

# UNDERGRADUATE GUIDE

ENVIRONMENTAL, FOREST &  
MARINE SCIENCES **2018**



ENVIRONMENTAL SCIENCE

FOREST SCIENCE

MARINE SCIENCE

SCIENCE




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**Dr Steven Purcell**  
Fisheries scientist, School of  
Environment, Science and Engineering



## Why study with us?

- ★ Ranked in the top 150 universities under 50 years old in the world. Times Higher Education Young University Rankings
- 
- ★ Outstanding research achievements – rated ‘at world standard or above’ in 24 key research areas.  
*Excellence in Research for Australia 2015 (ERA)*
  - ★ Rated ‘well above world standard’ in Environmental Science and Management; Geochemistry; Oceanography; Zoology; Crop and Pasture Production; Forestry Sciences; and Agricultural and Veterinary Sciences.
  - ★ Rated ‘above world standard’ in Environmental Sciences; Earth Sciences; Soil Sciences; Ecology; and Fisheries Sciences.
  - ★ Field trips to areas of ecological significance including World Heritage rainforests, subtropical forests and coastal and marine ecosystems.
  - ★ Remarkable campus locations in a stunning, ecologically diverse region which serves as a living laboratory.

## School of Environment, Science & Engineering

The School of Environment, Science and Engineering is a leader in environmental sustainability, and draws on Southern Cross University’s outstanding research strengths.

State-of-the-art facilities include the science and engineering precinct at the Lismore campus, and the University’s National Marine Science Centre in Coffs Harbour which provides advanced analytical equipment and resources for marine science students and researchers.

Courses combine academic rigour, laboratory work, field trips, professional experience and industry internships to maximise career opportunities.

### Studying with Southern Cross University

Studying with us involves a range of learning experiences which may vary based on your course of study, your location and your mode of study.

You may take part in face-to-face lectures, workshops and tutorials, and collaborative peer projects. Courses may include interactive video-conference lectures, podcasts, discussion forums and field trips. You can bring your own device onto campus (or use one of our on-campus computers) and tap into our extensive wireless network.

All environmental, marine and forest science degrees are available online, often with short residentials, for students who are balancing work and other commitments.

Students rub shoulders with leading experts in the environmental sciences, attend guest lectures and participate in field trips. They access labs featuring advanced analytical equipment, specifically for geochemistry, microscopy, aquaculture, genetic analysis, wood science and Geographic Information Systems, as well as labs for biology, chemistry and geology. (See facilities and resources on page 11.)

For a short video about the School of Environment, Science and Engineering, visit: [scu.edu.au/environment-science-engineering](http://scu.edu.au/environment-science-engineering)

View a field trip at: [scu.edu.au/environment-science-engineering/fieldtrips](http://scu.edu.au/environment-science-engineering/fieldtrips)

Southern Cross University acknowledges the Aboriginal and Torres Strait Islander peoples as the Traditional Custodians of the lands where we live, learn and work.

## Degrees which put you in the workplace

An internship program is available for students undertaking studies in **environmental science, marine science and management** and in **science**. Internships are undertaken as part of the course, to gain work-ready skills and establish valuable professional networks and industry contacts before graduation. They provide students with the opportunity to gain volunteer workplace experience to supplement the practical skills and the theoretical foundations provided throughout their studies, and to engage with industry representatives from the early stages of their course.

**Forestry** students complete 16 weeks of practical workplace experience during their studies in a forestry-related area including plantation and forested regions across Australia. Students are assisted to find paid and/or volunteer work placements that complement their studies.

## ENVIRONMENTAL, FOREST & MARINE SCIENCES DEGREES

| Degrees  | Career Opportunities   | Gold Coast | Lismore        | Coffs Harbour | Online          | UAC/<br>QTAC<br>codes                           | Units | Duration<br>(years)<br>F: full-time<br>P: part-time |
|--|--|------------|----------------|---------------|-----------------|---|-------|---|
| Indicative ATAR/OP   |  |            |                |               |                 |   |       |   |
| <b>B Environmental Science</b><br><br>ATAR: 68<br>OP: 13                                 | In public and private sectors, national park and protected area management, environmental protection, waste management, environmental impact assessment and monitoring, environmental education and interpretation, sustainable forestry, fisheries management, aquaculture, ecotourism, land/river/coast care programs; and in environmental science research.  |            | ✓              |               | ✓*              | <b>UAC:</b><br>334100<br><b>QTAC:</b><br>054001 | 24    | 3F/6P   |
| <b>B Forest Science and Management</b><br><br>ATAR: 68<br>OP: 13                         | In field forestry and in plantation establishment and management; use of geographic information systems; natural resource management and environmental planning; native forest management, fire prevention and control; forest resource assessment; policy development; pest and disease management; agroforestry and farm forestry advisory services; forest growth modelling and yield prediction; protected area management; international forestry focused on developing countries, reserve management; and forestry research. |            | ✓              |               | ✓*              | <b>UAC:</b><br>334102<br><b>QTAC:</b><br>054021 | 32    | 4F/8P   |
| <b>B Marine Science and Management</b><br><br>ATAR: 68<br>OP: 13                         | As a consultant, marine park planner, marine biologist and ecologist, marine reserve officer, aquaculturalist, fisheries manager, project officer, technical officer, state coordinator; and in marine research.   |            | ✓ <sup>#</sup> |               | ✓ <sup>*#</sup> | <b>UAC:</b><br>334104<br><b>QTAC:</b><br>054101 | 24    | 3F/6P   |
| <b>B Environmental Science/B Marine Science and Management</b><br><br>ATAR: 68<br>OP: 13 | Graduating with knowledge and skills in both environmental science and marine science enables students to enter professions in either field or pursue a career which spans both fields. See B Environmental Science and B Marine Science and Management above.   |            | ✓ <sup>#</sup> |               | ✓ <sup>*#</sup> | <b>UAC:</b><br>334112<br><b>QTAC:</b><br>054211 | 32    | 4F/8P   |
| <b>B Science</b><br><br>ATAR: 68<br>OP: 13   | Graduates typically find employment in public and private sectors and in a range of industries that are dependent on the student's choice of major. Typical professional outcomes include environmental resource manager, sustainability advisor and planner, policy developer, biologist, ecologist, health scientist and laboratory analyst.   |            | ✓ <sup>^</sup> |               | ✓               | <b>UAC:</b><br>334116<br><b>QTAC:</b><br>054611 | 24    | 3F/6P   |
| <b>Associate Degree of Science</b>   | Graduates may find work in para-professional roles in a range of settings. Graduates can proceed to Bachelor degrees in environmental, marine, or forest science; science, or engineering.   |            | ✓              |               | ✓*              | <b>UAC:</b><br>334312<br><b>QTAC:</b><br>054311 | 16    | 2F/4P   |
| <b>Diploma of Science</b>  | As for Associate Degree of Science above.  |            | ✓              |               | ✓*              | <b>UAC:</b><br>334014<br><b>QTAC:</b><br>054701 | 8     | 1F/2P   |

\* Online students attend compulsory residential workshops at the Lismore campus for some units.

<sup>#</sup> Final-year units for all students are delivered in intensive mode at the National Marine Science Centre, Coffs Harbour.

<sup>^</sup> Some units may only be available to study online or at specific campuses, and some include compulsory residential workshops.



## **Kitty McKnight**

**Bachelor of Environmental Science, majoring in Environmental Resource Management**  
**Research Assistant, CSIRO Land and Water, Lucas Heights**

Kitty McKnight conducts experiments to look at the effect of contaminants on aquatic organisms. The data she collects helps measure and predict the effects of those contaminants on ecosystems.

Kitty completed an eight-week internship at the CSIRO, in the same team where she now works.

“The internship definitely helped me secure the graduate role. I had shown the team that I was trustworthy, hardworking and passionate about this field of science.

“The environmental science degree at Southern Cross University

was fantastic. The lecturers were inspiring and the regular practicals in the laboratories helped build my confidence.

“There were lots of field trips to rock pools, mountains and lakes for sampling and surveys. I was living the dream.”

Kitty also spent a fortnight at an elephant conservation centre on the Indonesian island of Sumatra.

“We planted trees, did animal surveys by camera trapping and built turtle traps. We worked with the staff to build a light tower to deter poachers from coming onto the property looking for ivory. It was an incredible experience.”



## Bachelor of Environmental Science

The Bachelor of Environmental Science produces graduates who can manage the environment for future generations and focuses on building scientific knowledge and practical skills in land, water, and flora and fauna conservation.

As well as lectures and tutorials, students undertake classes in the School's scientific laboratories equipped with advanced analytical equipment.

Field trips feature in many units, enabling students to gain first-hand knowledge and a range of hands-on skills in many differing environments. The University is located near a variety of unique study environments, including significant wetlands and estuaries, forests, coastal and inland national parks, and urban and rural development.

Students can choose between completing an eight-week industry placement or completing a self-directed major project.

### Majors

**Coastal Management** provides insights into processes that affect our use of the coastal zone. Students explore the impact of climate change, land use planning, protected area management, economics, and people in the coastal environment.

**Environmental Resource Management** focuses on conducting wildlife surveys, the conservation of fauna and flora, and rehabilitating degraded land for future generations.

**Fisheries and Aquaculture Management** integrates fisheries biology, stock management, habitat protection, and aquaculture studies with environmental management. Students focus on developing strategies to maintain a sustainable fishery/aquaculture enterprise. Some third-year subjects for this major will be taught as intensive residential courses at the National Marine Science Centre in Coffs Harbour.

**Waste Management and Resource Recovery** develops multidisciplinary skills that will support innovation in providing solutions to dealing with waste and waste minimisation, now and in the future.

### Professional recognition

Graduates are eligible for membership of the Environment Institute of Australia and New Zealand.

### Professional placement

Students can complete an eight-week professional placement to gain industry experience. Interns can work with organisations across the environmental science spectrum including local, state or federal government agencies; private consultancies; or business enterprises in Australia or overseas.

## Jay Fowler

### Bachelor of Forest Science and Management Plantation Forester, Forico, Launceston

Forico is Tasmania's largest private plantation forest company and Jay helps to manage around 100,000 hectares of its plantation for wood fibre and another 80,000 hectares of natural forest for biodiversity and conservation.

“My day-to-day work involves organising the replanting of harvested areas and watching over the health of the stand until it reaches harvest age (around 15 years on average). We're coming into a second rotation for much of the plantation, so managing the slash and stumps on the site from the previous rotation is part of the process.

“We work to ensure a continuing cycle, so it's important to maintain sustainability in all aspects of what we do. Forestry is a diverse sector. For example, you can grow plantations for wood fibre or for electrical power poles, each with different growing practices.”

Long term, Jay would like to move into plantation planning. “Plantation forestry is guided by legislation to ensure best practice in the management of the natural landscape. The plantation planner oversees the land use and has an understanding of special values such as cultural heritage (including Indigenous values), flora, fauna, soil and water. These values are protected by prescriptions the plantation planner builds into operational plans.”

Jay said the future was bright for forestry graduates. “There's a generational change happening. Many older workers are approaching retirement, while plantations are a growing industry as Australia moves towards a 'greener' economy.”

“The Southern Cross forestry degree includes 16 weeks of compulsory work experience and the Lismore campus is well-located to learn about native landscapes, as it is on the doorstep to world heritage areas. There's a lot of outdoor practicals in the degree and you don't have to go too far to be within nature.

“The knowledge of the forestry team at Southern Cross is broad and inspiring. Many of them are leading their particular field of research. Having the chance to be a part of it was the most rewarding aspect of the journey.

“During my degree I worked for six months at Super Forest Plantations at Nimbin, owned by Southern Cross forestry graduate Mark Wright. I was managing silviculture and tree maintenance. It really helped my learning having this practical component to my degree.

Another highlight for Jay was a two-week forestry study trip to Vietnam, funded by a federal government AsiaBound grant, when he visited Agent Orange-affected national parks and a factory turning plantation wood into garden furniture for retail giant Ikea.

“It was a fantastic and eye-opening cultural experience and, on reflection, has added to my experience here at Forico.”





## **Bachelor of Forest Science and Management**

Forest management is a science concerned with the nature of forest ecosystems and best management of these systems – not only for timber but for biodiversity conservation, protection of catchments, storage of carbon and other essential functions.

Forestry students develop skills and an understanding of the multifaceted aspects of sustainable resource management. Students have the opportunity to specialise in small or large-scale plantations, restoration forestry, provision of environmental services, wood utilisation, forest inventory and planning, and international forestry.

Changes in the industry drive a continuing demand for degree-qualified foresters able to work in production, conservation and restoration forestry. Native forests continue to be important sources of high-value wood and require managers in public forest agencies and national parks where the focus is on fire management, weed and feral animal control and other important issues.

The course places an emphasis on field work and many trips to native and planted forest types. These provide an opportunity for students to learn key skills in forest science, in evaluating vegetation and planning management options. The NSW Northern Rivers region offers a variety of accessible subtropical environments close to the Lismore campus.

Most lectures and tutorials are taught via online activities and video-linked or podcast virtual classes. The course includes compulsory residential teaching periods at Lismore campus that all students must attend. These occur toward the middle of teaching sessions 1 and 2, and comprise approximately one-to-four days of lab classes and field work.

### **Major areas of study**

The course is distinctive for providing graduates with a strong foundation in forest science and incorporates field-based practicums and interactive tutorials. It also focuses on the business aspects of industrial forest management, while acknowledging the importance of alternatives such as small-scale farm forestry, mixed-species plantations and managed private native forests.

### **Professional recognition**

Graduates are eligible for membership of the Institute of Foresters of Australia.

### **Professional placement**

Students complete 16 weeks of compulsory practical workplace experience in a forestry-related area including plantations and forested regions across Australia. Students are assisted by a work experience coordinator to find paid and/or volunteer work placements that complement their studies.



## Bachelor of Marine Science and Management

The course combines marine science with contemporary management concepts and has a strong focus on conservation issues that challenge both coastal and marine ecosystems. There is an emphasis on developing practical skills, and it is taught in a range of tropical and subtropical environments including the Solitary Islands, Cape Byron and Great Barrier Reef marine parks.

First-year and most second-year units are based at Lismore campus. Some second-year and most third-year units are based at the University's National Marine Science Centre (NMSC) in Coffs Harbour, adjacent to the Solitary Islands Marine Park. Units taught at the NMSC are usually run as intensives with a compulsory six-day on-campus period for all students. In these units, students study specialist topics such as ocean change biology, marine community biology, marine pollution and marine ecosystem management.

### Major areas of study

While this course does not have majors, it includes marine units such as Marine Mammals: Biology and Conservation, Coral Reefs on the Edge, Ocean Change Biology, Marine Pollution, Successful Sampling and Marine Systems Science and Management.

### Professional recognition

During the course, students will have the option to gain a nationally recognised qualification in scientific scuba diving.

### Professional placement

Students can complete an optional eight-week professional placement to gain industry experience. Interns can work with organisations across the marine science spectrum including local, state or federal government agencies; private consultancies; or business enterprises in Australia or overseas.

### National Marine Science Centre

Southern Cross University operates the National Marine Science Centre (NMSC) in subtropical Coffs Harbour, on the edge of the spectacular Solitary Islands Marine Park, a protected marine habitat.

The NMSC is one of the world's best situated facilities for studying coastal and marine habitats and their inhabitants and provides the perfect setting for marine science students and researchers to undertake field work. Facilities include: a flow-through seawater supply system that supplies labs,

tank farm, hatchery and aquarium room; aquaculture farm; broodstock facility and hatchery; and a survey and research vessel providing a platform for scuba diving, water and sediment sampling and fish collection.

The NMSC has expertise in disciplines including marine biodiversity and ecology, aquaculture, estuarine and coastal processes, and coastal management. It is also home to the Solitary Islands Aquarium.





## Bachelor of Environmental Science/ Bachelor of Marine Science and Management

This combined degree brings together the terrestrial aspects of environmental management with marine science and management. It aims to produce graduates who can manage the environment for future generations. The degree focuses on building scientific knowledge and practical skills in land and water management, and flora and fauna conservation, as well as an emphasis on field training in a range of tropical and subtropical coastal and marine environments.

Students can choose between completing an eight-week industry placement or completing a self-directed major project.

### Majors

**Coastal Management** provides insights into processes that affect our use of the coastal zone. Students explore the impact of climate change, land use planning, protected area management, economics, and people in the coastal environment.

**Fisheries and Aquaculture Management** integrates fisheries, biology, stock management, habitat protection, and aquaculture studies with environmental management. Students focus on developing strategies to maintain a sustainable fishery/aquaculture enterprise. Some subjects for this major will be taught as intensive residential units at the National Marine Science Centre in Coffs Harbour.

**Waste Management and Resource Recovery** develops multidisciplinary skills that support innovation in providing solutions for dealing with waste and waste minimisation, now and in the future.

### Professional placement

Students have the opportunity to undertake an eight-week industry internship during their studies for practical experience to supplement the theory components of the course. Interns can work with organisations across the environmental science spectrum including local, state or federal government agencies; private consultancies; or business enterprises in Australia or overseas.



## Bachelor of Science

The Bachelor of Science provides a broad education in science as well as the opportunity to specialise in an area of interest through the study of a major such as human biology, environmental chemistry, biology, engineering, information technology, psychology and mathematics. The degree is ideal for attaining a general overview of science before specialising in a specific course of study. It offers flexibility in subject choices enabling students to tailor their study to their learning goals.

### Majors

**Biology** provides students with a broad base for understanding principles governing life processes at all levels – molecular, cellular, organismal, and ecological. There is a strong focus on human impacts on the environment. The management of ecosystems is embedded throughout the major.

**Engineering** ensures students have a sound base of environmental engineering knowledge coupled with principles of physical and biological sciences.

**Environmental Chemistry** gives students the knowledge to solve chemically related environmental problems. Students will gain an overview of sediment and aquatic chemistry, which includes laboratory analysis of materials.

**Human Biology** provides students with an area of specialisation within the health sciences. Students gain knowledge in physiology, anatomy, nutrition, and exercise and health science.

**Information Technology** enables students to specialise in computing technology including programming, system design and web development.

**Mathematics** provides an area of specialisation for students in advanced mathematical skills. Subject areas can include an overview of algebra, calculus, physics and more complex analysis and group theories.

**Psychology** provides an overview of a range of psychological theories including learning and memory, psychological assessment and research in the psychology discipline.

*\*Some units may only be available to study online or at specific campuses and some include compulsory residential workshops.*

### Professional placement

Students can elect to complete an eight-week industry internship to gain industry experience. Interns work with organisations across the science spectrum including local, state or federal government agencies; private consultancies; or business enterprises in Australia or overseas.



## Associate Degree of Science

The **Associate Degree of Science** is a two-year (full-time or part-time equivalent) course that equips students with knowledge and skills in areas including environmental, health and physical sciences. Graduates of the Associate Degree of Science are guaranteed entry into the following linked degrees: Bachelor of Science, Bachelor of Environmental Science, Bachelor of Marine Science and Management, Bachelor of Forest Science and Management, Bachelor of Engineering (Honours) in Civil Engineering and Bachelor of Engineering (Honours) in Mechanical Engineering. Graduates of the Associate degree may receive up to 16 units of credit (advanced standing) towards their Bachelor degree (depending on course and units studied).

The **Diploma of Science** is a one-year (full-time or part-time equivalent) course. It is available as an entry point, equipping students with foundational knowledge and skills and is a pathway to the Associate degree. The Diploma offers up to eight units of credit (advanced standing) into the same Bachelor degrees as for the Associate Degree of Science (depending on course and units studied).

Graduates of both courses can seek para-professional work in a range of industries, including positions as field assistants, laboratory assistants, revegetation officers and environmental monitoring officers.

For more information, visit: [scu.edu.au/scucollege](https://scu.edu.au/scucollege)

## Facilities and resources

Depending on their chosen degree, students in the School of Environment, Science and Engineering have access to laboratories at the Lismore campus across a range of scientific disciplines.

Laboratories feature advanced analytical equipment, specifically for geochemistry, microscopy, aquaculture, genetic analysis, wood science and Geographic Information Systems (GIS) as well as labs for biology, chemistry and geology.

Field equipment includes boats and 4WD vehicles, fish and animal sampling equipment, sediment samplers, diving equipment, underwater video recorder, geotechnical and geochemical data collection equipment, and a portable weather station and data loggers.

Civil and mechanical engineering students (see separate brochure) have access to world-class engineering facilities that enable effective practical teaching and high level experimental research.

## Key dates for 2018

|   |  |
|---|--|
| <b>Rising Stars Scholarship applications for 2018</b>   | Open July 2017<br>Check website for closing dates:<br><a href="http://scu.edu.au/scholarships">scu.edu.au/scholarships</a> |
| <b>UAC and QTAC on-time applications for 2018 entry (Session 1)</b><br><i>Late UAC and QTAC applications incur an extra fee</i> | Open early August 2017<br>Close late September 2017  |
| <b>STAR Early Entry opens</b>   | Early July 2017  |
| <b>STAR Early Entry offers</b>  | Early December 2017  |
| <b>Southern Cross University Info Days</b>  | 4, 5 and 7 December 2017   |
| <b>UAC and QTAC main round offers</b><br><i>For the full list of offer rounds visit the UAC and QTAC websites</i>               | Mid January 2018   |
| <b>Session 1 2018 teaching dates</b><br>Orientation   | 26 February – 25 May 2018<br>21 – 23 February 2018   |
| <b>Session 2 2018 teaching dates</b><br>Orientation   | 9 July – 5 October 2018<br>4 – 6 July 2018   |
| <b>Session 3 2018 teaching dates</b><br>Orientation   | 5 November 2018 – 30 January 2019<br>31 October – 2 November 2018  |

# 5 steps to Southern Cross

## 1 Choose a course



[scu.edu.au/courses](http://scu.edu.au/courses)

## 2 Find out more



[campustours@scu.edu.au](mailto:campustours@scu.edu.au)

[scu.edu.au/yourfuture](http://scu.edu.au/yourfuture)

E: [futurestudent@scu.edu.au](mailto:futurestudent@scu.edu.au)

Freecall: 1800 626 481

## 3 Apply



To study on campus (full-time or part-time) apply via

UAC [www.uac.edu.au](http://www.uac.edu.au) or QTAC [www.qtac.edu.au](http://www.qtac.edu.au)

To study online, apply direct to the University.

[scu.edu.au/howtoapply](http://scu.edu.au/howtoapply)

## 4 Accept your offer



[scu.edu.au/gettingstarted](http://scu.edu.au/gettingstarted)

## 5 Enrol in units



[scu.edu.au/enrol](http://scu.edu.au/enrol)



The information in this brochure was correct at the time of publishing (April 2017). All University courses are subject to change by the University and the information provided in this brochure should be used as a guide only. To the extent permitted by law, Southern Cross University excludes all liability arising from the use of, or reliance on, the information contained in this brochure.

**International students:** Southern Cross University welcomes international students. This guide however is not intended for their use. International students should contact SCU International. W: [scu.edu.au/international](http://scu.edu.au/international) E: [intoff@scu.edu.au](mailto:intoff@scu.edu.au) T: 02 6620 3876

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