

PROGRAM PLAN

BACHELOR OF MATHEMATICS / BACHELOR OF SCIENCE

PROGRAM OPTION:
Pathway A – 80 Unit Science
Major

START DATE:
Semester 1, 2019 & Semester 1
2020

LOCATION:
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 advice from your Program Advisor to ensure you remain on track.

 [PROGRAM HANDBOOK](#)

 [COURSE HANDBOOK](#)

NAME:

STUDENT NO.:

COURSE STATUS KEY

C = Completed

En = Enrolled

NS = Not Started

YEAR 1	SEMESTER 1	MATH1210 Mathematical Discovery 1 CORE --- OR --- MATH1110 Mathematics for Engineering, Science and Technology 1 CORE	B MATH PROGRAMMING DIRECTED COURSE DIRECTED	SCIE1001 Professional Scientific Thinking CORE	SCIE1002 Multidisciplinary Laboratories CORE	SEMESTER 2	MATH1800 Mathematical Modelling CORE	STAT2010 Fundamentals of Statistics CORE	MATH1220 Mathematical Discovery 2 CORE --- OR --- MATH1120 Mathematics for Engineering, Science and Technology 2 CORE	ELECTIVE* 1000/2000/3000 Level ELECTIVE
		MATH2310 Calculus of Science and Engineering CORE	SCIE2001 Professional Employment Skills CORE	SCIENCE MAJOR MAJOR	ELECTIVE* 1000/2000/3000 Level ELECTIVE --- OR --- MATH2340 Linearity and Continuity CORE		MATH2320 Linear Algebra CORE	SCIE2002 Interdisciplinary Challenges CORE	SCIENCE MAJOR MAJOR	ELECTIVE* 1000/2000/3000 Level ELECTIVE
YEAR 2	SEMESTER 1	MATH MAJOR 2000 level MAJOR	SCIENCE MAJOR MAJOR	SCIE3001A Transdisciplinary Capstone: Planning and Implementing CORE	ELECTIVE* 2000/3000 Level ELECTIVE	SEMESTER 2	SCIENCE MAJOR MAJOR	MATH MAJOR 2000 level MAJOR	SCIE3001B Transdisciplinary Capstone: Implementing and Communicating CORE	ELECTIVE* 2000/3000 Level ELECTIVE
		MATH MAJOR 3000 level MAJOR	MATH MAJOR 3000 level MAJOR	SCIENCE MAJOR MAJOR	SCIENCE MAJOR MAJOR		MATH MAJOR 3000 level MAJOR	MATH MAJOR 3000 level MAJOR	SCIENCE MAJOR MAJOR	SCIENCE MAJOR MAJOR

Science Majors available in Pathway A: Biology – Chemistry of Advanced Materials – Environmental and Analytical Chemistry – Medicinal and Organic Chemistry
Earth Sciences – Biodiversity and Conservation – Marine and Coastal Science – Sustainable Resource Management– Geography

*Elective Options include: Science Elective Pathways or any unrestricted courses offered within the university.

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To be eligible to graduate make sure you have completed 240 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 – 80 units (see Pathway A for Major sequences for individual requirements).
- Electives - 50 units for Standard pathway students or 40 units for Alternate Pathway students. Electives can be chosen from Science Elective Pathways or any unrestricted courses offered within the university. Refer to the Science Elective Pathway Documents located on the [Program Handbook](#) or visit the [Course Handbook](#) to see a list of available Electives.
- Students must not exceed 120 units at 1000 level in this program.
- The duration of this program is 4 year 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](#). Please refer to the [Program Handbook](#) for specific information on program structure. If you are intending varying from this program plan please seek advice from your [Program Advisor](#).

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BACHELOR OF MATHEMATICS / BACHELOR OF SCIENCE

SCIENCE MAJORS

BIOLOGY MAJOR

COMPULSORY COURSES

Complete the following compulsory courses:

BIOL1001: Molecules, Cells and Organisms
BIOL1002: Organisms to Ecosystems

DIRECTED COURSES – 2000 LEVEL

Complete 30 units from:

BIOL2020: Animal Physiology and Development
BIOL2050: Molecular Genetics
BIOL2090: Microbial Biology
BIOL2220: Plant Cell Development

DIRECTED COURSES – 3000 LEVEL

Complete 30 units from:

BIOL3020: Reproductive Physiology and Development
BIOL3090: Molecular Biology
BIOL3100: Microbiology
BIOL3330: Plant Development and Physiology

CHEMISTRY OF ADVANCED MATERIALS MAJOR

COMPULSORY COURSES

Complete the following compulsory courses:

CHEM1010: Introductory Chemistry I
CHEM1020: Introductory Chemistry II
CHEM2110: Analytical Chemistry
CHEM2210: Inorganic Chemistry
CHEM2410: Physical Chemistry
CHEM3410: Energy and Structure

DIRECTED COURSES – 3000 LEVEL

Complete 20 units from:

CHEM3210: Metal Complexation, Structure and Reactivity
CHEM3560: Materials Chemistry: Solids and Semiconductors
CHEM3580: Polymers and Colloids

ENVIRONMENTAL AND ANALYTICAL CHEMISTRY MAJOR

COMPULSORY COURSES

Complete the following compulsory courses:

CHEM1010: Introductory Chemistry I
CHEM1020: Introductory Chemistry II
CHEM2110: Analytical Chemistry
CHEM2610: Environmental Chemistry I

DIRECTED COURSES – 2000 LEVEL

Complete 10 units from:

CHEM2201: Analytical and Medicinal Chemistry
GEOS2060: Soil Properties and Processes

DIRECTED COURSES – 3000 LEVEL

Complete 30 units from:

CHEM3110: Instrumental Chemical Analysis
CHEM3570: Spectroscopic Characterisation of Compounds
ENVS3004: Ecotoxicology
ENVS3007: Environmental Remediation

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SCIENCE MAJORS

MEDICINAL AND ORGANIC CHEMISTRY MAJOR

COMPULSORY COURSES

Complete the following compulsory courses:

CHEM1010: Introductory Chemistry I
CHEM1020: Introductory Chemistry II
CHEM2210: Inorganic Chemistry
CHEM2310: Organic Chemistry
CHEM3310: Molecular Organic Synthesis
CHEM3550: Medicinal and Biological Chemistry

DIRECTED COURSES – 2000 LEVEL

Complete 10 units from:

CHEM2110: Analytical Chemistry
CHEM2201: Analytical and Medicinal Chemistry

DIRECTED COURSES – 3000 LEVEL

Complete 10 units from:

CHEM3110: Instrumental Chemical Analysis
CHEM3580: Polymers and Colloids

EARTH SCIENCES MAJOR

COMPULSORY COURSES

Complete the following compulsory courses:

GEOS1040: Earth's Dynamic Systems
GEOS1050: Earth Processes and Products

DIRECTED COURSES – 2000 LEVEL

Complete 30 units from:

GEOS2050: River Basin Processes
GEOS2060: Soil Properties and Processes
GEOS2080: Earth Science Field Course
GEOS2161: Spatial Science
GEOS2170: Optical Mineralogy
GEOS2190: Structural Geology
GEOS2200: Earth's Sedimentary Rocks & Environments

DIRECTED COURSES – 2000 LEVEL

Complete 30 units from:

ENVS3007: Environmental Remediation
GEOS3110: Igneous Petrology and Crustal Evolution
GEOS3160: Energy Resources
GEOS3170: Resource and Exploration Geology
GEOS3220: Coastal Environments and Processes
GEOS3250: Advanced Spatial Science
GEOS3280: Global Change and the Rise of Modern Environments
GEOS3330: Tectonics
GEOS3340: Climate Change and Resource Management

BIODIVERSITY AND CONSERVATION MAJOR

COMPULSORY COURSES

Complete the following compulsory courses:

ENVS1001: Environmental Science Concepts & Methods
ENVS1003: Environmental Values and Ethics
ENVS3003: Conservation Biology
ENVS3004: Ecotoxicology
ENVS3005: Animal Behaviour

DIRECTED COURSES – 2000 LEVEL

Complete 20 units from:

ENVS2004: Ecology
ENVS2005: Management of Australian Flora
ENVS2006: Ecology and Management of Wildlife

DIRECTED COURSES – 3000 LEVEL

Complete 10 units from:

ENVS3009: Advanced Water Science and Resource Management
ENVS3004: Advanced Research Project
MARI3320: Ecological Methodology
SRMT3060: Restoration Ecology

* Note: Students who commenced prior to 2020 please refer to the transition arrangements for this major on the [Program Handbook](#).

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SCIENCE MAJORS

MARINE AND COASTAL SCIENCE MAJOR

COMPULSORY COURSES

Complete the following compulsory courses:

MARI1000: Our Oceans
MARI2300: Marine Biology
MARI2500: Coastal and Marine Ecosystem Services *
MARI3300: Integrated Coastal Ecosystems
MARI3320: Ecological Methodology

DIRECTED COURSES – 1000 LEVEL

Complete 10 units from:

ENVS1001: Environmental Science Concepts & Methods
ENVS1003: Environmental Values and Ethics

DIRECTED COURSES – 3000 LEVEL

Complete 20 units from:

ENVS3005: Animal Behaviour
MARI3410: Coral Reef Biology, Ecology and Sustainability
ENVS3400: Advanced Research Project
ENVS3009: Advanced Water Science and Resource Management

* Note: Students who commenced prior to 2020 please refer to the transition arrangements for this major on the [Program Handbook](#).

SUSTAINABLE RESOURCE MANAGEMENT MAJOR

COMPULSORY COURSES

Complete the following compulsory courses:

ENVS1001: Environmental Science Concepts & Methods
ENVS1003: Environmental Values and Ethics
ENVS2009: Catchment and Water Resource Management
ENVS3001: Integrated Impact Assessment
ENVS3003: Conservation Biology
SRMT3040: Community Resource Management
SRMT3060: Restoration Ecology

DIRECTED COURSES

Complete 10 units from:

ENVS2005: Management of Australian Flora
ENVS2006: Ecology and Management of Wildlife

GEOGRAPHY MAJOR

COMPULSORY COURSES

Complete the following compulsory courses:

GEOG1020: Introduction to Human Geography
GEOS1040: Earth's Dynamic Systems
GEOS2161: Spatial Science
GEOS3250: Advanced Spatial Science

DIRECTED COURSES – 2000 LEVEL

Complete 10 units from:

ENVS2002: Environmental Legislation & Planning
ENVS2008: The Sustainable Society
GEOG2080: Cities and Regions
GEOG2130: Geographies of Development
GEOS2050: River Basin Processes
GEOS2080: Earth Science Field Course
SOCS2400: Applied Social Research

DIRECTED COURSES – 3000 LEVEL

Complete 30 units from:

ENVS3001: Integrated Impact Assessment
ENVS3006: Sustainability: Theory and Practice
ENVS3007: Environmental Remediation
GEOG3090: Society and Space
GEOG3240: Globalisation: Cities, Economies
GEOG3300: Rethinking Development
GEOG3330: Work Integrated Learning in Development Studies and Human Geography
GEOS3220: Coastal Environments and Processes
GEOS3280: Global Change and the Rise of Modern Environments
GEOS3340: Climate Change and Resource Management

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MATHEMATICS MAJORS

DIRECTED MATH PROGRAMMING COURSE

DIRECTED COURSES

Complete 10 units from:

ENGG1003: Introduction to Procedural Programming
INFT1004: Introduction to Programming
SENG1110: Object Oriented Programming

APPLIED MATHEMATICS MAJOR

COMPULSORY COURSES

Complete the following compulsory courses:

MATH2330: Analysis
MATH2800: Ordinary Differential Equations

DIRECTED COURSES

Complete 40 units from:

MATH3210: Directed Studies in Mathematics
MATH3242: Complex Analysis
MATH3700: Partial Differential Equations
MATH3800: Optimisation
MATH3820: Numerical Methods
MATH3840: Optimisation in Business and Industry
MATH3850: Industrial Project

PURE MATHEMATICS MAJOR

COMPULSORY COURSES

Complete the following compulsory course:

MATH2330: Analysis

DIRECTED COURSES – 2000 LEVEL

Complete 10 units from:

MATH2600: Introduction to Modern Mathematical Computation
MATH2800: Ordinary Differential Equations

DIRECTED COURSES – 3000 LEVEL

Complete 40 units from:

MATH3010: Logic and Set Theory
MATH3120: Algebra
MATH3170: Number Theory
MATH3180: Topology
MATH3205: Fourier Analysis
MATH3210: Directed Studies in Mathematics
MATH3242: Complex Analysis
MATH3510: Combinatorics and Graph Theory
MATH3700: Partial Differential Equations
MATH3820: Numerical Methods

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STATISTICS MAJOR

COMPULSORY COURSES

Complete the following compulsory courses:

STAT2000: Applied Statistics and Research Methods
STAT2020: Predictive Analytics
STAT3010: Statistical Inference

DIRECTED COURSES

Complete 30 units from:

STAT3030: Generalised Linear Models
STAT3040: Time Series Analysis
STAT3100: Systems Thinking for an Integrated Workforce
STAT3120: Applied Bayesian Methods
STAT3170: Surveys and Experiments

STUDIES IN MATHEMATICS AND STATISTICS MAJOR

COMPULSORY COURSES

Complete 20 units, including at least one of MATH2330 or STAT2000 from:

MATH2330: Analysis
MATH2600: Introduction to Modern Mathematical Computation
MATH2800: Ordinary Differential Equations
STAT2000: Applied Statistics and Research Methods
STAT2020: Predictive Analytics

DIRECTED COURSES

Complete 40 units from:

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: Partial 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