

PROGRAM PLAN



BACHELOR OF SCIENCE

PROGRAM OPTION:
80 Unit Double Major

START DATE:
Semester 1, 2019 - 2020

LOCATION:
Callaghan and Central Coast

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 1	SEMESTER 1	SCIE1001 Professional Scientific Thinking CORE	SCIE1002 Multidisciplinary Laboratories CORE	MAJOR 1 MAJOR	MAJOR 2^ MAJOR	SEMESTER 2	STAT1070 Statistics for the Sciences CORE	DIRECTED MATH* 1000 level DIRECTED	MAJOR 1 MAJOR	MAJOR 2^ MAJOR
	YEAR 2	SEMESTER 1	SCIE2001 Professional Employment Skills CORE	MAJOR 1 MAJOR	MAJOR 1 MAJOR		MAJOR 2^ MAJOR	SEMESTER 2	SCIE2002 Interdisciplinary Challenges MAJOR	MAJOR 1 MAJOR
YEAR 3	SEMESTER 1	SCIE3001A Transdisciplinary Capstone: Planning and Implementing CORE	MAJOR 1 MAJOR	MAJOR 2^ MAJOR	MAJOR 2^ MAJOR	SEMESTER 2	SCIE3001B Transdisciplinary Capstone: Implementing and Communicating CORE	MAJOR 1 MAJOR	MAJOR 1 MAJOR	MAJOR 2^ 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 – Mathematics – Statistics – Psychology

*Students choose their MATH Directed course based on previous mathematical background. See the [Enrolling in mathematics](#) – Maths Placement Test information.

^ Major 1 and Major 2 are to be chosen from different disciplines. Please refer to the [Program Handbook](#) to see which discipline each major belongs to.

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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 – 70 units.
- Directed – 10 unit MATH Directed.
- Major 1+ – 80 units chosen from one discipline.
- Major 2+ – 80 units chosen from another discipline.
- Students must ensure that each Major is chosen from a different discipline – visit the [Program Handbook](#) for more information.
- Each major must have a minimum of 60 units of unique courses. Please note that here are courses that can be counted towards both majors – which may allow you to complete up to 20 units of electives.
- Students must not exceed 100 units at 1000 level in this program.
- **Students who commenced in 2019** must complete a minimum of 40 units at all levels (1000, 2000 and 3000).
- **Students who commenced in 2020** must complete a minimum of 40 units at 1000 and 2000 level and a minimum of 60 units at 3000 level.
- The duration of this program is 3 year full-time (40 units per semester) or part-time equivalent.
- The maximum time to complete this program is 8 years.

+Important Information for students who commenced the program prior to 2021:

Bachelor of Science Majors

The majors in the Bachelor of Science program have changed from 2021, please refer to the [Transition Arrangements](#) in the Bachelor of Science Program Handbook.



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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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 Adaption 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 & 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: Applied Analytical Chemistry
CHEM2210: Materials Chemistry
CHEM2410: Physical Chemistry

DIRECTED COURSES – 3000 LEVEL

Complete 30 units from:

CHEM3110: Instrumental Chemical Analysis
CHEM3210: Functional Materials
CHEM3410: Energy and Structure
CHEM3560: Materials Chemistry: Solids and Semiconductors (no longer offered)
CHEM3580: Colloids, Interfaces and Soft Matter

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: Materials 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: Functional Materials
CHEM3570: Spectroscopic Characterisation of Compounds
CHEM3580: Colloids, Interfaces and Soft Matter
ENVS3004: Ecotoxicology
ENVS3007: Environmental Remediation

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MEDICINAL AND ORGANIC CHEMISTRY MAJOR

COMPULSORY COURSES

Complete the following compulsory courses:

CHEM1010: Introductory Chemistry I
CHEM1020: Introductory Chemistry II
CHEM2110: Applied Analytical Chemistry
CHEM2310: Organic Chemistry
CHEM2410: Physical Chemistry
CHEM3110: Instrumental Chemical Analysis

DIRECTED COURSES – 3000 LEVEL

Complete 20 units from:

CHEM3210: Functional 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: Materials Chemistry
CHEM3580: Colloids, Interfaces and Soft Matter

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

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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

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:

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

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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MATHEMATICS MAJOR

Students must complete MATH1110 as their Math Directed course.

COMPULSORY COURSES

Complete the following compulsory courses:

MATH1120: Mathematics for Engineering, Science and Technology 2
MATH2310: Calculus of Science and Engineering
MATH2340: Linearity and Continuity
MATH2800: Ordinary Differential Equations
MATH2242: Complex Analysis
MATH2320: Linear Algebra (no longer offered)

DIRECTED COURSES – 3000 LEVEL

Complete 20 units from:

MATH3010: Logic and Set Theory (no longer offered)
MATH3120: Algebra
MATH3170: Number Theory
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)
MATH3700: Partial Differential Equations and Modelling
MATH3800: Optimisation (no longer offered)
MATH3820: Numerical Methods
STAT3800: Deterministic and Stochastic Optimisation
SCIE3500: Research Integrated Learning

STATISTICS MAJOR

COMPULSORY COURSES

Complete the following compulsory courses:

STAT2000: Applied Statistics and Research Methods
***STAT2010: Fundamentals of Statistics (no longer offered)**
STAT2020: Predictive Analytics

DIRECTED COURSES – 1000 LEVEL

Complete 10 units from:

ENGG1003: Introduction to Procedural Programming
INFT1004: Introduction to Programming
MATH1120: Mathematics for Engineering, Science and Technology 2
SENG1110: Object Oriented Programming

DIRECTED COURSES – 3000 LEVEL

Complete 40 units from:

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)
SCIE3500: Research Integrated Learning

*** If you have not yet completed STAT2010, you need to complete STAT1300 instead. STAT1300 will count towards your program as a 2000 level course**

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