directed Course List A (10 Units) 2000 level Physics Directed Course List B (10 Units) 3000 level Physics Directed Course List C (10 Units)

Psychology Major Psychology

PSYC1010 Psychology Introduction 1 PSYC1020 Psychology Introduction 2 PSYC2300 Cognitive Psychology PSYC2400 Biological Psychology STAT2000 Applied Statistics and Research Methods STAT2010 Fundamentals of Statistics STAT2020 Predictive Analytics PSYC3000 Advanced Research Methods and Statistics in Psychology PSYC3001 Advanced Psychological Measurement PSYC3200 Pre-Professional Psychology III PSYC3301 Advanced Perception and Learning in Psychology PSYC3700 Advanced Development Psychology and Developmental Psychopathology
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Helpful Hints & Tips

ENROLMENT HELP



Need help? >>
Ask UON >>



How do I use the Web Timetable? >>

RULES

It is important to follow this Program Plan.

You cannot repeat a course you've passed to try and get a better grade.

You cannot enrol in any extra courses not required by your program >>

INFO FOR NEW STUDENTS



First year undergraduate students usually only enrol in 1000 level courses >>

New Postgraduate students should only enrol in 6000 level courses >>



Find out all you need to know about getting started at uni >>

UNDERSTANDING COURSES & PROGRAMS



Not sure what courses to study? >>



Understanding program and course jargon >>



Understanding UON Jargon >>

PRIOR STUDY



Check you have met the assumed knowledge and requisites for courses before enrolling >>



Have you studied elsewhere or transferred programs? Don't forget to apply for credit >>

CONSIDERING A BREAK?



Need to take a break? This is called a 'leave of absence'. Check if you are eligible >>



Planning on going overseas? Keep electives free, so it's easier for you to receive credit for your overseas studies >>



UON offers a range of support services to assist with your health and wellbeing >>

MORE QUESTIONS?

We are here to answer questions about your program. Talk to us your way!

Ask UON

1300 ASK UON

Visit Student Central

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UONline via myUON