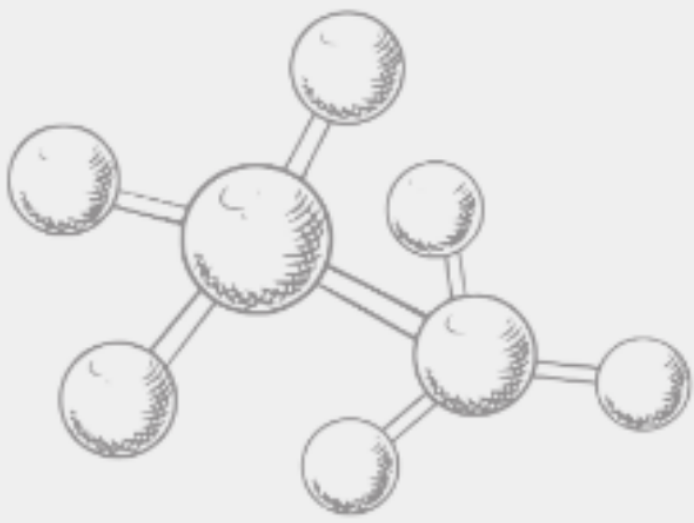
UNSW SCISOC

MEET YOUR



MAJORS

SCISOC
UNSW

ALL YOU NEED TO KNOW ABOUT:

Advanced Physical Oceanography

Physical oceanography is the study of the physical properties and dynamic processes of the oceans. Physical oceanographers study the interaction of the ocean with the atmosphere, how the ocean stores and releases heat and chemical content of water, among many other issues. Studying physical oceanography as a major entails understanding the mathematical equations that describe fluid flow and how these apply to the ocean. It also explores ocean measurement and the modelling of processes at various scales.

- IS PHYSICAL OCEANOGRAPHY SUITED FOR YOU? -

Mathematical Knowledge

Since the major focuses on describing the evolving patterns of ocean circulation and fluid motion, it will involve many calculations so a strong mathematical foundation is important for things such as determining the concentration of dissolved chemical elements and gases, etc.

Understanding of Physics

An understanding of physics will also be helpful when studying the ocean currents, helping you to determine why, where and how the water moves.

Field Observation Skills

A great deal of physical oceanography involves studying the dynamics of global climate and sustainability of human activity in coastal and estuarine regions which will involve making such observations in field.

Problem Solving Skills

You will be faced with a range of real-life issues that require innovative solutions using the limited resources available.

Internships & Career Paths

- UNSW | Graduate Diploma in Physical Oceanography
- Dolphins Research Centre | Internship
- Reef Environmental Education Foundation | Internship
- Hydrologist
- Ocean driller
- Marine biologist
- Research assistant
- Water pollution technician

Fun Fact!

There is a 41% chance for the role of geoscientists to be fully automated within the next two decades.

SCISOC UNSW

ALL YOU NEED TO KNOW ABOUT

ANATOMY

WHAT IS IT?

Anatomy consists of vast branches of science, studying both the macroscopic and microscopic structure of the body. This includes the anatomy of the developing body (developmental anatomy or embryology) and evolutionary or comparative anatomy including biological anthropology. The major UNSW offers a large variety of possible career development opportunities in Clinical Practice, Medical Imaging, Medical Education & Ethics, Bioarchaeology, Anthropology, Sports Medicine / Coaching and many more.

IS ANATOMY SUITED FOR YOU?

PATIENCE & DISCIPLINE

- Patience and Discipline: The study of anatomy requires students to learn many terminologies and diagrams which can be achieved through a disciplined and planned study approach.

INTEREST IN ANATOMY STRUCTURE

- An interest in the structure of the body: Most of anatomy will be on body structures and students will be required to perform dissections on body parts which requires a degree of comfortability.

INTEREST IN VISUAL LEARNING

- interest in Visual Learning: A lot of anatomy is learnt through graphs and 3D-Models showing movements and techniques. This should appeal to those who are visually active and find learning more effective through such methods.

GOOD AT RESEARCH

- When studying anatomy, students will be required to write up reports and assignments which will require thorough research on various scholar articles.

INTERNSHIPS/JOB OPPORTUNITIES

- Medical Scientist
- Biological Science Professor
- Biochemist
- Biophysicist

FUN FACT

Messages from the human brain travel along nerves at up to 200 miles an hour (322 km/h).

BIOINFORMATICS

The 21st century has seen many breakthrough discoveries in various facets of science, and one pivotal discipline that has played a big part in this is bioinformatics. It's essential for management of data in modern biology and medicine, providing a computational framework to analyse various data conducive to new scientific discoveries. As a major, bioinformatics encompasses the disciplines of computer science, biology, physics, mathematics, statistics and engineering.

After graduating, you'll see yourself as a jack-of-all-trades and have a variety of options you can branch out to when it comes to your career pathways. In the field of bioinformatics, you'll expect to be engaging in work involving the analysis of gene variation and expression, prediction of gene structure and function, developing algorithms to detect mutations in genomes, and more.

TRAITS SUITED FOR THIS MAJOR

INTEREST IN RESEARCH & DEVELOPMENT

Having some form of interest in research and development and the disciplines that bioinformatics involves can be a good indicator of pursuing this pathway.

PROBLEM SOLVING SKILLS & COMFORTABLE W/ COMPUTERS

As said by Dr Richard Edwards

"If you enjoy problem-solving and are comfortable with computers, you will probably enjoy bioinformatics. It is ideal for anyone who loves biology but does not enjoy laboratory or field work. Bioinformaticians come in many different flavours and so it is pretty easy to find an aspect that interests you."

He also explained that having a logical mind and attention to detail are probably the core skills that a bioinformatician needs, and that some interest or skills in programming will be deemed useful.

VISION TO MAKE THE WORLD A BETTER PLACE

Nevertheless, a vision to make the world a better place is also a great indicator and of course, having a passion for science!

INTERNSHIPS

- Norvatis Graduate program
- CSIRO Studentships & Scholarships

POST-GRADUATE

- PhD - Bioinformatics
- Master of Information Technology

FUN FACT!!

The human genome was first sequenced in 1999, and it took years and hundreds of millions of dollars to complete. The National Institutes of Health is funding an initiative to drive the cost down to $1,000 or less to sequence an individual's genome and to cut the time down to a day or two.

ALL YOU NEED TO KNOW ABOUT

BIOLOGY

WHAT IS IT?

This degree entails living organisms and the study of life, single-celled or muti-cellular. The different expertise in this degree are botany, ecology, marine biology and zoology. Botany is the study of plants and how their relationship with their natural habitat. Not only this, but marine biology is about organisms in the ocean, coastal environment as well as estuaries. A last big example would be zoology, which would be the different aspects, such as structure, behaviour, genetics, evolution and classification of animals.

IS BIOLOGY SUITED FOR YOU?

PASSION FOR NATURE

- Animals and plants perhaps, furthermore, an interest in preserving their habitat would also be a useful interest.

ADAPTABILITY

- You have to deal with a lot of different environments – water, mountains, small, tiny animals that you can't even see, all the way to huge mammals.

INTEREST IN LEARNING ABOUT THE ENVIRONMENT

- For example, what makes the environment around us the way it is? How do certain species adapt in certain environments?

OBSERVATION SKILLS

- Being sensitive with your surroundings will help you learn a lot more and improve. This area has a lot to be discovered, with a lot of unanswered discoveries and questions. Therefore, asking insightful questions will help you succeed.

FUN FACT

The female egg is the largest cell in the human body and the male sperm is the smallest.

INTERNSHIPS/JOB OPPORTUNITIES

- Research scientist
- Pharmacologist
- Biologist
- Ecologist
- Nature conservation officer
- Biotechnologist
- Forensic scientist

BIOTECH

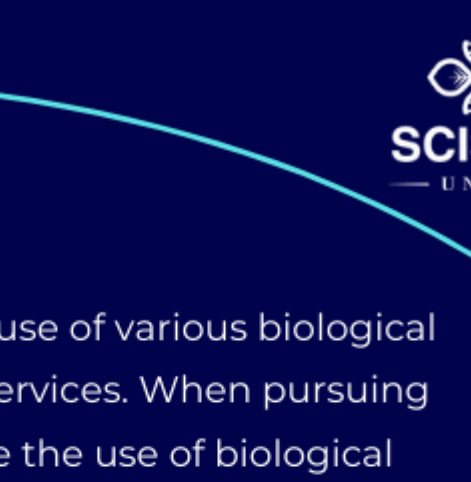
Biotechnology is a discipline that involves the use of various biological processes to produce products and perform services. When pursuing this major, studies you might pursue include the use of biological processes based on living cells and biochemical macromolecules such as proteins, DNA and RNA in a rapidly-expanding range of activities to benefit society. Biotechnology combines the disciplines of molecular biology, protein chemistry, and microbiology to modify living cells and cellular materials that develop new technologies and products in the areas of medicine, agriculture, and industrial biotechnology.

This major provides a great range of career pathways you can follow that extend from the field of science such as becoming a bioanalytical chemist, biodiversity scientist, clinical researcher or even a business development manager. This is simply due to the strong analytical and problem solving skills you develop throughout your degree's specialisation which creates diverse job opportunities.

TRAITS SUITED FOR THIS MAJOR

EAGERNESS TO MAKE A DIFFERENCE

This major would be great for students that have an eagerness to make a difference in the world. Biotechnology is heavily associated with activities that benefit mankind and thus is suitable for students that want to improve the world through the development of new technologies.



INTEREST IN SCIENCE

A mere interest in science is also enough to consider yourself suitable for this major, as spending time in this degree can foster greater aspirations!

INTERNSHIPS

- Children's Cancer Institute: Research Assistant
- Cerebral Palsy Alliance: Research Assistant

CAREER PATHWAYS

- Bioanalytical Chemist
- Clinical Researcher
- R&D Scientist

FUN FACT!!

DNA stores "information" or "data", and one gram of DNA can approximately store over 200 petabytes worth. Thinking about how much storage a phone or laptop has on average, DNA can store over a million times more information than these devices can.

- All human DNA is 99.9% similar. It is the 0.1% that accounts for the difference in people (individual uniqueness).
- DNA can be used to store data just like your typical hard drives. Scientists have been able to store 700 terabytes in a single gram of DNA.

CHEMISTRY

Chemistry as a major is aimed to educate and train students in all contemporary specialties of science, and thus should be chosen for those dedicating the majority of their degree to chemical sciences. There are a flurry of complementary discipline areas for Chemistry majors; Biochemistry, Earth Science, and Materials Science to name a few. As a result, specialising in other fields can offer a nuanced chemical sciences degree, which can open many doors for unique areas of study. For example, studying Chemistry alongside Biochemistry gives students opportunities to study toxicology and neurochemistry. Similarly, Chemistry with Mathematics can give you the foundations for learning the applications of computers within Chemistry, while Chemistry in conjunction with Physics or Materials Science sets the foundations for expertise within advanced materials.

TRAITS SUITED FOR THIS MAJOR

PASSION FOR THE MAJOR

Though to have passion for your major may sound obvious and should be applicable for all degrees, chemistry in particular as stated above, is set for students who are intrigued by chemistry and its adaptability as a discipline.

STRONG RESEARCH SKILLS

Chemistry has a strong basis in research as all sciences are, and thus requires strong research skills, and the ability to analyse data and use previous papers to consolidate new discoveries.

GREAT DEXTERITY W/ LAB EQUIPMENT

A chemistry major requires great dexterity with laboratory equipment and a clear understanding of the laboratory setting, and how it can affect results gathered and conclusions drawn.

GRADUATE OPPORTUNITIES

Most chemistry degrees direct you towards postgraduate studies or research positions. The programs you apply for would be catered towards the specialisation or chemistry branch of your interest. As for research, many universities and companies such as CSIRO offer research positions. Some job you could take on after graduation are listed below:

- Analytical chemist
- Biotechnologist
- Chemical engineer
- Forensic scientist
- Pharmacologist
- Toxicologist

QUOTE:

"As the central science, students with very diverse interests enjoy chemistry majors. Hunting for aliens, making better medicines or materials, solving environmental issues, cooking; everything is open to you with a chemistry degree. Chemistry is the tool you need to understand and design the microscopic world around you."

- Professor Laura McKemmish

SCISOC UNSW

ALL YOU NEED TO KNOW ABOUT:

Earth Science

Earth Science as a major studies the nature and evolution of the structure of our planet, covering earth related topics from natural crystals and fossils to the force that drives earthquakes and volcanoes and moves continents across the globe. This major includes areas of study in environmental geology, geophysics, geochemistry, mineral and petroleum exploration and resources, hydrogeology and underwater contamination, palaeontology, remote sensing and many more. Field work is also an essential part of geology courses.

- IS EARTH SCIENCE SUITED FOR YOU? -

Performing Lab Experiments

Earth science provides plenty of opportunities to gain hands-on experience working with real-life challenges, so you should have skills and enjoy performing experiments in the lab.

Interest in Earth

Ever wondered what happens below the surface you are standing on? If you are interested in Earth, what it is composed of, its functions, and how it compares to other planets, then this major is the right fit for you.

Curiosity & Outdoors Fan

Studying Earth Science enables participation in fieldwork in the environment you enjoy. This major examines tangible objects and addresses a wide array of issues. You may also work in harsh environments such as the arctic or volcanic regions.

Creativity

You will be faced with a range of real-life issues that require innovative solutions using the limited resources available.

Internships

- Chevron | Earth Science Vacation Program

Career Paths

- Environmental technician
- Laboratory assistant
- Water policy officer
- Natural resource manager
- Landcare coordinator

Fun Fact!

The length of Earth's day is increasing. When Earth was formed 4.6 billion years ago, its day would have been roughly six hours long. Today, the average day is 24 hours long, but is increasing by about 1.7 milliseconds every century.

SCISOC UNSW

ALL YOU NEED TO KNOW ABOUT:

Ecology

Ecology is the study of how organisms interact with their surroundings, among species and within their habitat. It delves deeper into how these organisms interact with not only their close, biological habitats but also physical surroundings. There are many different aspects of Ecology, such as community ecology, marine ecology, eco-toxicology, animal ecology and so on, which each discipline deals with different environments and ecosystems.

- IS ECOLOGY SUITED FOR YOU? -

Genuine Passion & Enthusiasm

You need a fundamentally good understanding and enthusiasm for the ecosystem and our natural habitat. A genuine passion is needed in order to deal on-hand with real-life wildlife.You must also have a passion to learn fundamental, foundational understanding of biology; not just the anatomy of animals, but how the ecosystem works, the food chain and the necessary details associated with it.

Precise Obeservation Skills

Since this degree delves deeper into the relationship between two vast ecosystems, you need a good eye and delicate observation skills to notice their interactions.

Conservationist Mindset

The prospecting field of ecology mainly deals with preserving our environment. Thus, an enthusiasm for the climate and its changes, as well as how this impacts our ecosystem and how we can preserve this would be an important aspect in being able to consistently engage in the degree even in the future.

Good Memory

There are a variety of different technical languages and formal terms associated with these studies, thus good memorisation skills will come in handy.

Career Paths

- Environmental consultant
- Research scientist
- Natural resource manager
- Park naturalist
- Restoration ecologist
- Research assistant

Fun Fact!

Half of the world's species live in tropical rainforests.

FOOD SCIENCE

Studying Physics entails a grounding in the fundamental understanding of the universe that Physicists have developed to date. This incorporates understanding mechanics, optics, waves, gravitation, special relativity and the maths needed to study those. At a higher level physics those fundamental relationships allow the study of quantum mechanics, electromagnetism, statistical mechanics and more advanced astrophysics.

The next level is understanding the questions that Physicists are still researching the answers to. The UNSW Physics major offers expertise across 9 areas of research, including Astrophysics, Acoustics, Biophysics, Computational Physics and Big Data, Condensed Matter Physics and Quantum Devices, Experimental and Observational Physics, Fundamentals Physics, Theoretical Physics and Physics Education Research.

TRAITS SUITED FOR THIS MAJOR

FOOD LOVER

If you are a food lover, you will definitely love working in industries furthering from this major. You will be exposed to many food products, creating new products, testing the food quality or doing research on food products. You can also discover new flavours, and new recipes that you have never known before. There's nothing more enjoyable than studying an area of interest.

DIVERSE ENVIRONMENT

When working in a food industry, it provides many opportunities in a diverse environment. You will not be limited to a desk job or lab work but instead will be open to different departments like quality, sales, manufacturing, marketing and even teaching. Food Science can open you to countless opportunities in a diverse environment, allowing adaptation specific to your area of interest.

DEDICATED AND DISCIPLINED

While working in the food industry, you need to be totally dedicated and disciplined. There needs to be a passion within you that drives you to help other people. Food is associated with the lives of millions of people, meaning that dedication and discipline are a key trait in this field.

FUN FACT!!

When apples are sliced, they turn brown.This browning effect is caused by an enzyme - Polyphenol oxidase or PPO - that is naturally present in the apple itself. Slicing an apple breaks and ruptures the tissue cells located along the cut surface, allowing PPO enzymes and other cell constituents to combine and react to create the brown discoloration.

CAREER PATHWAYS

- Food technologist or Scientist
- Nutritionist or Public Health Nutritionist
- Product manager
- Food Safety Officer

SOME INTERNSHIPS

- Brands and Manufacturers Internship, Supplements Internship - The George Institute for Global Health
- Food Technologist - R&D team

SCISOC UNSW

ARC CLUBS

ALL YOU NEED TO KNOW ABOUT

GENETICS

WHAT IS IT?

Genetics focuses mainly on the behaviour of genes which are fundamental to all organisms. Such genes influence every characteristic the organism possesses, ranging from lifespan to appearance and behaviour. By researching genetics, new technologies can be developed which can change the molecular composition of genes, altering traits from human diseases to plant breeding. UNSW BAB's Genetics major offers specialised areas including molecular genetics, human genetics, plant and microbial molecular biology and conservation biology. The major has a significant focus in the discipline of integration of these approaches at the cellular, whole organism and population levels.

IS GENETICS SUITED FOR YOU?

INTEREST IN GENETICS

- Those with an interest in understanding genetics and DNA analysis: The study of genetics is very much about how DNA sequences can modify behavioural and physical traits of an organism which appeals to those who wish to understand the basic foundational building blocks of our bodies.

EFFICIENT ANALYSIS & DATA INTERPRETATION

- Those who can efficiently analyse and interpret data: Geneticists focus on how traits and qualities are passed to successive generations. This requires conducting many experiments and interpreting massive amounts of data to investigate the relationship between certain traits.

INTEREST IN HEALTHCARE INDUSTRY

- Those who are interested in working in the healthcare industry: The study of Genetics allows healthcare workers to effectively translate genome information which is extremely useful for identifying diseases and risk involved.

FUN FACT

Cheetahs were almost wiped out by the last ice-age, and all modern cheetahs are descended from a small portion of the surviving cats that interbred to maintain their species. Because of this, cheetahs are practically genetic clones of one another.

INTERNSHIPS/JOB OPPORTUNITIES

- Agricultural and Food Scientists
- Biomedical Engineers
- Forensic Science Technicians
- Medical Scientists

SCISOC UNSW

ALL YOU NEED TO KNOW ABOUT:

Geography

Geography is the study of spatial and temporal variations of the phenomena which make up natural and human-dominated environments. As a major, you will engage in studying about the past, present and future of the physical and social world. In doing so, you will come to realise the cultural significance of geography and its contribution to an understanding of the total environment. Geography as a degree is unique as it shapes your perspective about your surroundings, and doesn't necessarily provide a specific aquriable hard skill compared to other degrees. As a geographer, you will likely work in fields such as urban management, regional planning, and environmental assessment. Geographers have strong spatial awareness that not only provides educational and professional opportunities, but also spills over to daily life benefits such as having a greater understanding of the community, country, etc.

- IS GEOGRAPHY SUITED FOR YOU? -

Critical Thinking Skills

Possessing critical thinking skills can be very valuable towards the degree.

Interest in the Environment

Although geography is technically a major of science degrees at UNSW, this does not mean geography should be limited to only students interested in or pursuing science, but rather can be for all students interested in understanding more about the environment in which they live.

Interest in Geography

Having some type of interest in geography is also an indicator that this degree can be for you. Even if you don't believe you have skills that can be beneficial in this major, a passion for Geography is essential to the fundamental enjoyment of it, which is arguably more important than having the technical skills for the degree!

Fun Fact!

We normally view deserts as dry barren land that's sandy and hot. Oddly, this is only somewhat true considering that Antarctica is the world's largest desert. Deserts are defined as an area of land that doesn't receive over 25cm of precipitation a year. Antarctica is called an Antarctic Polar Desert that covers approximately 14 million square kilometres.

Career Paths

- Environmental consultant
- Town planner
- Landscape architect

SCISOC UNSW

ALL YOU NEED TO KNOW ABOUT:

Marine & Coastal Sciences

Marine and coastal science focuses on the marine environment involving the study of biology, Earth science and oceanography. Marine biologists study life on the shore and in oceans and estuaries, while marine geologists study the structure and topography of the ocean floor, ocean sedimentation and marine resources. In studying marine and coastal science, you will learn from experts in marine, coastal and ecological fields and engage with key figures in industry. You will conduct fieldwork in key coastal and marine landscapes from estuaries to urban developments, major waterways and coastal zones.

- IS MARINE & COASTAL SCIENCES SUITED FOR YOU? -

Teamwork

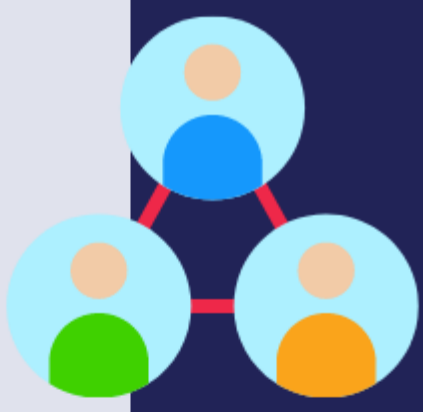
Working with other scientists in other areas of science is a common trend as a marine scientist. Thus, effective teamwork and enjoyment in working with others is needed if you want to follow this career path. Some examples of effective teamwork characteristics include good communication, clear direction, and support for risk-taking and change.

Conservationist Mindset

By studying and immersing yourself in the marine environment, your work will often take a conservationist approach as you first understand human impacts on the environment and try to reverse and slow damage to the environment.

Collaboration with Other Fields

Marine biologists work as a team alongside geologists to study the topography of the ocean floor, sediment and marine resources; with chemists to study the chemical composition of seawater, examining the concentration of pollutants and nutrients; or can work with physical oceanographers to study the waves, current and tides.



Fun Fact!

It's possible to find rivers and lakes in the ocean. When salt water and hydrogen sulfide combine, it becomes denser than the water around it allowing a river or lake to form that flows beneath the sea.

Postgraduate Programs

- UNSW | Master of Marine Science and Management
- USYD | Master of Marine Science and Management
- USYD | Graduate Diploma in Marine Science and Management

Career Paths

- Environmental Scientist

MATERIAL SCIENCE

Materials science involves learning about the relations between the structures (atomic-scale) and microstructures (optical-scale) of materials, as these properties are affected by how materials are synthesised. The areas of research this major entails include, but aren't limited to, metals, ceramics, polymers, and their composites. The size range of these materials include anything from nanotechnology up to large structures and their forms range from quantum dots to thin films to bulk materials.

TRAITS SUITED FOR THIS MAJOR

INTEREST IN MATERIALS & THEIR PROPERTIES

The study of materials science involves investigating materials and their properties, such as physical, chemical, mechanical, thermal, electrical, magnetic, optical, etc. properties. These properties are then considered and connections are drawn between them and how these materials will perform in different situations.

INTEREST IN RESEARCH

Materials science involves a lot of hands-on research and laboratory work, as it deals with learning and understanding how certain materials work on the atomic, micro and macroscopic scale.

INTEREST IN CHEMISTRY

When working in the field of materials science, a sound understanding of chemistry is helpful, if not necessary. However, materials science particularly targets chemistry in its solid state, as opposed to the traditional teachings of chemistry, which deals with gases and liquids. A working knowledge of maths and physics is also helpful.

INTERNSHIPS/ JOBS

- ResMed - Student Materials Engineer Summer Internship Program
- CSIRO - Mineral Resources Discovery Internship Program
- Design Engineer
- Metallurgist
- Analytical Chemist
- Biomedical Engineer

POSTGRADUATE

- Master of Materials Technology
- Materials Science and Engineering Masters of Science
- PhD - Materials Sc and Engineering (Must have been enrolled in Masters by Research program for a year)

FUN FACT!!

Materials scientists have started to adopt what is known as the 'Iron Man' Technique to try potentially synthesise new compounds; similar to what Tony Stark did in his film Iron Man 2 when creating a new element, scientists have started looking into reverse engineering new alloys to create stronger, better alloys.

MATHEMATICS

Mathematics is a diverse language, a tool for analysis and prediction that studies the relationship between numbers, structures and patterns. This includes areas such as algebra, calculus, trigonometry, geometry, statistics, number theory, and discrete mathematics. The discipline of mathematics examines numerical, algebraic, and analytical structure as well as the development of quantitative methods that are essential for developments in the fields of science, engineering and economics. The analysis of such quantitative problems gives a deeper insight into the inner workings of various scientific relationships while also developing vital critical thinking skills.

TRAITS SUITED FOR THIS MAJOR

INTEREST IN DIVERSE MATHEMATICS TOPICS

When choosing mathematics as a major, you want to make sure that you can do well in a wide range of mathematics courses. You should have interest working with different types of math, including calculus, algebra, statistics, discrete mathematics, etc.

KEEN INTEREST IN PROBLEM SOLVING

Although there are many different topics within mathematics, a core component to all of them is problem solving. Maths is like a language that allows us to construct mathematical narratives. It allows us to play and experiment with the 'words and styles' available.

The study of mathematics largely revolves around being able to apply problem solving skills to a wide range of scenarios and situations to discover all sorts of fascinating mathematical relationships that exist in the world around us.

PATIENCE

When working in mathematics, it's common for the answer to a question to not come easily at first, even though patience is required and it is easy to become frustrated, the process and outcome is rewarding in some way. You should also have the willingness to work on a particular problem as long as it takes, despite its difficulty.

SOME INTERNSHIPS

- Data analyst
- Risk modelling
- Quantitative research analyst
- Investment Banking
- University Lecturer

CAREER PATHWAYS

- Bachelor of Science (honours) in Mathematics
- Master of Mathematics
- Doctor of Philosophy - PhD (Mathematics)

POSTGRADUATE

- Quantium - Data Analytics Internship
- Akuna - Trading Internship

FUN FACT!!

There are 7 mathematical problems called the Millenium Prize Problems, each of which offer a $1 Million reward for solving one of the problems. Only one of these problems has been solved so far, although the mathematician who solved it, Grigori Perelman, surprisingly declined the prize money.

ALL YOU NEED TO KNOW ABOUT:

MICROBIOLOGY

WHAT IS IT?

A discipline that has contributed to many of the world's most important scientific discoveries that have underpinned the modern era is microbiology. Microbiology is the study of the smallest organisms and their impacts on their environment and can be classified into pure and applied sciences: taxonomy, bacteriology, mycology, protozoology, and phycology. This major plays an essential role in the study of the greater world answering questions regarding the diversity of life on Earth and also in the universe.

WHAT CHARACTERISTICS DO YOU NEED?

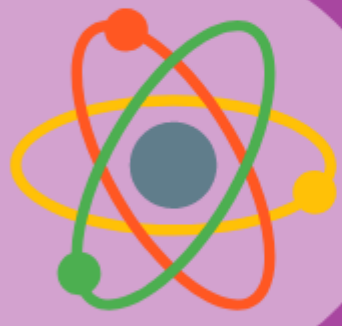
As a microbiologist, there is a high level of flexibility in the field you can work in which include hospitals, universities, medical schools, agriculture and food, and even in the space industry. You will most likely be researching and studying microorganisms and their synergy with their environment to further understand their role in being the biological wheels that are responsible for sustainability of life.

IS MICROBIOLOGY IS A GOOD FIT?

Like any science major, having an interest in the general area of science is an indicator that microbiology can be for you. More specifically, an interest in biology is a stronger indicator that Microbiology is a great fit for you.

Appreciating the 'smaller' things in life and having a passion for understanding the world and beyond at greater lengths are strong signs that show you would be very suitable for Microbiology.

Given microbiology encompasses lots of hands-on work alongside research, having some level of discipline in completing laboratory work with a high degree of effort can go a long way in the quality of your outcomes.



SCISOC UNSW

ALL YOU NEED TO KNOW ABOUT

MOLECULAR AND CELL BIOLOGY

WHAT IS IT?

Molecular biology is a combination of biochemistry, microbiology, and cell biology, said to have an increasingly vital role to play in many aspects of modern medicines, genetics, evolutionary biology, bioinformatics, biotechnology and genomics. As for cell biology, it is the sub-discipline of biology that studies the basic unit of life and the cell in areas such as cell division and cell processes. This major has the ultimate goal of understanding the world at a deeper, molecular level, which is crucial given the many scientific breakthroughs that have led to our understanding of science and our environment today. Molecular and cell biologists compile and analyse molecular and cellular experimental data, design molecular or cellular experiments, oversee them, and interpret results. As a major, molecular and cell biology is a vast field and as such, opens many career pathways for students to pursue, such as becoming a chemist, biomedical engineer, epidemiologist, and even possibly find various roles in the agriculture industry. This major is a discipline that is broad and in turn can be very appealing to many, and if you're looking for something more specific you can always pursue the other disciplines that molecular or cell biology encompass (e.g. microbiology).

IS MOLECULAR AND CELL BIOLOGY SUITED FOR YOU?

CRITICAL THINKING

- As for any science degree, critical thinking to a strong degree will assist in your problem solving and analytical skills which are essential for this major.

INTEREST IN A MIX OF HANDS-ON WORK ALONGSIDE RESEARCH

- This degree will guarantee you will need to get your hands dirty and it's guaranteed you'll be doing laboratory work pretty often. Alongside this, you'll also be doing research and analysis in this field which means if you enjoy spending time in both worlds of hands-on work and research, this major could definitely be for you.

FUN FACT

In 1953, a molecular biologist of the name James Watson was at the forefront of a breakthrough discovery about DNA. He found that the essential DNA components must be linked in pairs, playing an integral part in his formulation of the molecular model for DNA, which we now commonly refer to as a double helix.

INTERNSHIPS/JOB OPPORTUNITIES

- Regeneron: Quality Control & Assurance Intern
- Johnson & Johnson: R&D Intern
- Bayer: Nucleic Acid Technologies Intern

- Toxicologist
- Materials Scientist
- Forensic Analyst

ALL YOU NEED TO KNOW ABOUT:

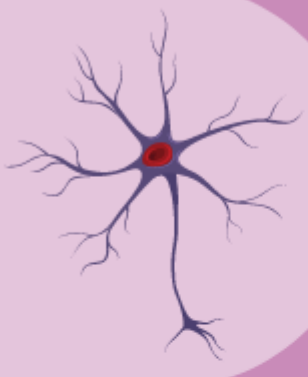
NEUROSCIENCE

WHAT IS IT?

Neuroscience encapsulates the biological and behavioural aspects of the nervous system, specifically the neurological links between the brain and behaviour, and is offered by the departments of Anatomy, Physiology, and Pharmacology, as well as the School of Psychology. With a neuroscience major, you can explore a variety of fields linked to the medical and health industry, and gain a career in research or as a counselor, psychologist, or neurologist/neuroscientist.

IS NEUROSCIENCE IS A GOOD FIT?

As with most if not all sciences, research skills are critical to success within a neuroscience major. To be able to analyse data and utilise research tools to build on your own knowledge is significant for this ever-evolving field.



A good memory is key for all majors but for neuroscience in particular, it is important that you are able to recall knowledge, facts, and material about the brain and the nervous system in order to build solid foundations for future learning and application.

A transferable skill, problem-solving is key for neuroscience majors as it involves a flurry of other disciplines such as biology and mathematics, hence your versatility as a learner is critical in synthesising your knowledge and learning how to critically think at the same time.

Fun Fact

In the field of connectomics, physicist Sebastian Seung created a game called Eyewire, which challenges users to map retinal neurons from the brain at his lab at Princeton University! Players do not need a neuroscience nor scientific background at all to play, and the goal is to reconstruct 3D models of neurons from electron microscope images by solving puzzles!

ALL YOU NEED TO KNOW ABOUT:

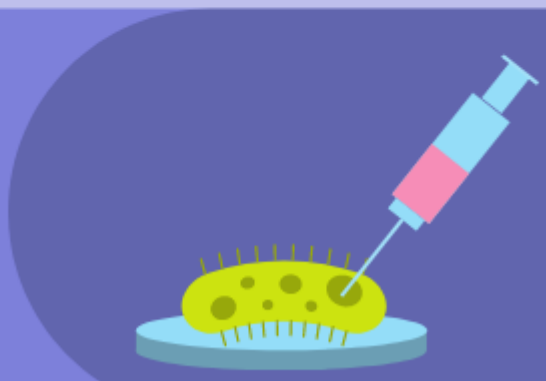
PATHOLOGY

WHAT IS IT?

Pathology is a discipline concentrated in the study of diseases at multiple levels; genetic, molecular, cellular, and organ. Specifically it centers on how and why diseases, such as infections and cancers, develop, the process of a disease, and its subsequent effects such as symptoms and complications. It is an integral science in the medical industry, playing a role in more than 70% of clinical diagnoses and forming many decisions regarding the most optimal treatments for patients. As a degree, the content revolves around examination of disease processes, identifying specimens and learning the differences between normal and abnormal cells, tissues, and organs. A wide range of significant disorders are also studied, including but not limited to auto-immune diseases, cancers, heart disease, and HIV/AIDS.

IS PSYCHOLOGY IS A GOOD FIT?

As a pathology major, to be detail-oriented is key considering the potential complexity that your studies will involve. Since pathology is tied in with other disciplines, you will need to piece together knowledge from a variety of sources and pick out patterns, which requires a critical eye as well as attention to detail.



A pathologist can be described as a 'medical detective' and as the name suggests, involves detecting a disease and all of its characteristics and effects on humans. Hence, problem solving skills are essential as the process of diagnosing a disease requires compelling analysis, in conjunction with an in-depth understanding of the content taught within the degree.

Pathology is a degree heavily dependent on interaction with others whether it is discussing research, ideas, concepts, or conveying your own analysis, data or conclusions. You must be open-minded in order to facilitate productive and insightful discussion with other students and professionals in the industry.

Fun Fact

While it's well-known that the current mortality rate for COVID-19 worldwide is 2%, it's less well-known that many COVID survivors suffer from something known as 'Long COVID'. Long COVID causes shortness of breath/headaches/fatigue/anxiety/depression/etc. for a long period of time after having first been infected. It's been shown that 57% of COVID survivors have suffered symptoms of long-COVID for a period of 6 months or longer.

Internship/Jobs

- Anatomical Pathology Technician
- Biomedical Scientist
- Bioinformatician
- Medical Laboratory Scientist

Internship/Jobs

- Master of Science (Research) - Pathology
- Master of Public Health
- Master of Infectious Diseases Intelligence
- PhD - Pathology

ALL YOU NEED TO KNOW ABOUT:

PHARMACOLOGY

WHAT IS IT?

Pharmacology is a branch of medicine that deals with the uses, effects and modes of action of drugs. It draws from toxicology, chemistry, biology and physiology as you create new chemical substances and analyse the effects of existing medicinal compounds, both good and bad. It will involve a great deal of research into the effects of existing and new compounds and enable you to innovate ways to remedy many physical and mental ailments. As you complete this major, you will have ideally strengthened laboratory, research and technical skills which are essential for the transition to work.

IS PHARMACOLOGY IS A GOOD FIT?

As you will be designing and carrying out experiments and testing hypotheses throughout your career, it is essential that you have a strong understanding of experimental design process

.

You will use your **problem solving** skills as the frontier of research and development of new medicinal compounds and find new uses for existing medicines to treat prevalent conditions.

Your research and data collection will collectively contribute to the studies of pharmacists, toxicologists and veterinarians by updating their understanding on the changing state of the medicine world. You will also make recommendations of medicinal compounds based on data from experiments and research and see their implementation in modern medicines.

Fun Fact

In 1886, a pharmacist John S. Pemberton created Coca-cola as a treatment for common ailments. The drink was based on cocaine from the coca leaf and caffeinated extracts from a kola nut.

POSTGRADUATE PROGRAMS

Master of Philosophy
Masters by Research in Pharmacology
Postgraduate Diploma in Science

CAREERS

- Pharmacologist
- Research fellow
- Medical writer
- Medical Liaison

PHYSICS

Studying Physics entails a grounding in the fundamental understanding of the universe that Physicists have developed to date. This incorporates understanding mechanics, optics, waves, gravitation, special relativity and the maths needed to study those. At a higher level physics those fundamental relationships allow the study of quantum mechanics, electromagnetism, statistical mechanics and more advanced astrophysics.

The next level is understanding the questions that Physicists are still researching the answers to. The UNSW Physics major offers expertise across 9 areas of research, including Astrophysics, Acoustics, Biophysics, Computational Physics and Big Data, Condensed Matter Physics and Quantum Devices, Experimental and Observational Physics, Fundamentals Physics, Theoretical Physics and Physics Education Research.

TRAITS SUITED FOR THIS MAJOR

STRONG MATHEMATICAL UNDERSTANDING

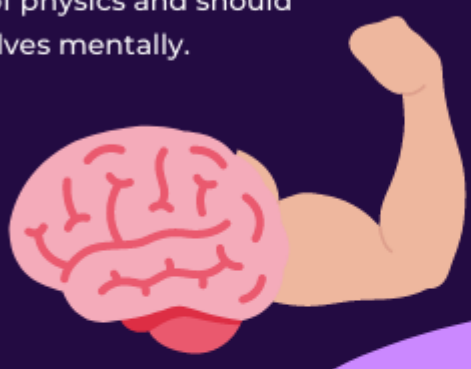
A lot of physics is mathematically founded and requires an extensive understanding of mathematics to solve or interpret problems. Those who have a strong mathematical background will more likely find this pursuit easier and more enjoyable. Strong logic is also ideal for undertaking such a study.

INTEREST IN HOW THE WORLD WORKS

Physics explores the fundamental structure of the universe, starting with the smallest subatomic particles. It deals with the nature of space and time, matter and energy, and provides the foundation for modern technology. You will ideally be interested in how the universe works and what are the mathematical relationships that describe the fundamental structure of the universe.

ENJOY CHALLENGING YOURSELF

Academic challenges and puzzles are very much a part of physics and should appeal greatly for those who aspire to challenge themselves mentally.



SOME INTERNSHIPS

- CERN Summer Student Programme
- National Measurement Institute Student Opportunities
- Fermilab Internship Program
- NASA International Internship Program

POSTGRADUATE

- Bachelor of Science (Honours) in Physics
- Master of Physics
- Doctor of Philosophy - PhD (Physics)

CAREER PATHWAYS

- Theoretical Physicist
- Experimental Physicist
- University Lecturer
- Research scientist
- Astrophysicist

FUN FACT!!

This was the first degree attained by the beloved Big Bang Theory character, Sheldon Cooper, who managed to complete his bachelors by the age of 14 and then only 2 years later received his PhD in physics.

SCISOC
UNSW

ALL YOU NEED TO KNOW ABOUT

PHYSIOLOGY

WHAT IS IT?

Involves the study of how the human body works, describing the chemistry and physics behind basic bodily functions and how different aspects of the body work together cohesively. Physiology contributes to all major aspects of biology including comparative biology, neuroscience and pathology.

Completing an advanced science major in physiology will equip you with the technical skills in a professional laboratory environment that will segue into later pursuits such as research and work in private practices. Undergraduate study will focus on topics like growth and development, respiratory function and vascular control in the human body. As it is a very practical science, a range of laboratory exercises coupled with theory, will maximise your understanding of how organs, muscles and nerves work.

IS PHYSIOLOGY SUITED FOR YOU?

INTEREST IN HOW THE BODY WORKS

- Much of physiology is concerned with the function of our bodies and how various systems within it function. Those interested in understanding such systems would have a keen interest in physiology.

INTEREST IN HEALTHCARE INDUSTRY

- Physiology can open up a wide range of careers including exercise physiologists, sport coaching institutes, health administration and biomedical research which would greatly appeal to those with an interest in the health sector.

STRONG SCIENCE BACKGROUND

- Physiology covers chemistry, physics and biology which encompasses a large range of science content. Those who are confident in their fundamental science knowledge would likely find this course more enjoyable.
- Patience and discipline: Like all medical majors, the study of physiology requires students to learn many terminologies and diagrams which can be achieved through a disciplined and planned study approach.

FUN FACT

A human's ears and nose never stop growing.

INTERNSHIPS/JOB OPPORTUNITIES

- Medical technologist
- Science teacher
- Biomedical engineer
- Health administrator
- Sport coach

ALL YOU NEED TO KNOW ABOUT:

PSYCHOLOGY

WHAT IS IT?

Psychology as a science is focused on behaviour and mental processes, and as a discipline, covers both scientific research and applied practice. As a major, it encapsulates a broad range of topics such as learning, memory, cognition, perception, motivation, life-span development, personality, social interactions, and abnormal psychology, and offers transferable skills such as research and evidence-based practice methods. It is versatile with its multiple applications, whether it be in a clinical context or organisational setting. Those with a major in psychology have a limitless scope of what they can achieve and what careers they can take on from academic research to rehabilitation to management, and marketing.

IS PSYCHOLOGY IS A GOOD FIT?

It is vital that you have critical thinking and problem solving skills. The ability to think outside the box and analyse the content you are consuming critically is valuable in this major. To be able to synthesise a variety of psychological theories and research within the abundance of study areas is a skill you must possess for this major and its subsequent career pathways.

To be able to communicate well is a skill required for most if not all majors, but for psychology specifically, it is imperative to know how to communicate with others respectfully and effectively. You may need to present research, speak to professionals, or simply brainstorm ideas with other like-minded people, which requires clear and productive communication from your end.

In a field like psychology, it is important to know the history, ethical discussions, and contemporary issues that are inherently involved within it. This requires an open mind, an empathetic mindset, and cross-cultural sensitivity that will hence allow you to perceive critically with respect to your own background compared to others, no matter the ultimate career you decide to pursue with this major.

Career Paragraphs

In conjunction with psychology, another pathway you can undertake alongside other areas of study is business, which will provide you with skill sets to take on specialisations like marketing and market research, public relations, and overall management roles. These particular areas would involve majoring in:
Marketing

- Human Resources
- Management

Graduate Opportunities

There are two relevant graduate programs
Generalist management
Human resources.
Both are relevant in both public and private organisations (all disciplines considered), and such include the VPS graduate program and GoGrad, a local government graduate program. Human resources are necessities in all organisations as well as specific HR consulting companies.

STATISTICS

The study of statistics mainly uses mathematics to organise data so that it can be utilised in making decisions in the real world. Computing has become firmly entrenched in modern statistics and so will be a big part of what you learn in this major. In a statistics major, students learn about theoretical, computational and applied statistics, and probability theory. Later electives allow students to further develop their statistical capabilities according to their own interests. This will only enhance the portfolio of skills that students bring into their career.

TRAITS SUITED FOR THIS MAJOR

APPRECIATION FOR DATA

In this career, it is important that you have an appreciation for data's value and can present it to audiences in a meaningful manner.

ABILITY TO COLLECT, ORGANISE & ANALYSE DATA

In today's world, data has become an invaluable asset and so the ability to collect, organise and analyse data by whichever means to guide decisions is a necessity in this career. Since almost every industry requires some understanding of analytics and numbers, it will be quite easy to branch out into almost any field.

INTEREST IN RESEARCH

The demand for statistics related knowledge in the workplace is very high and the BLS (Bureau of Labour Statistics) predicts that statistics related careers will grow by 27 percent in the next ten years. Possible career options after studying this major excluding research and academia are countless

SOME INTERNSHIPS

- Citadel - Quantitative Research Analyst Intern
- Deloitte - Vacation Internship Program
- Quantium - Analyst Summer Internship

CAREER PATHWAYS

- Statistician
- Data Analyst
- Risk Analyst
- Financial Analyst
- Business Systems Analyst
- Market and Survey Researcher

POSTGRADUATE

- Master of Statistics (UNSW)
- Honours in Statistics (UNSW)
- PhD of Mathematics and Statistics (UNSW)

FUN FACT!!

Crazy statistic!: If you lived on an average sized street in Australia comprised of 100 households, on that street there would be a marriage every 9 months, a death every 7 months and a birth every 14 weeks.

ALL YOU NEED TO KNOW ABOUT:

VISION SCIENCE

WHAT IS IT?

The degree of Vision Science is the study of the different sensors in our nervous systems that determine vision and the way we see, as well as the usage and development of the progressive technologies that enhance the study of vision. In this degree, students will learn and be trained to be able to work in ophthalmic industries regarding areas including, but not limited to, development of new vision related technologies, patient treatment and research. Furthermore, these thorough insights can open wider paths such as anatomy, eye disorders, clinical optometry, ocular therapy, sensation and perception and psychophysics.

IS VISION SCIENCE IS A GOOD FIT?

For clinical optometry and patient care, the desire to treat people and assist their diseases to make their lives better will help you enjoy this major. For people willing to go down into research on eye disorders and anatomy,

For people willing to delve into development of vision technology, a further understanding of the mechanics of technology and a good understanding of the different optical diseases that can be treated more accurately and safely by a higher level technology.

The most important strength is the ability to adapt between various disciplines of study. This degree will not only require you to study the eye and its anatomy, but it will require an understanding of vast differences between natural science majors, such as chemistry, and d physics.

Internships/Jobs

- Teaching in academic settings
- Consultant for clinical research
- Development of new product
- Working in government sectors, relating to public health mainly

FUN FACT

Your eyes focus on 50 different objects every second.