

2025 Guide to Undergraduate Degrees, Majors and Courses in the Biological Sciences



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Welcome!

The School of Biological Sciences offers two undergraduate degrees (the Bachelor of Science and the Bachelor of Biomedical Science), each with several distinct majors to choose from. This guide provides information on the requirements of each degree major, some example programmes of study, and descriptions of the courses we will offer in 2025.

We hope this guide is helpful in planning your studies, but if you have any questions, here are some ways to get additional help:

FOR GENERAL INQUIRIES

If you have any general inquiries about your studies, the Tītoko Centre for Student Success is here to assist you. The team serves as the first point of contact for help with planning the courses necessary to complete your qualification, modifying your current courses or programs, overcoming challenges in your academic progress, connecting you with support services, and addressing various aspects of student life.

Every student at Te Herenga Waka—Victoria University of Wellington gets assigned a personal Student Success Adviser. You can find the name and contact details of your advisor using these instructions: <https://www.wgtn.ac.nz/students/tools-and-help/help-and-advice/your-adviser#find>

Or, if you don't know who your advisor is, you can also drop into the Tītoko office or contact the team by phone or email. Their hours are 9 am – 4 pm, Monday to Friday.

Tītoko Office: CO144, Ground floor, Cotton Building, Kelburn campus

Tītoko Email: info@vuw.ac.nz

Tītoko Phone: 0800 04 04 04 or +64 4 472 1000

FOR QUESTIONS ABOUT SPECIFIC DEGREE MAJORS

If you have questions about one of our undergraduate majors, you can also contact one of our programme directors—their contact information is listed below.

Undergraduate Programme Directors

Programme	Director name	Contact email
Biology	Dr Diane Ormsby	Diane.Ormsby@vuw.ac.nz
Biomedical Sciences (all majors)	A/Prof Davide Comoletti	Davide.Comoletti@vuw.ac.nz
Biotechnology	Prof David Ackerley	David.Ackerley@vuw.ac.nz
Cell and Molecular Bioscience	A/Prof Bronwyn Kivell	Bronwyn.Kivell@vuw.ac.nz
Ecology and Biodiversity	Prof Phil Lester	Phil.Lester@vuw.ac.nz
Marine Biology	Prof James Bell	James.Bell@vuw.ac.nz

FOR QUESTIONS ABOUT SPECIFIC COURSES

If you have questions about a specific course, please email the course coordinator (listed on pages 17-26). Staff email addresses follow the pattern of *firstname.lastname@vuw.ac.nz*.

PLANNING YOUR STUDIES

Once you've chosen your Degree and Major and reviewed the requirements and courses, you can use the template below to plan your degree.

Start by adding the required courses for your Major to each year in the table below.

Then, add in any other courses you are interested in taking.

Note that generally, 100-level courses in the Sciences are worth 15 points (so you'll need to take eight courses in Year 1), but at 200-300-level, there is a mix of 15 and 20-point courses (so the number of courses you need may vary).

You need a total of 360 points for a BSc or BBMedSc degree.

Year 1:								120 points
Year 2:								120 points
Year 3:								120 points

If you have any questions or need help planning your degree, reach out to the team at Titoko Centre for Student Success (page 3).

THE BACHELOR OF SCIENCE (BSc)

General Bachelor of Science Degree Requirements:

- A total of 360 points.
- At least 210 points must be from 200 and 300-level courses, including:
 - At least 150 points from courses listed for the BSc.
 - At least 75 points from 300-level courses listed for the BSc.
- 90 points can be from outside science (some combinations of majors may also permit up to an additional 60 outside points).
- One major from the BSc, i.e. Biology, Biotechnology, Cell and Molecular Bioscience, Ecology and Biodiversity or Marine Biology. See pages 6-10 for more information about these majors.
- . Students can also take a second major, which can be from the BSc or any other first degree of the University

General Bachelor of Science Minor Requirements:

- 60 points above the 100-level specified in the major, of which 15 points must be at the 300-level. See page 11 for more details.

BIOLOGY (BIOL)

Mātai Koiora

A Biology major introduces you to the wonder of life, in all its forms and at all levels, from molecules to ecosystems. The major begins with courses that introduce cell, plant, and animal biology. During your second and third years, you can follow your passion and choose courses that span the spectrum of biological disciplines. You can also combine elements of other majors for a more flexible and broader degree. A major in Biology serves as a foundation for broad and diverse career options. There are also pathways for postgraduate study and further specialisation – although if you think you might want to continue your studies, make sure you include the prerequisite courses for entry into your postgraduate programme of interest.

REQUIRED COURSES

1. BIOL 111, BIOL 113, BIOL 114 and STAT 193 (or equivalent).
2. Any 60 points from BIOL/BMSC/BTEC 201–299.
3. Any 60 points from BIOL/BMSC/BTEC 301–399.

Below is an example programme of study for an undergraduate Biology major, which also meets the entry requirements for our postgraduate programmes in Cell and Molecular Bioscience (CBIO) and/or Molecular Microbiology (MBIO).

If you have any questions and/or need course advice, please feel free to contact the Biology Programme Director, Dr Diane Ormsby (diane.ormsby@vuw.ac.nz).

Example programme of study (the required courses for the Biology major are highlighted in bold).

	Year 1	Year 2	Year 3
T1	BIOL 113: Biology of Plants BIOL114: Biology of Animals BTEC101: Introduction to Biotechnology CHEM 113: Concepts of Chemistry*	BIOL244: Introductory Biochemistry BIOL228: Animal Diversity BIOL252: Cell & Developmental Biology	BMSC343 Advanced Genetics BIOL325: Global Change Biology BMSC301: Medical Microbiology
T2	BIOL111: Cell Biology STAT193: Statistics in Practice BIOL132: Biodiversity and Conservation BMSC 117 The Biology of Disease	BIOL236: Microbes & their Environments BIOL241: Genetics BTEC201: Molecular Biotechnology	BIOL329: Evolution BMSC334: Cell and Immunobiology BMSC339: Cellular Regulation

*Note: We recommend that students with a strong background in NCEA Chemistry take STAT 193 in Tri 1, and CHEM 121 in Tri 2 (instead of CHEM 113).

BIOTECHNOLOGY (BTEC)

Hangarau Koiora

Biotechnology is the application of biological sciences and technologies to solve real-world problems. While it has been used for decades - for example, to provide insulin for diabetics - its potential and its implications for society are still being realised. A major in Biotechnology 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 or reproductive technologies. As well as gaining a sound scientific education, students consider cultural and ethical issues and are introduced to aspects of the commercial environment and technology transfer involved in bringing biotechnological developments to Aotearoa's marketplace, as well as internationally.

As a constantly progressing area of science, Biotechnology prepares students for a diverse array of career opportunities, with a focus on those in the biotech sector.

REQUIRED COURSES

1. BTEC 101, BIOL 111, CHEM 121* and one course from (CHEM 122, PHIL 106, PHIL361 or SCIS 211).
2. BTEC 201, BIOL 241, and two courses from (BIOL 236, BIOL 244, BIOL 252, CHEM 201, CHEM 205, CHEM 207, CHEM 208).
3. BTEC 301, SCIE 310** and one course from (BIOL 340, BMSC 301, BMSC 334, BMSC 339, CHEM 301, CHEM 305, CHEM 307, CHEM 308, CHEM 309).

If you have any questions and/or need course advice, please feel free to contact the Biotechnology Programme Director, David Ackerley (david.ackerley@vuw.ac.nz)

Example programme of study (required courses for the BTEC major are highlighted in bold).

	Year 1	Year 2	Year 3
T1	BTEC 101 Introduction to Biotechnology STAT 193 Statistics in Practice BIOL 114 Biology of Animals SCIS 101 Science in Everyday Life*	BIOL 244 Introductory Biochemistry BIOL 252 Cell and Developmental Biology SCIS 211 Contemporary Issues in Science, Environment and Technology	BTEC 301 Biotechnological Techniques and Processes BIOL 340 Genes and Genomes BMSC 301 Medical Microbiology
T2	BIOL 111 Cell & Molecular Biology CHEM 121 Chemistry of Life MAOR 123 Te Iwi Māori me ān Tikanga/Māori Society and Culture BIOL 117 The Biology of Disease	BIOL 241 Genetics BTEC 201 Molecular Biotechnology BIOL 236 Microbes and their Environments	SCIE 310 Innovation and Entrepreneurship in Science** BMSC 334 Cell and Immunobiology BMSC 339 Cellular Regulation

**Note: Students without the NCEA requirements to enter directly into CHEM 121 Chemistry of Life should take CHEM 113 Concepts of Chemistry in Trimester 1 and CHEM 121 in Trimester 2. Students who can enter directly into CHEM 121 Chemistry of Life can take an alternative course such as SCIS 101 in Trimester 1, as shown above.

** Not offered in 20. Instead, two courses from the alternative offerings should be selected, with additional alternatives able to be considered with approval from the Programme Director.

CELL AND MOLECULAR BIOSCIENCE (CBIO)

Mātauranga Koiora Pūtau

The cutting edge of biology is at the cellular and molecular level. Only by understanding the molecular machinery inside cells and the interactions between cells can you understand the ongoing revolutions in medicine, agriculture, and even genomics-based disciplines such as modern ecology.

A major in Cell and Molecular Bioscience gives you this deep understanding of “the stuff too small to see”.

Courses in this major concentrate on areas such as biochemistry, molecular biology, cell biology, genetics, physiology, and pharmacology.

REQUIRED COURSES

1. BIOL 111, BIOL 113, BIOL 114, and CHEM 121*.
2. BIOL 241, BIOL 243, BIOL 244 and BIOL 252.
3. BIOL 340, BMSC 339 and one course from (BMSC 334, 335, 343, 354, BTEC 301).

If you have any questions and/or need course advice, please feel free to contact the Cell and Molecular Bioscience Programme Director, Dr Bronwyn Kivell (Bronwyn.Kivell@vuw.ac.nz)

Example programme of study (required courses for the Cell and Molecular Bioscience major are highlighted in bold).

	Year 1	Year 2	Year 3
T1	BIOL 113 Biology of Plants BIOL 114 Biology of Animals BTEC 101 Introduction to Biotechnology CHEM 113 Concepts of Chemistry*	BIOL 244 Introductory Biochemistry BIOL 252 Cell and Developmental Biology BIOL 228 Animal Diversity	BIOL 340 Genes and Genomes BMSC 335 Advanced Physiology BTEC 301 Biotechnological Techniques and Processes
T2	BIOL 111 Cell & Molecular Biology CHEM 121 Chemistry of Life* BMSC 117 The Biology of Disease MAOR 123 Te Iwi Māori me āna Tikanga/Māori Society and Culture	BIOL 241 Genetics BIOL 243 Physiology and Pharmacology BTEC 201 Molecular Biotechnology	BMSC 339 Cellular Regulation BMSC 334 Cell and Immunobiology BIOL 329 Evolution

*Note: Students without the NCEA requirements to enter directly into CHEM 121 Chemistry of Life should take CHEM 113 Concepts of Chemistry in Trimester 1 and then CHEM 121 in Trimester 2. Students who can enter directly into CHEM 121 Chemistry of Life can take it in Trimester 2 and take an alternative course in Trimester 1.

ECOLOGY AND BIODIVERSITY (EBIO)

Mātai Hauropi, ngā Momo Koiora hoki

In this major, you will learn about the huge diversity of plants, animals and microorganisms 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.

Study in Wellington offers access to unique centres of native biodiversity including the Otari-Wilton's Bush, Kapiti Island Nature Reserve and the urban ecosanctuary Zealandia.

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

REQUIRED COURSES

1. BIOL 111, BIOL 113, BIOL 114 and STAT 193.
2. BIOL 222; BIOL 241 or STAT 292; and 40 further points from (BIOL 227, BIOL 228, BIOL 236 or BIOL 241).
3. BIOL 327 and 40 further points from (BIOL 325, BIOL 328 or BIOL 329).

If you have any questions and/or need course advice, please feel free to contact the Ecology and Biodiversity Programme Director, Prof Phil Lester (Phil.Lester@vuw.ac.nz)

Example programme of study (required courses for Ecology and Biodiversity are highlighted in bold. In some cases, the requirement is to take one of two specific courses; this is indicated by italics).

	Year 1	Year 2	Year 3
T1	BIOL 113 Biology of Plants BIOL 114 Biology of Animals GEOS 101: Our Dynamic Earth and Environment GEOG 114: Sustainability: People and Environment	BIOL 222 Ecology and Environment <i>STAT 292 Applied Statistics 2A</i> BIOL 228 Animal Diversity	BIOL 327 Population and Community Ecology BIOL 325 Global Change Biology GEOG 224 Geomorphology
T2	BIOL 111 Cell & Molecular Biology STAT 193 Statistics in Practice MAOR 123 Te Iwi Māori me āna Tikanga/Māori Society and Culture BIOL 132 Biodiversity and Conservation	<i>BIOL 241 Genetics</i> BIOL 227 Plants and Algae: Function and Diversity BIOL 236 Microbes and their Environments	BIOL 328 Behaviour and Conservation Ecology BIOL 329 Evolution GEOG 214 Environment and Resources: New Zealand Perspectives

MARINE BIOLOGY (BMAR)

Mātai Koiora Moana

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 Te Herenga Waka, 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 (WUCEL), 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 in Wellington. These varied links mean that at Te Herenga Waka, you will learn both how the oceans work and how humans interact with the marine environment.

REQUIRED COURSES

1. BIOL 111, BIOL 113, BIOL 114, and STAT 193.
2. BIOL 227, BIOL 228, BIOL 271 and STAT 292.
3. BIOL 371, BIOL 372, and BIOL 370.

If you have any questions and/or need course advice, please feel free to contact the Marine Biology Programme Director, Dr James Bell (james.bell@vuw.ac.nz)

Example programme of study (required courses for Marine Biology are highlighted in bold..)

	Year 1	Year 2	Year 3
T1	BIOL 113 Biology of Plants BIOL 114 Biology of Animals GEOS 101: Our Dynamic Earth and Environment GEOG 114: Sustainability: People and Environment	BIOL 228 Animal Diversity STAT 292 Applied Statistics 2A BIOL 222 Ecology and Environment	BIOL 370 Field Marine Ecology BIOL 371 Marine Ecology BIOL 325 Global Change Biology: The Ecology of Our Planet Under Stress
T2	BIOL 111 Cell & Molecular Biology STAT 193 Statistics in Practice MAOR 123 Te Iwi Māori me āna Tikanga/Māori Society and Culture BIOL 132 Biodiversity and Conservation	BIOL 227 Plants and Algae: Function and Diversity BIOL 271 Introductory Marine Ecology BIOL 241 Genetics	BIOL 372 Applied Marine Biology BIOL 328 Behaviour and Conservation Ecology BIOL 329 Evolution

MINORS IN THE BACHELOR OF SCIENCE (BSc)

Biology, Biotechnology, Cell and Molecular Bioscience, Ecology and Biodiversity, and Marine Biology subjects are also available in the BSc as minors. You may also be able to have a minor in one of the subjects from the Bachelor of Biomedical Science*.

To achieve a minor in one of these subjects, you must have at least 60 points at 200 level or above from the courses required for the major in that subject. Of those 60 points, at least 15 must be at the 300 level. Where our subjects have specialist codes (such as the BTEC code for Biotechnology), you must have at least 40 points for courses with that subject code.

Additionally, you cannot use a 300-level course to count towards two or more qualifications (e.g., a major and a minor or two minors). For example, you cannot use BIOL 340 to meet the requirements of a major in Biotechnology and a minor in Cell and Molecular Bioscience. You cannot have a major and a minor in the same subject.

Although minors are described in terms of courses at 200-level and above, remember that you will need to do 100-level courses to meet the prerequisite requirements of the courses you choose to take in your minor.

Example minors

There are many combinations of courses you could take to meet the requirements of a minor*. The examples given here are to illustrate how minors work. In designing your combination, note the above requirements and plan to meet the prerequisites for the courses you intend to take.

Biology

40 points from BIOL/BMSC/BTEC 201–299 and any 20 points from BIOL/BMSC/BTEC 301–399.

Biotechnology

BIOL 241, BTEC 201, 301

Cell and Molecular Bioscience

Example 1: A genetics route: BIOL 241, 244, 340

Example 2: A cell biology route: BIOL 244, 252, BMSC 339

Ecology and Biodiversity

BIOL 227, 228, 325

Marine Biology

BIOL 228, 271, 372

* There is one exception: *if you are majoring in Biology, Biotechnology or Cell and Molecular Bioscience in the BSc, you can't do a minor from the BBmedSc.*

BACHELOR OF BIOMEDICAL SCIENCE (BBmedSc)

General Bachelor of Biomedical Science Degree Requirements:

- A total of 360 points.
- At least 180 points must be from the 200 and 300 level.
- All BBmedSc majors must take:
 - BIOL 111, 114, BMSC 117, CHEM 121*, STAT 193.
 - BIOL 241, 243, 244.
 - And the courses required for at least one major (i.e. Human Genetics, Molecular Pathology, or Molecular Pharmacology and Medicinal Chemistry. See pages x-y for more information about these majors.

*Note: If you have fewer than 16 NCEA Level 3 Achievement Standard credits in Chemistry, including two external standards or equivalent background, you must pass CHEM 113 in Trimester 1 before entering CHEM 121 (which is taught in both T1 and T2).

General Bachelor of Science Minor Requirements:

- 60 points at 200-level or above from the courses listed for the majors in the degree. At least 15 points must be at 300-level and not counted towards a major or another minor. See page 16 for more details.

HUMAN GENETICS (HGEN)

Mātai Iranga

Majoring in Human Genetics will give you the skills and vocabulary to understand how systems work, how genes are encoded and interpreted correctly and how all the proteins in the cells function together. You'll learn how to carry out research that will contribute to this field of science. You will also learn about the links between genetics and cancer or diseases such as multiple sclerosis, reproductive dysfunction, drug addiction and neurodegenerative disease.

REQUIRED COURSES

1. BIOL 111, BIOL 114, BMSC 117, CHEM 121, STAT 193 and COMP 132 (or 102 or 112).
2. BIOL 241, BIOL 243, BIOL 244 and BIOL 252.
3. BIOL 340, BMSC 339 and BMSC 343.
4. At least one further course from 200 or 300-level BIOL, BMSC, BTEC, COMP, DATA, PSYC or STAT courses.
5. An additional course from 300-level BIOL, BMSC, BTEC, COMP, DATA, PSYC or STAT courses.

If you have any questions and/or need course advice, please feel free to contact the Biomedical Science Programme Director, Dr Davide Comoletti (davide.comoletti@vuw.ac.nz)

Example programme of study for the HGEN major (required courses are highlighted in bold).

	Year 1	Year 2	Year 3
T1	BIOL 114 Biology of Animals STAT 193 Statistics in Practice CHEM 113 Concepts of Chemistry* PSYC 121 Foundations in Psychology 1	BIOL 244 Introductory Biochemistry BIOL 252 Cell & Developmental Biology BIOL 228 Animal Diversity	BIOL 340 Genes and Genomes BMSC 343 Advanced Genetics BMSC 335 Physiology and Pathology 2
T2	BIOL 111 Cell & Molecular Biology BMSC 117 The Biology of Disease CHEM 121 Chemistry of Life COMP 132 Programming for the Natural and Social Sciences	BIOL 241 Genetics BIOL 243 Physiology and Pathology 1 BIOL 236 Microbes and their Environments	BMSC 339 Cellular Regulation BMSC 334 Cell and Immunobiology BIOL329 Evolution

Note: Students who meet the NCEA requirements to enter directly into CHEM 121 (T2) can replace CHEM 113 (T1) with an alternative course, such as WRIT 101 (Writing at University) or WRIT 151 (Writing in English as a Second Language).

MOLECULAR PATHOLOGY (MOLP)

Mātai Mate Rāpoi Ngota

The Molecular Pathology major investigates the structure of organs and how diseases are caused at a system level. You will examine the bacterial, viral, and parasitic microorganisms that can cause disease and how the immune system works. You'll also look at what happens to tissue and organ function when diseases take over the body.

REQUIRED COURSES

1. BIOL 111, BIOL 114, BMSC 117, CHEM 121, STAT 193 and COMP 132 or PSYC 122 (or COMP 102 or 112).
2. BIOL 241, BIOL 243, BIOL 244 and BIOL 252.
3. BMSC 301, BMSC 334, BMSC 335, BIOL 340.

If you have any questions and/or need course advice, please feel free to contact the Biomedical Science Programme Director, Dr Davide Comoletti (davide.comoletti@vuw.ac.nz).

Example programme of study based on the Molecular Pathology (MOLP) major (required courses are highlighted in bold).

	Year 1	Year 2	Year 3
T1	BIOL 114 Biology of Animals STAT 193 Statistics in Practice CHEM 113 Concepts of Chemistry ¹ WRIT101 Writing at University	BIOL 244 Introductory Biochemistry BIOL 252 Cell and Developmental Biology BIOL 228 Animal Diversity	BMSC 301 Medical Microbiology BIOL 340 Genes and Genomes BMSC 335 Physiology and Pathology 2
T2	BIOL 111 Cell & Molecular Biology CHEM 121 Chemistry of Life BMSC 117 The Biology of Disease COMP 132 Programming for the Natural and Social Sciences	BIOL 241 Genetics BIOL 243 Physiology and Pathology 1 BIOL 236 Microbes and their Environments	BMSC 334 Cell and Immunobiology BMSC 339 Cellular Regulation BMSC 354 Pharmacology

Note: Students who meet the NCEA requirements to enter directly into CHEM 121 (T2) can replace CHEM 113 (T1) with an alternative course, such as WRIT 101 (Writing at University) or WRIT 151 (Writing in English as a Second Language).

MOLECULAR PHARMACOLOGY AND MEDICINAL CHEMISTRY (MPMC)

Mātai Taka Rongoā, Matū Rongoā Hoki

This major will give you a solid grounding in the chemistry of the human body. You'll learn about modern chemical methods for synthesising drugs - and the application of those drugs, and how they work within a living system.

REQUIRED COURSES

1. BIOL 111, BIOL 114, BMSC 117, CHEM 121, STAT 193 and COMP 132 or PSYC 122 (or COMP 102 or 112).
2. BIOL 241, BIOL 243, BIOL 244 and two courses from (CHEM 201, 205, 207, 208).
3. BMSC 335 and BMSC 354.
4. Two courses from (CHEM 301, 305, 307, 308 or 309).

If you have any questions and/or need course advice, please feel free to contact the Biomedical Science Programme Director, Dr Davide Comoletti (davide.comoletti@vuw.ac.nz).

Example programme of study for the Molecular Pharmacology and Medicinal Chemistry (MPMC) major. Required courses are highlighted in bold. In some cases, the requirement is to take two courses from the given options; these courses are indicated in italics.

	Year 1	Year 2	Year 3
T1	BIOL 114 Biology of Animals STAT 193 Statistics in Practice CHEM 113 Concepts of Chemistry MAOR 123 Te Iwi Māori me āna Tikanga/Māori Society and Culture	BIOL 244 Introductory Biochemistry BIOL 252 Cell and Developmental Biology <i>CHEM 208 Chemistry of Life: Organic, Biomolecular and Medicinal Chemistry</i>	BMSC 335 Physiology and Pathology 2 <i>CHEM 307 Advanced Experimental Techniques</i> BMSC301 Medical Microbiology
T2	BIOL 111 Cell & Molecular Biology CHEM 121 Chemistry of Life BMSC 117 The Biology of Disease COMP 132 Programming for the Natural and Social Sciences	BIOL 241 Genetics BIOL 243 Physiology and Pharmacology <i>CHEM 207 Experimental Chemistry and Spectroscopy</i>	BMSC 354 Pharmacology <i>CHEM 309 Chemical Biology and Medicinal Chemistry</i> BMSC 339 Cellular Regulation

Note: Students who meet the NCEA requirements to enter directly into CHEM 121 (T2) can replace CHEM 113 (T1) with an alternative course, such as WRIT 101 (Writing at University) or WRIT 151 (Writing in English as a Second Language).

MINORS IN THE BACHELOR OF BIOMEDICAL SCIENCE (BBmedSc)

The subjects of the BBmedSc degree can also be taken as minors. To get a minor in a BBMedSc subject, you must have at least 60 points at 200-level or above from the courses listed for the majors in the degree, including those listed for the subjects below. At least 15 points must be at 300-level and not counted towards a major or minor.

Example minors

There are many combinations of courses you could take to meet the requirements of a minor*. The examples given here are to illustrate how minors work. In designing your combination, note the above requirements and plan to meet the prerequisites for the courses you intend to take.

You can also choose to minor in a subject from another undergraduate degree. There is one exception: due to the overlap in courses, you are not allowed to take a minor in Biology, Biotechnology or Cell and Molecular Science from the BSc if you are doing a BBmedSc.

Human Genetics minor

Example: BIOL 241, 252, BMSC 343

Complete at least 15 points at 200-level or above from the Human Genetics major.

Molecular Pathology minor

Example: BIOL 243, BMSC 335

Complete at least 15 further points at 200-level or above from the Molecular Pathology major.

Molecular Pharmacology and Medicinal Chemistry minor

Example: BIOL 243 or 244; BMSC 354, CHEM 208

Complete at least 15 further points at 200-level or above from the Molecular Pharmacology and Medicinal Chemistry major.

COURSE DESCRIPTIONS

These are the planned courses for 2025. However, the university may cancel courses due to insufficient resources, student demand, or other unforeseen circumstances. Check online for up-to-date information, as well as more detailed course information (e.g. syllabus, timetable) at <https://www.wgtn.ac.nz/study/programmes-courses/courses>

HOW TO USE THIS GUIDE

Course	Course reference number	Title	Points	Trimester(s)
↓	↓	↓	↓	↓
BIOL 000	CRN 000	BIOLOGY COURSE XYZ	15 PTS	Tri 2

100-LEVEL COURSES

BIOL 111	CRN 566	CELL AND MOLECULAR BIOLOGY	15 PTS	Tri 2
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Course coordinator: A/Prof Monica Gerth

This course will explore the molecular basis of life, providing students with a strong foundation in cell biology. Key concepts will include the structure and function of major cell types, biological chemistry and metabolism, and cell division and development. We'll explore these concepts using a variety of examples from across the tree of life, including plants, animals and microbes.

BIOL 113	CRN 7037	BIOLOGY OF PLANTS	15 PTS	Tri 1
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Course coordinator: Dr Nicola Day

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	Tri 2
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Restriction: **BMSC 114** *Course coordinator: Dr Julian Day-Cooney*

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 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	Tri 2
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Course coordinator: Prof Phil Lester

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.

CHEM 122	CRN 35060	CHEMISTRY OF MATTER, ENERGY AND THE ENVIRONMENT	15 PTS Tri 2
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Prerequisites: CHEM 114 or (A- or better in CHEM 113 and concurrent enrolment in CHEM 114)
Restrictions: CHEM 204

*Please check the School of Chemistry and Physical Sciences (SCPS) for further information:
<https://www.wgtn.ac.nz/courses/CHEM/122/>*

STAT 193	CRN 1791/11333 CRN 4442/6164 CRN 17069	STATISTICS IN PRACTICE	15 PTS Tri 1 Tri 2 Tri 3
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Restrictions: MATH 277, QUAN 102
Streams:
11333) 1/3: Stream A (CRN 1791) Stream B (CRN 11333)
2/3: Stream A (CRN 4442) Stream B (CRN 6164)
3/3: CRN 17069

*Please check the School of Mathematics and Statistics for further information:
<https://www.wgtn.ac.nz/courses/STAT/193/>*

200-LEVEL COURSES

BIOL 219	CRN 8828	NEW ZEALAND FLORA & FAUNA	15 PTS Tri 3
Prerequisite: 60 points		<i>Course coordinator: Prof Kevin Burns</i>	

A field course that explores the unique flora and fauna of Aotearoa, New Zealand. This course covers the basic principles of species interactions and how they can shape the ecology and evolution of native trees. The reading materials will cover how New Zealand's flora and fauna parallel that of other isolated islands. Daily field trips will reinforce the concepts learned in lectures and give hands-on experience with native plants and animals.

BIOL 222	CRN 15180	ECOLOGY AND ENVIRONMENT	20 PTS Tri 1
		<i>Course coordinators: Dr Rachael Shaw & Dr Nicola Day</i>	

Prerequisites: STAT 193 & 30 points from (BIOL 111, 113, 114, 132, ENVI/GEOG 114, ESCI/GEOG 111, ESCI 112)
Restrictions: GEOG 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.

Note: Students who enroll in field courses must be physically able and must have a good level of physical fitness. If you are unable to undertake a field course like BIOL 222 which is required for your major, please contact your Titoko advisor to support you in making alternative arrangements that will enable you to complete your major.

BIOL 227	CRN 9214	PLANTS AND ALGAE: FUNCTION AND DIVERSITY	20 PTS Tri 2
Prerequisite: BIOL 111 or BIOL 219; BIOL113		<i>Course coordinator: Prof Joe Zuccarello</i>	

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

BIOL 228	CRN 9215	ANIMAL DIVERSITY	20 PTS Tri 1
Prerequisite: BIOL 114		<i>Course coordinator: Prof Kevin Burns</i>	

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 236	CRN 10761	MICROBES AND THEIR ENVIRONMENTS	20 PTS Tri 2
Prerequisite: BIOL 111		<i>Course coordinator: A/Prof Monica Gerth</i>	

Microbes may be small, but they are mighty. They make up ~15% of the biomass on Earth and are critical drivers of ecological processes. This course will introduce the physiological and biochemical diversity of microbes. It will also explore the important roles that microbes play in different environments (soil, water, and within hosts).

BIOL 241 CRN 9055 GENETICS 20 PTS Tri 2
Prerequisite: BIOL 111 *Course coordinator: A/Prof Melanie McConnell*

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. DNA technologies and the ethics of their use.

BIOL 243 CRN 9057 PHYSIOLOGY AND PATHOLOGY 1 20 PTS Tri 2
Prerequisites: BIOL 111, 114; one of CHEM 113-121 *Course coordinator: A/Prof Davide Comoletti*
Restriction: BIOL 253

The functioning and roles of the peripheral nervous system and endocrine/neuroendocrine systems in the control of activity of the cardiovascular, respiratory, renal and reproductive systems. The emphasis is on human physiology. For these systems, mechanisms of disease (pathological processes) will be presented alongside normal and abnormal physiology.

BIOL 244 CRN 18337 INTRODUCTORY BIOCHEMISTRY 20 PTS Tri 1
Prerequisites: BIOL 111; CHEM 113 or 114 or 121 *Course coordinator: Dr Helen Woolner*
Restriction: BIOL/BMSC 239, 240, BMSC 244

An introduction to the relationship between structure and function of proteins, including catalysis and its regulation; the mechanisms and roles of metabolic processes in the interconversion of molecules in animals, plants and micro-organisms.

BIOL 252 CRN 9056 CELL AND DEVELOPMENTAL BIOLOGY 20 PTS Tri 1
Prerequisites: BIOL 111, 114 *Course coordinator: Dr Diane Ormsby*
Restriction: BMSC 252

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

BIOL 271 CRN 9216 INTRODUCTORY MARINE ECOLOGY 20 PTS Tri 2
Prerequisites: 60 points, including BIOL 114 *Course coordinator: Prof Simon Davy*

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 Tri 2
Prerequisites: BIOL 111, BTEC 101 *Course coordinator: Prof David Ackerley*

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. A key focus will be the understanding of important biotechnological processes and events at a molecular level.

CHEM 207	CRN36108	EXPERIMENTAL CHEMISTRY AND SPECTROSCOPY	20 PTS Tri 2
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Prerequisite: 15 points from CHEM 121, 122 (or 114, 115)

Restrictions: CHEM 205 or 206

Please check the School of Chemistry and Physical Sciences (SCPS) for further information:

<https://www.wgtn.ac.nz/courses/CHEM/207/>

CHEM 208	CRN36109	CHEMISTRY OF LIFE: ORGANIC, BIOMOLECULAR AND MEDICINAL CHEMISTRY	20 PTS Tri 1
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Prerequisite: 15 points from CHEM121 (or 114)

Restriction: CHEM201

Please check the School of Chemistry and Physical Sciences (SCPS) for further information:

<https://www.wgtn.ac.nz/courses/CHEM/208/>

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

Please check the School of Mathematics and Statistics for further information:

<https://www.wgtn.ac.nz/courses/STAT/292/>

300-LEVEL COURSES

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

Course coordinator: Dr Christopher Cornwall

This course introduces 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. It 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 Tri 1
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Prerequisites: BIOL/GEOG 222 and 15 200-level BIOL, ENVI or STAT points

Course coordinator: A/Prof Stephen Hartley

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 Tri 2
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Prerequisite: BIOL/GEOG 222, 15 200-level ENVI or STAT points

Course coordinator: Dr Rachael Shaw

This course will cover the behaviour and conservation ecology of animals and plants. The course will include ethology and socio-biology, 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 Tri 2
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Prerequisite: 40 200-level BIOL, BMSC, BTEC point

Course coordinator: A/Prof Peter Ritchie

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 Tri 1
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Prerequisites: BIOL/BMSC 241, 244

Course coordinator: Dr Darren Day

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 Tri 1
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Prerequisites: BIOL 271, STAT 292

Course coordinator: Dr Alice Rogers

Restrictions: BIOL 272, 373, SCIE 304 in 2018-2020

A research-based course of sampling, analysis, and independent projects, which includes several days of intensive fieldwork and laboratories. PLEASE NOTE: There are two different streams of this course running in 2025. Stream 1 (CRN 19801) will take place 10-16 February, and will be shore-based, where we work in the intertidal zone. Information on Stream 2 (CRN 33237) is listed below. See details for each stream in the course content description at <https://www.wgtn.ac.nz/courses/biol/370/2025/offering?crn=19801>

BIOL 370	CRN 33237	SUBTIDAL FIELD MARINE ECOLOGY	20 PTS Tri 1
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Prerequisites: BIOL 271, STAT 292

Course coordinator: Prof Jeff Shima

Restrictions: BIOL 272, 373, SCIE 304 in 2018-2020

A research-based course of sampling, analysis, and independent projects, which includes several days of intensive fieldwork and laboratories. PLEASE NOTE: Stream 2 (CRN 33237) will take place 17-23 February 2025 and will include boating and snorkelling components (passing a swim test is an additional entry requirement for this stream; the only opportunity to complete this swim test will be on 15 October 2024, 9 am-11:30 am in-person at Freyberg Pool, contact jeffrey.shima@vuw.ac.nz for more details of what to bring, etc). See details for each stream in the course content description at <https://www.wgtn.ac.nz/courses/biol/370/2025/offering?crn=19801>

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

Course coordinator: Prof Jeff Shima

Focusing on marine system quantitative ecology; teaching encourages students to think critically while investigating ecological processes and impacts upon population dynamics and community structure across various marine settings (e.g., soft shores, rocky and coral reefs). The course emphasises quantitative methods including design, statistical analysis and interpretation of field experiments and observational studies.

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

Course coordinator: Prof James Bell

The biology, form, and function of selected New Zealand marine invertebrate groups with special emphasis given to species of economic or cultural significance; the biological, ecological, legal, and economic background to fisheries, fisheries management and aquaculture worldwide and in New Zealand.

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

Course coordinator: Dr Joanna Mackichan

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

Course coordinator: Prof Anne La Flamme

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	PHYSIOLOGY AND PATHOLOGY II	20 PTS	Tri 1
Prerequisite: BIOL/BMSC 243		<i>Course coordinator: A/Prof Peter Pfeffer</i>		
Restriction: BIOL 335				

The course covers (1) the physiology and pathology of skeletal muscle, the gastrointestinal tract and the liver, (2) the anatomy, function and diseases of the brain, (3) energy homeostasis, (4) human embryology and (5) reproductive physiology and pathology with a focus on the male.

BMSC 339	CRN 15265	CELULAR REGULATION	20 PTS	Tri 2
Prerequisites: BMSC/BIOL 244, 252		<i>Course coordinator: Dr Lifeng Peng</i>		
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	Tri 1
Prerequisite: BMSC/BIOL 241		<i>Course coordinator: Dr Andrew Munkacsi</i>		
Restrictions: BIOL 343, BIOL/BMSC 341, 342				

In this course, we survey 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	Tri 2
Prerequisite: 35 points from (BIOL/BMSC 243, 244, CHEM 115, 201)		<i>Course coordinator: Prof Paul Teesdale-Spittle</i>		

Review of the principles of pharmacology; transport across the blood-brain barrier and placental membrane; drug bio-transformations 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	Tri 1
Prerequisite: BTEC 201		<i>Course coordinator: A/Prof Janet Pitman</i>		

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 processes involved in development of therapeutics, vaccines, and diagnostics, and to stem cell and genetic technologies. A six-week laboratory component will provide hands-on experience with key techniques and concepts introduced in both BTEC 201 and BTEC 301.

CHEM 307	CRN 36112	ADVANCED EXPERIMENTAL TECHNIQUES	20 PTS	Tri 1
Prerequisites: CHEM 207 (OR one of CHEM 205, 206)				
Restrictions: CHEM305 or CHEM 306				

Please check the School of Chemistry and Physical Sciences (SCPS) for further information:
<https://www.wgtn.ac.nz/courses/CHEM/307/>

CHEM 309	CRN 36114	CHEMICAL BIOLOGY AND MEDICINAL CHEMISTRY	20 PTS Tri 2
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Prerequisite: CHEM 208 (or 201)

Please check the School of Chemistry and Physical Sciences (SCPS) for further information:
<https://www.wgtn.ac.nz/courses/CHEM/309/>

CHEM 310	CRN 36115	REACTIVITY, MOLECULES AND MATERIALS	20 PTS Tri 1
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Prerequisite: CHEM 210 OR (CHEM 202 and CHEM 203)

Restrictions: Any of CHEM 302, 303 or CHEM 311, 312 in 2024

Please check the School of Chemistry and Physical Sciences (SCPS) for further information:
<https://www.wgtn.ac.nz/courses/CHEM/310/>

COURSES BY TRIMESTER

Trimester 1

BIOL 113	Biology of Plants
BIOL 114	Biology of Animals
BIOL 222	Ecology & Environment
BIOL 228	Animal Diversity
BIOL 244	Introductory Biochemistry
BIOL 252	Cell & Developmental Biology
BIOL325	Global Change Biology
BIOL 327	Population and Community Ecology
BIOL 340	340 Genes and Genomes
BIOL 370:19801	Field Marine Ecology: Intertidal
BIOL 370:33237	Field Marine Ecology: Subtidal
BIOL 371	Marine Ecology
BMSC 301	Medical Microbiology
BMSC 335	Physiology & Pathology II
BMSC 343	Advanced Genetics
BTEC 101	Introduction to Biotechnology
BTEC 301	Biotechnological Techniques & Processes

Trimester 2

BIOL 111	Cell & Molecular Biology
BIOL 132	Biodiversity and Conservation
BIOL 227	Plants and Algae: Function and Diversity
BIOL 236	Microbes & Environments
BIOL 241	Genetics
BIOL 243	Physiology & Pharmacology
BIOL 271	Introductory Marine Ecology
BIOL 328	Behaviour and Conservation Ecology
BIOL 329	Evolution
BIOL 372	Applied Marine Biology
BMSC 117	The Biology of Disease
BMSC 334	Cell and Immunobiology
BMSC 339	Cellular Regulation
BMSC 354	Pharmacology
BTEC 201	Molecular Biotechnology

Trimester 3

BIOL 219	New Zealand Flora & Fauna
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