



**MONASH**  
University

**MONASH**  
SCIENCE

**Undergraduate  
Course Guide  
2018**

[monash.edu/science](http://monash.edu/science)





*“The love of science means respect for intellect. The thirst for opportunity. And the determination to put in the effort.”*

Dr Alan Finkel AO,  
Chief Scientist and former Monash University Chancellor

**We are facing a wide range of complex challenges – environmental pressure, climate change, booming population and an ever-changing technological, economic and social landscape.**

Our future depends on bright minds, innovators and collaborators who can create solutions that will change the world. With a science degree from Monash University the possibilities to be a driver of change are endless.

You could find yourself on a field trip searching for fossils in Antarctica, exploring gravitational waves using the LIGO Observatory in the US, developing a life-saving new vaccine, or influencing national and international policy on environmental issues.

Or you might want to be an entrepreneurial scientist using your training and knowledge in the business, government, and not-for-profit sectors.

If you want to make a difference, and use your science training and knowledge to influence our future, Monash Science is the place for you.









Science Student Learning Lounge

# WHY CHOOSE SCIENCE AT MONASH?

## Flexibility

- Our science degree offers flexibility and choice unrivalled by any other Australian university.
- You can study subjects across the scientific spectrum and even take units from other areas, such as arts, music, business, to name a few.
- We offer double degree options. Graduate with two degrees in less time.
- You can build your course around your love of science, and not be directed to study subject areas outside science that may not interest you.
- Our VTAC subject bonus rewards students studying more than one science subject—this could improve your ranking and eligibility into the Bachelor of Science by providing additional points towards your ATAR aggregate.

## Real experience from the world's best

- Learn from pioneering academics who are leaders in their scientific disciplines.
- We offer almost twice the number of lab hours as most Australian universities.
- Get involved in a research project—some of our students have been published in leading scientific journals before graduating!

## The world is your classroom

- We offer 25 units that can take you from the classroom out into the field—to Heron Island's pristine coral cays, the jungles of Borneo, and the rocky outcrops of the Cinque Terre in Italy.

- Seize the opportunity to assist our senior staff with research into topics as diverse as natural resource exploration in Tanzania, fossicking for fossils in Antarctica and developing solutions to water purity using graphene.
- Take advantage of the Monash Abroad exchange program and study for one or two semesters at our Monash Malaysia campus, or at one of our 100 university partners worldwide.

## Australia's best science facilities

- Study in our new state-of-the-art science precinct.

## Science Student Learning Lounge

- We have two 24/7 student lounges just for science students, along with many other comfortable break-out spaces for studying or just hanging out.



### Earth Sciences Garden

- We provide a unique approach to teaching. For example, you'll study geology by working in our Earth Sciences Garden – an outdoor classroom like no other, being the first of its kind in Australia and the most comprehensive worldwide.

### Jock Marshall Reserve

- We are home to the three-hectare Jock Marshall Reserve – an outdoor reserve that allows you to study the natural world in the great outdoors. The Reserve also includes a new Integrated Learning Facility.

### Green Chemical Futures Building

- Budding chemists take note – our new home of Chemistry, is an award-winning, multidisciplinary innovation hub where teaching, research and industry R&D mix in an exciting, creative space.

### Physics & Astronomy Collaborative-learning Environment (PACE)

- It's the end of traditional lectures in our first-year physics and astronomy classes. Instead you will benefit from problem-based learning through hands-on activities in a collaborative

learning environment, with purpose-built spaces to foster teamwork and improve learning outcomes.

### New Horizons Research Centre

- This houses the research laboratories of the School of Physics and Astronomy. It brings together world-class researchers from Monash and CSIRO, with diverse backgrounds in physics, astrophysics, engineering, mathematics, IT and biosciences.

### Getting ready for the real world

- We provide coaching and guidance to prepare you for the world after university, from learning leadership skills to writing your CV.
- We have an in-house careers consultant, and leadership and mentoring programs to help prepare you for your dream job.
- We engineer invaluable networking exposure through our Science Industry Placement Program or Industry Internship unit, supplemented by our annual Science Industry Week where students can access their future employers.

- The jobs database and other services offered by Monash Career Connect assists you with work opportunities during your studies and upon graduation.
- We have a proven track record for providing a springboard to a huge range of careers and postgraduate research in science and beyond.
- Depending on your major, you may be eligible to join the following professional bodies: Royal Australian Chemical Institute, Australian Institute of Biology, Australian Society for Microbiology, Environment Institute of Australia and many others.

For more information about career development and support, visit: [monash.edu/science/careers-support](https://monash.edu/science/careers-support)



Physics & Astronomy Collaborative-learning Environment (PACE)





Earth Sciences Garden, the first of its kind in Australia

## SUPPORTING YOU ALL THE WAY

Your success is our success. We partner with you to bring out the best in you. Science at Monash offers a range of services to help you when you start and throughout your course. These include:

### Science Student Services

Our expert course advisors are there to help you shape your course, according to your interests, passions and career goals.

### Science Transition Program

We have developed an online hub to help you make a smooth transition to uni. Each week when you log in you will see tips on where to get lecture notes, how to access library materials, managing workload, preparing for exams and much more.

### Drop in study centres

We offer drop-in homework centres for all students where you will find free tutoring and academic support. If you need assistance with lecture, tutorial or laboratory class content, the tutors in the learning centres can help. Many of the tutors are also instructors in first-year units so they have extensive knowledge of the unit, assignments and assessment tasks you need to complete. Tutors can also assist with developing study plans, providing tips on study techniques and showing you how to access the range of university support services available.

### Mentors

The Science Peer Mentoring Program matches you with a senior science student who can help you get settled in and make new friends as you begin your studies.

The six-week program provides you with opportunities to meet like-minded fellow students in a social setting.

For more information on our help and support services, visit:  
[monash.edu/science/student-help](https://monash.edu/science/student-help)





# GET INVOLVED

We offer many additional opportunities to develop networks within the university and to help you take your Science degree to the next level.

## Dean's Student Action Committee

The Dean's Student Action Committee gives you the opportunity to represent the student voice to our senior managers. Being part of the Committee gives you the opportunity to shape the Faculty's future and influence decisions that affect students.

## Becoming a mentor

As a mentor, you play a vital part in helping new students make a smooth transition from high school to university life. You meet with your mentee weekly and organise fun activities to help your mentee settle in, make friends and have a fun and successful first year. As a mentor, you receive training and support from your own 'super mentor'.

## Monash Science Societies

The Monash Science Society (MSS) is one of our largest student clubs offering a range of activities throughout the year. There are also a number of other science societies providing a great opportunity to make new friends and get involved.

Monash University also offers over 150 student clubs and societies as well as plenty of opportunities to get involved through the many different volunteering and leadership initiatives.

## Science Future Leaders Program

Influence and inspire the next generation of up-and-coming scientists by joining the Science Future Leaders Program. Activities undertaken during the year-long program will assist you in developing a range of skills relevant to leadership in your studies and career. Activities include a camp, a series of leadership seminars and workshops, and the opportunity to practice leadership within the university, your chosen profession, and/or wider community.

## Science Student Ambassador Program

Science Student Ambassadors play a key role in promoting science programs and activities to future and current students. You will gain hands-on experience with public speaking, social media management and events. Science Student Ambassadors receive \$1,000 as recognition of their commitment to the role.

For more information on the leadership and social experiences you can add as a Monash Science student, visit: [monash.edu/science/social-leadership](https://monash.edu/science/social-leadership)



@MONASHSCIENCE

Follow us on Instagram to see what life on campus is really like.

Jock Marshall Reserve, Biology teaching facility – Clayton Campus



# OUR COURSES

## At a glance

For students looking to begin study in 2018

BACHELOR OF SCIENCE	
ATAR	IB SCORE
85.00*	31
Monash Guarantee 75.00	

The choice, flexibility and depth across the huge range of science disciplines available at Monash means that you will graduate with a degree unique to you, tailored to your individual expertise, interests and career aspirations.

- Flexible, not locked-in from day one to a defined area of science.
- 26 majors to choose from.
- Specialise in up to two majors— can include one from Science or one from another eligible faculty.

### Subject prerequisites

VCE	IB
<b>English:</b> Units 3 and 4: a study score of at least 30 in English (EAL) or 25 in English other than EAL	<b>English:</b> At least 4 in English SL or 3 in English HL or 5 in English B SL or 4 in English B HL
<b>Maths or Science:</b> Units 3 and 4: a study score of at least 25 in one of Biology, Chemistry, Environmental Science, Geography, Mathematical Methods (CAS), Specialist Mathematics, Physics or Psychology	<b>Maths or Science:</b> At least 4 at Standard Level (SL) or 3 at Higher Level (HL) in one of Biology, Chemistry, Environmental Systems and Societies (SL only), Further Mathematics (HL only), Geography, Mathematics, Physics or Psychology

Course details	
📍 <b>Location(s):</b>	On-campus at Clayton
🕒 <b>Duration:</b>	3 years (full-time)

Our VTAC Subject Bonus	
Rewards students studying more than one Year 12 science subject - this could improve your ranking and eligibility by providing additional points towards your ATAR aggregate.	

\*Australian domestic students ATAR.

International students should consult [study.monash](http://study.monash)

BACHELOR OF SCIENCE ADVANCED Global Challenges (Honours)	
ATAR + RC**	IB SCORE + RC**
90.00*#	33
Monash Guarantee 85.00	
** Range of Criteria includes supplementary information form and interview.	

Unique course, only one of its kind in Australia

- Two internships, with at least one international placement.
- Includes an 'Impact through science' stream, that provides high-level training in leadership, persuasive communication, entrepreneurship, policy, ethics and corporate social responsibility.
- Transforms scientific expertise into a thriving business venture or social enterprise.

### Subject prerequisites

VCE	IB
<b>English:</b> Units 3 and 4: a study score of at least 35 in English (EAL) or 30 in English other than EAL	<b>English:</b> At least 5 in English SL or 4 in English HL or 6 in English B SL or 5 in English B HL
<b>Maths or Science:</b> Units 3 and 4: a study score of at least 30 in one of Biology, Chemistry, Environmental Science, Geography, Mathematical Methods (CAS), Specialist Mathematics, Physics or Psychology	<b>Maths or Science:</b> At least 5 in Standard Level (SL) or 4 at Higher Level (HL) in one of Biology, Chemistry, Environmental Systems and Societies (SL only), Further Mathematics (HL only), Geography, Mathematics, Physics or Psychology

Course details	
📍 <b>Location(s):</b>	On-campus at Clayton
🕒 <b>Duration:</b>	4 years (full-time)

# Estimated ATAR

Visit <a href="http://study.monash">study.monash</a> to view entry requirements and to read more about our courses.	
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BACHELOR OF SCIENCE ADVANCED Research (Honours)	
ATAR	IB SCORE
95.05*	37
Monash Guarantee 90.00	

Do you see yourself making a difference in the world through the advancement of scientific research?

If so, this is the course for you.

- Designed for students who intend to pursue a career in research.
- Allows for accelerated learning by progressing earlier to higher-level and advanced units.
- Enhanced opportunities for research projects.
- Research mentoring by leading scientists.
- Must undertake two science majors.
- Possible entry into a PhD.

### Subject prerequisites

VCE	IB
<b>English:</b> Units 3 & 4: a study score of at least 35 in English (EAL) or 30 in English other than EAL	<b>English:</b> At least 5 in English SL or 4 in English HL or 6 in English B SL or 5 in English B HL
<b>Maths:</b> Units 3 & 4: a study score of at least 30 in Mathematical Methods (any)	<b>Maths:</b> At least 5 in Mathematics SL or 4 in Mathematics HL or 4 in Further Mathematics HL
<b>Maths or Science:</b> Units 3 & 4: a study score of at least 30 in two of Biology, Chemistry, Environmental Science, Geography, Specialist Mathematics, Physics or Psychology	<b>Maths or Science:</b> At least 5 in Standard Level (SL) or 4 in Higher Level (HL) in two of Biology, Chemistry, Environmental Systems and Societies (SL only), Further Mathematics (HL only), Geography, Mathematics, Physics or Psychology.

Note: Mathematics or Further Mathematics can only be used if not counted towards the Maths prerequisite.

Course details	
📍 <b>Location(s):</b>	On-campus at Clayton
🕒 <b>Duration:</b>	4 years (full-time)



# DOUBLE DEGREES

If you have a passion for an area outside of science, or would like to go into a field in which scientific knowledge would be an advantage, a double degree could be the perfect choice for you.

Combining science with another area of specialisation gives you a unique set of skills and helps you stand out in today's competitive job market.

COURSE	SECOND DEGREES AVAILABLE	LENGTH FT (YRS)	2017 ATAR
Bachelor of Science	+ Bachelor of Arts	4	85
	+ Bachelor of Biomedical Science	4	95.05
	+ Bachelor of Commerce	4	91.4
	+ Bachelor of Computer Science	4	85.2
	+ Bachelor of Global Studies	4	90.15
	+ Bachelor of Commerce Specialist	4	93.2
	+ Bachelor of Education (Honours)	4	85.7
	+ Bachelor of Engineering (Honours)	5	91
	+ Bachelor of Information Technology	4	85.7
	+ Bachelor of Laws (Honours)	5	98
	+ Bachelor of Music	4	85 <sup>#</sup> +RC <sup>**</sup>

To find out more about double degrees, including how they work and why you should do one, visit: [study.monash/courses](http://study.monash/courses)



<sup>#</sup> **Estimated ATAR**

<sup>\*\*</sup> **Range of Criteria includes Audition**

## SAMPLE COURSE MAP

This is an example of what your studies as a science student could look like (single degree). As a Bachelor of Science student you will have the option to take electives, allowing you to choose subjects outside of science, or extra science subjects, depending on your interests.

YEAR 1	Semester 1	Science major	Science	Maths or Statistics	Elective
	Semester 2	Science major	Science	Science elective	Elective
YEAR 2	Semester 1	Science major	Science	Science Communication	Elective
	Semester 2	Science major	Science	Science	Elective
YEAR 3	Semester 1	Science major	Science major	Elective	Elective
	Semester 2	Science major	Science major	Elective	Elective



# WHERE YOUR FIRST-YEAR STUDY CAN TAKE YOU

## What you can study in first year

### Biology

#### Choose from:

Biology I, Biology II  
Environmental biology



#### Possible Majors

Biochemistry  
Developmental Biology  
Ecology and Conservation Biology  
Environmental Science (extended major)  
Genetics  
Human Pathology  
Immunology  
Microbiology  
Pharmacology  
Physiology  
Plant Sciences  
Zoology



#### Example careers

Agricultural Researcher  
Animal Technician  
Bioinformatician  
Biotechnologist  
Biotechnology Product Developer  
Botanist/Plant Scientist  
Clinical Scientist  
Cytogeneticist  
Ecologist Entomologist  
Environmental/Conservation Biologist  
Environmental Consultant  
Environmental Health Promoter  
Evolution And Adaptation Biologist  
Fauna Assessment Officer  
Geneticist  
Hospital Scientist  
Laboratory Research Technician  
Marine/Freshwater Biologist  
Medical Researcher  
Microbiologist  
Museum Curator  
Park Ranger  
Patent Officer  
Research Scientist  
Science Journalist  
Science Teacher  
Soil Scientist  
University Lecturer  
Wildlife Manager  
Zoologist

### Chemistry

#### Choose from:

Chemistry I, Chemistry II  
Chemistry advanced I  
Chemistry advanced II



#### Possible Majors

Biochemistry  
Chemistry  
Materials Science  
Physiology



#### Example careers

Agrochemicals Chemist  
Analytical Chemist  
Biomedical Chemist/Analytical Chemist  
Biotechnologist  
Biotechnology Sales and Marketing Manager  
Drug Development Chemist  
Environmental/Water Chemist  
Explosives Chemist  
Food Technologist  
Forensic Scientist  
Hospital or Medical Laboratory Technician  
Industrial Chemist  
Instrument Specialist  
Molecular Design Chemist  
Occupational Health and Safety Officer  
Occupational Hygienist  
Paint Chemist  
Pharmaceutical and Product Manufacturer  
Pharmaceutical Representative  
Polymer Chemist/Materials Scientist  
Process Control Specialist  
Quality Controller  
Research Chemist  
Risk-Management Consultant  
Science Journalist  
Teacher  
Toxicologist  
Waste and Resources Management Consultant  
Water Quality and Management Consultant  
Winemaker

### Earth, Atmosphere and Environment

#### Choose from:

Earth, atmosphere and environment I  
Earth, atmosphere and environment II



#### Possible Majors

Earth Science  
Geographical Science  
Environmental Science (extended major)  
Atmospheric Science



#### Example careers

Atmospheric Scientist  
Ecotourism Operator  
Environmental Geoscientist  
Environmental Scientist  
Geochemist (Analytical Laboratories)  
Geological Survey Scientist  
Geologist (Mineral/Petroleum Exploration)  
Geophysicist  
Geospatial Analyst  
Geotechnical Engineer  
Government Adviser (Environmental Policy and Management)  
Hydrologist  
Hydrogeologist  
Land Use Planner  
Landcare Project Manager  
Marine Biologist  
Marine Geoscientist  
Metallurgist  
Museum Scientist  
Natural Resource Manager  
Palaeontologist  
Park Ranger  
Research Geologist  
Research Geophysicist  
Soil Scientist  
Weather Forecaster





## What you can study in first year

### Mathematics

#### Choose from:

Functions and their applications  
Analysis of change  
Techniques for modelling  
Techniques for modelling (advanced)  
Discrete mathematics for computer science  
Multivariable calculus  
Multivariable calculus (advanced)  
Introduction to statistical reasoning  
Statistical methods for science



#### Possible Majors

Applied Mathematics  
Financial and Insurance Mathematics (extended major)  
Mathematics  
Mathematical Statistics  
Pure Mathematics



#### Example careers

Atmospheric Scientist  
Biostatistician/Data Analyst  
Business Analyst  
Computational Mathematician  
Computer Software Developer  
Data Mining Analyst  
Environmental Resource Model Developer  
Financial Consultant  
Investment/Business Analyst  
Market Statistician  
Mathematical Modeller  
Mathematics Teacher  
Meteorologist  
Oceanographer  
Programmer  
Quantitative Analyst  
Statistician

### Physics

#### Choose from:

Classical physics and relativity  
Fields and quantum physics  
Physics for the living world  
Foundation physics  
Earth to cosmos – introductory astronomy  
Life and the universe - astrobiology



#### Possible Majors

Astrophysics  
Materials Science  
Physics  
Physiology



#### Example careers

Accelerator Physicist  
Acoustics Scientist  
Applied Physicist  
Astronomer and Astrophysicist  
Atmospheric Physicist  
Biophysicist  
Electron Microscopist  
Energy Consultant  
Forensic Physicist  
Industrial Physicist  
Instrumentation Physicist  
Materials Scientist  
Medical Physicist  
Nuclear Physicist  
Optical Physicist  
Optical Systems Specialist  
Patent Attorney  
Physics Teacher  
Synchrotron Scientist  
Telecommunications Specialist  
University Lecturer

### Information Technology

#### Choose from:

Introduction to computer science  
Algorithms and programming fundamentals in Python



#### Possible Majors

Computational Science



#### Example careers

Business Analyst  
Business Operations Coordinator  
Consultant Business Systems Analyst  
Graduate Project Manager  
IT Analyst  
IT Consultant  
IT Domain Specialist  
IT Support  
Project Manager  
Software Consultant  
Software Developer  
Software Test Analyst  
Strategic Analyst  
Technology Consultant  
Web Developer

### Psychology

#### Choose from:

Psychology 1A  
Psychology 1B



#### Possible Majors

Psychology



#### Example careers

Career Counselling  
Child Psychology  
Clinical Neuropsychology  
Clinical Psychology  
Counselling Psychology  
Educational and Developmental Psychology  
Forensic Psychology  
Health Psychology  
Management  
Organisational Psychology  
Sport Psychology  
Teaching



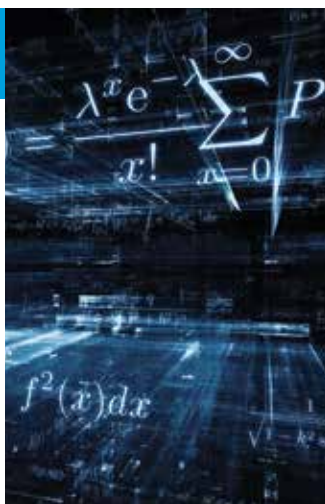
# A – Z GUIDE OF SCIENCE MAJORS

Within the Bachelor of Science at least eight units will make up your primary major. You will also have eight units of free electives, which offer you the flexibility to shape your course in a number of different ways, like extending your major to add depth, adding a second major or a minor from the same or another course, or studying a range of units from across the university.

## APPLIED MATHEMATICS

Apply techniques and models to solve problems from medicine, engineering, information technology and commerce.

- Explain observations or predict future trends.
- Contribute to new theories and adapt existing mathematical approaches to new problems.
- Develop key technical skills in advanced calculus, linear algebra, differential equations and computational methods.



## ASTROPHYSICS

Use observations and the laws of physics to understand the Universe and its constituents.

- Study celestial objects such as planets and stars, comets, pulsars and quasars, black holes and galaxies.
- Link the smallest and the largest objects in the universe, from strings to super clusters of galaxies.
- Explore the possibility of extraterrestrial life.
- Use the latest technology – from large telescopes to supercomputers.



## ATMOSPHERIC SCIENCE

Explore the relationship between the Earth's atmosphere, weather and climate.

- Study aspects of environmental science, applied mathematics and physics that drive weather and climate.
- Ask the big questions: Is the climate changing, and is it our fault? How can we better forecast day-to-day weather?
- Undertake exciting fieldwork, analyse and model climate, and engage in research.



## BIOCHEMISTRY

Explore the chemical components and biological processes of all living systems.

- Study the chemistry within the biological processes that form the foundation for all living matter.
- Understand the cause of disease.
- See how effective treatments/ vaccines are developed.



## CHEMISTRY

**Study the science of matter and energy.**

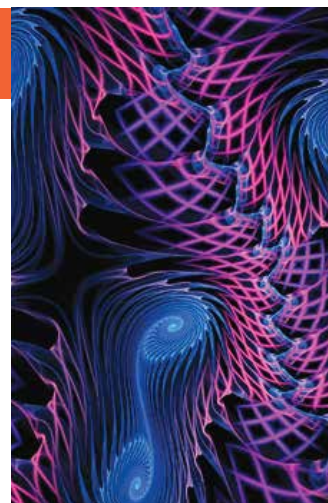
- Investigate the structure of substances.
- See how atoms and molecules react and interact, and how this affects materials, medicine and technology.
- Learn about synthetic and analytical chemistry, medicinal and biological chemistry, and physical and environmental chemistry.
- Undertake lab work in a brand-new, purpose-built chemistry facility.



## COMPUTATIONAL SCIENCE

**Solve scientific problems through computers.**

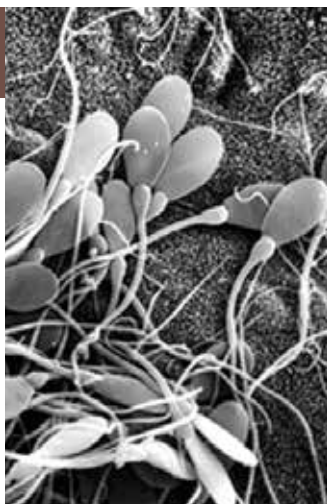
- Construct and apply mathematical models, simulations and data-analysis techniques.
- Learn the fundamentals of algorithmic problem solving to advanced programming, 3D computer graphics and intelligent systems.
- Undertake parallel computation for massive data analysis and simulation to tackle the world's current and emerging problems.



## DEVELOPMENTAL BIOLOGY

**Explore the processes of development from a single cell to an adult organism.**

- Investigate cellular and molecular mechanisms underlying normal and abnormal development.
- Apply laboratory practices incorporating cellular, molecular and imaging techniques.
- Study topics such as gene expression, stem cell biology, tissue engineering, regenerative biology and medicine.



## EARTH SCIENCE

**Study the structure, geology, chemistry and biology of the materials that make up our Earth.**

- Explore how the Earth has changed over geological time, and the processes that created the change.
- Investigate processes such as plate tectonics, volcanism, earthquakes and how these affect the atmosphere, biosphere, the Earth's surface and oceans.
- Gain an understanding of our major resources, including mineral deposits, oil, gas and water.



## ECOLOGY AND CONSERVATION BIOLOGY

**Study the ecological and evolutionary interactions between organisms and their environments.**

- Explore conservation management.
- Develop ways to reduce the escalating biodiversity loss within our world.
- Study ecosystem structure and function.
- Discover how organisms adapt to changing environments.



## ENVIRONMENTAL SCIENCE

**Study the interactions between the physical, chemical, geographical and biological components and processes of the environment.**

- Explore current environmental challenges, such as climate change, water and land management, resource use and sustainability.
- Apply scientific information to the management of our natural systems.
- Understand how environmental science can affect policy and management changes.





## FINANCIAL AND INSURANCE MATHEMATICS

**Apply mathematical modelling and statistical techniques to understand and assess risk in insurance and financial markets.**

- Develop financial and risk models.
- Evolve financial and investment business strategies.
- Demonstrate high-level critical-thinking skills to analyse, use and interpret data.



## GENETICS

**Study genes – their structure, function, transmission and evolution.**

- Learn how genetics underpins areas such as biomedical science, conservation biology, forensics and biotechnology.
- Develop advanced practical skills in recombinant DNA technology, transgenic organism analysis, genotyping, genomics and bioinformatics.
- Design and implement both laboratory and computer-based genetic experiments.



## GEOGRAPHICAL SCIENCE

**Discover the relationships between people, society and the natural environment.**

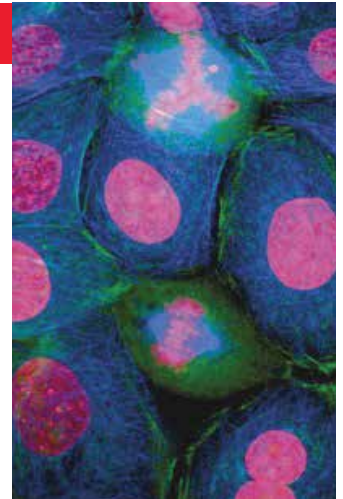
- Study physical and human geography, such as climatology, hydrology, soil science and sustainability theory.
- Learn about atmospheric circulation, climate change, land and water management, the coastal zone, vegetation dynamics, how landscapes change, urbanisation and environmental policy.



## HUMAN PATHOLOGY

**Study disease processes, including cell death, inflammation, disorders of immunity and neoplasia.**

- Learn about organ system failure during disease and injury, and how this knowledge is critical for diagnosis, prognosis and medical intervention.
- Develop a comprehensive knowledge of cell injury, wound healing, fluid and vascular disorders, growth disorders and immunopathology.
- Apply practical laboratory skills such as microscopy, histological staining techniques and diagnosis.



## IMMUNOLOGY

**Learn how the immune system protects us from harmful pathogens such as bacteria and viruses.**

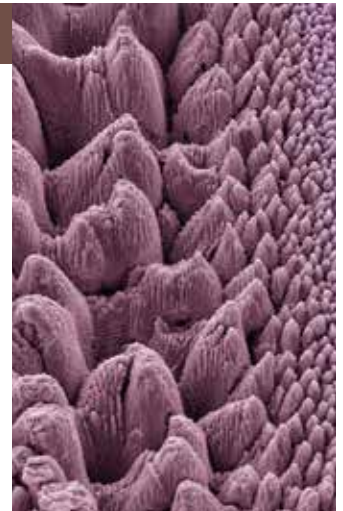
- Study the immune system's mechanisms in cancers, allergies, autoimmunity and transplant rejection.
- Explore how the function of the immune system can be manipulated to improve development of vaccines and cures for autoimmune diseases.



## MATERIALS SCIENCE

**Study different types of materials, including metals, polymers, ceramics, nanomaterials, glasses and composites.**

- Discover the relationship between structure, property, processing and performance of these materials.
- Understand the manipulation of these materials to benefit technologies in health, engineering and manufacturing.
- Study topics such as crystallography, thermodynamics, biological engineering and solid mechanics.



## MATHEMATICAL STATISTICS

**Study mathematical theory and the applications of this theory in the real world.**

- Explore models involving random, unpredictable components and learn how to use these models to make informed decisions.
- Develop key technical skills in advanced calculus and linear algebra.
- Apply high-level probability, statistical and stochastic processing techniques to real-life problems.



## MATHEMATICS

**Discover how mathematics is used to describe, model, understand and even create aspects of the world around us.**

- Develop key technical skills in advanced calculus and linear algebra.
- Explore techniques for modelling and how to use these techniques to solve complex problems.



## MICROBIOLOGY

**Learn about microorganisms, including bacteria, viruses, protozoa, algae and fungi.**

- Study their diversity, structure, molecular biology and how they interact with humans and other living organisms.
- Study the rise of antibiotic resistance in medically important bacteria.
- Discover how microbiologists are involved in the development of vaccines.



## PHARMACOLOGY

**Study the effect of drugs on living organisms and how to scientifically define the term 'drug.'**

- Discover how drugs affect cell responses, including whether drug action will be selective and long lasting, and the nature of side effects.
- Learn about drugs used in the prevention or treatment of an illness and those that are taken for recreation.



## PHYSICS

**Study space and time, matter and energy.**

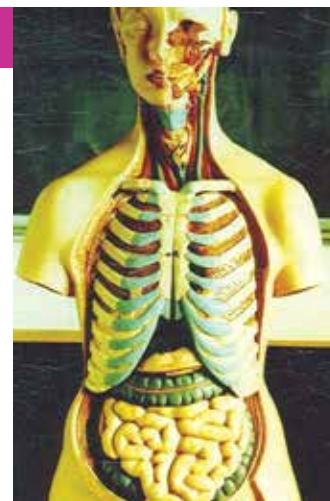
- Explore the full spectrum of topics, from atom optics and BECs to particle physics and quantum science.
- Investigate recent discoveries such as the Higgs boson and Gravitational Waves.
- See how physics underpins other science disciplines, including medicine and engineering.
- Develop high-level analytical, numerical modelling and problem-solving skills.



## PHYSIOLOGY

**Learn how the body functions in health and disease.**

- Explore how body systems adapt when challenged by stresses such as exercise or environmental extremes, and how body functions change in diseased states.
- Examine the nerves and muscles, the brain and hormones, and the body's functionality from the molecular and cellular through to the body systems level.





## PLANT SCIENCES

**Study the structure, function, genetics, and diversity of plants – from algae and mosses through to gymnosperms and angiosperms.**

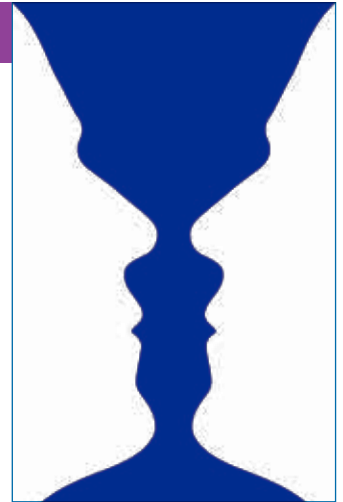
- Discover the differences and similarities between plants living on the land, in the sea and in freshwater environments.
- Learn how plants adapt to particular environments and what factors influence the distribution and diversity of plant species and communities in which they grow.



## PSYCHOLOGY

**Study the mind and behaviour, including investigations of the brain, learning, memory, reasoning, decision-making, language, developmental and social processes, personality and mental health.**

- Examine the practical and ethical applications of psychological research.
- Opportunity to complete the Australian Psychology Accreditation Council (APAC) accredited study for those wanting to specialise in psychology.



## PURE MATHEMATICS

**Pure Mathematics deals with the abstract, the rigour and the beauty of perfection.**

- Explore how pure mathematics becomes the basis for applied mathematics to solve the most concrete problems.
- See how the theory of prime numbers is fundamental to security systems and electronic banking.
- Apply high-level knowledge in advanced analysis, algebra and geometry.



## ZOOLOGY

**Study the diversity of animals, their evolution, form, function, behaviour and ecology.**

- Explore the interactions of animals with their environments through food chains and competition for resources.
- Understand the impact that parasites and pests have on our natural food supplies.
- Undertake field trips in Australia and overseas.



# PATHWAYS INTO SCIENCE

Getting the 'right' ATAR isn't the end of the world, there are alternative pathways into a Bachelor of Science at Monash.



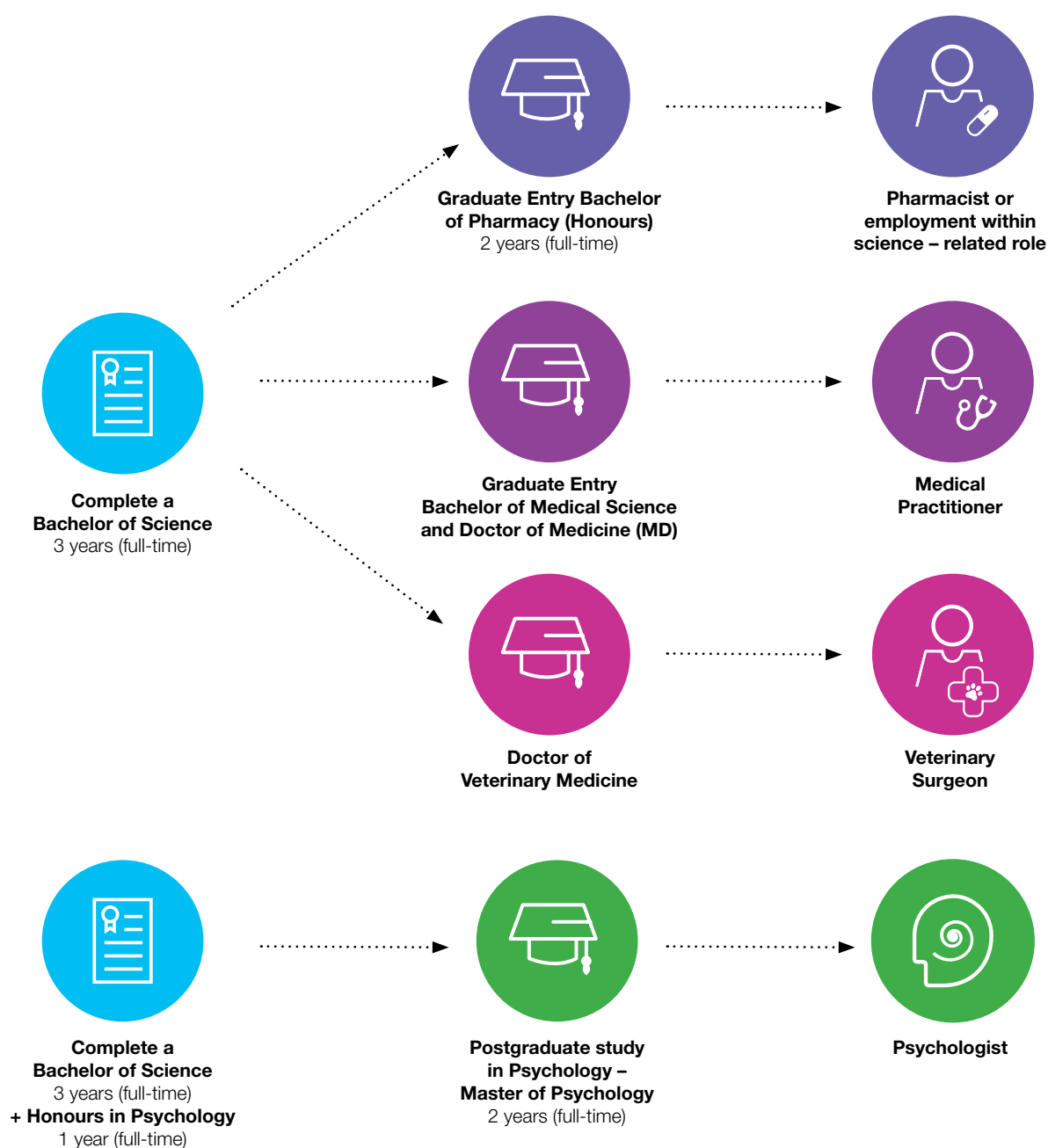
For more information about science as a pathway into other study areas, visit:  
[monash.edu/science/pathways](https://monash.edu/science/pathways)





# USING SCIENCE AS A PATHWAY TO OTHER STUDY AREAS

A Monash Bachelor of Science forms a strong foundation for students wanting to work towards further study in medical, pharmaceutical or psychology fields\*.



For more information about science as a pathway into other study areas, visit:  
[monash.edu/science/pathways](https://monash.edu/science/pathways)



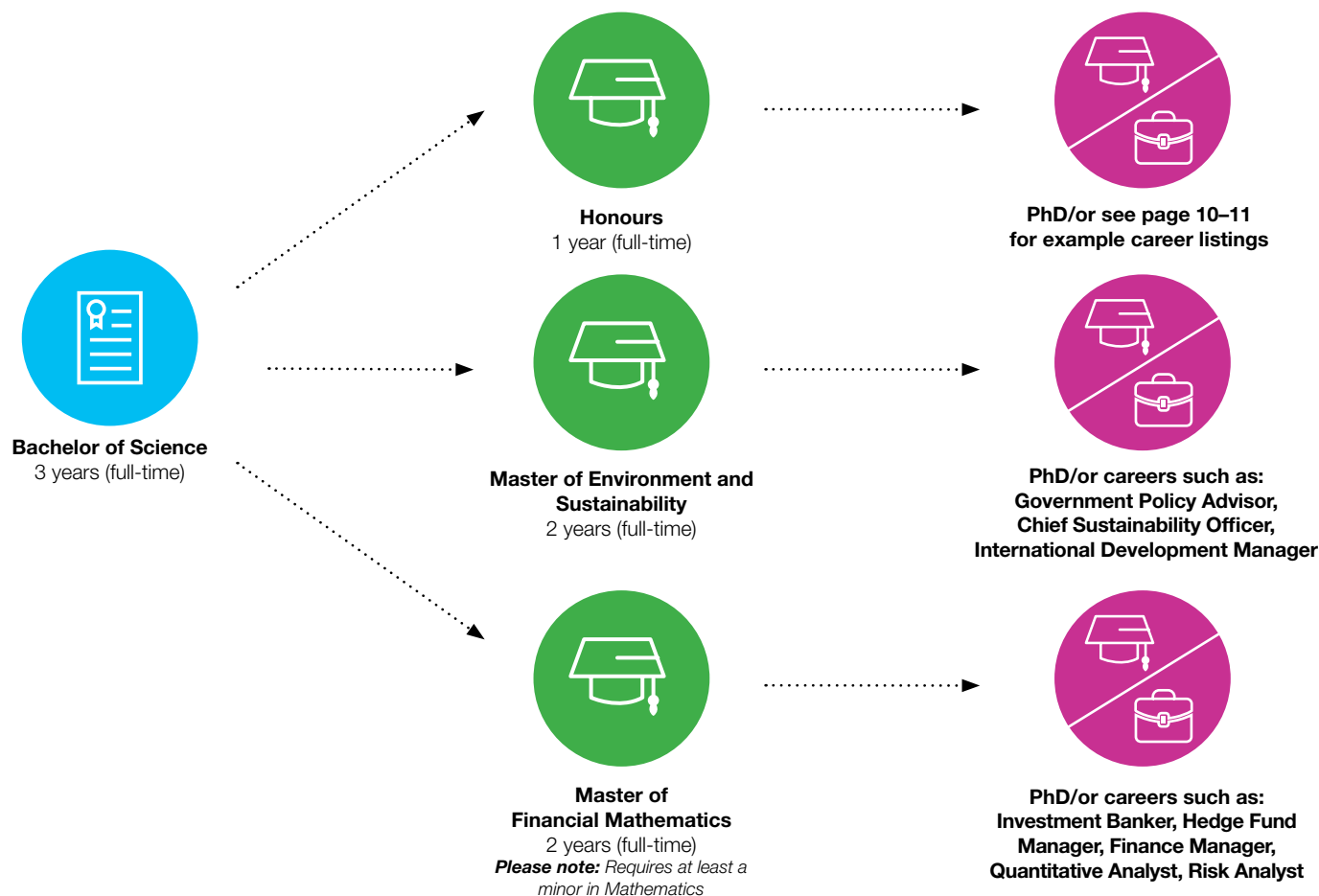
*\*Entry requirements apply; interested applicants should enquire with destination courses.*



New Horizons Research Centre

# TAKING YOUR SCIENCE FURTHER

On completion of your science degree you will be equipped with the knowledge and skills to either enter the workforce in your chosen area or continue with studies in a particular area of expertise.





**Monash Online**

[monash.edu/science](https://monash.edu/science)

**Find a course**

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**International students**

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@MonashUniScience

**Future student enquiries**

**Australian citizens, permanent residents,  
and New Zealand citizens**

Tel: 1800 MONASH (666 274)

Email: [future@monash.edu](mailto:future@monash.edu)

[monash.edu/study/contact](https://monash.edu/study/contact)

**International students**

Australia freecall tel: 1800 181 838

Tel: +61 3 9903 4788 (outside Australia)

Email: [study@monash.edu](mailto:study@monash.edu)