Biological Sciences
Bring study to life
Adventure around every corner

Study Biological Sciences at Waikato and begin your adventure on a lifelong journey of learning.

Whether you enjoy solving problems in a laboratory or working outdoors, our degrees are hands-on from day one.

As a Biology student at Waikato you’ll benefit from one-on-one time with world-renowned researchers and enjoy significantly more practical laboratory time throughout your degree than at many other major tertiary providers.

Surrounded by lakes, rivers and amazing ecosystems, the University of Waikato is uniquely placed in the heart of the North Island to provide the ultimate learning environment.

Careers in Biological Sciences come in many shapes and sizes, with many offering opportunities for travel. From managing the Savannah animals at Hamilton Zoo, to working with embryos at a London fertility clinic, our graduates find jobs in exciting and challenging industries both in New Zealand and overseas.
Biological Sciences major

Biological Sciences is taken as a major within the Bachelor of Science (BSc) or the Bachelor of Science (Technology) (BSc(Tech)). A major is the main subject in your degree that you study to a higher level.

Areas of interest within the Biological Sciences major include restoration ecology, animal physiology, behavioural ecology and conservation, biochemistry, biomedical sciences, botany, ecology, freshwater biology, genetics, microbiology, plant physiology and zoology.

Which degree should I study?

The BSc is a three-year degree which equips you for a career that requires logical thinking, analytical talent, a curious mind and practical skills. Alternatively you can study Biological Sciences through the BSc(Tech). The BSc(Tech) is a four-year degree which offers you the chance to gain practical, paid work experience during your study.

Postgraduate study opportunities

A BSc or BSc(Tech) is an excellent first step, but you don’t have to stop there. A postgraduate diploma or certificate, Master of Science or Master of Science (Technology) will take your skill-set to the next level and give you the chance to study in-depth, a topic which you are truly passionate about.

The University of Waikato’s Biological Sciences research teams are recognised internationally for their success in obtaining funding for interesting research projects and collaborations with research organisations such as NIWA, GNS, Scion, Cawthron and AgResearch, guaranteeing Waikato is at the forefront of industry research.
MARINE AND FRESHWATER ENVIRONMENTS

Water is the driving force in nature: it is both one of our most valuable resources and the one most under threat.

As a biologist you can study both freshwater ecosystems including lakes, rivers, streams and wetlands, alongside marine environments such as the ocean and estuaries. At Waikato you’ll experience these environments first-hand, with field trips to areas such as Raglan and Rotorua’s lakes.

Studying these ecosystems involves looking at the plant, animal and microbial populations that inhabit them and the structure and function of the water.

Knowledge of organisms that live in these environments leads to an understanding of the processes and factors controlling populations, which is critical to the organism’s conservation and sustainable management. The distribution and abundance of organisms and how they carry out basic functions such as feeding, metabolism and reproduction, is integral to this knowledge.

Teaching is closely coupled with research that involves restoration of biodiversity in marine and freshwater habitats.

CAREERS: Environmental Resource Manager, Biodiversity Ranger, Fisheries Scientist, Marine Biologist, Freshwater Scientist.
Dr Eloise Brown has always been fascinated by water environments and how the biology, chemistry and physics of water shape ecosystems.

"In my role I am a specialist in technical water advice for Genesis Energy. My main task is to help secure and protect access to water, to allow power generation. This involves developing and implementing environmental management processes and providing technical assessments and advice.

"A highlight of my career has been the international travel to remote locations, alongside incredible technical specialists and scientists. Working with great people makes every day at work challenging and exciting."
Hearing heart-warming pregnancy success stories from her patients is the ultimate reward for Catherine Charleson, who works in a London fertility clinic as a clinical embryologist. Everyday tasks for Catherine include working in a lab with oocytes and sperm to create human embryos; interacting and educating patients; and helping women with IVF cycle management.

A work placement at AgResearch Ruakura as an embryologist and laboratory technician led her to her first full-time position as a clinical embryologist at Fertility Associates in Hamilton. An aspiration to work overseas took her to London, in mid-2011, where she is now enjoying life in England.
**CELLS, MICROBES AND MOLECULES – THE BASIC BUILDING BLOCKS OF LIFE**

Whether you’re in a field covered in mud or in a pristine laboratory, cells, microbes, and molecules are all around.

Cell and molecular biology is the study of the machinery by which cells and whole organisms function. It combines genetics, biochemistry, and cell biology to discover the role of proteins in all living organisms. Genes and gene function provide tools for the study of populations, for conservation, and when reconstructing evolutionary relationships.

Microbiology concerns micro-organisms, typically bacteria and fungi; how to identify and culture them; how they live; how some infect and cause disease in plants and animals; and how we can make use of their activities. Micro-organisms are crucial to the function of an ecosystem and are an important component in biotechnology.

Waikato University’s research in the discipline of thermophiles is highly regarded. Thermophiles are micro-organisms living in extreme environments such as the freezing temperatures of Antarctica and Rotorua’s thermal hot pools. In these areas, scientists find a collection of organisms, genes, and enzymes which can be used in biotechnology studies.

**CAREERS: Medical Researcher, Biotechnologist, Forensic Scientist, Food Quality Control, Animal Health Scientist, Biosecurity Scientist.**
Plants are vital to the continuation of life on our planet, through their role as a source of energy for people, animals, birds and bugs.

From humble mosses to towering kauri trees, the study of botany encompasses the structure and evolution of plants, their organisation into communities, their way of functioning and how they reproduce.

Terrestrial ecology introduces you to the interactions between organisms and their environment, adaptation to environmental change and restoration principles. Naturally, this involves field trips to fascinating places such as Mount Taranaki, Waingaro Forest, Maungatautari Ecological Island and Pureora Forest Park.

Restoration ecology is a specialisation across the disciplines relating to land, freshwater and marine ecology. Learn about the consequences of environmental change and destruction and how to set about the delicate and complicated task of recreating communities consisting of interdependent ecosystems. Experience the thrill of helping to secure the future of endangered species and witness the eradication of predators in communities of animals and birds.

CAREERS: Botanist, Plant Biologist, Conservation Officer, Restoration Ecologist, Plant Physiologist, Environmental Scientist, Forestry Technician, Research Assistant.
Ben Paris

Bachelor of Science (Technology)
Senior Biodiversity Advisor, Auckland Council

“At Auckland Council my role includes giving community advice and conducting ecological assessments and wildlife surveys, with a large focus on bats. I believe my work with long tailed bats has significantly raised the profile of these tiny mammals in the Auckland region and internationally by speaking at schools, community events and conferences.”

During a BSc(Tech) Ben spent his summer break feeding kiwi, surveying wetlands, baiting predator traps and much more. These experiences grew his CV and lead to his first role at the Waikato Regional Council, where he has left a legacy of tui breeding in the city, during his work on the Hamilton Halo Project.
ZOOLOGY AND ANIMAL BEHAVIOUR

Zoologists study all of animal life – from their ecology and evolution, through to their physiology and morphology. Animal behaviour, or ‘ethology’, is a sub-discipline of zoology focusing on the behaviour of animals in their natural habitats and ecosystems.

New Zealand is a Mecca for zoologists and animal behaviourists, primarily because it’s the only place in the world where you can study a unique native fauna, dominated by birds, reptiles and invertebrates; these are animals that have evolved for tens of millions of years in isolation from terrestrial mammals (with the exception of a few bat species).

In the contemporary world, zoologists and animal behaviourists also play a major role in lessening damage to ecosystems wrought by habitat destruction and the introduction of exotic terrestrial and aquatic pests.

Studying zoology and animal behaviour at the University of Waikato you will investigate a wide range of both fundamental and applied topics. This may include animal communication, the evolution of mating systems, population ecology, the control of pest species and the conservation biology of native birds. The combination of applied and fundamental topics allows you to work toward developing solutions to New Zealand’s ecological problems, and to better appreciate the unique attributes of our native animals.

Louise van der Sande

Bachelor of Science (Technology)

Mammal Keeper: Hamilton Zoo

Louise van der Sande has recently been named as the primary Savannah run keeper at Hamilton Zoo, and spends her days looking after zebra, antelope, giraffes and other exotic animals.

Louise scored a one year work placement at the Hamilton Zoo during her fourth year of study, mainly working with hoof stock and small primates. The relationships she formed during this time led to her full time role as a zoo keeper.

“I knew within a few months of study that this was what I wanted to do. My degree gave me a more comprehensive knowledge of animal physiology and behaviour which has given me a great base knowledge for animal training and health assessment.”
THERE’S NO STOPPING YOU
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