

PROGRAM PLAN

BACHELOR OF MATHEMATICS/BACHELOR OF SCIENCE

PROGRAM OPTION:
Pathway A – 80 Unit Science Major

START DATE:
Semester 2, 2019-2020

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 Academic 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	SEMESTER	COURSE	LEVEL	MAJOR	SEMESTER	COURSE	LEVEL	MAJOR					
YEAR 1	SEMESTER 1				SEMESTER 2	B MATH PROGRAMMING DIRECTED COURSE ENGG1003 or INFT1004 or SENG1110 DIRECTED		SCIENCE MAJOR SCIENCE MAJOR	ELECTIVE* 1000/2000/3000 Level ELECTIVE	ELECTIVE* 1000/2000/3000 Level ELECTIVE			
YEAR 2	SEMESTER 1	MATH1110* Mathematics for Engineering, Science and Technology 1 (MATH1210 no longer offered) CORE		SCIE1001 Professional Scientific Thinking CORE		SCIE1002 Multidisciplinary Laboratories CORE		SCIENCE MAJOR SCIENCE MAJOR	SEMESTER 2	MATH1120* Mathematics for Engineering, Science and Technology 2 (MATH1220 no longer offered) CORE	MATH1800 Mathematical Modelling CORE	STAT1300 Fundamentals of Statistics (replaces STAT2010 Fundamentals of Statistics) CORE	SCIENCE MAJOR SCIENCE MAJOR
YEAR 3	SEMESTER 1	MATH2310 Calculus of Science and Engineering CORE		SCIE2001 Professional Employment Skills CORE		MATH MAJOR 2000 level MATH MAJOR		MATH2340* Linearity and Continuity 1 (if you have completed both MATH1210 and MATH1220 you will complete an elective instead of MATH2340) CORE	SEMESTER 2	MATH2350 Linearity and Continuity 2 (replaces MATH2320 Linear Algebra) CORE	SCIE2002 Interdisciplinary Challenges CORE	MATH MAJOR 2000 level MATH MAJOR	SCIENCE MAJOR SCIENCE MAJOR
YEAR 4	SEMESTER 1	SCIE3001A Transdisciplinary Capstone: Planning and Implementing CORE		MATH MAJOR 3000 level MATH MAJOR		SCIENCE MAJOR SCIENCE MAJOR		ELECTIVE* 2000/3000 Level ELECTIVE	SEMESTER 2	SCIE3001B Transdisciplinary Capstone: Implementing and Communicating CORE	MATH MAJOR 3000 level MATH MAJOR	SCIENCE MAJOR SCIENCE MAJOR	SCIENCE MAJOR SCIENCE MAJOR
YEAR 5	SEMESTER 1	MATH MAJOR 3000 level MATH MAJOR		MATH MAJOR 3000 level MATH MAJOR		SCIENCE MAJOR SCIENCE MAJOR		ELECTIVE* 2000/3000 Level ELECTIVE	SEMESTER 2				

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 - Psychology

***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 – 130 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.
- Science Major – 80 units (see Pathway A for Major sequences for individual requirements).
- Electives – 40 units. 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.

** The Standard and Alternate Pathways have now been removed from the program. If you have completed both MATH1210 and MATH1220 you will complete an elective instead of MATH2340, you will complete a total of 60 units of core courses and 50 units of electives. Please refer to the transition documents for further information.*



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 [Academic Program Advisor](#).

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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:

BIOL2001: Molecular Lab Skills for Biological Sciences
BIOL2020: Animal Physiology and Development (no longer offered)
BIOL2050: Molecular Genetics
BIOL2090: Microbial Biology
BIOL2220: Plant Adaptation to Climate Change
ENVS2004: Ecology
ENVS2005: Management of Australian Flora
ENVS2006: Ecology and Management of Wildlife

DIRECTED COURSES – 3000 LEVEL

Complete 30 units from:

BIOL3020: Animal Physiology, Reproduction and Development
BIOL3090: Molecular Biology
BIOL3100: Microbiology
BIOL3330: Plant Development and Physiology (no longer offered)
ENVS3002: Environmental Management Perspectives
ENVS3003: Conservation Biology
ENVS3004: Ecotoxicology

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
CHEM3110: Instrumental Chemical Analysis

DIRECTED COURSES – 3000 LEVEL

Complete 30 units from:

CHEM3210: Metal Complexation, Structure and Reactivity
CHEM3410: Energy and Structure
CHEM3560: Materials Chemistry: Solids and Semiconductors (no longer offered)
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

DIRECTED COURSES – 2000 LEVEL

Complete 20 units from:

CHEM2201: Analytical and Medicinal Chemistry (no longer offered)
CHEM2210: Inorganic Chemistry
CHEM2610: Environmental Chemistry I (no longer offered)
CHEM2310: Organic Chemistry
GEOS2060: Soil Properties and Processes

DIRECTED COURSES – 3000 LEVEL

Complete 30 units from:

CHEM3110: Instrumental Chemical Analysis
CHEM3210: Chemistry of Nanostructured Materials
CHEM3570: Spectroscopic Characterisation of Compounds
CHEM3580: Polymers and Colloids
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
CHEM2110: Analytical Chemistry
CHEM2310: Organic Chemistry
CHEM2410: Physical Chemistry
CHEM3110: Instrumental Chemical Analysis

DIRECTED COURSES – 3000 LEVEL

Complete 20 units from:

CHEM3210: Chemistry of Nanostructured Materials
CHEM3310: Molecular Organic Synthesis
CHEM3550: Medicinal and Biological Chemistry

Courses removed from major, if you have already completed these courses, they still count towards your major:

CHEM2210: Inorganic Chemistry
CHEM3580: Polymers and Colloids

EARTH SCIENCES MAJOR

COMPULSORY COURSES

Complete the following compulsory courses:

GEOS1040: Earth's Dynamic Systems
GEOS1050: Earth Processes and Products
GEOS2080: Earth Science Field Course
GEOS2161: Spatial Science
GEOS3250: Advanced Spatial Science

DIRECTED COURSES – 2000 LEVEL

Complete 10 units from:

GEOS2050: River Basin Processes
GEOS2060: Soil Properties and Processes
GEOS2170: Optical Mineralogy (no longer offered)
GEOS2190: Structural Geology (no longer offered)
GEOS2200: Earth's Sedimentary Rocks & Environments (no longer offered)
ENVS2009: Catchment and Water Resource Management
SCIE2223: Weather and Waves

DIRECTED COURSES – 3000 LEVEL

Complete 20 units from:

ENVS3007: Environmental Remediation
GEOS3110: Igneous Petrology and Crustal Evolution (no longer offered)
GEOS3160: Energy Resources (no longer offered)
GEOS3170: Resource and Exploration Geology (no longer offered)
GEOS3220: Coastal Environments and Processes
GEOS3280: Global Change and the Rise of Modern Environments
GEOS3330: Tectonics (last offer 2021)
GEOS3340: Climate Change and Resource Management
ECON3006: Environmental Economics
ENVS3009: Advanced Water Science 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 (Callaghan offering only)
ENVS3004: Advanced Research Project (no longer offered)
MARI3320: Ecological Methodology
SRMT3060: Restoration Ecology
SCIE3500: Research Integrated Learning

* 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
ENVS3009: Advanced Water Science and Resource Management
(Callaghan offering only)
ENVS3400: Advanced Research Project (no longer offered)
MARI3410: Coral Reef Biology, Ecology and Sustainability
SCIE3500: Research Integrated Learning

* 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
SRMT3060: Restoration Ecology

DIRECTED COURSES – 1000 LEVEL

Complete 10 units from:

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

DIRECTED COURSES – 3000 LEVEL

Complete 10 units from:

ENVS3008: Organisational Placement in the Environmental Sector
ENVS3009: Advanced Water Science and Resource Management
SCIE3500: Research Integrated Learning
SRMT3040: Community Resource Management (no longer offered)

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: Surviving the Anthropocene
ENVS3007: Environmental Remediation
ENVS3008: Organisational Placement in the Environmental Sector
GEOG3090: Society and Space
GEOG3240: Globalisation: Cities, Economies (no longer offered)
GEOG3300: Rethinking Development
GEOG3330: Work Integrated Learning in Development Studies
and Human Geography (no longer offered)
GEOS3220: Coastal Environments and Processes
GEOS3280: Global Change and the Rise of Modern Environments
GEOS3340: Climate Change and Resource Management
SCIE3500: Research Integrated Learning

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PSYCHOLOGY MAJOR

COMPULSORY COURSES

Complete all the following compulsory courses:

PSYC1010: Psychology Introduction 1
PSYC1020: Psychology Introduction 2
PSYC2300: Cognitive Psychology
PSYC2400: Biological Psychology
PSYC3000: Advanced Research Methods and Stats in Psych

DIRECTED COURSES – 3000 level

Complete 30 units from:

ENVS3005: Animal Behaviour
PSYC3001: Advanced Psychological Measurement
PSYC3200: Foundations of Applied Neuropsychology
PSYC3301: Advanced Perception and Learning in Psychology
PSYC3800: Special Topics

Courses removed from major, if you have already completed these courses, they still count towards your major:

STAT2000: Applied Statistics and Research Methods
STAT2010: Fundamentals of Statistics
STAT2020: Predictive Analytics
PSYC3700: Advanced Devel Psych & Devel Psychopathology

DIRECTED MATH PROGRAMMING COURSE

DIRECTED COURSES

Complete 10 units from:

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

MATHEMATICS MAJORS

APPLIED MATHEMATICS MAJOR

DIRECTED COURSES – 2000 LEVEL

Complete 20 units from:

MATH2242: Complex Analysis (*replaces MATH3242, you cannot enrol if you have completed MATH3242*)
MATH2330: Analysis (*no longer offered*)
MATH2350: Linearity and continuity 2 (*if you have completed both MATH2320 and MATH2330 you cannot enrol in MATH2350*)
MATH2800: Ordinary Differential Equations

DIRECTED COURSES – 3000 LEVEL

Complete 40 units from:

MATH3120: Algebra
MATH3170: Number Theory
MATH3205: Fourier Analysis
MATH3210: Directed Studies in Mathematics (*no longer offered*)
MATH3242: Complex Analysis (*replaced by MATH2242, cannot enrol in both*)
MATH3700: Partial Differential Equations
MATH3800: Optimisation (*no longer offered*)
MATH3820: Numerical Methods
MATH3840: Optimisation in Business and Industry (*no longer offered*)
MATH3850: Industrial Project (*no longer offered*)
STAT3030: Generalised Linear Models
STAT3040: Time Series Analysis
STAT3100: Systems Thinking for an Integrated Workforce
STAT3120: Applied Bayesian Methods (*no longer offered*)
STAT3170: Surveys and Experiments (*no longer offered*)
STAT3800: Deterministic and Stochastic Optimisation

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MATHEMATICS MAJORS

PURE MATHEMATICS MAJOR

DIRECTED COURSES – 2000 LEVEL

Complete 20 units from:

- MATH2242: Complex Analysis** (*replaces MATH3242, you cannot enrol if you have completed MATH3242*)
- MATH2330: Analysis** (*no longer offered*)
- MATH2350: Linearity and continuity 2** (*if you have completed both MATH2320 and MATH2330 you cannot enrol in MATH2350*)
- MATH2600: Introduction to Modern Mathematical Computation** (*course no longer offered*)
- MATH2800: Ordinary Differential Equations**

DIRECTED COURSES – 3000 LEVEL

Complete 40 units from:

- MATH3010: Logic and Set Theory** (*no longer offered*)
- MATH3120: Algebra**
- MATH3170: Number Theory**
- MATH3180: Topology** (*no longer offered*)
- MATH3205: Fourier Analysis**
- MATH3210: Directed Studies in Mathematics** (*no longer offered*)
- MATH3242: Complex Analysis** (*replaced by MATH2242, cannot enrol in both*)
- MATH3510: Combinatorics and Graph Theory** (*no longer offered*)
- MATH3700: Partial Differential Equations**
- MATH3820: Numerical Methods**
- STAT3030: Generalised Linear Models**
- STAT3040: Time Series Analysis**
- STAT3100: Systems Thinking for an Integrated Workforce**
- STAT3120: Applied Bayesian Methods** (*no longer offered*)
- STAT3170: Surveys and Experiments** (*no longer offered*)
- STAT3800: Deterministic and Stochastic Optimisation**

STUDIES IN MATHEMATICS AND STATISTICS MAJOR

DIRECTED COURSES

Complete 20 units, including at least one of MATH2330 or MATH2350 or STAT2000 from:

- MATH2330: Analysis** (*no longer offered*)
- MATH2350: Linearity and continuity 2** (*if you have completed both MATH2320 and MATH2330 you cannot enrol in MATH2350*)
- MATH2600: Introduction to Modern Mathematical Computation** (*no longer offered*)
- 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** (*no longer offered*)
- MATH3205: Fourier Analysis**
- MATH3210: Directed Studies in Mathematics** (*no longer offered*)
- MATH3242: Complex Analysis** (*no longer offered*)
- MATH3400: Research Topics in Mathematics** (*no longer offered*)
- MATH3510: Combinatorics and Graph Theory** (*no longer offered*)
- MATH3700: Partial Differential Equations**
- MATH3800: Optimisation** (*no longer offered*)
- MATH3820: Numerical Methods**
- MATH3840: Optimisation in Business and Industry** (*no longer offered*)
- MATH3850: Industrial Project** (*no longer offered*)
- STAT3010: Statistical Inference** (*no longer offered*)
- STAT3030: Generalised Linear Models**
- STAT3040: Time Series Analysis**
- STAT3100: Systems Thinking for an Integrated Workforce**
- STAT3120: Applied Bayesian Methods** (*no longer offered*)
- STAT3170: Surveys and Experiments** (*no longer offered*)
- STAT3800: Deterministic and Stochastic Optimisation**
- STAT3990: Topics in Statistics** (*no longer offered*)

STATISTICS MAJOR

COMPULSORY COURSES

Complete the following compulsory courses:

- STAT2000: Applied Statistics and Research Methods**
- STAT2020: Predictive Analytics**
- STAT3010: Statistical Inference** (*no longer offered – if you have not completed STAT3010, you need to complete STAT2300*)

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** (*no longer offered*)
- STAT3170: Surveys and Experiments** (*no longer offered*)
- STAT3800: Deterministic and Stochastic Optimisation**