UNSW Science is where the brightest minds converge to...

**LEARN, EXPLORE, DISCOVER AND GROW.**

We provide a vibrant and welcoming community that will prepare you for real-world challenges and future leadership opportunities.

Our programs provide a breadth of choice and a depth of knowledge to suit your talents and interests. And our state-of-the-art facilities, award-winning researchers and excellent teachers will help you achieve your goals.

We’re motivated not only by passion at UNSW Science, but also by a well-defined purpose. We solve complex scientific mysteries, investigate issues of global importance and invent and build the technologies that will shape the future – and we do it in collaboration with high profile industry partners and leading research institutions around the world.

It’s the extended-team effort which makes us so successful.

We welcome your interest and participation as we journey into the future. We’re glad to have you along for the ride.

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Professor Merlin Crossley
Dean, UNSW Science
UNSW Australia

Our understanding of the world is advancing at an unprecedented pace. Scientists are exploring new frontiers and making exciting new discoveries that provide the raw material for new inventions.
You should think about studying science if you:

- Have a curious mind
- Would like to help advance our society
- Are enjoying your high school Maths and Science subjects
- Hope to pursue a fulfilling career in a wide variety of sectors
- Are an all-rounder who’s keen to further develop life skills like leadership and team work

Why? Science at UNSW

Our size

In our case big really is better. With a population of over 50,000 students – as well as more than 200 university partnerships – you’ll enter a welcoming, vibrant and culturally diverse community at UNSW and an internationally focused learning environment.

Outstanding career prospects

Our graduates are highly sought after in government, industry and the not-for-profit sectors. In the 2014 Good Universities Guide UNSW obtained a five star rating for graduate employability, starting salaries and positive graduate outcomes. More than 44 per cent of recently surveyed UNSW Science graduates reported earning annual salaries greater than $100,000 (UNSW Graduate Survey 2014).

Science is an ideal first degree for students who want to go on to study for another profession, or to undertake postgraduate research.

Our prestige

Our Bachelor of Science degree has one of the highest entry requirements in NSW (84.00 ATAR in 2015). Your fellow students will be bright and inquisitive high achievers, attracted by the University’s international reputation and the high ranking of our scientific research schools.

We offer excellence and innovation in teaching, and our staff are award-winning researchers and leaders in their fields, including:

Professor Emma Johnston, the inaugural recipient in 2014 of the Australian Academy of Science’s Nancy Mills Medal for Women in Science for her leadership and groundbreaking research in marine ecology.

Scienza Professor Michelle Simmons, NSW Scientist of the Year 2011 and winner of the Australian Academy of Science’s 2015 Thomas Ranken Lyle Medal, for her research in quantum physics.

Scienza Professor Veena Sahajwalla, one of Australia’s best known engineers and scientists, who developed the internationally commercialised “green steel” technology in collaboration with industry partner OneSteel, an Arrium company.

Our state-of-the-art facilities

At UNSW Science you’ll have access to world-class laboratories, clinics and simulators that will equip you with the tools to challenge knowledge, explore new frontiers and make mind-blowing discoveries.

Putting science under the microscope

Science encompasses a wide range of fields and suits an equally wide range of people.

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- Would like to help advance our society
- Are enjoying your high school Maths and Science subjects
- Hope to pursue a fulfilling career in a wide variety of sectors
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Scholarships

We aim to reward excellence and make a university education accessible to all, with a wide range of scholarships available to suit a diverse range of students and interests. A scholarship could cover your living expenses, subsidise tuition fees, provide an industry partnership, or facilitate overseas travel. Be sure to have a look at our comprehensive scholarships website and find the scholarship that is right for you.

Applications are usually due in September: scholarships.unsw.edu.au

Key industry partners

We are well connected to the changing world of business and work closely with high profile industry partners to help inspire you to achieve your goals and enjoy a fulfilling career.

Our Industry Partnership Awards, available to full-time undergraduates, provide recipients with real-world experiences and a competitive edge while offering industry access to our top students. Recipients receive $2,500 to $5,000 each year for a four year degree, as well as industrial training during summer breaks.

Our industry-relevant research is focused on serving society. In the last five years our science researchers have entered into more than 250 agreements with industry, government and other collaborators, and 82 patent applications have been taken out on their work (ARC Linkage grants, NewSouth Innovations 2009-2014).

We have placed or are working to place students in the following companies:

- ANSTO (Institute of Environmental Research)
- ANSTO (Life Sciences)
- Arrium Ltd
- Boral
- Bureau Veritas Asset Reliability and Integrity Services
- Cochlear
- Commonwealth Bank of Australia
- CSIRO – Materials Science and Engineering
- CSIRO – Minerals Down Under Flagship
- Defence Science and Technology Organisation
- Gujarat NRE Minerals
- Hisachi Chemical Ltd
- IBM
- Laser Bond
- OneSteel
- Parex Davco
- Sandvik Materials Technology
- SAS Institute Australia Pty Ltd
- Schneider Electric
- SIRCA
- Veolia Environmental Services
- Weir Minerals
- Woolworths

Talented students’ program

The Science Talented Students’ Program (TSP) offers elite students access to an academic mentor and exposure to leading edge research and renowned researchers within the Faculty. If you achieve outstanding results during high school (ATAR or equivalent) you may be invited by the Dean of Science to join our program.

Your participation in the TSP is noted on your official record and is listed on your secondary transcript.

For more information on the TSP, including eligibility see: science.unsw.edu.au/tsp

Why Science at UNSW

...
Life at UNSW is never dull. We offer the perfect environment to study, socialise, stay fit and build your future. Kensington Campus is home to award-winning architecture nestled among beautiful, natural surroundings.

It offers everything you need to stay happy and healthy on campus, including a 50m heated Olympic-standard indoor pool, ovals, shops, health clinics and a host of venues for live entertainment, films, recitals and cultural gatherings.

We understand that starting university can be challenging. It involves adapting to new experiences and expectations, both academically and socially. Our job is to help make the transition as smooth as possible so you can focus on the business of making friends and excelling at your studies. We don't expect you to do it alone.

UNSW Science offers a Peer Mentoring Program to all new students to ease the transition to university life. Senior Science students are trained as mentors to provide you with non-academic support and make you feel comfortable and confident. Your mentor will give you first-hand insight into life as a science student at UNSW – whether it's finding a great place to eat, locating the nearest car park or booking a study lab.

Arc, the student organisation, is your ticket to a fun, affordable and rewarding university experience. Arc runs a packed program of events including O-Week, Foundation Day, International Festival, Artsweek and semester parties. It is also your one-stop-shop for student services and support, where you'll find everything from discount vouchers and legal support to career advice. There are more than 130 clubs and societies for you to join and they cover interests ranging from cheerleading, comedy, film and yoga to debating, politics, sports and circus.

Arc also runs volunteer programs that include teaching in outback schools, promoting campus events and creating podcasts. Volunteering is a great way to help the community and make new friends while developing skills that will impress prospective employers.

International education is your gateway to a competitive edge. Our Global Education and Student Exchange Office will help make the experience easy, enjoyable and rewarding. A number of programs are available for student exchange, overseas placements, short courses and internships. We encourage you to spend at least one semester studying overseas to experience different cultures and establish unique professional networks. With more than 200 partner universities in more than 35 countries you’re sure to find the right country and experience.

People should study science at university because it's incredibly interesting. It’s contemporary, it’s always evolving, it’s something that's constantly within the media in some form.

When you start working you notice how relevant and how important critical analysis is and it’s one skill you really do get pushed to develop in a science degree, which is just vital.

I work at Centennial Parklands and I am the Community Program Manager, which includes education programs. The Bachelor of Science at UNSW has given me a set of skills to excel in a job that involves management, strategy, analysis, asking questions as well as getting a depth of knowledge about wildlife and nature in the park.

To anyone thinking of studying science I would wholeheartedly tell you to do it. You won't regret it. It will open up opportunities in your life and career.

I'm a Production Officer at Sydney Water. On a day to day basis I use the skills I developed through all my courses at UNSW - from how to write a report and present a power point presentation to being able to investigate and understand science areas.

The most exciting part is definitely when things go wrong - it provides technical challenges that I have to think around.

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Vanessa Barrett
Bachelor of Science

I'm a Science teacher at Newington College. After my first practical I absolutely loved teaching. I thought it was perfect, working with young people, working with a topic that I was incredibly interested in and passionate about. It all fits together.

Thomas Costgrave
Bachelor of Science/Education

‘My career highlight so far - something I never thought would happen to me was that I got to run an event at the Natural History Museum in London, with David Attenborough and Richard Dawkins.’

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Matt Teston
Bachelor of Science (Ecology and Chemistry)
### Life Sciences

The life sciences domain brings together the biological, environmental and medical sciences into a far-reaching and fascinating field of study.

The Bachelor of Life Sciences will satisfy your innate curiosity about life, from the way things work at the molecular level, to the study of entire ecosystems. Discoveries in the life sciences are integral to the advancement of our world and society.

Many students are drawn to study life sciences rather than science’s physical or numerical disciplines. Although maths and the physical sciences aren’t necessarily part of the science’s physical or numerical disciplines. Although maths and the physical sciences aren’t necessarily part of the

### Degree structure:

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### Assumed knowledge

Mathematics, plus one or more of Biology, Chemistry, Earth and Environmental Science (depending on chosen area of study).

### Majors

- Anatomy
- Biology
- Biological Chemistry
- Biotechnology
- Ecology
- Genetics
- Marine Science
- Microbiology
- Molecular and Cell Biology
- Pathology
- Pharmacology
- Physiology
- Psychology

### Careers

Life sciences have valuable applications in health, agriculture, medicine and the pharmaceutical and food science industries. In fact many of the jobs available to science graduates originate from the study of life sciences. If you enjoy working in interesting and varied outdoor locations, majors such as biology and ecology involve fieldwork and can be the beginning of a life of intellectual and geographic adventure.

### Science

When the choices seem never ending, knowing how to get started can be harder than the study itself. We make getting started easy and then we help you explore all the options along the way. The Bachelor of Science sets you in and gets you heading in the right direction.

### Tailoring your degree

In first year, you can ask, listen and learn about anatomy, ecology, pathology, psychology and so on... and then decide on neuroscience if that excites you the most.

The Bachelor of Science starts with an open study pathway that you refine along the way. By second year, you’re in control and the choices become more obvious. It’s a ride you will feel confident taking, knowing the foundation knowledge you’re building is the springboard into a career you will love. Free electives give you the opportunity to explore interests before selecting your major; you can even study courses outside of Science.

You’ll also have the opportunity to undertake an additional honours year should you perform well over the first three years of your degree.

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### Assumed knowledge

Mathematics and Chemistry plus one or more of Biology, Earth and Environmental Science, Physics or HSC Mathematics Extension 1 (depending on chosen area of study).

### Majors

- Anatomy
- Bioinformatics
- Biology
- Biotechnology
- Chemistry
- Earth Science
- Ecology
- Food Science
- Genetics
- Geography
- Marine Science
- Materials Science
- Mathematics
- Microbiology
- Molecular and Cell Biology
- Neuroscience
- Pathology
- Pharmacology
- Physical Oceanography
- Physical Science
- Physiology
- Psychology
- Statistics
- Vision Science

### Careers

You’ll be open to opportunities in a variety of fields in science and technology-based industries and businesses in management, research and communication within industry, government and the private sector. Recent graduates work in business, industry, government and universities. They’re employed in areas as diverse as pharmaceutical and medical research, occupational health and safety, environmental research and industry, manufacture of new products, forensic science, patent law, cognitive science, oceanography, food manufacture, science teaching, science journalism, meteorology, optics and applications of mathematics and statistics in the finance industry.

### Dual degrees

The Bachelor of Science may be studied with the following degrees:

- Actuarial Studies
- Arts
- Commerce
- Computer Science
- Economics
- Education
- Engineering
- Fine Arts
- Law
- Music
- Social Research and Policy
**Science (Advanced)**

The Bachelor of Science (Advanced) degree offers you the opportunity to undertake a research project. This degree is aimed at developing critical and integrative thinking. Your final year is an honours year when you get the opportunity to undertake a research project. This degree is aimed at developing critical and integrative thinking. You will work hard but with a globally recognised degree in hand you will be in the best possible position to chase the career you want.

**Course content**

The Bachelor of Science (Advanced) degree offers you access to advanced level courses and includes an honours year. You will study foundation courses such as biology, chemistry, physics and maths, before getting the chance to knuckle down, choose your major (or two) and really explore what inspires you most. You will also be given the option to choose free electives from other areas of the university such as arts and social science, business, engineering, law or the built environment.

Your first year is an honours year when you get the opportunity to undertake a research project. This degree is aimed at developing critical and integrative thinking. You will work hard but with a globally recognised degree in hand you will be in the best possible position to chase the career you want.

**Degree structure**:

- **18 Courses** Major+Science Electives
- **4 Courses** Free electives - Any UNSW faculty course
- **1 Year** Honours

*The degree structure above is for a single degree. The degree structure is different for a single degree and dual degree.

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**Science (International)**

Why not study science and travel the world at the same time? The Science (International) degree offers you just that opportunity.

**Course content**

The Science (International) degree recognises that science involves a global network; the aim of this degree is to prepare you for an increasingly globalised work environment. You will not only gain a science degree but you will also take courses in languages, international relations, politics, and international law, ensuring a truly global education.

This four year degree includes overseas study at one of our partner universities, giving you the essential knowledge and skills you need to work in a rapidly changing global environment. With this world-recognised degree you will be ready to work for global organisations and companies, local or international governments, or in scientific research. The world is yours.

**Careers**

You’ll be open to a broad range of career options in Australia and overseas. Graduates are employed in a variety of science and technology-based industries and businesses, in management, research and communication, within industry, government and the private sector.

**Degree structure**:

- **16 Courses** Major+Science Electives
- **6 Courses** Directed Electives
- **6 Courses** Free electives - Any UNSW faculty course
- **6 Courses** Language Minor
- **1 Year** Optional Honours

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**Assumed knowledge**

Mathematics and Chemistry plus one or more of Biology, Earth and Environmental Science, Physics or HSC Mathematics Extension 1 (depending on chosen area of study).

**Majors**


**Electives**

- Cell Biology
- Neuroscience
- Pathology
- Pharmacology
- Cell Biology
- Neuroscience
- Pathology
- Pharmacology
- Physical Geography
- Physics
- Physiology
- Psychology
- Statistics
- Vision Science

**Course content**

- Chemistry, Physics and Maths, before getting the chance to knuckle down, choose your major (or two) and really explore what inspires you most. You will also be given the option to choose free electives from other areas of the university such as arts and social science, business, engineering, law or the built environment.

Your final year is an honours year when you get the opportunity to undertake a research project. This degree is aimed at developing critical and integrative thinking. You will work hard but with a globally recognised degree in hand you will be in the best possible position to chase the career you want.

**Degree structure**:
Science and Business

Successful careers are built on a range of skills and it's a challenge to prepare yourself to cover all the bases when you graduate. Studying both Science and Business is a great starting point.

Now it's possible to study Science and Business in a dedicated three-year degree. If you're passionate about science and you also want a valuable foundation in business knowledge, study both in this single degree.

Course content
Two thirds of your study will be science and you'll select a science major to specialise in. High performing students can apply to do honours in Science in their fourth year.

The remaining courses are from the UNSW Business School, including foundations in accounting, microeconomics, marketing, business law and management, and additional options to give you a greater depth of knowledge in marketing, business law and management.

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- Molecular and Cell Biology
- Neuroscience
- Pathology
- Pharmacology
- Physical Oceanography
- Physical Science
- Physiology
- Psychology
- Statistics
- Vision Science

Careers
You'll be qualified to work in a variety of fields in science and technology-based industries. Graduates are skilled in the context of working in the scientific industry as well as having an understanding of the commercial environment in which they are employed.

Dual degrees
The Bachelor of Science and Business may be studied with the following degree:
- Law

“Scientists already have the advantage of formal training in rational thinking and the scientific method, as well as the ability to think outside the square. Now with training in the added dimensions of business and marketing, graduates of the Bachelor of Science and Business degree at UNSW are extremely well placed to succeed, and to do so at an earlier stage in their careers.”

Trevor Daniels
Partner, Corrs Chambers Westgarth

Major areas of study

Anatomy
Anatomy is the study of the structure of the human body. It focuses on how our body parts interact to create our capacity to move, feel and think.

Archaeology and Palaeoenvironments
Archaeology and Palaeoenvironments is a major that focuses on two themes – the physical and cultural evolution of humans, and the interaction of humans with the environments they inhabited.

Bioinformatics
Bioinformatics is an interdisciplinary area of study which draws upon both computing and the life sciences. It is concerned with the development of technologies for storing, extracting, organising, analysing, interpreting and utilising biological information.

Biological Chemistry
Biological Chemistry is a broad and multidisciplinary major that places an emphasis on organic and inorganic chemistry, and also includes biochemistry and molecular biology. The Biological Chemistry stream allows undergraduate students to combine an interest in chemistry with studies in biochemistry and molecular biology.

Biological Science and Biology
Biological Science is the study of life and living organisms. UNSW has an international reputation for quality teaching and research in this area, offering expertise in botany, ecology, marine biology and zoology.

Botany looks at all aspects of plants and their relation to the environment. An understanding of Ecology is necessary for conservation. Marine Biology is about life in the ocean, estuaries and other coastal environments. Zoology looks at the structure, behaviour, habits, genetics, distribution, evolution and classification of animals.

Biotechnology
Biotechnology is a mix of the natural sciences and engineering. It is the innovative use, either direct or indirect, of all living organisms and their parts to improve existing industrial processes. Biotechnology is the future of sustainable development, from bio-mining and bio-remediation to the development of biomaterials for medicine, including processes such as tissue engineering and stem cell therapies.

As well as acquiring cutting-edge scientific skills, you will also investigate current and future directions of commercial biotechnology. The study of business aspects such as patenting will help equip you for the many career directions available to biotechnologists.

Chemistry
Chemistry is a central science that deals with the properties, analysis, design and synthesis of molecules. Courses will equip you with skills relevant to design of new therapies, new materials, and new technologies so necessary for meeting the real-world challenges that face us today. Studying Chemistry at UNSW also helps you to develop analytical and problem-solving capabilities in demand by employers in scientific and non-scientific fields.
Major areas of study

Climate Dynamics
Climate Dynamics focuses on the science of the Earth’s climate with particular emphasis on understanding the dynamical systems within the atmosphere and oceans. This understanding has applications in climate and weather research, forecasting, and environmental and resource management. Courses provide the skills to use and interpret models of fluid flows, as well as the ability to undertake directed research in a related area.

Climate Systems Science
Climate Systems Science provides a broad introduction to the science of the Earth’s climate system. You’ll gain an understanding of the fundamentals of atmospheric science, oceanography and chemistry. You can focus your studies in areas such as climate and vegetation, hydrology, biology, biogeochemistry or environmental and resource management.

Earth Science
Earth Science is the science of planet Earth. The science and skills of geology are used in the search for and development of mineral and energy resources; identification of natural hazards and solutions to environmental problems; engineering site investigations; and groundwater studies.

Ecology
Ecology is the science of the relationships between organisms and their environments. To conserve our natural environment we need to understand how animals and plants interact with one another as well as their environment, either on land or in the sea.

Environmental Chemistry
Environmental chemistry is the scientific study of the chemical and biochemical phenomena that occur in natural places. Environmental chemistry can be defined as the study of the sources, reactions, transport, effects, and fates of chemical species in the air, soil, and water environments, and the effect of human activity and biological activity on these.

Food Science
Food Science involves the understanding of basic sciences and the application of this knowledge from paddock to plate. It involves the study of production, handling, processing, preservation and distribution and marketing through to consumption and utilisation by consumers.

Food Science is concerned with food processes, food commodities, food composition and food quality (including sensory properties, safety and nutritional value).

Genetics
Genetics is the study of evolution and inheritance, how biological information is passed on between generations and how it is used and altered. Molecular geneticists study how DNA encodes genes, how genes are expressed to make proteins, and how those proteins are controlled and affect life (such as the genetic defects that cause cystic fibrosis or diabetes). Genetics is increasingly relevant to biological research, agriculture, industry, the monitoring of harvested and utilisation by consumers.

Materials Science
Materials Science is the underlying science of high performance materials including metals, ceramics, plastics, composites, nanomaterials and biomaterials. Materials scientists and engineers develop these high performance materials, engineer new applications, develop and customise innovative processing techniques, predict and analyse materials performance, and manage commercial materials production.

Marine Science
Marine scientists are often involved in multidisciplinary research programs, exploring life on the shore, in oceans and estuaries. They can work with geologists (who study the topography of the ocean floor, sediments and marine resources), physical oceanographers (who study the waves, currents and tides) or chemists (who study the chemical composition of seawater). These collaborative research programs aim to answer questions about the effect of pollution on marine ecosystems and the relationship between ocean currents and weather. Marine Science can be studied with an emphasis on biology, ecology, earth sciences, environmental chemistry, oceanography or physical oceanography.

Geochemistry
Geochemistry is a broad discipline that integrates knowledge and skills derived from many different areas of science. Geochemistry investigates the source, fate and geochemical behaviour of materials and the processes involved in geochemical systems operating in natural and human-altered environments. Geochemistry contributes to the discovery and use of resources, sustainable development and the control or remediation of environmental pollution.

Geography
Modern geography is a problem-based discipline that examines environmental systems and the relationship between human societies and the earth, resources and environmental management, and the built environment. Some students conduct their senior undergraduate projects in locations as varied as the desert, Indonesia, Thailand and the Great Barrier Reef.

Geography (Human) or (Physical)
Geography is the study of social and environmental relationships. The cultural significance of geography lies in its contribution to an understanding of the total environment. Geographers are employed as professionals in urban management, regional planning, and environmental assessment. Many courses in geography include laboratory and field work, involving the use of qualitative and quantitative techniques.

Marine and Coastal Science
As the ocean covers more than 70 percent of the earth’s surface, an understanding of the processes and hazards associated with the coastal and oceanic environment is essential. Biologists, geologists and oceanographers want to learn more about the seas so we can both use and protect this valuable resource. Marine and Coastal Science offers a unique opportunity to study across these diverse areas by exploring both physical and biological aspects of the marine environment. UNSW is a leading Australian hub of marine science research and teaching, with many active researchers, diverse research groups and excellent facilities.

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Major areas of study

Mathematics and Statistics
Mathematics provides the language for a fundamental understanding of nature, technology and commerce. Data and factual information can be understood using the techniques and theory of statistics. Mathematics and statistics graduates are highly sought after for employment in a diverse range of jobs including finance, insurance, computing, and environmental modeling.

Microbiology
Microbiology studies the smallest organisms and their impacts. Micro-organisms are the oldest known and most diverse forms of life that we know of. Many are used beneficially in areas such as baking, brewing, the manufacture of dairy foods and pharmaceuticals. However, some microorganisms are also responsible for disease, food spoilage, water contamination and the destruction of materials. Knowledge of bacteria, fungi, viruses, protozoa and archaea is important in both the environmental and medical fields.

Molecular and Cell Biology
Recent advances in molecular and cell biology, especially the continuing development of recombinant DNA technology, have revolutionised our understanding of the structure, function and regulation of individual genes. These advances have opened up the exciting field of molecular biology, one of the most rapidly growing areas in biology. The marriage of biochemistry, microbiology, and cell biology provides an exciting new approach for the study of all living organisms, including humans.

Neuroscience
Neuroscience has two primary goals: to understand and explain behaviour and consciousness; and to understand and treat diseases of the nervous system such as schizophrenia and Alzheimer's disease. It addresses critical questions such as how we perceive the world around us, how we generate actions and how our brain is modified when we learn.

Pathology
The science of pathology involves the study of diseases, such as infections and cancers, at the genetic, molecular, cellular, and organ levels. Studying pathology involves the examination of various disease processes such as inflammation, wound healing and cancer. Students become familiar with examining both macroscopic specimens and the microscopic differences between normal and abnormal cells, tissues and organs. Courses offered in pathology allow in-depth study of many fascinating and important disorders such as meningitis, auto-immune diseases, congenital diseases, HIV/AIDS, heart disease and asthma.

Pharmacology
Pharmacology is the study of the interaction between drugs and living systems, particularly molecular interactions of drugs at the organ, tissue and cellular level. Discovering new drugs and optimising their use to help improve the delivery of quality health care is an important part of pharmacology. Pharmacology combines extremely well with physiology and Australian graduates in these disciplines are in demand around the world.

Physical Oceanography/ Advanced Physical Oceanography
Physical Oceanography involves an understanding of the mathematical equations that describe fluid flow, and how these are used in the context of the ocean. This background can be applied to disciplines such as climatology, the dynamics of marine populations and the dynamic structure of marine and coastal habitats.

Physical Oceanography is essential to understanding climate change and global warming. At UNSW it is a research focus of the Climate Change Research Centre (CCRC) and the marine science group in the School of Biological, Earth and Environmental Sciences.

Physics and Physical Science
Physics is the study of the laws of nature that govern the behaviour of the universe, from sub-atomic particles to galaxies. Physics applies these laws to the solution of practical and theoretical problems and to the development of new technologies. The School of Physics specialises in research in a wide range of areas such as astrophysics, theoretical physics, quantum physics, biophysics and acoustics. Physics graduates are highly employable in a diverse range of industries including research, teaching, finance, medical physics, computing, and environmental modeling.

Psychology
Psychology is the scientific study of human behaviour. It is a diverse discipline that covers the relationship between the brain and behaviour; the processes of perceiving, learning and memory; the assessment of abilities and attitudes; the origins of personality and emotional states; the nature and effects of social interactions; and the causes of abnormal behaviour. To become a registered NSW psychologist and member of the Australian Psychological Society, you must complete four years of undergraduate study followed by two years of postgraduate study. The Bachelor of Psychology and Bachelor of Science (Advanced) meet the four-year requirement; so do the Bachelor of Psychological Science, Bachelor of Science, Bachelor of Science (International), and the Bachelor of Science and Business with an additional honours year. You can also undertake two years of supervised experience in professional practice to meet government registration requirements.

Vision Science
Vision Science is the science of how we see, and the application of technology to help us see better. You will develop scientific skills that enable you to create new instruments and vision technologies. As well as exploring the sciences that underpin vision and light, you can select from a wide range of electives, enabling you to develop unique skills and carve your niche in the marketplace. Career opportunities in ophthalmic industries are growing strongly.
**Advanced Mathematics**

If you are interested in maths and looking for a career which takes advantage of new mathematical developments and innovations this is the degree for you. The Bachelor of Science (Advanced Mathematics) degree lets you explore your passion for maths while still allowing the flexibility to study courses from across the University.

**Course content**
The Advanced Mathematics degree is a four-year degree, with the fourth year being an honours year. Honours year integrates advanced level coursework with a research project that’s both challenging and rewarding.

**Degree structure**:

- **16 Courses**
  - Major-Science Electives

- **2 Courses**
  - General education - Non science courses

- **1 Year**
  - Honours

*The degree structure above is for a single degree. The degree structure is different for a single degree and dual degree.

**Assumed knowledge**
HSC Mathematics Extension 1

**Recommended knowledge**
HSC Mathematics Extension 2

**Majors**
- Applied Mathematics
- Pure Mathematics
- Advanced Statistics
- Quantitative Risk (by invitation only)

**Careers**
You’ll have career opportunities in banking, insurance and investment, environmental modelling, oceanography, meteorology, computing, information technology, government, education and research.

**Specialised degrees**

**Aviation**

Aviation is a multi-faceted sector that requires people skilled in many disciplines. It is uniquely international in its application, demanding a level of cultural and political awareness. If you are looking to be an influence in the aviation industry one of these degrees is right for you.

**Course content**
The Flying stream of the Aviation degree educates and trains pilots to the highest commercial standards. In this degree you’ll learn the core science behind aviation management as well as gain your pilot licence. As part of the Professional Pilot Program you will have up to 240 hours of flight training and approximately 30 hours of simulator training.

On completion of the degree, you will have attained, at a minimum, a Commercial Pilot Licence (CPL) with a Multi Engine Command Instrument Rating and an Air Transport Pilots Licence (frozen) with advanced options including Instructor Rating, Multi-Crew Coordination Course or a research project.

You will need to pay for the flight training costs portion of this degree. In 2015 the estimated flight training cost is approximately $126,000 - $138,000 over three years, depending on the chosen options.

**Degree structure**:

- **21 Courses**
  - Aviation Flying Core

- **1 Course**
  - Aviation Flying elective

- **2 Courses**
  - General education - Non science courses

**Additional selection criteria**
- Interview
- Class 1 Civil Aviation Authority (CASA) medical examination

Completion of the Internal Application for Admission to Bachelor of Aviation is required. The application form can be obtained from the School of Aviation:

T: +61 (2) 9385 6767
E: aviation@unsw.edu.au
Applications due by 30 September 2015

**Assumed knowledge**
Mathematics (not general Mathematics)

**Recommended knowledge**
- Physics

**Careers**
Graduates work as pilots for regional or major commercial airlines, training centres, charter flights, or as aerial surveyors, and later often take roles as management pilots.
Biotechnology

Biotechnology is used for the production of pharmaceuticals; food and industrial chemicals; in the development of improved crops and livestock for farming; for environmental clean-up; and in forensics. Modern biotechnology makes practical use of the most recent scientific advances. Are you ready to change the world we live in?

Course content
As with all our science degrees, you start your degree building on the fundamentals of science with courses such as biology, chemistry and maths. You’ll also begin your journey as a biotechnologist with introductory biotechnology.

Your following two years will see you delve deeper into the multi-disciplinary world of biotechnology, with courses in molecular biology, microbiology, chemistry, genetics and, of course, biotechnology.

You’ll explore current trends and professional issues in the biotechnology industry, including commercialisation of biotechnology.

In your final year you’ll complete a research project as part of your honours year.

Our ability to cope with many of the world’s medical, environmental, agricultural and manufacturing problems in the 21st century will depend heavily on advances in biotechnology. This is your time to shine.

Assumed knowledge
Mathematics

Recommended knowledge
Biology

Careers
Your career opportunities could find you working in areas such as a scientist or researcher with medical, biological or pharmaceutical research organisations.

Aviation (Management)

Course content
The Management Stream might be right for you if you’re seeking a career in flight operations, on or off the flight deck. If you have aviation industry experience or licenses you might be looking to further your qualifications to a tertiary level.

The degree shares a common academic core with the Flying Stream, but offers a range of additional courses in management areas such as Operations Management, Aviation Economics, Law and Regulations, Airline Marketing, Air Traffic Control and Regional Airlines.

Assumed knowledge
Mathematics

Recommended knowledge
Physics

Careers
You could gain employment as a manager in an airline, freight company, regulatory authority or airport.

Degree structure:
- 16 Courses: Aviation Management Core and Electives
- 6 Courses: Free electives - any UNSW faculty course
- 2 Courses: General education - Non science courses
- 20 Courses: Biotechnology Core and Electives
- 2 Courses: Free electives - any UNSW faculty course
- 2 Courses: General education - Non science courses
- 1 Year: Honours
Understanding how we, and our activities, impact our planet is becoming increasingly important. Even more important is learning how we manage human activity and create a sustainable balance with nature. Environmental management is an all-encompassing area of study which looks to find the answers to a sustainable existence.

Course content
The Bachelor of Environmental Management will provide you with the skills and knowledge necessary to work or carry out research as an environmental scientist. You will consider the scientific aspects of the environment within the general context of the policy and legal framework of environmental regulations, as well as economic and social dimensions of environmental policy and management.

Assumed knowledge
Mathematics, Chemistry

Recommended knowledge
Biology, Earth and Environmental Science, Physics

Majors
Biology | Earth Science | Ecology | Environmental Chemistry | Geography | Marine Science

Careers
Graduates would be qualified environmental professionals and could gain employment as an environmental consultant or officer within industry or with local, state or federal government. Employers may include National Parks and Wildlife or the Environmental Protection Authority.

Dual degrees
The Bachelor of Environmental Management may be studied with the following degree:
- Arts

**Degree structure**

20 Courses Environmental Management core + major + electives

2 Courses General education - Non science courses

2 Courses Free electives - Any UNSW faculty course

1 Year Optional Honours

*The degree structure above is for a single degree. The degree structure is different for a single degree and dual degree.

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Materials Science and Engineering

The Bachelor of Engineering (Materials Science and Engineering) offers unlimited possibilities for innovation and development. As a materials engineer you could be involved in developing environmentally friendly and economically efficient metals, advanced surface coatings, biomedical materials, advanced composites and much more.

Course content
The first two years are the same for everyone completing this degree. You'll study areas such as chemistry, physics, mathematics, engineering, computing, the fundamental properties and structures of materials, aspects of engineering design, and the application and selection of materials. In your final two years you become more focused on your chosen specialist area, which ultimately results in your final year research project and seminar.

This degree will be sure to give you an advantage; we are the only school in Australia to offer specialisations in Ceramic Engineering, Metallurgical Engineering and Materials Engineering and have well equipped facilities to put you ahead of the field.

Assumed knowledge
HSC Mathematics Extension 1, Physics

Recommended knowledge
HSC Mathematics Extension 2, Chemistry, Engineering Studies

Majors
Physical Metalurgy | Process Metallurgy | Materials Engineering | Ceramic Engineering

Careers
Work would be available in the areas of research and development, quality, technical support, process improvement, team leadership and management, technical sales, marketing and more for companies producing engineered materials, metals, ceramics and plastics.

This world-recognised degree is accredited with the Institute of Engineers Australia.

Dual degrees
The Bachelor of Engineering (Materials Science and Engineering) may be studied with the following degrees:
- Biomedical Engineering
- Chemical Engineering
- Commerce

*The degree structure above is for a single degree. The degree structure is different for a single degree and dual degree.
Medical Science

Medical Science underpins the practice of medicine. Whether you are looking for a career in biomedical research, or to go into graduate medicine or paramedical degrees, if you are fascinated about how the human body works, this could be the degree for you.

A limited number of high-performing students may be able to gain entry to the UNSW Medicine degree with advanced standing.

Course content

Medical Science is offered over three years and run jointly by the Science and Medicine faculties.

You will learn about the human body, how it functions down to its smallest parts and how it reacts to disease and the drugs that are used to treat disease. Discover the processes of development from the fertilised ovum to why we all look different, learn about the role genetics plays, how and why we have natural defences and which structures and parts of our brain command how we move, think and feel. Medical science truly incorporates many facets of the scientific disciplines.

You will have the opportunity, if you choose and your performance permits, to undertake a fourth year that involves research leading to an honours degree.

Degree structure:

| 28 Courses | Medical Science Core + electives |
| 2 Courses | Free electives - Any UNSW faculty course |
| 2 Courses | General education - Non science courses |
| 1 Year | Optional Honours |

Assumed knowledge
Mathematics and Chemistry

Recommended knowledge
Biology and/or Physics

Graduate entry stream for UNSW Medicine

If you are interested in studying Medicine at UNSW, there is a pathway for high-performing Medical Science students. If you are intending to apply for entry to the degree via the Bachelor of Medical Science you must have completed all compulsory courses by the end of Stage 2. For information visit: med.unsw.edu.au

Areas of specialisation
Anatomy | Biochemistry | Genetics |
Microbiology and Immunology | Neuroscience |
Pathology | Pharmacology | Physiology

Careers

You’d be able to find employment in areas such as medical research, paramedical professions, health policy, medical laboratory science, pathology, forensic science, pharmaceutical and related industries.

Medicinal Chemistry

Medicinal Chemistry is an exciting, rapidly-expanding area within the broad discipline of chemistry that has seen enormous growth recently both within Australia and globally.

It is quite simply, the development of new pharmaceutical agents from concept to clinic.

Course content

The Bachelor of Medicinal Chemistry is a professionally-oriented, truly interdisciplinary degree. It has been designed to ensure that you will have a strong background in contemporary biology, biochemistry and pharmacology, based upon a solid foundation of essential chemistry. Your first year includes study in chemistry, maths and biology.

As you move into your second and third year you will take more advanced chemistry as well as biochemistry, contemporary pharmacology and related courses.

By the time you graduate you will be equipped with a unique set of skills, in demand both locally and globally in pharmaceutical companies involved in modern drug design.

The multidisciplinary nature of the degree also means you could work in other science-based industries and related fields.

The research focus in your final honours year will also enable you to progress seamlessly into a higher degree, should that interest you.

Degree structure:

| 429700 | 3991 | 3 Years | Full-time |
| 429720 | 3992 | 4 Years | Full-time |

Assumed knowledge
Mathematics, Chemistry

Recommended knowledge
Biology, Physics

Careers

Work for medicinal chemists is available in the pharmaceutical and biotechnology industries. Graduates are equipped with skills in modern molecular biology and pharmacology, underpinned with a comprehensive background in chemistry with relevant skills necessary for synthesising complex drug candidates. Graduates will also find employment opportunities within the research, government, management, legal, and education sectors.

Dual degrees

The Bachelor of Medicinal Chemistry may be studied with the following degree:

- Law

UNSW Science Undergraduate Guide 2016
Nanotechnology covers the exciting and extremely broad area of science on the really small scale. Nanotechnology is already revolutionising everything from advanced materials to medicine and even makeup.

Course content

The Bachelor of Science (Nanotechnology) is a truly multi-disciplinary degree, taught by the Schools of Chemistry, Physics and Materials Science and Engineering. By featuring a wide range of subjects, students are poised to make advances in the understanding, development, application and engineering of new nanotechnology systems.

Your first year involves courses in areas such as biology, chemistry, materials science, physics, mathematics and nanotechnology. In your second year you can specialise in Nanodevices or Nanomaterials, with various courses in physics, chemistry, biotechnology, materials science and nanotechnology. In the third year you’ll move to specialist courses in nanotechnology such as Nanomedicine and Nanomaterials, and other courses depending upon your major.

In your fourth and final year you’ll conduct research as part of your Honours year. This will involve a novel nanotechnology research project with one of your lecturers and/or world leading researchers at UNSW. You can choose between the Schools of Chemistry, Physics or Materials Science and Engineering, or an interdisciplinary project.

Ultimately, the Nanotechnology degree offers you a broad training in both conventional and cutting-edge science.

Optometry/Science

The Bachelor of Optometry/Bachelor of Science degree provides students with an understanding of the theoretical discipline of vision science and the clinical art of primary eye care. Vision science covers topics such as optics of lenses and instruments, the physiology of the eye, the psychophysics of vision and the neuroscience of the brain.

Optometry includes the diagnosis and management of ocular disease, the dispensing of spectacles and contact lenses, the management of people with special needs (children, low vision), sports vision and vision in the workplace.

The School of Optometry and Vision Science at UNSW is the largest optometry school in Australia that links its academic learning with clinical practice. It has a modern clinic providing a full range of optometry services. The School also houses a number of outstanding research units including the Optics and Radiometry Laboratory, and the Brien Holden Vision Institute which sits alongside the School.

Course content

The Bachelor of Optometry/Bachelor of Science degree is taken over five years. In your first year you’ll cover foundation sciences including physics, chemistry, mathematics and biology, as well as three vision science courses which include Geometrical and Physical optics, and Visual Optics. During your second and third years you will become more focused on vision science courses such as physiology, pathology, pharmacology, ocular disease, advanced vision science and clinical examination of the eye and the optics behind visual instruments.

Assumed knowledge

HSC Mathematics Extension 1
Chemistry
Physics

Recommended knowledge

Biology

Careers

By focussing on both nanotechnology and conventional science you could work in developing and commercialising products in the emerging nanotechnology industry, or you could also find opportunities in areas available to conventional science majors; including research, government, management, legal, education sectors and the rapidly growing (nano)medicine sector. A significant number of our graduates continue on nanotechnology research projects.
Psychological Science

The Bachelor of Psychological Science degree allows you to complete an accredited psychology degree in three years, or if you’re interested in becoming a professional psychologist you can complete an additional fourth year honours.

Course content

The Psychological Science degree allows you to combine your interest in psychology with other interest areas across the University.

If you’re commercially minded you might choose to combine a major in human resources, marketing or management. Alternatively you might like to combine psychology with areas in the arts and social sciences such as philosophy, criminology, or linguistics. Or, if you’d prefer to pursue a career in healthcare or biomedical research, you could combine your degree with vision science or neuroscience.

If pursuing a career as a professional psychologist is what you’re after, you can choose to complete an additional fourth year honours (subject to satisfying the minimum entry criteria), paving your way towards professional registration. Your honours year will prepare you for the Masters degree. The Masters degree will allow you to specialise in your chosen area of psychology, Clinical, Forensic or Organisational – and allow you to practice as a professional Psychologist.

Assumed knowledge

Mathematics

Recommended knowledge

English Advanced, Biology, and one of Chemistry, Earth and Environmental Science or Physics

Majors

Criminology | Human Resource Management |
Linguistics | Management | Marketing | Neuroscience |
Philosophy | Psychology | Vision Science

Careers

Work in a wide variety of different contexts would be available; including clinical, legal, organisational, educational and research settings in both private and public sector. Psychologists are employed across several industries including health care and social assistance; public administration and safety; education and training; and administrative and support services.

Assumed knowledge

Mathematics

Recommended knowledge

English Advanced, Biology, and one of Chemistry, Earth and Environmental Science or Physics

Majors

Criminology | Human Resource Management |
Linguistics | Management | Marketing | Neuroscience |
Philosophy | Psychology | Vision Science

Careers

Work in a wide variety of different contexts would be available; including clinical, legal, organisational, educational and research settings in both private and public sectors. Psychologists are employed across several industries including health care and social assistance; public administration and safety; education and training; and administrative and support services.

Degree structure:

**Psychological Science**

13 Courses
Psychological Science Core and Electives

- 2 Courses
General education - Non science courses

- 1 Year
Optional Honours

**Psychology**

16 Courses
Psychology Core and Electives

- 2 Courses
General education - Non science courses

- 6 Courses
Free electives - Any UNSW faculty course

- 1 Year
Honours
Bonus points

Bonus points are awarded in recognition of outstanding performance and achievement, and in some cases are awarded without you having to do any paperwork.

HSC Plus

HSC Plus automatically awards up to five bonus points for achievement in subjects that are highly-relevant to our degrees in science.

HSC courses considered by the Faculty of Science may include:
- Biology
- Chemistry
- Earth and Environmental Science
- English Advanced
- English Ext 1 and Ext 2
- Geography
- Mathematics
- Mathematics Ext 1 and Ext 2
- Physics

To see which subjects are relevant to your degree of interest visit uns.edu.au/hsoplus

The Elite Athletes and Performers (EAP) Program

If you excel in sport, academia, performance, leadership or music, this program may offer you the possibility of bonus points. To see if you’re eligible and for information on how to apply visit: uns.edu.au/eap

UNSW Science

Admission to UNSW is based on academic merit and some of our degrees have additional selection criteria. To check what the entry requirements are visit:

unsw.edu.au/entryrequirements

How to apply

Domestic Applicants

If you’re a domestic applicant you will need to apply online through the Universities Admissions Centre (UAC) at uac.edu.au

International Applicants

If you’re an international applicant you must apply through UAC. International if you are currently completing:
- an Australian year 12 (either in Australia or offshore)
- NZ NCEA level 3 qualification
- the International Baccalaureate

If you’re an international applicant who has completed or is completing qualifications other than those listed above you will need to apply for admission directly to UNSW by visit:

apply.unsw.edu.au

Before lodging your application please visit our international student website at international.unsw.edu.au

Bonuses points

UNSW Science

Assumed and recommended knowledge

UNSW Prep

Sometimes circumstances beyond your control can get in the way of results that reflect your true potential. If you are keen to study at uni but have faced challenges in year 11 and 12 that make you ineligible for the UNSW ACCESS Scheme, and you don’t meet the cut-off for degree entry, consider UNSW Prep.

UNSW Prep is a one year pathway to a UNSW degree place. You study subjects that allow you to develop your academic skills, including maths skills if needed, so that you can achieve your best results. You also study degree level courses from week one, to give you a realistic introduction to university level study. If you do well in these courses you can also earn course credit towards your degree.

Visit: uns.edu.au/uniaccess

Preparation Program (UPP)

At UNSW it’s not a case of how much you are willing to pay or how ‘mature’ you are, it’s about hard work and potential. By completing the University Preparation Program (UPP) you can build your academic skills, experience part-time study in a subject area of your interest and decide if you will make the decision to study at university as a mature student. Visit: uns.edu.au/upp

Indigenous Students

Advice and applications for Indigenous Preparation Programs are available at the UNSW Indigenous Programs and Student Centre, Nura Gili. Visit: nuragili.unsw.edu.au

Rural Students

UNSW provides scholarships, financial and mentoring support to rural students. Visit: uns.edu.au/supportstudents

Alternative entry

Degree Transfer

For many of our degrees, if you are studying at UNSW you can apply to transfer to another degree via the UNSW Internal Program Transfer. You’ll be assessed on your performance in previous UNSW studies via your Weighted Average Mark (WAM). Visit uns.edu.au/ipt

If you’re studying a degree outside of UNSW you can apply for a transfer through UAC after completing a minimum of 0.75 full time equivalent in a degree. Assessment will be based on a combination of AVAR and university results.

UNSW Foundation Studies

The UNSW Foundation Studies program is designed specifically for students with an international education background. After the successful completion of the Foundation Studies program students have a guaranteed place via a provisional offer to an undergraduate degree at UNSW. Visit: info.unsw.edu.au/ufs

Bridging courses

Bridging Courses in chemistry, mathematics and physics can assist in getting you up to speed and are highly recommended. The courses are held in late January and are completed before you start your studies in semester 1. Visit:

science.unsw.edu.au/bridging

No Maths or General Maths at high school?

Maths courses recommended for most of our degrees. If you haven’t got the high school maths level assessed for your degree the Mathematics Essentials for Higher Education course offered in partnership by UNSW and TAFE Randwick, can help you catch up and get you on track. Visit:

science.unsw.edu.au/bridging and click Mathematics for more information.
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## Dual degree index

Dual degrees enable you to combine a Science degree with a degree from another faculty, offering you the flexibility to explore interests beyond science. A dual degree helps you expand your skill base and broaden your career prospects, and can be completed in as little as four years.

### Art and design

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<th>Degree</th>
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<th>UNSW code</th>
<th>Duration</th>
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<td>Science/Fine Arts</td>
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### Social sciences

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<th>Degree</th>
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<th>UAC code</th>
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<th>Duration</th>
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<tbody>
<tr>
<td>Science/Fine Arts</td>
<td>84.00/31</td>
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<td>4 years</td>
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<tr>
<td>Science/Social Research &amp; Policy</td>
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<tr>
<td>Advanced Science/Music</td>
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### Business school

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<th>Duration</th>
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### Engineering

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### Law

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*Check the UNSW Law Undergraduate Guide and Law website for current entry requirements.