Bachelor of Mathematics/Bachelor of Science

See the last page for some helpful hints & tips!

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

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				Semester 2			
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	MATH1800 Mathematical Modelling	STAT2010 Fundamentals of Statistics	MATH1220 Mathematical Discovery 2 or MATH1120 Mathematics for Engineering, Science and Technology 2	ELECTIVE**
Year 2	MATH2310 Calculus of Science and Engineering	SCIE2001 Professional Employment Skills	SCIENCE MAJOR	ELECTIVE or MATH2340 Linearity and Continuity	MATH2320 Linear Algebra	SCIE2002 Interdisciplinary Challenges	SCIENCE MAJOR	ELECTIVE**
Year 3	MATH MAJOR 2000 level	SCIENCE MAJOR	SCIE3001A Transdisciplinary Capstone: Planning and Implementing	ELECTIVE**	SCIENCE MAJOR	MATH MAJOR 2000 level	SCIE3001B Transdisciplinary Capstone: Implementing and Communicating	ELECTIVE**
Year 4	MATH MAJOR 3000 level	MATH MAJOR 3000 level	SCIENCE MAJOR	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 A: Biology – Biodiversity and Conservation – Chemistry of Advanced Materials – Environmental and Analytical Chemistry – Earth Sciences – Geography – Marine and Coastal Science – Mathematics – Medicinal and Organic Chemistry – Statistics – Sustainable Resource

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

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 – 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.
- ✓ 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 pages 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	**Core courses that count towards Major** MATH1800 Mathematical Modelling STAT2010 Fundamentals of Statistics **Compulsory Courses** MATH2330 Analysis MATH2800 Differential Equations **Directed Courses** Students must complete 40 units of 3000 level Directed courses, including at least one of MATH3840 or MATH3850. MATH3700 Advanced Differential Equations MATH3800 Optimisation MATH3820 Numerical Methods MATH3840 Optimisation in Business and Industry MATH3850 Industrial Project
Pure Mathematics Major	**Core courses that count towards Major** MATH2310 Calculus of Science and Engineering MATH2320 Linear Algebra **Compulsory Courses** MATH2330 Analysis **Directed Courses** Students must complete 10 units of 2000 level Directed Courses MATH2600 Introduction to Modern Mathematical Computation MATH2800 Differential Equations Students must complete 40 units of 3000 level Directed Courses, including at least one of MATH3120 or MATH3170. 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

Bachelor of Mathematics Major Sequences cont…

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 Mathematics/ Bachelor of Science 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.

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

Majors	Courses (Compulsory Courses listed in ORANGE)	Majors	Courses (Compulsory Courses listed in ORANGE)
Biology Major Biology	BIOL1001 Molecules, Cells and Organisms BIOL1002 Organisms to Ecosystems 2000 level Biology Directed Courses (30 Units) 3000 level Biology Directed Courses (30 Units)	**Chemistry Major** Chemistry of Advanced Materials	CHEM1010 Introductory Chemistry I CHEM1020 Introductory Chemistry II CHEM2110 Analytical Chemistry CHEM2210 Inorganic Chemistry CHEM3410 Energy and Structure 2000 level Chemistry of Advanced Materials Directed Course (10 units) 3000 level Chemistry of Advanced Materials Directed Course (20 units)
Chemistry Major Environmental and Analytical Chemistry	CHEM1010 Introductory Chemistry I CHEM1020 Introductory Chemistry II CHEM2110 Analytical Chemistry CHEM2610 Environmental Chemistry I CHEM3410 Energy and Structure 2000 level Chemistry of Advanced Materials Directed Course (10 units) 3000 level Chemistry of Advanced Materials Directed Course (10 units)	**Chemistry Major** Medicinal and Organic Chemistry	CHEM1010 Introductory Chemistry I CHEM1020 Introductory Chemistry II CHEM2210 Inorganic Chemistry CHEM2310 Organic Chemistry CHEM3310 Molecular Organic Synthesis CHEM3550 Medicinal and Biological Chemistry 2000 level Medicinal and Organic Chemistry Directed Course (10 units) 3000 level Medicinal and Organic Chemistry Directed Course (10 units)
Earth Science Major Earth Sciences	GEOS1040 Earth's Dynamic Systems GEOS1050 Earth Processes and Products 2000 level Earth Science Directed Courses (30 Units) 3000 level Earth Science Directed Courses (30 Units)	**Environmental Science Major** Biodiversity and Conservation	ENVS1001 Environmental Science Concepts & Methods ENVS1003 Environmental Values and Ethics ENVS3003 Conservation Biology ENVS3004 Ecotoxicology ENVS3005 Animal Behaviour MARI3330 Marine Fisheries Biology and Management 2000 level Biodiversity and Conservation (20 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.

Major	Courses (Compulsory Courses listed in ORANGE)		
Subject to change- Please refer to the program handbook for up to date information.			
Environmental Science Major Marine and Coastal Science	MARI1000 Issues in the Marine Environment MARI2300 Marine Biology MARI2320 Marine Ecology MARI3300 Integrated Coastal Ecosystems MARI3320 Ecological Methodology MARI3330 Marine Fisheries Biology and Management 1000 level Marine and Coastal Directed Courses (10 Units) 3000 level Marine and Coastal Directed Courses (10 Units)	**Environmental Science Major** Sustainable Resource Management	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 2000 level Biodiversity and Conservation (10 Units)
Geography Major Geography	GEOG1020 Introduction to Human Geography GEOG1040 Earth's Dynamic Systems GEOS2161 Spatial Science GEOS3250 Advanced Spatial Science 2000 level Geography Directed Courses (30 Units) 3000 level Geography Directed Courses (30 Units)		

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
- Message us on Facebook
- or Twitter
- UONline via myUON