



## Master of Biotechnology

by coursework or  
coursework and dissertation



### The Master of Biotechnology with specialisations in:

- Biochemistry and Molecular Biology
- Environmental Biotechnology
- Genetics and Breeding
- Genetics and Genomics

### Course description, features and facilities

Unique in Australia, this course offers a thorough grounding in state-of-the-art biotechnology in combination with training in enterprise, commercialisation and intellectual property (IP) protection.

Biotechnology is central to our lives. The use of plants, animals and bacteria, enhanced by areas such as genetics and genomics, gives rise to new food, fibre and chemical production routes, and new strategies for environmental protection and stewardship, all central requirements as the global population increases over the coming decades.

You will train in the theory of genetics and molecular biology and receive training in 'next generation' practical

techniques such as proteomics, metabolomics, and genomics. These core skills will be complemented by bioinformatics practices.

### Key features

- Offers up-to-date instruction in biotechnology in combination with training in enterprise and commercialisation.
- Utilises the expertise of world-leading research staff in the Faculty of Science and in the UWA Business School – along with Business 'Angels' and mentors in biotechnology spin-outs.
- Unique set of specialisations.
- Close working links with industry, both public and private.

### Specialisations

#### Biochemistry and Molecular Biology

Much of biotechnology is dependent on biochemistry and molecular biology technologies to understand cellular content, structure, organisation, function and interactions.

- Understand how the natural world works. Biochemistry and molecular

biology give us insights into the mechanisms of evolution, growth, development, reproduction, disease, and senescence.

- These disciplines offer humankind the tools to improve our quality of life - this may be through the development of a novel drug, the generation of a drought resistant crop plant, or the understanding of what controls an individual's health. It's empowering and exciting!

#### Environmental Biotechnology

This specialisation explores the application of biotechnology to the environmental arena in areas such as environmental monitoring, protection and food security in a changing world.

- The environment is facing unprecedented pressures through population expansion, increased pollution inputs and the need to feed the next 1 billion inhabitants. Environmental Biotechnology is central to diagnosing the health of the environment and generating novel solutions to these pressures.
- Uncover the vast array of organisms which sustain the main nutrient

cycles that support all other life on Earth and how we can harness this hidden diversity to enhance our environment.

### Genetics and Breeding

The application of biotechnology at a core and advanced level to the breeding of animals and plants. Using genes as a basis, the units explore the evolutionary and quantitative genetic basis of traits and their variation as well as the use of modern genetic tools to generate and monitor new traits.

- Genetics and breeding directly applies our understanding of genome evolution and structure, and genetic selection in domesticated plants and animals, to solve world-wide issues of malnutrition, climate change, disease and loss of arable land.
- Learn how to apply biotechnology to enhance food security in Australia and developing countries, and the benefits of a broad integrated approach to plant and animal breeding, linking lab to landscape and paddock to plate.

### Genetics and Genomics

Underpinning many areas of biotechnology are next generation technologies in genetics and genomics, including the development of high throughput systems and the analysis of large datasets.

- Routine technologies are now available to sequence entire genomes, giving insights into the numbers and categories of genes that characterise particular species, and the elegant fine-tuning of genome function.
- Genes responsible for desirable traits and medical conditions are being identified more quickly with the new technologies, offering major advances in fields such as medicine, veterinary science, plant breeding, and conservation biology.
- Genetics and genomics underpins the rapidly expanding field of synthetic biology.

## Course Structure

---

### Core units

- MKTG5503 Innovation and Enterprise
- MKTG5604 Biotechnology Commercialisation
- SCIE4001 The Objectives and Applications of Genomics
- SCIE4002 Bioinformatics and Data Analysis for Genomics

Each specialisation has core units in addition to those listed above, with other units selected as options. Visit [handbooks.uwa.edu.au/courses/coursedetails?id=c389](http://handbooks.uwa.edu.au/courses/coursedetails?id=c389)

You may apply to replace the equivalent of half a year's units with a research project.

## Career opportunities

---

The Master of Biotechnology is a cross-disciplinary degree, providing graduates with a unique combination of state-of-the-art science and business skills to meet the global challenges we face.

With core training in contemporary biotechnology, a range of career paths are possible, from plant and livestock production linked to food security and feeding the next billion people, environmental diagnostics and cleanup to protect our planet, through to research and developing the new tools and technologies the biotechnology arena will use in the future.

## Admission requirements

---

You must have a bachelor's degree that aligns with one of the specialisations of this course, or an equivalent qualification, as recognised by UWA. You must also demonstrate a minimum level of English language requirements. See [study.uwa.edu.au/elc](http://study.uwa.edu.au/elc)

## Key information

---

While the standard time frame for completion of this degree is two years (full time), if you have previously completed an undergraduate degree in a cognate (related) area, it may be possible to complete within 1.5 years.

Example cognate areas are: Agricultural Science, Biochemistry and Molecular Biology, Conservation Biology, Environmental Science, Genetics, Marine Science, and Zoology.

- **Intake periods:**  
February and July each year
- **International students** should also visit [student.uwa.edu.au/international/esos](http://student.uwa.edu.au/international/esos), which gives more information about the study environment, course fees, refund policy and support services.
- **Scholarships for international students:**  
[study.uwa.edu.au/International-students/fees-and-scholarships](http://study.uwa.edu.au/International-students/fees-and-scholarships)
- **Domestic students:**  
Commonwealth supported
- **More information:**  
Visit the Future Students website for fees, refund policy and support services [study.uwa.edu.au](http://study.uwa.edu.au)
- **How to apply:**  
[study.uwa.edu.au/how-to-apply](http://study.uwa.edu.au/how-to-apply)
- **Course enquiries:**  
[ask@uwa.edu.au](mailto:ask@uwa.edu.au)



## Faculty of Science

---

The University of Western Australia  
M083, Perth WA 6009 Australia  
[ask@uwa.edu.au](mailto:ask@uwa.edu.au)  
[science.uwa.edu.au](http://science.uwa.edu.au)