The Faculty of Science is internationally renowned for its record of innovative research. The Faculty’s researchers maintain a high level of funding from the Australian Research Council, National Health and Medical Research Council and a range of other prominent agencies. We also have productive research partnerships with Australian industries, Government agencies and regional organisations.

Faculty of Science staff have an enviable reputation for publishing in the most prestigious international journals as well as research monographs. The Faculty is equipped with world class amenities, including dedicated research laboratories and instruments for a diverse range of analytical methods within the biological, chemical, earth and environmental sciences; modern computing facilities; and resources for field research, such as four-wheel drive vehicles, boats, mobile laboratories and a drilling rig. About 150 research students are involved in our research effort. The UOW Library caters well for research needs in Science by enabling access to a wide range of journals online.

The Faculty offers quality postgraduate coursework degrees, a number of which articulate to research programs. A distinctive feature of the Faculty is the close connection between cutting edge research in each of our areas and teaching. Our lecturers are also top researchers. As a student, you will benefit from a high degree of personal contact with staff at the forefront of their fields. In addition you will have the opportunity to conduct independent research as a part of your program, sometimes with our collaborators at overseas universities.

The Faculty comprises three schools:

> **SCHOOL OF BIOLOGICAL SCIENCES**  
Current research includes terrestrial ecology; marine biology; animal physiology and systematics; plant physiology and molecular biology; cell biology and biotechnology.

> **DEPARTMENT OF CHEMISTRY**  
Current research includes targeted drug design and synthesis; understanding the molecular basis of diseases and drug action; development of NMR spectroscopy and mass spectroscopy for studying biological processes; advanced materials and nanotechnology; atmospheric chemistry; food chemistry; analytical and environmental chemistry; and chemical education.

> **SCHOOL OF EARTH & ENVIRONMENTAL SCIENCES**  
Current research includes quaternary environmental change; quaternary geochronology and stable-isotope studies; catastrophic tsunamis; coral reef development; spatial image analysis; past and present interactions with the Australian environment; economy, culture and environment; estuarine and coastal processes; basin analysis; organic petrography and fuels; palaeozoic fold belts; environmental geology; and regional mapping.

For more information on the Faculty of Science:  

For information on specific courses available in the Faculty:  
RESEARCH CENTRES & INSTITUTES

> INSTITUTE FOR BIOMOLECULAR SCIENCE

The Institute for Biomolecular Science brings together a large multidisciplinary team of chemists and biologists from the Department of Chemistry and the School of Biological Sciences, with exciting research programs focused in three key areas: antimicrobial agents (targeted at new anti-bacterials, anti-virals, and anti-malarials), age-related diseases (cataract, neurodegenerative disease) and cancer (apoptosis, new therapeutics for breast and prostate cancer). These programs are underpinned by crucial core expertise in drug discovery, design and synthesis; together with the discovery and structural characterisation of biological targets. The long term goals are to develop new drug leads to address problems of drug resistance in infectious disease and to tackle in a new and more effective way diseases associated with ageing.

> INSTITUTE FOR CONSERVATION BIOLOGY
www.uow.edu.au/science/biol/icb

The Institute for Conservation Biology and Law is one of the University’s major research groupings. It is unique in combining expertise in environmental law and policy with a strong research group in ecology and environmental biology. The ICB has several interrelated aims:

- To conduct world-class research concerning the biology and conservation of Australia’s native biota
- To train research students to be highly competent researchers in this area
- To foster interdisciplinary research and research training linking science with law, policy and management
- To interact with other scientists as well as managers and policy personnel to achieve effective conservation of the Australian biota.

> INTELLIGENT POLYMER RESEARCH INSTITUTE
www.uow.edu.au/science/research/ipri

The Intelligent Polymer Research Institute currently comprises seven academic staff members from the Departments of Chemistry and Materials Engineering, and more than 30 other research personnel and postgraduate students. Research and development programs cover nanoscience and nanotechnology, monomer and polymer processing, polymer characterisation and the application of these intelligent multifunctional materials in membrane technology, asymmetric synthesis, chromatography, sensors, biomaterials, advanced coatings, actuators, solid state devices, solar cells and batteries.

> GEOQUEST RESEARCH CENTRE

GeoQuEST brings together outstanding researchers from the disciplinary traditions of Geography, Geology and Environmental Science. They share central interests in earth processes and environmental change, including human interactions. GeoQuEST has internationally renowned expertise in and facilities for Quaternary Science and Geochronology, providing fundamental temporal frameworks for the understanding of global environmental change. It is recognised for its innovative research on the relationships between Environment and Society across timeframes from prehistory to the present. The group leads UOW initiatives to apply cutting-edge Spatial Technologies to a range of research questions, working at scales from the local to the global.

> ATMOSPHERIC CHEMISTRY RESEARCH GROUP
www.uow.edu.au/science/research/acrg

The central role of atmospheric chemistry in all aspects of global climate change is undisputed. The focus of our research is the measurement of atmospheric trace gas concentrations, their total column amounts and the sources and sinks of key atmospheric trace gas species.

ASSOCIATE PROFESSOR PAUL KELLER
PHD UNSW, BSC (HONS) UNSW

Paul is a Researcher and Senior Lecturer in the Department of Chemistry. He has built up an extensive research program at UOW in bio-organic and medicinal chemistry – an area of great importance to medicine. His current work is funded by the Australian Research Council, the National Health and Medical Research Council, as well as by an Australian pharmaceutical company. Paul’s research investigates the design and synthesis of new drugs for treating diseases such as HIV, multi-drug resistant bacteria, malaria and for the prevention of premature birth. Paul is also collaborating with the University of Würzburg, Germany on the development of chiral ligands for use in stereoselective reactions for incorporation into his drug design programs. This research is at the cutting edge of methodology for the preparation of new organic compounds, including exciting new molecules based on a new form of carbon – the fullerenes.
RESEARCH DEGREES

DOCTOR OF PHILOSOPHY (PHD)
Duration > 3 years or part-time equivalent

MASTER OF SCIENCE - RESEARCH
Duration > 1.5 years or part-time equivalent
Location > Wollongong
Delivery > Flexible
Starting sessions > Autumn/Spring
Entry requirements > Listed on page 4.

- Biological Sciences
- Biotechnology
- Chemistry
- Geography
- Geology
- Medieval Chemistry
- Physics

*The School of Earth & Environmental Sciences also offers a Master of Arts – Research in Geography. Details can be found at on the UOW Coursefinder website at http://coursefinder.uow.edu.au/coursefinder.

**Physics is located in the Faculty of Engineering. See page 30 for further information.

MASTER OF ENVIRONMENTAL SCIENCE – RESEARCH
Duration > 1.5 years or part-time equivalent
Location > Wollongong
Delivery > Flexible
Starting sessions > Autumn/Spring
Entry requirements > A Bachelor degree with Honours in Environmental Science, Science or Engineering at a level of at least Class II, Division 2; or a Master of Environmental Science or Master of Science (by coursework with a credit average); or equivalent qualifications, or appropriate publications and work experience.

There is an urgent need for high quality research to provide information for improved understanding of how ecosystems work, for solving environmental problems of immediate concern, and for assisting policy makers in developing new strategies and legislation for environmental management.

Students complete a maximum of 24cp of subjects selected from those listed under the Master of Environmental Science (page 50), followed by a 48cp research project. Students with a Bachelor Honours degree at the level of at least Class II, Division 2, or a Master of Environmental Science degree (or equivalent), will normally be awarded advanced standing for the 24cp of coursework, except for candidates with no background in environmental science, who will be required to complete the 8cp subject ENV9920 Scientific Basis of Environmental Management.

This coursework program is designed for students who seek further knowledge and skills in the biological sciences, or seek to qualify for a postgraduate research degree. Students complete four 12cp subjects: BIOL970 Advances in Conservation Biology; BIOL971 Marine & Terrestrial Ecology; BIOL972 Ecological & Evolutionary Biology; and BIOL973 Fisheries & Aquaculture. Research projects, and subjects in Molluscan Biology and other areas may be substituted with the approval of the Masters Coordinator. Students may not enrol in subjects where they have completed the equivalent 300-level subjects at UOW.

MASTER OF SCIENCE (BIOTECHNOLOGY)
Duration > 1 year or part-time equivalent (48cp)
Delivery > Day
Location > Wollongong
Starting sessions > Autumn
Entry requirements > A recognised Bachelor degree in Biotechnology with an equivalent average mark of 75%, or in a relevant discipline that includes one or more of biology, biochemistry, cell biology, molecular biology, or microbiology, and the equivalent of at least one year of academic study in chemistry.

The Master of Science (Biotechnology) is designed for graduates who seek knowledge and technological expertise in specific areas of cell and molecular biology, which are the basis for modern biotechnological research and development. Tutorials and laboratory-based practical work will be undertaken in each of the subjects, which will be offered on a modular basis. The subjects provide an introduction to the basic elements of modern cell and molecular biology, before proceeding to intensive training in current biotechnology.

Students complete four 12cp subjects: BIOL980 Biotechnology; BIOL981 Molecular Cell Biology; BIOL982 Cellular & Molecular Immunology; and BIOL984 Applied Bioinformatics. One of these subjects may be substituted with a research project or coursework in ecological and evolutionary physiology with approval of the Course Coordinator.

CHEMISTRY

MASTER OF SCIENCE (CHEMISTRY)
Duration > 1 year or part-time equivalent (48cp)
Delivery > Day
Location > Wollongong
Starting sessions > Autumn
Entry requirements > A relevant undergraduate degree of at least three years duration, or a similar tertiary qualification with relevant work experience.

Students complete CHEM910 Research Skills Training (12cp), and choose three of the following 24cp subjects: CHEM915 Advanced Chemistry Laboratory Project; CHEM919 Literature Report in Chemistry; CHEM940 Contemporary Topics in Biomolecular Chemistry; or CHEM950 Contemporary Topics in Analytical and Environmental Chemistry.

MASTER OF SCIENCE (MEDICINAL CHEMISTRY)
Duration > 1 year or part-time equivalent (48cp)
Delivery > Day
Location > Wollongong
Starting sessions > Autumn
Entry requirements > A Bachelor of Science or an appropriate science-related degree.

The program provides vocational training in medicinal chemistry, an area where there is currently a high demand for graduates. The program consists of special coursework in medicinal chemistry and a small research project. Students complete two 12cp subjects: CHEM910 Research Skills Training and CHEM930 Selected Topics in Medicinal Chemistry, and two of the following: CHEM915 Advanced Chemistry Laboratory Project; CHEM919 Literature Report in Chemistry; CHEM940 Contemporary Topics in Biomolecular Chemistry; or CHEM950 Contemporary Topics in Analytical & Environmental Chemistry.

EARTH & ENVIRONMENTAL SCIENCES

MASTER OF SCIENCE (GEOGRAPHY OR GEOLOGY)*
Duration > 1–1.5 years full-time or part-time equivalent (48–72cp)
Delivery > Day
Location > Wollongong
Starting sessions > Autumn/Spring
Entry requirements > A relevant undergraduate degree of at least three years duration, or a similar tertiary qualification with relevant work experience.

*The School of Earth and Environmental Science also offers a Master of Arts in Geography.

These programs have been devised to meet the needs of students who wish to proceed to the postgraduate level in Geography or Geology to enhance their qualifications in an area without undertaking a research project.

Students with a satisfactory background in Earth and Environmental Sciences will be required to complete subjects to a value of 48cp. Other students will be required to complete subjects to a value of 72cp. The subjects are grouped in three strands, reflecting the major research strengths of the School.

Physical geography and environments
- EESC901 Advanced Plate Tectonics,
- Macrotopography & Earth History (12cp)
- EESC902 Advanced Coastal Environments: Processes & Management (12cp)
- EESC903 Advanced FluvialGeomorphology & Sedimentology (12cp)
- EESC904 Advanced Geographic Information Science (12cp)
- EESC905 Advanced Remote Sensing (12cp)
- EESC912 Advanced Soils, Landscape & Hydrology (12cp)
- EESC950 Advanced Topic A (12cp)
- EESC951 Advanced Topic B (8cp)
> Human geography and environments
EESC904 Advanced Geographic Information Science (12cp); EESC905 Advanced Remote Sensing (12cp); EESC907 Advanced Spaces, Places & Identities (12cp); EESC908 Advanced Social Spaces: Rural & Urban (12cp); EESC918 Advanced Environmental and Heritage Management (12cp); EESC950 Advanced Topic A (12cp); and EESC951 Advanced Topic B (8cp).

> Geology
EESC901 Advanced Plate Tectonics, Macrotectonics and Earth History (12cp); EESC903 Advanced Fluvial Geomorphology and Sedimentology (12cp); EESC904 Advanced Geographic Information Science (12cp); EESC905 Advanced Remote Sensing (12cp); EESC911 Isotope Geochemistry (12cp); EESC921 Environmental Geology (12cp); EESC950 Advanced Topic A (12cp); EESC951 Advanced Topic B (8cp).

MASTER OF ENVIRONMENTAL SCIENCE – ADVANCED (BY RESEARCH AND COURSEWORK)
Duration > 2 years or part-time equivalent (96cp)

MASTER OF ENVIRONMENTAL SCIENCE
Duration > 1 year or part-time equivalent (48cp)
Delivery > Flexible (Advanced)/Day or Evening (MEnvSc)
Location > Wollongong
Starting sessions > Autumn/Spring
Entry requirements > A Bachelor degree of at least three years duration in Environmental Science, Science, Applied Science, Agriculture, Forestry, Veterinary Science or Engineering, or equivalent tertiary qualifications and/or professional experience. Students may be admitted into the MEnvSc program if they have been working in a position for at least five years which, if they left, would be filled by an appropriately qualified graduate. Normally a written statement from a suitably qualified person, usually a senior manager with a strong science background, is required as confirmation of the necessary skills. Students must consult with the Coordinator of the Environmental Science Unit for approval of overall entry. This program is designed for students who wish to extend their knowledge of science relating to the environment by studying areas not covered in their undergraduate Science or Engineering degree, including environmental policy, planning and management. The Advanced program allows for the inclusion of research and the tailoring of coursework to suit the individual requirements of students seeking a more advanced level of knowledge in Environmental Science.

Program structure: Advanced program students complete:
> ENVI920* Scientific Basis of Environmental Management (8cp); ENVI921* Environmental Planning (8cp); STS929 Studies in Resource & Environmental Policy (8cp), and ENVI930 Thesis (either 24 or 32cp);
> Two or three of the following: LAW9380 Law for Environmental Managers (8cp); ENVE985* Environmental Engineering (8cp); or STS930 The Environmental Context (8cp);
> Plus at least two of the following subjects: ENVI910* Directed Studies in Pollution Chemistry (12cp); ENVI911* Directed Studies in Ecology (12cp); ENVI912 Directed Studies in Land Resources (12cp); or ENVI913* Directed Studies in Earth Sciences (12cp).
Other relevant subjects may be selected with the approval of the Head of Environmental Science.

Master of Environmental Science students complete 48cp of subjects chosen from those marked * above, and/or from EESC902 Advanced Coastal Environments: Processes & Management (12cp); EESC903 Advanced Fluvial Geomorphology & Sedimentology (12cp); EESC904 Advanced Geographic Information Science (12cp); EESC905 Advanced Remote Sensing (12cp); EESC912 Advanced Soils, Landscape & Hydrology (12cp); EESC918 Advanced Spaces, Places & Identities (12cp); EESC951 Advanced Topic B (8cp); and STS929 Studies in Resource & Environmental Policy (8cp).

GRADUATE DIPLOMA IN SCIENCE
Duration > 1 year or part-time equivalent (48cp)
Delivery > Day
Location > Wollongong
Starting sessions > Autumn/Spring
Entry requirements > A relevant undergraduate degree of at least three years duration, or a similar qualification with relevant work experience.

This program offers students the opportunity to acquire competency or update, broaden, or intensify their knowledge in one of the following disciplines:
> Biological Science
> Chemistry
> Geography
> Geology
> Physics.

The program is also useful for those who require additional preparation before proceeding to a Master of Science degree or other postgraduate studies. Students complete 48cp of subjects approved by the Head of the relevant School or Department.

GILL BASNETT
MASTER OF ENVIRONMENTAL SCIENCE – RESEARCH STUDENT
“My job as Education Officer at the Minnamurra Rainforest brought me to Wollongong. I decided to broaden the base of my Resource and Environmental Management degree with a Masters degree in Environmental Science at UOW. Experience working overseas for the Thai Society for the Conservation of Wild Animals (mainly on bears and elephants) intensified my longtime interest in wildlife management. My research project is being jointly supervised by the NSW Department of Environment and Conservation and Professor Rob Whelan (Institute for Conservation Biology and Law). I’m looking at the effects of different fire regimes on the sustainability of the habitat for native fauna at Coolah Tops National Park, near Mudgee. In the future I would like to work within a National Parks organisation on wildlife management and fire ecology.”