Interested in Science and Engineering?

See where a career in Science and Engineering can take you ...

Make Life Matter
Whatever your own interests are, if you have ever wondered about how everything came to be, or have a need to understand how things work, or even impact on the world around you – a rewarding and exciting career in Science and Engineering could be for you.

Whether you already have a clear picture of what you want to do with your scientific knowledge and skills, or you are open to the many possibilities, JCU’s Science and Engineering programs offer you the opportunity to develop and strengthen your existing skills as well as learn many new ones.

So be curious, ask questions, experiment! You will be astounded by what you can achieve through Science and Engineering. Here at James Cook University (JCU), we can provide you with the strong foundation that will allow you to embark on your rewarding career in these amazing fields.

Make Life Matter
Bachelor of Engineering: be part of future growth.

Have you ever wanted to turn your love of playing with Lego or building blocks into a real life career as an Engineer? Then a Bachelor of Engineering is for you.

Your passion for building things – regardless of the material you used is a sign that you have an interest in how things are made and how they work. Ever wondered why roads are made of bitumen? Or how bridges simply don’t crumble when a heavy vehicle travels over it? Engineering is the practice of identifying a problem, applying the fundamentals of Maths and Science, creativity and innovation and coming up with a solution. As an Engineer, you will develop the skills needed to solve real-world problems and design and develop innovative products for use in the real world.

What is an Engineer?
As an Engineer – you’re a scientist, inventor, designer, builder and a great thinker all wrapped up in one. You will improve the state of the world, amplify human capability and make people’s lives safer and easier. The road you drive on, the bridges we travel across, the machines that will get us to Mars and the inventions we use in our daily lives have all been designed by an engineer.

What could I work as after I have graduated as an Engineer?
Engineers – as practitioners of engineering, are professionals who invent, design, analyse, build and test machines, systems, structures and materials to fulfill objectives and requirements, and while it might look amazing to build the tallest bridge in the world, engineers are bound to consider limitations imposed by practicality, cost, regulation and safety requirements.

How Do I Study Engineering?
If you are studying on campus full time (four subjects over one semester), the course will take you 4 years, or longer if you wish to study part-time.

Studying these subjects while you’re at school will be invaluable to your understanding of the essential concepts required for your studies at university.

OP/Rank: 12/74
You’re excited to learn more about Aquaculture Science and Technology? 

We can help you with that.

Have you ever wanted to combine your love of science and engineering with aquatic animal or plant breeding? Maybe a Bachelor of Science, majoring in Aquaculture Science and Technology is for you?

**Not your average Farmer**

So what does an Aquaculturist do? They use cutting-edge technologies to enable sustainable breeding and harvesting of different types of aquatic species in diverse environments. Aquaculturists will lead the development of sustainable food security within the upcoming decades.

**Where can I work after I have graduated as an Aquaculturist?**

You have a wide variety of career opportunities as an Aquaculturist. You could be a global aquaculture business manager, a technical / operations farm manager or in-charge of a cutting-edge R&D program.

These positions can involve operating hatcheries, overseeing harvest and post-harvest activities, planning and managerial responsibilities, developing stock nutrition programs, designing water supply systems and establishing advanced genetic breeding programs. Graduates such as yourself also find employment in the multitude of aligned industries which service aquaculture including biosecurity, disease control, engineering infrastructure, genetic diagnostics, alternate sustainable feed development, wild fisheries stock management for example.

**How do I become an Aquaculturist?**

Studying on campus full time (four subjects over one semester), the course will take 3 years, or longer if you wish to study part-time. If you are interested in this course, make sure you study English and Maths B in year 11 and 12, as it will be assumed knowledge once you begin university. Our most successful students have also taken combinations of Maths C, Biology, Chemistry and Physics during their senior school years. Studying these subjects while you’re at school will be invaluable to your understanding of the essential concepts required for your studies at university.
Science is curiosity; answer your questions and excite your mind with a Bachelor of Science.

DEGREE: BACHELOR OF SCIENCE
MAJOR: CHEMISTRY

Have you ever wondered how the Universe came to be?

You can find out through studying Chemistry.

Chemistry is the study of everything around us – in fact, we are made up of chemistry, through elements in our bodies. Chemistry is the study of matter, and the way that it transforms to create the Universe that we live in. You may not believe it, but making ice, or frying an egg on a pan is a form of a chemical reaction. Our perfumes, deodorants and soap are all manufactured by chemistry, and there is so much more to this career than just a scientist in a white lab coat.

Will I really be in a lab all the time if I am a Chemist?
A Chemist is a scientist researching and experimenting with chemical substances and how their different properties interact. Chemistry concerns itself with the structure, composition and properties of matter and its transformations and is important in any field where a molecular-level understanding is required. Chemistry forms the basis for all medical, health, biological, earth and environmental sciences – how rewarding is that? To put it simply, not all chemists wear white lab coats!

Where can I work after I have Graduated?
As a chemist, you have employment opportunities in a diverse variety of science-related areas including mining, pharmaceutical, agriculture and food industries for both state and federal governments and agencies.

How do I become a Chemist?
Studying on campus full time (four subjects over one semester), the course will take 3 years, or longer if you wish to study part-time. If you are interested in this course, make sure you study English and Maths B in year 11 and 12, as it will be assumed knowledge once you begin university. Our most successful chemistry students have also taken combinations of Chemistry, Maths C, Biology, and Physics during their senior school years. Studying these subjects while you’re at school will be invaluable to your understanding of the essential concepts required for your studies at university.
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DEGREE: BACHELOR OF SCIENCE
MAJOR: EARTH SCIENCE

You’re interested in learning more about our Planet?

You can find out through studying Earth Science.

Have you ever wondered exactly why Earth is the only planet that is known to sustain life, or why climate change exists? Why are there so many forms of life on Earth, while there is none on other planets? And where do all the minerals come from that we need to maintain our way of life?

Since the beginning of time, humans have been constrained to the Earth’s boundaries. Now, we are exploring further – learning more about our planet and the planets that surround us. Studying Earth Science will allow you to answer all your questions about Mother Earth, as well as broaden your understanding of the complex systems that link life to oceans, the atmosphere and the rocks that surround us – both above and below the Earth surface.

Developing a sustainable Earth
As an Earth Scientist – you will understand exactly how and what powers the Earth, as well as understand its natural resources. You will study the physical characteristics of the Earth, examining the land, water, minerals and atmosphere. You will study its history and the changes that have taken place over time to gain an understanding of how to create a future that is sustainable for later generations. You will study rocks and minerals that are of use in supporting our economy, and are key to the development of new sustainable solutions to energy.

You will also have the opportunity to contribute to research on climate change and its impact on our planet’s systems.

Ultimately, we as humans have the power and responsibility to protect our planet from global warming before its effects begin to be detrimental. Imagine being a part of this important research?

What can I do if I pursue a career as an Earth Scientist?
As an Earth scientist you can develop ways to utilise resources sustainably and to minimise the impact of humans on the environment. Earth scientists manage our soils, minerals, freshwater, oceans, and atmosphere. There are a wide range of careers available within government, management, private consulting, as well as within industry, including the minerals and mining sectors.

How to study Earth Science?
If you are studying on campus full time (four subjects over one semester), the course will take you 3 years. There is also a part time option available.

If you are interested in this course, make sure you study English in year 11 and 12, as it will be assumed knowledge once you begin university. Our most successful students have also taken Maths B, as well as either Chemistry or Physics during their senior school years. Studying these subjects while you’re at school will be invaluable to your understanding of the essential concepts required for your studies at university.

OP/Rank: 16/65
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DEGREE: BACHELOR OF SCIENCE
MAJOR: MARINE BIOLOGY

Are you interested in the mystery of ocean life?

You can find out through studying Marine Biology.

Have you ever been curious to explore the depths of the ocean and study species that live there? Or do you have a passion for being on the water, and want to learn more about how sea life interacts with the environment? Over 70% of the Earth is water, so why not take the opportunity to study the intriguing, undiscovered parts of the ocean through a major in Marine Biology? At JCU, you will have the opportunity to build networks with students who have travelled from around the world to study the same course as you have.

What is a Marine Biologist?
A Marine Biologist is a scientist that studies marine organisms, their behaviours and interactions with the environment. Marine Biology is the study of all marine life – from plankton to the blue whale. In fact, JCU pioneered the study of Marine Biology in Australia and since then, has been the world leader in tropical Marine Biology.

What does a Marine Biologist Do?
You already have a huge advantage, with the Great Barrier Reef – a natural Wonder of the World – literally at your doorstep. This Reef is the biggest structural organism on Earth, and can even be seen from space! Wouldn’t it be incredibly rewarding to learn how to preserve, protect and manage marine organisms and ecosystems the reef is home to? With the Reef under threat due to climate change and poor water quality, now is the time to kickstart this incredibly inspiring career to protect the most complex ecosystem in the world.

How Do I become a Marine Biologist?
Studying on campus full time (four subjects over one semester), the course will take 3 years, or longer if you wish to study part-time. If you are interested in this course, make sure you study English and Maths B in year 11 and 12, as it will be assumed knowledge once you begin university. Our most successful students have also taken combinations of Maths C, Biology, Chemistry and Physics during their senior school years. Studying these subjects while you’re at school will be invaluable to your understanding of the essential concepts required for your studies at university.

OP/Rank: 16/65
Are you interested in solving problems and explaining how things work?

You can find out through studying Mathematics.

Mathematics is the one true universal language. Mathematics is the fundamental language of science used to explain countless real-world phenomena that you can be a part of. Mathematicians think logically and critically as they analyse problems, create theories, identify solutions and draw conclusions. From calculating how many lollies you can buy with some spare change – to solving the biggest problems in the world, mathematics covers everything from counting to explaining the universe. If you have a passion for developing new skills, and a curiosity for how things work – consider studying a major in Mathematics.

What can I do as a Mathematician?
A Mathematician is a scientist who analyses and explains numbers, patterns, quantities, measurements, shapes, change and the relationships between them all. Mathematicians use theories, models and techniques to solve practical problems in many different fields. Mathematicians are responsible for shaping the world we live in today. There’s no doubt that everything you come in contact with today was either designed or invented by a Mathematician. You’ll also be following in the footsteps of some of the greatest scientists of all time such as Pythagoras, Fibonacci and Isaac Newton.

How can I turn my passion for mathematics into a career?
Mathematicians are in high demand across many industries. Be inspired to have your own ‘Eureka!’ moment, as exclaimed by the famous mathematician, Archimedes. You will use your extensive knowledge of mathematical concepts to develop problem solving skills and analytical reasoning that are essential to many industries such as sciences, business and medicine. These skills are also used to develop theories in many other fields such as engineering, finance and government. A career in mathematics is undoubtedly both rewarding and challenging – and comes with the added incentive that your work can contribute to some of the world’s most important industries.

How do I become a Mathematician?
Studying on campus full time (four subjects over one semester), the course will take 3 years, or longer if you wish to study part-time. If you are interested in this course, make sure you study English and Maths B in year 11 and 12, as this will be assumed knowledge once you begin university. Our most successful mathematics students have also taken combinations of Maths C, Biology, Chemistry and Physics during their senior school years. Studying these subjects while you’re at school will be invaluable to your understanding of the essential concepts required for your studies at university.
Are you interested in the big picture?

Physics has the answers.

Do you find yourself wanting to explore science’s most challenging questions? Do you want to look down into atomic world, and try to unravel the mysterious laws of quantum physics, the laws which today underpin the whole physics, chemistry and biology? Can you imagine yourself researching how the universe is created in the Big Bang, or making a new subatomic particle in lab? Consider a Physics major if you are itching to learn more about how everything connects.

What is a Physicist?
A Physicist is a scientist that specialises in the field of Physics. You will be surrounded by the same material as genius physicists before you, such as Albert Einstein and Isaac Newton. You will study mechanics and electrodynamics, theory of relativity and mysterious laws of quantum mechanics – to name a few, and you will discover exactly how the world is made. You’ll also have the opportunity to explore and research subfields including Astrophysics, Biological Physics and Nuclear Physics, if you are interested in the big picture.

What Career Options do I have as a Physicist?
As a Physics graduate, you will examine how matter and energy relate to each other and how they affect each other over time and through space. We are surrounded by physics every day. You will have the opportunity to pursue careers in a range of industrial, scientific and educational occupations. These include areas such as health, meteorology, environmental monitoring, energy production, telecommunications, computing, electronics, communications and aerospace fields. Specific job roles include metallurgist, geophysicist and seismic interpreter.

How do I become a Physicist?
Studying on campus full time (four subjects over one semester), the course will take 3 years, or longer if you wish to study part-time. If you are interested in this course, make sure you study English and Maths B in year 11 and 12, as this will be assumed knowledge once you begin university. Our most successful students have also taken combinations of Maths C, Biology, Chemistry and Physics during their senior school years. Studying these subjects while you’re at school will be invaluable to your understanding of the essential concepts required for your studies at university.
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DEGREE: BACHELOR OF SCIENCE
MAJOR: ECOLOGY AND ZOOLOGY

Interested in the Animal Kingdom – from bugs to gorillas?

You can find out through studying Ecology and Zoology.

When you were younger, did you ever have a ‘pet’ ant, or grasshopper, or lady beetle that you found in your garden? Did you binge watch David Attenborough’s Planet Earth documentaries to marvel at the weird and wonderful creatures that you share the planet with? Have you ever been fascinated to learn more about the animal kingdom and their intricate behaviours they have adapted to sustain life? Your obvious love for all animals and your interest in exploring your environment can be coupled with an exciting career in Zoology and Ecology.

What is a Zoologist and an Ecologist?
A Zoologist studies animals, their behaviour, and their interaction with other species and their environment. An Ecologist on the other hand, studies the interrelationships between organisms and their environments. Both skills are very complimentary and most biologists choose to study both – and students at JCU have more access to field learning experiences than any other university in Australia.

What can I do as a Zoologist and an Ecologist?
As a graduate in this type of science, you can use your knowledge and expertise in a variety of differing occupations, such as an environmental consultant, an employee at a national park, a specialised animal carer, a biosecurity officer, a research scientist or a field trials officer. You will study the evolution, behaviour and ecology of animals and plants, including how ecosystems function and how animals and plants respond to environmental changes, both natural and man-made. Zoologists and ecologists can be found engaging in a variety of activities including, managing Australia’s unique animal and plant populations, monitoring their health and developing sustainability strategies. You might also find yourself advising and providing strategies to industries and corporations on how to manage the environmental impact and outcomes of their business.

How do I become a Zoologist and Ecologist?
Studying on campus full time (four subjects over one semester), the course will take 3 years, or longer if you wish to study part-time. If you are interested in this course, make sure you study English and Maths B in year 11 and 12 as this will be assumed knowledge once you begin university. Our most successful zoology and ecology students have also taken combinations of Maths C, Biology, Chemistry and Physics during their senior school years. Studying these subjects while you’re at school will be of benefit to your understanding – if not necessities - to your understanding of the essential concepts required for your studies at university.

OP/Rank: 16/65
Science is curiosity; answer your questions and excite your mind with a Bachelor of Advanced Science.

DEGREE: BACHELOR OF ADVANCED SCIENCE

A Bachelor of Advanced Science takes Science to the next level

Do you want to have a career one step above the rest? A Bachelor of Advanced Science will equip you with high-level IT, problem solving, analytical, qualitative and quantitative reasoning skills that industry leaders have told us are what they need.

Explore your passion and curiosity with this hands-on course that will allow you to sink your teeth into every aspect of science you can only dream of. Whether you are in the labs or out on site, this course will get you thinking big. You’ll be out of your comfort zone, but you will be rewarded with the experience and knowledge you have gained. The scientific and environmental challenges of the future are increasingly interdisciplinary and quantitative, and they require scientists who can work comfortably with the cutting edge methods of scientific analysis and modelling that now pervade all of the sciences.

Upon graduating with a Bachelor of Advanced Science, you’ll demonstrate that you have prepared yourself to tackle these challenges head-on. You’ll be exactly what a potential employer is after. So, regardless of whether your passion is Marine Biology, Aquaculture, Earth Science, Chemistry, Mathematics, Molecular and Cell Biology, Physics, or Zoology and Ecology, this is your opportunity to get the best preparation to be both a leader and innovator in your field.

How do I study a Bachelor of Advanced Science?

Studying on campus full time (four subjects over one semester), the course will take 3 years, or longer if you wish to study part-time. If you are interested in this course, make sure you study English and Maths B in year 11 and 12. Our most successful students have also taken combinations of Maths C, Biology, Chemistry and Physics during their senior school years. Studying these subjects while you’re at school will be invaluable to your understanding of the essential concepts required for your studies at university.

OP/Rank: 6/89
Do you want to be part of the cities of the future?

You can find out through studying a Bachelor of Planning.

When you were younger, do you remember making your own town out of building blocks? Would you like to make your childhood passion into a satisfying career? Imagine a job in which you shape the way whole cities develop. This is the work of a planner – they help decide the design and appearance of cities and towns as well as their services, facilities and communities. Few other careers enable you to make such a profound impact on the public good. A Bachelor of Planning will help you deliver functional cities, thriving regions and healthy urban environments – right alongside better social, environmental and economic wellbeing.

**How do I study a Bachelor of Planning?**

Studying on campus full time (four subjects over one semester), the course will take 3 years, or longer if you wish to study part-time.

If you are interested in this course, make sure you study English in senior school. If you are keen to succeed whilst at university, it is strongly encouraged you consider adding Geography to your studies as well. Studying these subjects while you’re at school will be invaluable to gauging your understanding of these concepts when you begin studying at university.
DEGREE: BACHELOR OF ENVIRONMENTAL PRACTICE

Interested in the Environment you live in? Want to make a difference?

You can find out through studying a Bachelor of Environmental Practice.

Ever wondered why those three words you undoubtedly remember – reduce, reuse and recycle are so important? Would you like to be one of the experts called upon to solve the great sustainability and environmental problems that face our world?

Our environment is constantly changing due to human impact, and the world is in desperate need of more people who share a passion for wanting to conserve our precious environment for generations to come. By studying Environmental Practice at JCU, you will learn how to manage the interactions between humans and the environment to find potential solutions to pressing environmental problems. A degree in Environmental Practice brings together areas such as environmental management, urban ecology, terrestrial ecosystem assessment, and corporate environmental governance. You will be able to develop the valuable skills and knowledge required to understand the environment and how humans can interact it in sustainable ways. Upon your graduation, you’ll be ready to hit the ground running and contribute to a whole range of organisations who need environmental, social and economic skills from their employees.

How do I study Environmental Practice?

If you are studying on campus full time (four subjects over one semester), the course will take you 3 years, or longer if you wish to study part time.

If you are interested in this course, make sure you study English in senior school. If you are keen to do one of the two science majors in this degree, it is strongly encouraged you consider adding Maths B and either Biology, Chemistry, Physics or Maths C to your studies in senior school. Studying these subjects while you’re at school will be invaluable to your understanding of the essential concepts required for your studies at university.
Interested in the beauty of the ocean?

You can find out through studying a Bachelor of Marine Science.

Are you more intrigued by the mysterious world of Marine Physics, Chemistry, Geology and Biology under the ocean than on the land?

**Marine Life Doctors**
A Marine Scientist researches the sea and studies its interactions with its organisms, sea floors, coastal areas and the atmosphere. Already, you are at an advantage – with the Great Barrier Reef on our doorstep – a marvellous 2,300km long – you will never be at a loss of real life experience in the field. Here at JCU, you will study with the best marine scientists in the world who continue to break new ground. Inspire your mind as you witness the breakthrough of new technologies, and marvel at the beauty and greatness of the Barrier Reef.

What career opportunities would I have as a Marine Scientist?
As a Marine Scientist, you will study not only the ocean, but the multitude of ecosystems that exist below the surface, including coastal environments, ocean currents and the sea floor. Marine Science encompasses elements of marine biology, oceanography, marine geosciences and environmental management. Altogether, you will be constantly surrounded by beautiful marine life, researching their environment and developing new strategies on how their home can be conserved.

JCU’s Bachelor of Marine Science focuses on developing the high-level skills technologically enabled professionals need if they are to address the challenges facing the world’s oceans over coming decades. A diversity of rapidly evolving technologies are providing marine scientists with increasingly powerful ways to collect diverse data from above and below the waves, data that support and direct solutions to previously insoluble problems. These methods include: water quality sensors, seabed mapping and fish assessment sonar, sensors for detecting underwater mineral deposits and wrecked ships, oceanographic sensors, acoustic tagging and tracking equipment, sensors for monitoring the activity and physical environment of marine mammals, reptiles and fish.

**How do I become a Marine Scientist?**
If you are studying on campus full time (four subjects over one semester), the course will take you 3 years, or longer if you wish to study part time.

If you are interested in this course, make sure you study English, Maths B and Chemistry in senior school, as this will be assumed knowledge once you begin university. If you are keen to succeed whilst at university, it is strongly encouraged you consider adding either Biology, Physics or Maths C to your studies in senior school. Studying these subjects while you’re at school will be invaluable to gauging your understanding of these concepts when you begin studying at university.
Are you interested in the history of Earth?

You can find out through studying a Bachelor of Geology.

When you were younger, do you have memories of having a rock collection? Did you understand how they came to be rocks? Have you ever wondered what happens under the surface of the Earth, or what was on the surface of the Earth before humans came about? Have you ever wondered where all the minerals we use in our mobile phones, solar panels, cars and computers actually come from, and how they formed and where they are found?

What is a Geologist?

Geology is simply a more applied aspect of Earth Science. Geologists study the past, present and future of the earth, and its component parts, including the history of rocks, oceans and the atmosphere and how they interacted with life forms as they evolved over time, from the earliest bacteria, via dinosaurs to humans. Geologists make maps to illustrate how the Earth has changed over time. More importantly, they identify where to find important minerals that host metals like Copper, Zinc or Gold, and fuels such as oil, or new minerals that contain metals that will fuel the high-tech economy of tomorrow like lithium and dysprosium. Geologists are also responsible for studying and predicting natural disasters such as earthquakes, mudslides, tsunamis and volcanic eruptions, so you may find yourself at the base of an active volcano at some point throughout your career!

Can I make a satisfying career with Geology?

Geologists don’t just study rocks! They are often global explorers (and increasingly space explorers). One of the most special aspects of being a geologist is the opportunity to travel the world, which is required of many geologists who often get the opportunity to visit mines, volcanoes, and explore for new resources or solutions all over the planet. You might also be interested to know that Geologists are amongst the highest paid scientists and professionals in industry, both in Australia and Globally.

As a geologist you could be a leader in locating new reserves of rare minerals used in green energy development, precious metals or clean water. Your job may find you being responsible for finding feasible and sustainable ways to extract resources, or evaluate geologic natural hazards that may threaten communities. Imagine being a part of history when you develop a more sustainable way to extract ground water to grow crops in a remote area? And if your sites are set beyond Earth, then you may be interested to know that planetary geology is a rapidly growing field of Geology.

If you’re interested in working within industry, the mineral exploration and mining industry is rapidly evolving, and so too is a myriad of potential employment prospects if you wish to work within this area.

How Do I become a Geologist?

If you are studying on campus full time (four subjects over one semester), the course will take you 3 years. There is also a part time option available.

If you are interested in this course, make sure you study English in senior school. If you are keen to succeed whilst at university, it is highly recommended you add Maths B, as well as either Chemistry or Physics to your studies in senior school.