

Undergraduate courses 2019

Biological Sciences



School of Biological Sciences

Te Kura Mātauranga Koiora

Location: Level 2, Te Toki a Rata Building, Kelburn Campus
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www.victoria.ac.nz/sbs

December 2018

BACHELOR OF SCIENCE

Bachelor of Science Degree Requirements

- A total of 360 points
- 210 points above 100-level, of which 150 points must be Science
- 75 points at 300-level
- 90 points can be from outside science (some majors also permit an additional 30 outside points).
- At least one Major, and a second Major may be from science or from any other first degree with a maximum of 150 points permitted from outside science.

Science Major Requirements

- 60 points at 300-level
- 60–80 points at 200-level
- 45–60 points at 100-level.

Science Minor Requirements

- 60 points above 100-level specified in the major, of which
- 15 points must be at 300-level.

PLEASE NOTE

Cancellation of courses

The courses offered by the University and listed in this prospectus may be cancelled by the University as a result of insufficient resources or student demand, or if other unforeseen circumstances arise.

Timetable changes

Check the timetable online for confirmation of course times.
<http://www.victoria.ac.nz/students/study/timetables>

HOW TO USE THIS GUIDE

Course code	Course reference number	Title	Points	Trimester
↓	↓	↓	↓	↓
BIOL 111	CRN 566	CELL BIOLOGY	15 PTS	2/3

DISSECTION WORK

If you are doing a major within the School of Biological Sciences you will be expected to carry out some dissection work. This is because first-hand experience of organismal anatomy is an integral part of being a successful biologist. The extent of this work will vary depending on your degree programme, but will not exceed 35 hours. All dissection work done within the School conforms to the high standards of the Victoria University of Wellington Animal Ethics Committee, which meets both New Zealand and international standards for animal welfare. All our staff members are committed to the welfare of animals, and every effort has been made to minimise the use of dissections in our courses. However, if you still have valid reasons why you are unable to participate in dissection work, these can be considered on a case-by-case basis.

YOUR PROGRAMME

Use this template to plan your programme. Start by adding in the core papers for your degree.

Year 1:

120 points

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Year 2:

120 points

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Year 3:

120 points

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BIOLOGY

At Victoria's School of Biological Sciences you can specialise in any of the latest fields of contemporary biology, from genetics to ecology. With the Biology major you can combine elements of the other majors for a more flexible and broader degree.

Note: Students with a BIOL major who wish to progress into BSc(Hons) or MSc in Biological Science must ensure that they have the pre-requisite courses for entry into a 400-level programme.

MAJOR REQUIREMENTS

- BIOL 111, 113, 114, STAT 193 (or equivalent)
- 60 points from BIOL/BMSC/BTEC 201–299
- 60 points from BIOL/BMSC/BTEC 301–399

BIOTECHNOLOGY

Biotechnology is the application of science and technology to living organisms. While it has been used for decades—to provide insulin for diabetics, for example—its potential and its implications for society are still being realised.

A BSc major in Biotechnology at Victoria provides a grounding in biotechnology and its underlying biological and chemical sciences. It is helpful to have some elementary knowledge of biology, chemistry and statistics. Students can specialise in areas such as bioactives and biodiscovery, protein and nucleic acid biotechnology and bioprocessing and microbial biotechnology. As well as a sound scientific education, students consider cultural and ethical issues, and are introduced to aspects of the commercial law and technology transfer involved in bringing biotechnological developments to the marketplace.

MAJOR REQUIREMENTS

- BIOL 111, BTEC 101, CHEM 114, 115; one course from (PHIL 106, 361, SCIS 211)
- BIOL 241, BTEC 201; two courses from (BIOL 236, 244, 252, CHEM 201, 205)
- BTEC 301, SCIE 310; one course from (BIOL 340, BMSC 301, 334, 339, CHEM 301, 305)

CELL AND MOLECULAR BIOSCIENCE

Science is at the heart of a knowledge-based economy, and bioscience is leading the way in innovation, enterprise and expansion. Cell and Molecular Bioscience is one of the five majors offered by the School of Biological Sciences within the BSc.

The subject concentrates on four areas: biochemistry and molecular biology, the science of living organisms at the molecular level; cell biology, the structure and function of cells in animals, plants and bacteria; genetics, the structure, function and regulation of genetic material; physiology and pharmacology, the integrated function of human organ systems and the effect of drugs.

One of the most in-demand and exciting areas in modern science, Cell and Molecular Bioscience offers a range of employment opportunities in New Zealand.

MAJOR REQUIREMENTS

- a. BIOL 111, 113, 114, CHEM 114
- b. BIOL 241, 243, 244, 252
- c. BIOL 340, BMSC 339; one course from (BMSC 334, 335, 343, 354, BTEC 301)

ECOLOGY AND BIODIVERSITY

At Victoria's School of Biological Sciences, you'll learn about the huge diversity of plants, animals and micro-organisms that inhabit the Earth. After a broad introduction, the major in Ecology and Biodiversity focuses on areas of plant, animal and ecosystem diversity and function. Topics include physical and biological processes in ecology, genetics and molecular biology, statistics, plant ecology and conservation, animal ecology and behaviour, and evolution. You'll find it helpful to have some elementary knowledge of biology and statistics.

Wellington offers access to some unique centres of native biodiversity including the Otari Native Plant Museum, Kapiti Island Bird Sanctuary and the urban wildlife sanctuary Zealandia. Current research interests include tuatara evolution and conservation, insect invasions and sex in plants.

For a career that has anything to do with the understanding and management of living things and their interactions with people, a BSc major in Ecology and Biodiversity is ideal.

MAJOR REQUIREMENTS

- a. BIOL 111, 113, 114, STAT 193
- b. BIOL 222, 227, 228, 241
- c. BIOL 329, 40 further points from (BIOL 325, 327, 328)

MARINE BIOLOGY

Marine Biology is the study of ocean organisms and how they interact with one another and their environment. New Zealand has one of the most extraordinary and unspoilt marine ecosystems in the world, and Victoria, which has the closest campus to the sea, is a leader in the field of marine biology. The University has its own marine field station, the Coastal Ecology Laboratory (VUCCEL), and its own research vessels, the tri-hull *Raukawa Challenger* and three aluminium vessels, *Pipi*, *Tuatua* and *Tipa*.

In addition to links with a host of New Zealand and international universities, the Marine Biology group has ties with industry and all the major players in the public sector of the marine industry. These include Crown research institutes such as NIWA, the Ministry of Fisheries and the Department of Conservation, all of which are located in Wellington. These varied links mean that at Victoria you will learn both how the oceans work and how humans interact with the marine environment.

Victoria also benefits from its proximity to New Zealand's major fishing port, Nelson, and the nation's aquaculture centre, the Marlborough Sounds. No other university is better placed to study life in the sea.

MAJOR REQUIREMENTS

- a. BIOL 111, 113, 114, STAT 193
- b. BIOL 227, 228, 271, STAT 292
- c. BIOL 370, 371, 372

BACHELOR OF BIOMEDICAL SCIENCE

Human health and clinical medicine are supported by researchers and professionals whose training and skills are in the biomedical sciences. Old diseases that resist treatment or control, new diseases, changing human lifestyles and environments, and new and improved drugs are all challenges that draw the attention of biomedical scientists.

BBMEDSC MAJORS

- Human Genetics
- Molecular Pathology
- Molecular Pharmacology and Medicinal Chemistry

MAJOR REQUIREMENTS FOR BIOMEDICAL SCIENCE

PART 1—all majors

- a. BIOL 111, 114, BMSC 117, CHEM 114, STAT 193
- b. BIOL 241, 243, 244

Note: If you have fewer than 18 NCEA level 3 chemistry credits (or an approved alternative), you must take CHEM 113 in trimester 1 before entering CHEM 114

PART 2—students must complete one of the following majors in addition to Part 1:

HUMAN GENETICS (HGEN)

- a. BMSC 116, COMP 132 (or 102 or 112)
- b. BIOL 252
- c. BMSC 339, 343, BIOL 340; plus at least 20 further points from 200 or 300 level BIOL, BMSC, BTEC courses, and an additional 20 points from 300-level BMSC courses

MOLECULAR PATHOLOGY (MOLP)

- a. BMSC 116, COMP 132 or PSYC 122 (or COMP 102 or 112)
- b. BIOL 252
- c. BMSC 301, 323, 334, 335, BIOL 340

MOLECULAR PHARMACOLOGY AND MEDICINAL CHEMISTRY (MPMC)

- a. CHEM 115, COMP 132 or PSYC 122 (or COMP 102 or 112)
- b. CHEM 201, 205
- c. BMSC 335, 354, CHEM 301, 305
- d. 15 further points from 300-level BIOL, BMSC, BTEC or CHEM courses

Note: BIOL 340 can count towards both the HGEN and the MOLP majors; and BMSC 335 can count towards both the MOLP and the MPMC majors.

The writing courses, WRIT 101 (Writing English) and WRIT 151 (Academic Writing in ESL) are recommended.

100-LEVEL COURSES

BIOL 111	CRN 566	CELL BIOLOGY	15 PTS	2/3
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Structure and function of pro- and eukaryotic cells, an introduction to biological chemistry, cell ultrastructure and metabolism, cell division and development. An extensive introduction to cell biology. Cellular structure and function are examined, using examples from bacteria, plants and animals. A knowledge of introductory chemistry is an advantage but not essential.

BIOL 113	CRN 7037	BIOLOGY OF PLANTS	15 PTS	1/3
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An exploration into the structure, function and biodiversity of plants and fungi, emphasising their adaptations to different environments, their interactions with other organisms, and their fundamental importance to humanity. It offers a solid foundation for students who wish to pursue a career in plant sciences, ecology, conservation biology or biotechnology and is a key element of the Ecology and Biodiversity major. Extensive previous knowledge of plant biology is not required, but secondary school biology is helpful.

BIOL 114	CRN 7038	BIOLOGY OF ANIMALS	15 PTS	1/3
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Restriction: BMSC 114

An introduction to animal structure and function. This course is largely based on the biology of mammals with a strong emphasis on human biology but comparison is made throughout with other animals. The aim is to demonstrate the structural and functional unity of animals and their variety and diversity as expressed in evolutionary terms. It is not assumed that students have an extensive previous knowledge of the subject, and those who do will find differences in scope and emphasis from school studies.

BIOL 132	CRN 568	BIODIVERSITY AND CONSERVATION	15 PTS	2/3
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An introduction to the diversity, management and conservation of microbial, plant and animal communities. Using key taxa or ecosystems as examples, students will gain an appreciation of the current issues facing the world's biodiversity, and explore possible methods for conservation, including habitat restoration, translocation and predator control.

BMSC 116	CRN 8738	SEX AND EVOLUTION	15 PTS	1/3
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Restriction: BIOL 116

This course examines broad evolutionary themes in relation to mating patterns, gamete and early development. Examples will be taken from fungi, plants and a range of animals, both vertebrate and invertebrate. Human pregnancy and birth will also be examined. Tutorial workshops are an opportunity to discuss and explore selected topics in more depth. The course introduces basic aspects of human anatomy, physiology, genetics and psychology, and is thus a stepping-stone to advanced courses in these subjects.

BMSC 117	CRN 8739	THE BIOLOGY OF DISEASE	15 PTS	2/3
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The nature and origin of disease. Bacteria and viruses: structure, identification and classification. Mechanisms of infection, pathogenesis, virulence, host susceptibility, immunity, epidemiology. Control strategies, new technologies. New organisms. Invertebrate and fungal parasites. Ecological and cultural aspects of disease.

BTEC 101	CRN 11092	INTRODUCTION TO BIOTECHNOLOGY	15 PTS	1/3
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The aims of this course are to provide a solid understanding of the pure and applied science underlying the biotechnology industry, and to provide insight into the cultural and ethical values, and economic and political issues, that this science must align with. Particular focus in lectures will be

given to the techniques and applications of recombinant biotechnology in microbes, plants and animals; harnessing natural resources; health-related biotechnology; reproductive biotechnology; environmental biotechnology and regulation of biotechnology.

CHEM 113	CRN 17147	CONCEPTS OF CHEMISTRY	15 PTS	1/3
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Prerequisites: We strongly recommend students who have not completed level 2 NCEA Chemistry take CHEM 191 over the summer

Restrictions: CHEM 114, 115

This course covers the fundamental concepts of Chemistry—the electronic structure and properties of atoms, periodic trends, chemical bonding, the relationship between structure and reactivity, chemical equilibria and thermodynamics, acids and bases, redox reactions, organic nomenclature and isomerism, the identification and reactivity of a selection of organic functional groups.

CHEM 114	CRN 17148 CRN 17170	PRINCIPLES OF CHEMISTRY	15 PTS	1/3 2/3
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Prerequisites: CHEM 113 or 18 AS credits at NCEA Level 3 Chemistry including: AS91390, AS91391 and AS91392 or equivalent background in Chemistry

Principles of atomic and molecular structure; thermodynamics and kinetics; an introduction to the systematic chemistry of the main group of elements and transition metals and applications; and to a mechanistic interpretation of organic chemistry.

CHEM 115	CRN 17149	STRUCTURE AND SPECTROSCOPY	15 PTS	2/3
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Prerequisites: CHEM 114 or (A- or better in CHEM 113 and concurrent enrolment in CHEM 114)

Restrictions: CHEM 204

This is a unifying chemistry course in which we use a skills-based approach to chemical structural elucidation using electromagnetic radiation (i.e. light). In particular electronic, vibrational and rotational excitations, electron spin alignment and complete ejection of an electron, i.e. UV-Vis, IR, Raman, Microwave, NMR spectroscopies and X-ray diffraction will be explored from fundamentals to practical. Mass spectrometry will also be introduced.

STAT 193	STATISTICS IN PRACTICE	15 PTS	1/3 2/3 3/3
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Restrictions: MATH 277, QUAN 102

Streams: 1/3: Stream A (CRN 1791), Stream B (CRN 11333);
2/3: Stream A (CRN 4442), Stream B (CRN 6164);
3/3: Stream A CRN 17069

An applied statistics course for students who will be advancing in other disciplines as well as those majoring in Statistics. It is particularly suitable for students majoring in Biological Science subjects, Geography, Linguistics, Psychology, social sciences such as Education. This course assumes no previous knowledge of statistics, but mathematics to Year 12 is preferred. Topics covered include estimation, confidence intervals and hypothesis testing, comparison of means and proportions, simple regression and correlation, and analysis of variance.

200-LEVEL COURSES

BIOL 219	CRN 8036	NEW ZEALAND FLORA AND FAUNA	15 PTS	2/3
	CRN 8828			3/3

Prerequisite: 60 points

A hands-on exploration of how New Zealand's natural history has evolved to be so different from that found on continental landmasses. Lecture-based material will cover the basic principles of evolution, island ecology and historical biogeography. Local field trips in the Wellington region will reinforce lecture-based material by exposing students to native plants and animals.

BIOL 222	CRN 15180	ECOLOGY AND ENVIRONMENT	20 PTS	1/3
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Prerequisites: STAT 193, 30 points from (BIOL 111, 113, 114, 132, ENVI/GEOG 114, ESCI/GEOG 111, ESCI 112)

Restrictions: GEOG/ENVI 222

The course will focus on physical and biological processes in terrestrial environments and ecosystem functioning. The field trip will introduce techniques relevant to field-based enquiry in ecology, environmental and earth science. Also taught as GEOG 222.

Note: Students who enrol in field courses must be physically able and must have a good level of physical fitness.

BIOL 227	CRN 9214	PLANTS AND ALGAE: FUNCTION AND DIVERSITY	20 PTS	2/3
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Prerequisite: BIOL 113.

Plant and algal physiology and structure with emphasis on adaptations of the whole organism; diversity and evolution of photosynthetic organisms (including blue-green bacteria, algae and plants) and fungi.

BIOL 228	CRN 9215	ANIMAL DIVERSITY	20 PTS	1/3
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Prerequisite: BIOL 114

Diversity, form and function of animals; an overview of the taxonomic and morphological diversity of all animals; focused study of selected terrestrial and aquatic taxa, including sponges, cnidarians, annelids, molluscs, arthropods and vertebrates (including fish, amphibians, reptiles, birds and mammals).

BIOL 241	CRN 9055	GENETICS	20 PTS	2/3
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Prerequisite: BIOL 111

Restriction: BMSC 241

An introduction to the structure, behaviour and regulation of chromosomes, genes and DNA; and to the processes of heredity and the mechanisms by which genetic information is transmitted and expressed in animals (including humans), plants and micro-organisms. Introduction to population genetics and DNA technologies.

BIOL 243	CRN 9057	PHYSIOLOGY AND PHARMACOLOGY	20 PTS	2/3
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Prerequisites: BIOL 111, 114; CHEM 113 or 114

Restriction: BMSC 243

The functioning and roles of the central and peripheral nervous system and endocrine/ neuroendocrine systems in the control of activity of the cardiovascular, respiratory, gastrointestinal and reproductive systems, as well as the digestion, absorption and metabolic responses to different environmental and energy demands. The emphasis is on mammalian physiology with particular reference to human functions. Elements of pharmacology are introduced in the context of modulation of normal function by pharmaceuticals.

BIOL 244	CRN 18337	INTRODUCTORY BIOCHEMISTRY	20 PTS	1/3
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Prerequisites: BIOL 111; CHEM 113 or 114
Restriction: BIOL/BMSC 239, 240, BMSC 244

The mechanisms and roles of metabolic processes in the interconversion of molecules in animals, plants and microorganisms.

BIOL 252	CRN 9056	CELL AND DEVELOPMENTAL BIOLOGY	20 PTS	1/3
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Prerequisites: BIOL 111, 114
Restriction: BMSC 252

This course expands on topics introduced in first-year cell biology, covering the structure and behaviour of cells in relation to the underlying molecular events and the role of cells in the physiology and development of the whole organism.

BIOL 271	CRN 9216	INTRODUCTORY MARINE BIOLOGY	20 PTS	2/3
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Prerequisites: 60 points, including BIOL 114

An introductory course focusing on marine biology and ecology. This course introduces students to the diversity and physiology of marine organisms, biological oceanography, the structure and function of marine ecosystems such as the deep sea, polar seas, rocky shores, mangrove forests and coral reefs and marine conservation issues.

BTEC 201	CRN 11093	MOLECULAR BIOTECHNOLOGY	20 PTS	2/3
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Prerequisites: BIOL 111, BTEC 101

The aims of this course are to introduce the biotechnology industry, through examples of biotechnological innovation, introduction to microbial, plant and animal biotechnology, harnessing natural resources, health-related biotechnology and placing these in the context of cultural and ethical values and political issues.

CHEM 201	CRN 8607	ORGANIC CHEMISTRY	15 PTS	2/3
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Prerequisite: (CHEM 114, 115) or equivalent

This programme builds on CHEM 114 and CHEM 115 with a molecular orbital approach to the mechanisms of fundamental organic chemical reactions, leading to a survey of the chemistry of conjugated systems, aromatic compounds and carbonyl chemistry.

CHEM 205	CRN 8610	CHEMICAL SYNTHESIS - LABORATORY COMPONENT	15 PTS	2/3
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Prerequisite: (CHEM 114, 115) or equivalent

CHEM 205 provides the opportunity to develop practical skills, competence and confidence in the chemistry laboratory with particular reference to the synthesis and purification of molecules and compounds; functional group transformations; physical, chemical and spectroscopic characterisation; and multi-step chemical syntheses. The programme provides an introduction to the nature of research involving organic and inorganic bench chemistry.

STAT 292	CRN 18331	APPLIED STATISTICS 2A	15 PTS	1/3
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Prerequisites: STAT 193 or a comparable background in Statistics

This course is central to the Applied Statistics stream. Topics are statistical methods and their application in the biological, environmental, health and social sciences, including design of experiments, one-way and multi-way ANOVA and t-tests for difference of means, regression, analysis of covariance, binomial and Poisson distributions, contingency tables, models for binary response variables, and log-linear models for contingency tables. Examples are used for illustration throughout the course, using a statistical computer package.

300-LEVEL COURSES

BIOL 314	CRN 27126	ISLAND ECOLOGY & EVOLUTION - INTERNATIONAL FIELD COURSE IN BIOLOGICAL SCIENCES	15 PTS	1/3
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Prerequisite: BIOL/GEOG 222 and 15 200-level BIOL,
ENVI or STAT pts or permission of Head of School

Restriction: BIOL 414

This course explores the biology of isolated landmasses. The primary focus of the course is a field trip to Lord Howe Island (LHI), a small sub-tropical island off the coast of New Zealand. First, students will learn the ecological principles that shape the evolution of island biotas in readings and pre-recorded lectures prior to the field trip. Next, students will travel to LHI for a week to conduct a range of field exercises that reinforce concepts that were covered previously readings and lectures. Students will also explore the specific conservation issues facing LHI and how they relate to the challenges that will likely face New Zealand in the future. Note additional field cost of around \$3,000 for this course. Tentative dates: 28 June – 5 July 2019.

BIOL 325	CRN 19701	GLOBAL CHANGE BIOLOGY: THE ECOLOGY OF OUR PLANET UNDER STRESS	20 PTS	1/3
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Prerequisites: 40 200-level BIOL pts

An introduction to the eco-physiological responses of plants and animals to environmental and anthropogenic stress, with an emphasis on the effects of changes in global climate and land use. The course focuses on biological functions as they are affected by interactions with their physical, chemical and biotic environments.

BIOL 327	CRN 9218	POPULATION AND COMMUNITY ECOLOGY	20 PTS	1/3
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Prerequisites: BIOL/GEOG 222, 15 200-level
BIOL, ENVI or STAT points

This course will cover practical and conceptual approaches to the study of plant and animal ecology; covering population dynamics, community structure and ecosystem ecology.

BIOL 328	CRN 9219	BEHAVIOUR AND CONSERVATION ECOLOGY	20 PTS	2/3
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Prerequisite: BIOL/GEOG 222, 15 200-level BIOL,
ENVI or STAT points

This course will cover the behaviour and conservation ecology of animals and plants. The course will include ethology and sociobiology, and ecological, genetic and biogeographic principles relevant to reservation, restoration and reconciliation ecology. Topics will incorporate animal, population and meta-population management, pest control and biosecurity, and human dimensions of environmental management. Case studies and issues of topical interest will be debated.

BIOL 329	CRN 9220	EVOLUTION	20 PTS	2/3
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Prerequisite: BIOL/BMSC 241

Origin and development of concepts about biological history including the establishment of modern experimental methods for understanding pattern and process in the origin of new species.

BIOL 340	CRN 9598	GENES AND GENOMES	20 PTS	1/3
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Prerequisites: BIOL/BMSC 241, 244

Restrictions: BMSC 340

Recombinant DNA technology, biotechnology, gene organisation, expression, chemical genetics and evolution in higher organisms, bioinformatics and comparative genomics.

BIOL 370	CRN 19801	FIELD MARINE ECOLOGY	20 PTS	1/3
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Prerequisites: BIOL 271, STAT 292

Restrictions: BIOL 272

This seven-day field course includes 2 nights/3 days at a remote field site (18 - 24 February 2019). The first meeting is at VUCEL (Victoria University Coastal Ecology Lab, 396 The Esplanade, Island Bay), 8.30am sharp. Purchase and read the course manual prior to the start of class for more details.

An introduction to selected marine communities, marine ecology fieldwork, and the scientific process. Complementary modules on the field-based course introduce students to hard and soft shore intertidal ecosystems, sampling techniques, experimental design, statistical analysis and data interpretation. Students design, undertake, and present independent research projects at a remote field site.

BIOL 371	CRN 9221	MARINE ECOLOGY	20 PTS	1/3
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Prerequisites: BIOL 271, STAT 292

This course focuses on quantitative ecology of marine systems. Lectures and laboratories encourage students to think critically and investigate ecological processes and how they shape population dynamics and community structure across a range of marine settings (e.g. soft shores, rocky reefs, and coral reefs). Course modules and assessments will emphasise quantitative methods including the design, statistical analysis, and interpretation of ecological field experiments and observational studies.

BIOL 372	CRN 9222	APPLIED MARINE BIOLOGY	20 PTS	2/3
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Prerequisites: BIOL 228, 271

This course focuses on applied aspects of marine biology. In the first half of the course students will gain an understanding of New Zealand and world fisheries and aquaculture. The second half of the course focuses on conservation and marine management and topics covered include invasive species ecology, pollution, application of molecular techniques to marine management and marine protected area ecology.

BMSC 301	CRN 8747	MEDICAL MICROBIOLOGY	20 PTS	1/3
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Prerequisites: BMSC/BIOL 244 or BTEC 201

This course charts the development of the microbiology field up to the present day. The course features an in-depth investigation of microorganisms at the genetic and phenotypic levels and examines their role in infectious diseases. Students will acquire practical experience in the characterization and identification of microbes using both classical and modern techniques. This course includes six 4-hour laboratory classes. Students are advised to check the laboratory class times before course enrolment.

BMSC 323	CRN 8754	SYSTEMS PATHOLOGY	20 PTS	2/3
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Prerequisite: BMSC/BIOL 335

Restriction: BMSC 202

The pathogenesis, morphology and complications of common benign and malignant diseases.

BMSC 334	CRN 15262	CELL AND IMMUNOBIOLOGY	20 PTS	2/3
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Prerequisite: BMSC/BIOL 241, 252

Restrictions: BIOL 334

The cellular and molecular basis of the immune system, its organisation, reactions and controls in health and disease. Topics covered include the activation, differentiation and control of specific cell functions and immunological methods in research.

BMSC 335	CRN 15263	ADVANCED PHYSIOLOGY	20 PTS	1/3
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Prerequisite: BIOL/BMSC 243

Restriction: BIOL 335

Cellular, organismal and integrative physiology of the mammalian neural, cardiovascular, respiratory, renal, and endocrine systems. Advanced topics include neuroendocrine and pharmacological control of renal excretion and the circulation. Other topics covered include functional brain anatomy, motor control, cognition, and speech, muscle physiology, exercise physiology, control of coronary blood flow, hormone release, control of target cell function and reproductive physiology.

BMSC 339 CRN 15265 CELLULAR REGULATION 20 PTS 2/3

Prerequisites: BMSC/BIOL 244, 252

Restriction: BIOL 339

Consideration of molecular processes which affect normal cell structure and function and their regulation. Abnormalities, including cancer, are also described.

BMSC 343 CRN 19861 ADVANCED GENETICS 20 PTS 1/3

Prerequisite: BMSC/BIOL 241

Restrictions: BIOL 343, BIOL/BMSC 341, 342

A survey of experimental approaches in genetics, from classical screens to genome-wide analyses, examining a variety of genetic model organisms and their specific applications, cytogenetics, chromosomal abnormalities and associated genetic counselling issues in humans. Fundamentals are applied to searches for complex disease genes, and understanding genetic variation in human populations.

BMSC 354 CRN 8756 PHARMACOLOGY 20 PTS 2/3

Prerequisite: 35 points from (BIOL/BMSC 243, 244, CHEM 115, 201)

Review of the principles of pharmacology; transport across the blood brain barrier and placental membrane; drug biotransformations and application to prodrugs; assay techniques; quantification of drug absorption, distribution and elimination kinetics; drug targets; drug design; illustrative case studies.

BTEC 301 CRN 11094 BIOTECHNOLOGICAL TECHNIQUES AND PROCESSES 20 PTS 1/3

Prerequisite: BTEC 201

Theoretical and practical aspects of biotechnological techniques and processes, including the following subject areas: gene therapy, cancer therapeutics, antibody technologies, vaccine design, stem cells, aptamers (nucleic acids as structural tools), biosensors, intellectual property, bacterial genetics, fermentation technology, and chemical genetics. Lectures are presented by practicing specialists in each research field.

CHEM 301 CRN 9058 ORGANIC CHEMISTRY 15 PTS 1/3

Prerequisite: CHEM 201

Advanced topics in organic chemistry such as biosynthesis of biologically important molecules, chemistry of reactive intermediates, pericyclic reactions, organometallic reactions in synthesis, retrosynthetic analysis, carbohydrate chemistry and biosynthesis.

CHEM 305 CRN 9059 CHEMISTRY SYNTHESIS LABORATORY 15 PTS 1/3

Prerequisites: CHEM 201, 205

This course involves the synthesis, isolation and purification of organic compounds. The programme provides for the development of advanced laboratory skills and the use of sophisticated techniques, including working under inert atmospheres and the application of advanced 2D NMR spectroscopy.

Research principles and methodology are illustrated with an emphasis on problem solving in organic chemistry.

SCIE 304	CRN 29110	SPECIAL TOPIC: TROPICAL FIELD MARINE ECOLOGY	15 PTS	1/3
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Prerequisite: BIOL 271, STAT 292

Restriction: BIOL 370

An intensive, research-based field course to the tropical island of Moorea, French Polynesia. Students will learn about the ecology of coral reef ecosystems, while developing fundamental skills required for sub-tidal marine ecology. Course entry requires strong swimming skills, specialist equipment, documents permitting international travel, and payment of a supplemental fee (\$5,750) to cover costs of airfares and accommodation. Date to be confirmed.

SCIE 310	CRN 26078	INNOVATION AND ENTREPRENEURSHIP IN SCIENCE	20 PTS	2/3
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Prerequisite: 60 200-level BSc or BBmedSc pts

The course covers the generic processes in the development of a technology or technological products with selected aspects such as economic analysis, entrepreneurship, project management, marketing and an introduction to tools for business planning.

WHO TO CONTACT

STUDENT AND ACADEMIC SERVICES—FACULTY OF SCIENCE

Te Wāhanga Pūtaiao

Address: Level 1, Cotton Building
Phone: 04-463 5101
Email: science-faculty@vuw.ac.nz
Website: www.victoria.ac.nz/science
Hours: 8.30am–5.00pm Monday, Wednesday, Thursday, Friday
9.30am–5.00pm Tuesday

At the Faculty of Science Student Administration Office, student advisers can help with admission requirements, degree planning, changing courses and transfer of credit from other tertiary institutions. They also deal with other aspects of student administration such as enrolment, exams organisation and the maintenance of student records.

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Johan Barnard	Manager, Student and Academic Services	04-463 5980
Kevin Gould	Associate Dean (Academic Undergraduate)	04-463 6649 or 04-463 5101

STAFF CONTACTS

STAFF		ROOM	CONTACT
Head of School	Prof Simon Davy	TTR214	463 5573
Deputy Head of School	A/Prof Kevin Burns	TTR326	463 6873
Undergraduate Programme Directors			
Biology	A/Prof Ken Ryan	TTR333	463 6083
Biomedical Science	Dr Lifeng Peng	AM302	463 5233 ext. 8076
Biotechnology	Prof David Ackerley	TTR411	463 5576
Cell and Molecular Bioscience	A/Prof Paul Teesdale-Spittle	AM308	463 6094
Ecology and Biodiversity	A/Prof Ken Ryan	TTR333	463 6083 ext. 8015
Marine Biology	A/Prof James Bell	TTR409	463 8104

ACADEMIC STAFF			RESEARCH AREAS	ROOM	CONTACT
Prof	David	Ackerley	<i>Enzyme engineering, biochemistry, microbiology</i>	TTR411	463 5576
A/Prof	James	Bell	<i>Marine biology, population genetics and conservation</i>	TTR409	463 5233 ext 8104
A/Prof	Kevin	Burns	<i>Biogeography and evolutionary ecology</i>	TTR326	463 6873
Dr	Davide	Comoletti	<i>tbc</i>	tbc	tbc
Dr	Lisa	Connor	<i>Cellular immunology</i>	AM310	463 5233 ext 7542
Prof	Simon	Davy	<i>Marine symbiosis and coral reef biology</i>	TTR214	463 5573
Dr	Darren	Day	<i>Biochemistry, molecular biology</i>	TTR336	463 6087
Prof	Elaine	Dennison	<i>Clinical research</i>	-	-
Dr	Julie	Deslippe	<i>Plant-microbial interactions</i>	TTR334	463 6084
Prof	Jonathan	Gardner	<i>Marine biology, population and seascape genetics, marine reserves</i>	TTR335	463 5574
Dr	Monica	Gerth	<i>Microbiology and biochemistry</i>	TTR316	463 4778
Prof	Kevin	Gould	<i>Plant ecophysiology</i>	TTR408	463 6649
Dr	Stephen	Hartley	<i>Conservation biology</i>	TTR330	463 5447
Dr	Bronwyn	Kivell	<i>Physiology and neurobiology</i>	TTR317	463 5233
Prof	Anne	La Flamme	<i>Immunology and cell biology</i>	AM306	463 6093
Prof	Phil	Lester	<i>Insect ecology</i>	TTR329	463 5096
A/Prof	Wayne	Linklater	<i>Wildlife biology, human dimensions ecology</i>	TTR337	463 5233 ext 8575
Dr	Joanna	MacKichan	<i>Bacterial pathogenesis</i>	AM303	463 4711
Dr	Melanie	McConnell	<i>Genetics and cancer</i>	AM323	463 5233 ext 8136
Dr	Andrew	Munkacsi	<i>Chemical genetics</i>	AM321	463 5233 ext 8136
A/Prof	Nicola	Nelson	<i>Conservation biology</i>	TTR406	463 5435
Dr	Diane	Ormsby	<i>Reproductive and developmental biology</i>	TTR331	463 5271
Dr	Jeremy	Owen	<i>Metagenomics</i>	TTR410	463 5277
A/Prof	Wayne	Patrick	<i>Biochemistry</i>	TTR318	463 4779
Dr	Lifeng	Peng	<i>Proteomics</i>	AM302	463 5233 ext 8076
A/Prof	Peter	Pfeffer	<i>Developmental and reproductive biology</i>	TTR319	463 7462
Dr	Nicole	Phillips	<i>Marine ecology and larval biology</i>	TTR332	463 5233 ext 8049
Dr	Janet	Pitman	<i>Reproductive biology</i>	TTR320	463 7450
A/Prof	Peter	Ritchie	<i>Evolutionary genetics</i>	TTR407	463 5233 ext 8105
Dr	Alice	Rogers	<i>Fisheries</i>	TTR325	463 4786
Prof	Ashley	Rowden	<i>Marine ecology and environment</i>	TTR322	463 6283
A/Prof	Ken	Ryan	<i>Antarctic biology and ecophysiology</i>	TTR333	463 6083
Prof	Jeff	Shima	<i>Marine ecology and fish biology</i>	TTR328	463 6494
A/Prof	Paul	Teesdale-Spittle	<i>Biochemistry and pharmacology</i>	AM308	463 6094
A/Prof	Heiko	Wittmer	<i>Conservation and restoration ecology</i>	TTR323	463 7432
A/Prof	Joe	Zuccarello	<i>Molecular biology and phycology</i>	TTR324	463 6414

Adjunct Staff at the Malaghan Institute of Medical Research

Prof Graham Le Gros, Director	<i>Asthma and parasitic diseases</i>	MIMR	499 6914
Prof Mike Berridge	<i>Cancer cell and molecular biology</i>	MIMR	499 6914
Dr Olivier Gasser	<i>Translational immunology</i>	MIMR	499 6914
Prof Ian Hermans	<i>Cancer immunotherapy</i>	MIMR	499 6914
Prof Franca Ronchese	<i>Immune cell biology</i>	MIMR	499 6914

Emeritus Professors

Prof Charles Daugherty	<i>Conservation Biology</i>	TTR213	-
Prof Phil Garnock-Jones	<i>Plant taxonomy, phylogeny and evolution</i>	TTR213	463 6085
Prof Ken McNatty	<i>Reproductive Biology</i>	TTR213	463 6029
Prof John Miller	<i>Cell biology and physiology</i>	AM307	463 6082

Administrative Staff

Lesley Thompson	School Manager	TTR212	463 5332
Sonja Hummel	Administration Assistant	TTR206	463 5339
Paul Marsden	Administrator - Operations	TTR206	463 5555
Mary Murray	Administrator - General	TTR206	463 5339
Sandra Taylor	Administrator - PA to HoS/Clinical Research	TTR206	463 5747
Mark Stephen	Administrator - Graduate Programmes	TTR206	463 5581

Senior Tutors

Dr David Maass	Senior Tutor – 200 & 300-level	TTR206	463 8172
Dr Fabian Westermann	Senior Tutor – 100-level	TTR206	463 6136

Technical Staff

Dr Stephen Meyer	Manager Technical Services	TTR211	463 5579
Melanie Dohner	Technical Officer	TTR401	463 4785
Craig Doney	Equipment Officer	TTR012	463 4782
Angela Fleming	Technical Officer	TTR401	463 9757
Shaun Graham	Equipment Officer	TTR015	463 4781
Kayla Griffin	Technical Officer	TTR401	463 9759
Dr Derek Heath	Technical Officer	TTR401	463 5580
Neville Higgison	Equipment Officer	TTR012	463 5154
Sue Keall	Senior Technical Officer	TTR401	463 5324
Danyl McLauchlan	Computational Biologist	AM301	463 5735
Daniel McNaughtan	Technical Officer – VUCCEL	CEL101	470 9257
Dr Lesley Milicich	Technical Officer	TTR401	463 8128
Stacey Parbhu	Animal Laboratory Coordinator	TTR401	463 6504
Sushila Pillai	Technical Officer	TTR401	463 4784
Dr Pisana Rawson	Technical Officer	TTR401	463 8240
Paul Roulston	Equipment Officer	TTR012	463 4783
Chris Thorn	Technical Officer	TTR401	463 9756
John van der Sman	Technical Officer – VUCCEL	CEL101	470 9250