

# Bachelor of Science, Majors, Minors and Transfer

## BIOLOGY

A Major and a Minor are offered

**Note:** VIU also offers a Bachelor of Arts, Minor in Biology.

### General Description

The Bachelor of Science Major and Minor in Biology emphasize a "hands-on," integrative approach to learning. Smaller class sizes allow one-on-one interaction, fostering development of the student-mentor relationship. Versatility is a key feature of the Biology program.

While the Major has a traditional core program, which all students must take, students can also select courses to suit their interests. For example, strong faculty expertise in Organismal Biology, Ecology, Molecular/Cellular Biology and Microbiology/Virology enables students to emphasize one of these directions. Students can also select electives from other departments (e.g., Fisheries, Forestry, Geography, Anthropology) to satisfy their degree requirements. An exciting and distinctive aspect of the program is that fourth year students conduct an Undergraduate Research Project with a Biology faculty member. This activity develops critical independent thinking skills, enhances the students' repertoire of laboratory and field techniques required for employment and graduate studies, and introduces students to the rewards and challenges of research in the life sciences.

The Major will be of interest to those looking towards teaching, graduate school, professional schools such as Medicine, Dentistry, Pharmacy, Veterinary Medicine and Law, or employment as scientists in the Biological and Environmental Sciences.

The Minor will be of particular interest to students proceeding towards a career in Primary and Secondary Education, with plans for teaching a science curriculum.

For additional information on the program, faculty, and undergraduate research, please visit the Biology home page at [viu.ca/biology](http://viu.ca/biology).

All B.Sc. students interested in the Biology Major or Minor must contact the Biology Degree Advisor.

### Research and Teaching Interactions

VIU Faculty and students enjoy interaction with two renowned marine facilities: the Pacific Biological Station (PBS) and the Bamfield Marine Sciences Centre. Both are among the most prominent, prestigious marine facilities on the west coast of North America and offer exciting experiences for students. Several VIU Faculty are engaged in collaborative research with scientists at PBS, located in Nanaimo. VIU Biology students are often involved in research projects, or are employed during summers for field and/or laboratory work at PBS. Several VIU Biology faculty are also involved with the Bamfield Marine Sciences Centre, situated on the rugged west coast of Vancouver Island. This remote, yet modern, field station is used by faculty members engaged in marine biological research who may either teach courses there, or use the excellent facilities for field trips to supplement courses. In addition, students may take advanced, field-oriented summer courses at the Bamfield Marine Sciences Centre. For details of course offerings, visit the Bamfield Marine Sciences Centre website at: [www.bms.bc.ca](http://www.bms.bc.ca).

# Tropical Biology Field School in Belize

Belize, in Central America, has the largest barrier reef in the western hemisphere, and about 70% of its rainforest remains intact. VIU's 6-week Tropical Biology Field School studies coral reef and rainforest ecosystems of Belize.

- Spend 2 of the 6 weeks on the Cayes to study fish, invertebrates, plankton, and water quality of coral reefs, mangrove forests, and seagrass meadows.
- Investigate the relationships among water, soil, plants and animals in three different habitats of the Sibun River watershed.
- Learn about the past and present cultures of this region.

For information, please check the Tropical Field School web page at: [web.viu.ca/belize](http://web.viu.ca/belize).

## Admission Requirements

- See general admission requirements for admission to first year.

## Notes on Admission

- Courses in first year have different prerequisites. To satisfy *all* first year course prerequisites, students must complete the following B.C. Secondary School courses: English 12, Biology 11 or 12, Chemistry 12, Math 12 (Principles of Math 12), and Physics 11 (Principles of Physics 11). A minimum grade of C+ is required, except for Math 12 which requires a minimum of "B". Physics 12 is recommended but not required. Some seats are available for students who have only completed Chemistry 11 with a min. C+.
- Students who do not satisfy all of the first year course prerequisites will not likely be able to complete the full degree program in four years. Students who are lacking any or all of the first year course prerequisites should speak with a VIU Advisor about upgrading courses.
- Students with a two-year diploma in a field related to the Biological Sciences may receive advanced standing, depending upon their program.
- Students are encouraged to become computer literate in word processing, spreadsheets and databases by second year.
- Transcripts from other institutions for courses used towards the B.Sc., Major in Biology degree must be received by VIU's Records office by August 15 for the Fall semester, and November 30 for the Spring semester.

## Special Fees

Books will cost about \$100 per year for each course and additional, nominal expenses for field trips are associated with some upper-level courses.

*All fees are subject to change without prior notice.*

## Requirements for a Major

See Institutional B.Sc. Degree Requirements. The 126 credits required for graduation are as follows:

Program Component	Credits
Core courses	78
Upper-level Biology electives (including specialization courses)	15
Non-science electives	6
Upper-level electives	12
General electives	15

**Note:** Most core, specialization, and elective courses have prerequisites. Students should check prerequisites carefully, and consult the Biology Degree Advisor when planning their program.

## Core Courses

The Core component of the degree, combined with appropriate electives, gives students sufficient knowledge and experience in their field to facilitate entry into graduate or professional schools, or into employment in their field.

Note: Students are strongly encouraged to complete **all** Year 1 and Year 2 core requirements in the order listed to minimize potential scheduling conflicts later in their degree.

YEAR 1 - Effective September 2009	Credits
BIOL 121 (Introductory Zoology)	4
BIOL 123 (Introduction to Cellular and Molecular Biology)	4
CHEM 111/112 or 121/122 or 111/122 (Chemistry Fundamentals)	8
MATH 121/122 (Calculus)	6
PHYS 111/112 (Physics for the Life Sciences)	8
Degree English Requirements	6

**Note:** At the end of first year or after completing a minimum of 24 credits, students need to declare their educational goals in consultation with the B.Sc. Advisor.

YEAR 2	Credits
BIOL 200 (Principles of Cell Biology)	3
BIOL 201 (Principles of Biochemistry)	3
BIOL 202 (Ecology)	3
BIOL 210 (Microbiology I)	3
BIOL 212 (Genetics)	3
CHEM 231/232 (Organic Chemistry)	6
MATH 203 (Biometrics)	3
MATH 211 (Statistics I)	3

**Note:** Students planning to transfer to Microbiology programs at UBC or UVic should also consider taking BIOL 211 (Microbiology II).

<b>YEARS 3 &amp; 4</b>	<b>Credits</b>
BIOL 305 (Animal Physiology)	3
BIOL 402 (Evolution)	3
BIOL 403 (Current Topics in Biology)	3
BIOL 491 (Undergraduate Research Project)	6

## Specialization

In addition to the above core courses, students must complete at least one of the following pairs of courses, each representing a particular biological specialization.

<b>Microbial Biology</b>	<b>Credits</b>
BIOL 336 (Bacterial Genetics) or BIOL 337 (Biochemistry and Physiology of Microbes)	3
BIOL 332 (Microbial Ecology)	3

<b>Molecular and Cellular Biology</b>	<b>Credits</b>
BIOL 341 (Molecular Cell Biology)	3
BIOL 342 (Advanced Biochemistry)	3

<b>Aquatic and Terrestrial Ecology</b>	<b>Credits</b>
BIOL 320 (Aquatic Ecosystem Fundamentals)	3
BIOL 322 (Terrestrial Ecosystems)	3

**Note:** In addition to the core and specialization courses listed above, students must complete a minimum of 9 additional credits of Biology courses numbered 300 or above.

## Undergraduate Research Project

In fourth year, students are required to complete an Undergraduate Research Project--BIOL 491. For this course, students will have a Research Advisor chosen from the faculty (in some cases faculty may be from another institution) and will carry out their research under the direction of this Advisor. Usually, the research will be carried out in the field of interest of the Advisor.

Students planning to take BIOL 491 in the Fall semester must have a Research Advisor identified by the previous spring. Details of the special registration process required for BIOL 491 may be obtained from the Biology department Chair or Biology Degree Advisor.

Further information on previous research projects performed by VIU Biology graduates is available at [viu.ca/biology](http://viu.ca/biology).

## Requirements for a Minor

Students must fulfill all Institutional B.Sc. Degree Requirements, including Degree English Requirements and courses listed below:

**Year 1:** Minimum "C-" in BIOL 121, BIOL 123; CHEM 111/112 or 121/122 or 111/122; and MATH

211.

**Year 2:** Minimum "C-" in BIOL 201, CHEM 231, and *two* courses selected from: BIOL 200, 202, 210, 212 or 223.

**Note:** Students should check upper-level course prerequisites to guide second year course choices.

**Years 3 and 4:** Minimum of 18 credits of Biology courses numbered 300 and above.

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