

Bachelor of Engineering (Honours) - Bachelor of Science



JAMES COOK
UNIVERSITY
AUSTRALIA



Ready today for tomorrow

jcu.edu.au



Why JCU?

A STUDENT EXPERIENCE LIKE NO OTHER

- Access to world-class teachers
- Develop skills in state-of-the-art facilities
- Achieve exceptional employment outcomes
 - Benefit from small class sizes
 - Connect with professional networks
- Support through scholarships for merit and equity
 - Discover great accommodation options

TOP MARKS ALL ROUND

Graduate with confidence. Get the support you need to succeed with JCU Engineering rated five stars for learner engagement, skills development, and teacher quality and #1 in Queensland for student support*.

WORK ANYWHERE IN THE WORLD

Leverage JCU's outstanding industry connections with global brands such as Huawei. Make a difference locally or globally with an internationally recognised qualification. JCU Engineering and JCU Science are independently ranked #1 in Queensland for full-time employment outcomes*.

BECOME A PROBLEM-SOLVER

Become an expert in the practice of identifying a problem, and coming up with a solution. Engineers and scientists are open to many opportunities and create technology and products that help make our lives easier.

SUPPORT FOR YOUR SUCCESS

Explore JCU's range of scholarships, grants and bursaries and discover the right financial assistance to achieve your goals.

*Good Universities Guide 2022



Bachelor of Engineering (Honours) - Bachelor of Science

✓ Enhance your career opportunities and develop a unique skill set through a Bachelor of Engineering (Honours) – Bachelor of Science. Engineers have unique problem-solving skills, which when combined with a Science specialisation can create a valuable qualification for many industries and for government and research careers.

✓ Develop as a scientist as you work alongside world-class researchers in JCU's state-of-the-art research facilities. Prepare to succeed through courses with small class sizes and learn from industry-leading engineering lecturers committed to student success.

✓ Gain a special mastery of the challenges facing engineering and scientific research in the tropics through your access to World Heritage sites and world-class research stations. Gain valuable experience in modern laboratories through courses designed around real industry needs and practical work placements.

COURSE DETAILS:

Locations:	Cairns, Townsville
Start Dates:	February, July
Duration:	5 years full-time, part-time available
ATAR:	78.1
Prerequisites:	English (3/4C), Mathematical Methods (3/4C)

Please visit the [handbook](#) for a detailed outline of the course structure. Note: Information is for domestic students only.

Majors

Tomorrow's problems are complex; be ready to meet them with an engineering science degree and your chosen specialisation. Explore different career pathways with a Bachelor of Engineering (Honours) – Bachelor of Science from JCU.

ENGINEERING MAJORS

The following are the Engineering specialties you could choose. Please see [handbook](#) for campus availability.

Chemical Engineering

Create, manipulate and design products using raw materials, and chemistry and physics principles. Become an expert in the intricacies of reactor design and modelling, and learn how to comprehend the concepts of instrumental analysis. Build an in-depth understanding of advanced chemical technologies such as minerals processing, extractive metallurgy and bioprocessing.

Civil Engineering

Benefit from JCU's expert lecturers and explore various civil engineering disciplines such as structural, hydraulic, geotechnical, transport and environmental engineering. Develop the skills required to assess the environmental impact of large projects and understand how to build community engagement. JCU graduates have a thorough understanding of how to make cities better places to live.

Electrical and Electronic Engineering

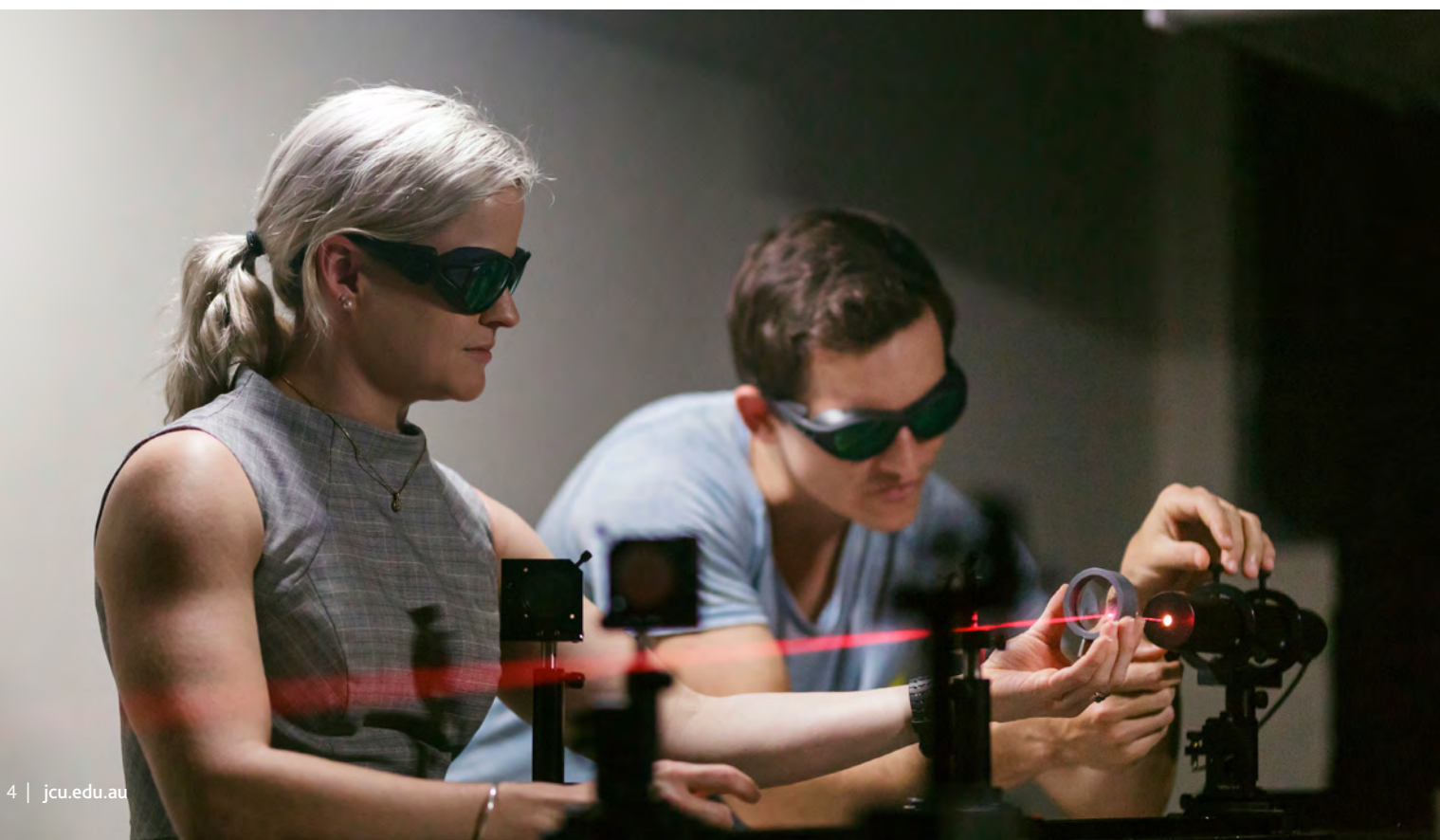
Learn how to design and maintain electrical energy infrastructure through the application of the electrical principles. You will integrate theory with practice and visit telecommunications companies, power utilities and mines. Build a comprehensive knowledge of electrical materials, circuit theory, single phase and three phase power system modelling and signal processing.

Electronic Systems and Internet of Things (IoT) Engineering

Develop sensor technologies, analyse big data and design smart technology that relates to various industries. Work with cloud computing and wireless communication utilising a state-of-the-art Internet of Things research lab. Become innovative technology leaders, accessing world-class lecturers and their strong industry partnerships.

Mechanical Engineering

Understand the principles of mechanics and thermodynamics to analyse, design, manufacture and maintain machines across almost all industries. Learn the foundations of thermofluid mechanics and the dynamics of machine elements. Through experiential learning, apply your understanding of heat exchange, momentum and strength of materials to design machines.



SCIENCE MAJORS

The following are the Science specialties you could choose. Please see [handbook](#) for campus availability.

Aquaculture Science and Technology

Throughout this major, you will explore the scientific and practical applications of breeding, rearing and harvesting of plants and animals in all types of water environments. You will understand the biodiversity of species and how they are farmed, the design of aquaculture systems, and the basics of nutrition.

Chemistry

Build a strong foundation of knowledge and skills in organic and inorganic chemistry, kinetics and the cutting-edge instrumental techniques you will need to succeed. Work anywhere in the world with a degree accredited by the Royal Australian Chemical Institute. Develop your professional network through access to award-winning laboratories, top researchers in the field and visits to local industries.

Data Science

Become an expert in the tech driving today's most sought-after jobs. Master the sophisticated algorithms that are leveraging Big Data and changing everything about how modern businesses work. Be ready to work anywhere with your skills in analytic and machine learning, including government, healthcare, finance, and internet start-ups.

Earth Science

Gain relevant practical skills by studying and assessing the surrounding environments such as both the Wet and Dry Tropics, and the Great Barrier Reef Marine Park. Experience field trips where you will collect, analyse and interpret data. You will gain a thorough understanding of the effect of humans on the natural environment and build skills to develop solutions to lessen the impact.

Marine Biology

Develop your understanding of the world with access to one of the Earth's most diverse ecosystems, the Great Barrier Reef, and gain hands-on skills at JCU's Orpheus Island Research Station. Build skills that are applicable to all areas of marine biology as you see first-hand how ecosystems interact and how human activity affects them.

Mathematics

Understand a number of mathematical techniques, data analysis, and multivariate statistical methods. You will learn how to formulate mathematical models to illustrate science and engineering problems, and use various techniques to help find solutions. To enhance your employability skills, you have the flexibility to combine this major with another science major.

Molecular and Cell Biology

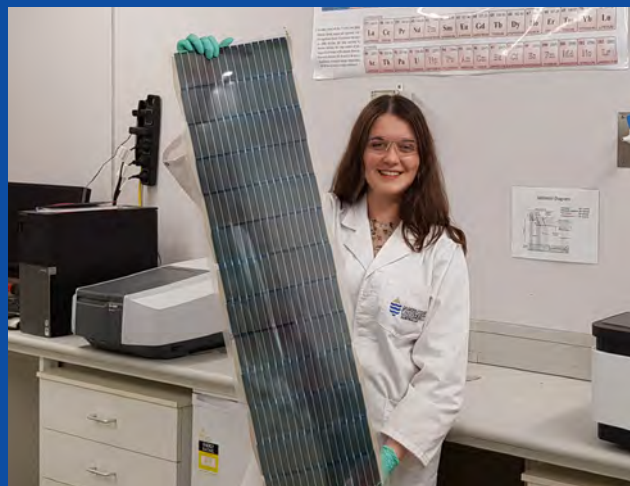
Learn how to amplify and edit DNA sequences and conduct laboratory-based and field-based projects. Throughout your degree, you will study the basis of health and disease at a molecular level and analyse the functions of a whole cell. Gain hands-on experience using cutting-edge equipment and techniques. Study biochemistry, microbiology, biotechnology and bioinformatics, and have an in-depth understanding of molecular genetics.

Physics

Make a difference as a leader ready to tackle the most challenging questions in the universe. Build a strong foundation of theoretical knowledge, then apply that knowledge in practical situations in energy development, quantum mechanics, weather and climate research or biophysics. Prepare yourself for a rewarding career in telecommunications, aerospace, health, meteorology, energy production, or wherever your interests take you.

Zoology and Ecology

Study the science of the biology of plants and animals and the natural world that they live in. Discover many of the environmental threats to the Tropics by studying the effects of deforestation, infrastructure expansion, habitat fragmentation, over-hunting, and invasive species.



“With small class sizes, there are many opportunities to work with and interact with fellow students and lecturers. There is also a great community with the Engineering Undergraduate Society (EUS); a student group that works to run social events and support the wider engineering and science student body. The best part of my degree was completing 12 weeks of vacation placement, which gives us an opportunity to experience engineering work in an industry or research environment over the summer break.”

Tayla Corbett

BACHELOR OF ENGINEERING (HONOURS)
AND BACHELOR OF SCIENCE



“This joint program offers a unique opportunity to combine the fundamental sciences, like Chemistry, Physics and Math, with the applied engineering program. This excellent combination positions graduates well in both academic and industry based careers as they have a deep understanding of the fundamental underpinnings of Engineering. I think this skill set is becoming ever more important in solving the world’s grand challenges like energy, clean water, medicines, and security.”

George Vamvounis

SENIOR LECTURER, CHEMICAL ENGINEERING

Career Opportunities

A JCU Bachelor of Engineering (Honours) – Bachelor of Science degree prepares students to work across a broad range of occupations and industries, depending on their chosen majors.

Graduates can use the joint degree to broaden their educational experience or use this as an opportunity to specialise. Joint degrees equip you with additional expertise and can enhance your career opportunities.

You could become a chemical, civil or mechanical engineer, a marine scientist, a meteorologist, an analytical or research chemist, a clinical diagnostician, a geologist, hydrologist, climatologist, or a bio-technician.





JCU Accommodation

Study and live in some of the most interesting places in the world. Cairns and Townsville are on the doorstep of the Great Barrier Reef, magnificent rainforests, the savannah region and Outback Australia.

Living on-campus is a great way to make the most of your time at JCU. JCU Townsville, Bebegu Yumba campus, Douglas, has five different accommodation options housing over 1,200 students. JCU Cairns, Nguma-bada campus, Smithfield, features an accommodation complex for 300 students. Living on-campus is a great place to make new friends and immerse yourself in the JCU culture. All rooms at our on-campus residences are single board, with a single bed, study desk, chair, fan, air-conditioning and Wi-Fi. Each residence is different in regards to style of living, culture and atmosphere. There are options for fully catered or self-catered housing. Find out more at jcu.edu.au/accommodation



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