

Biology: Bachelor of Science Major

Faculty of Science and Horticulture	kpu.ca/science
Implementation Date	01-Sep-2013
Start Date(s)	September January May
Admission Type	Selective entry
Enrolment Type	Open enrolment
Program Type	Undergraduate
Credential Granted	Baccalaureate Degree
Offered At	Surrey
Format	Full-time Part-time
How to Apply	www.kpu.ca/admission

DESCRIPTION

Biology is a branch of science which is fundamental to human existence. It is the study of life at various levels ranging from atoms and molecules, to cells, organisms, ecosystems and ultimately, the biosphere. The core theme linking all fields of biological study is evolution; a theme which is also reflected in our primal quest to discover where we came from and to understand our place in the world.

To study biology is to embark upon a lifelong process of learning about the diversity of living organisms and how they interact with each other, their environment, and with humans. All life forms are inextricably connected to each other and no other field of science has greater relevance or impact upon our lives and how we relate to our environment. This has come about from an understanding of organisms and biological processes which have led to advancements in fields as diverse as health and medicine, psychology, agricultural food production, forensics, genetic engineering and biotechnology and sustainable natural resource management.

The B.Sc. Major in Biology is a foundational degree program strongly grounded in scientific methodology and practical skills. The structure and breadth of courses offered is designed to equip graduates with a high level of competency in the knowledge, skills and experience necessary for competitive entry into the workforce in a wide range of fields. Graduates will also be well prepared for entry into a professional school or graduate studies program.

Central to this program is the provision of a lab intensive experience where students learn first-hand, the appropriate use of equipment and techniques to investigate living organisms and how they function. Upper level courses build upon the core knowledge and skills developed in 1st and 2nd Year, allowing the exploration of more advanced biological concepts and practical techniques. This culminates in a community focused research or directed studies project which requires students to apply the knowledge and skills they have learned.

Please note that the first and second year courses required in the program are normally available on both Richmond and Surrey campuses.

STUDENT PROFILE

This degree program will appeal to individuals with a passionate interest in living organisms and how they function. Whether entering from high school, other post-secondary institutions or returning from the workforce to study, this program will appeal to anyone who shares a concern for the future of humanity and the welfare of our planet and who is seeking a career that can make a difference.

Students who are successful in this program are likely to be self-motivated, have a strong work ethic and have well developed oral and written communication skills.

CAREER OPPORTUNITIES

Students graduating from this program will be well equipped for employment in government agencies as well as the private sector and may include career opportunities at entry level in the following fields:

- Agriculture
- Animal Science (Dairy/farming industry)
- Biotechnology
- Botany
- Environmental Consultant
- Fisheries Biologist
- Food Science and Technology
- Forensics
- Informatics
- Lab Assistant or Technician in a medical or scientific laboratory
- Marine Biology
- Microbiology
- Molecular Biology
- Natural Resource Conservation and Management
- Naturalist - Park Rangers
- Pharmaceutical sales
- Science Advisor - Government Policy
- Teaching at elementary or secondary level (Requires teacher certification)
- Toxicology - Medical or Environmental
- Zoo and Aquaria - Animal Care

PROGRAM ADMISSION REQUIREMENTS

In addition to KPU's General university admission requirements, including the undergraduate-level English Proficiency Requirement, the following program admission requirements apply:

- Minimum grade of 'B' in English 12 (or equivalent)
- Minimum grade of 'C+' in Chemistry 12 (or equivalent)
- Minimum grade of 'C+' in Pre-Calculus 12 (or equivalent)
- A passing grade in Physics 12 or PHYS 1100 (or equivalents)

Biology 11 and 12 are strongly recommended, but not required.

PROGRAM REQUIREMENTS

Please note, only Year 1 and Year 2 courses will be offered in the 2014-15 Academic Year.

General Requirements

All students must complete the following general requirements for a Bachelor of Science:

- A minimum of 120 credits and a minimum of 40 courses (at least 3 credits each) at the post-secondary level (numbered 1100 or higher).
- At least 45 of the credits (15 courses) must be at the 3000- or 4000-level; at least 9 of these credits must be at the 4000-level.
- A minimum of 18 credits of breadth electives (see Electives) including:
 - at least one 3000- or 4000-level course; and
 - at least 12 credits from fields or courses not regarded as science; and
 - a maximum of 6 credits may come from fields of science not already included in the Biology Major requirements.
- Completion of 6 credits of 4000-level Research or 6 credits of 4000-level Directed Studies in Year 4.
- A minimum of a passing grade (D or better) in all courses counting towards the BSc, with a cumulative GPA of 2.0.

To meet residency requirements, at least 50% of all courses for the BSc, and at least 66% of upper level courses for the BSc, must be completed at KPU.

Biology Major

The following outlines the specific course requirements for the Biology Major. The semester indicates the term in which students should plan to take their courses.

The Biology Major requires the completion of a minimum of 138 credits.

YEAR 1

Fall Semester

All of:

BIOL 1110	Introductory Biology I	4 credits
CHEM 1110	The Structure of Matter	4 credits
ENGL 1100	Introduction to University Writing	3 credits
MATH 1130*	Calculus for Life Sciences I	3 credits
PHYS 1101	Physics for Life Sciences I	4 credits

Spring Semester

All of:

BIOL 1210	Introductory Biology II	4 credits
CHEM 1210	Chemical Energetics and Dynamics	4 credits
MATH 1230	Calculus for Life Sciences II	3 credits
PHYS 1102	Physics for Life Sciences II	4 credits
English Elective	(any ENGL course numbered 1101 or higher)	3 credits

* MATH 1120 may be used as a substitute for MATH 1130

YEAR 2

Fall Semester

All of:

BIOL 2321	Cell Biology	4 credits
BIOL 2322	Ecology	4 credits
CHEM 2320	Organic Chemistry I	4 credits
MATH 2335	Statistics for Life Sciences	3 credits
Elective	(see Electives below)	3 credits

Spring Semester

All of:

BIOL 2320	Genetics	4 credits
BIOL 2421	Cellular Biochemistry	3 credits
CHEM 2420	Organic Chemistry II	4 credits
Elective	(see Electives below)	3 credits
Elective	(see Electives below)	3 credits

YEAR 3

Fall Semester

All of:

BIOL 3110	Animal Behaviour (under development)	4 credits
BIOL 3165	Conservation Biology (under development)	3 credits
BIOL 3180	Research Methodology (under development)	3 credits
BIOL 3321	Advanced Cell and Molecular Biology (under development)	4 credits
Elective	(see Electives below)	3 credits

Spring Semester

All of:

BIOL 3215	Zoology (under development)	4 credits
BIOL 3225	Botany (under development)	4 credits
BIOL 3320	Molecular Genetics (under development)	4 credits
Biology Elective	(any BIOL course numbered 1100 or higher)	3 or more credits
Elective	(see Electives below)	3 credits

YEAR 4

Fall Semester

All of:

BIOL 4140	Animal Physiology (under development)	4 credits
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BIOL 4150	Evolutionary Biology (under development)	3 credits
Elective	(see Electives below)	3 credits
Elective	(see Electives below)	3 credits

And one of:

BIOL 4190	Directed Studies I (under development)	3 credits
BIOL 4199	Research Project I (under development)	3 credits

Spring Semester

All of:

BIOL 4235	Marine Biology (under development)	3 credits
BIOL 4245	Developmental Biology (under development)	4 credits
Elective	(see Electives below)	3 credits
Elective	(see Electives below)	3 credits

And one of:

BIOL 4290	Directed Studies II (under development)	3 credits
BIOL 4299	Research Project II (under development)	3 credits

Electives

Students are required to complete 11 elective courses (33 or more credits) through their program including:

- At least one ENGL course numbered 1101 or higher; and
- At least one BIOL course numbered 1100 or higher; and
- At least one breadth course (see below) numbered 3000 or higher.

Courses with considerable content overlap may only be counted once towards degree completion. These include:

- BIOL 1112 or BIOL 1210
- ENVI 1106 or CHEM 1110
- ENVI 1206 or CHEM 1154 or CHEM 1210
- CHEM 2311 or CHEM 3310
- MATH 1120 or MATH 1130 or MATH 1140
- MATH 1220 or MATH 1230
- MATH 2335 or MATH 2341
- PHYS 1101 or PHYS 1120
- PHYS 1102 or PHYS 1220

BREADTH ELECTIVES

At least 12 credits must come from fields or courses not regarded as science courses. EDUC 4100 may be used as a breadth requirement.

Up to 6 credits of breadth may come from fields of science not prescribed in the specific requirements for the BSc Major in Biology. These may include:

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|-------------|-------------|
| ■ ASTR 1100 | ■ ASTR 3111 |
| ■ ASTR 1105 | ■ ENVI 3112 |
| ■ ASTR 3110 | ■ ENVI 2405 |

RECOMMENDED SCIENCE ELECTIVES

The following electives are recommended for students completing the Biology Major program.

- BIOL 2330
- CHEM 2315
- CHEM 3310
- CPSC 1100
- ENVI 2305
- PHYS 3202

CREDENTIAL AWARDED

Upon successful completion of this program, students are eligible to receive a **Bachelor of Science, Major in Biology**.