HONOURS BSC IN BIOLOGY (RESEARCH FOCUS) - PHYSIOLOGY OPTION

Recent discoveries and new technologies are revolutionizing the biological sciences, placing increasing emphasis on integrating knowledge across all levels of organization, from molecules to ecosystems. Our programs give students both the intellectual tools and the hands-on experience they need to pursue careers in fields as diverse as conservation and endangered species; land-use management; ecotoxicology; academic, industry or government research; or health care. Learning takes place through traditional classroom instruction, innovative laboratory projects with state-of-the-art technologies, field-based courses around the world, and a strong research program in which undergraduate students of all years are intensively mentored in a research lab.

The honours in biology allows for in-depth study in one or more biological disciplines. Students can concentrate on a particular area by choosing one of three options: Cellular and Molecular Biology, Physiology, or Ecology, Evolution and Behaviour. This route includes a compulsory independent research project to equip students with advanced research, analysis and communication skills applicable to diverse careers. Students thinking of a career in research should consider the Research Focus, an immersive research experience in the third and fourth years. Alternatively, they can pursue diverse interests by selecting a general course of study that includes a number of advanced courses, and they can gain work experience while studying through the Co-Operative Education Programs.

The major in biology introduces students to cell biology, genetics, evolution, ecology and physiology (both plant and animal). It is combined with either another major or a minor. The major allows students to pursue diverse interests while opening the door to graduate studies or a career in the life sciences.

The minor in biology is a flexible program that allows students to select a subset of biology courses.

This program is offered in English and in French.

Program Requirements
The extended French stream is available with this program.

Compulsory Courses at the 1000 level
BIO 1130 Introduction to Organismal Biology 3 Units
BIO 1140 Introduction to Cell Biology 3 Units
CHM 1311 Principles of Chemistry 3 Units
CHM 1321 Organic Chemistry I 3 Units
GEO 1111 Introduction to Earth Systems 3 Units
MAT 1330 Calculus for the Life Sciences I 3 Units
MAT 1332 Calculus for the Life Sciences II 3 Units
PHY 1321 Principles of Physics I 3 Units

Compulsory Courses at the 2000 level
BCH 2333 Introduction to Biochemistry 3 Units
BIO 2129 Ecology 3 Units
BIO 2133 Genetics 3 Units

Compulsory Courses at the 3000 level
BIO 3009 Research Practicum 6 Units

Compulsory Courses at the 4000 level
BIO 4158 Applied Biostatistics 3 Units
BIO 4920 Seminar I Evaluating Science 1.5 Units
BIO 4921 Seminar II Developing and Communicating Science 1.5 Units

Physiology Option - Block A
BIO 4009 Honours Research 9 Units

Physiology Option - Block B
One option from the following: 18 Units

Option 1: Animal Physiology
BIO 3137 Experiments in Animal Physiology 3 Units

Option 2: Plant Physiology
BIO 3140 Plant Physiology and Biochemistry 3 Units
BIO 3146 Ecophysiology of Plants 3 Units
BIO 4140 Plant Developmental Biology 3 Units

and 12 optional course units in biology (BIO), biopharmaceutical science (BPS) or environmental science (EVS), ITI 1120, BCH 3120, BCH 3125, BCH 3356, BCH 4122, BCH 4125, BCH 4188 with at least 3 of the 9 optional course units at the 3000 or 4000 level

Option 2: Plant Physiology

and 12 optional course units in biology (BIO), biopharmaceutical science (BPS) or environmental science (EVS), ITI 1120, BCH 3120, BCH 3125, BCH 3356, BCH 4122, BCH 4125, BCH 4188 with at least 3 of the 12 optional course units at the 3000 or 4000 level

Physiology Option - Block C
3 course units from: 3 Units
BIO 3147 Developmental Biology
BIO 3152 Cell Biology Laboratory
BIO 3153 Cell Biology
BIO 3170 Molecular Biology

Physiology Option - Block D
6 course units from: 6 Units
BCH 3120 General Intermediary Metabolism
BIO 3140 Plant Physiology and Biochemistry
BIO 3146 Ecophysiology of Plants
BIO 3302 Animal Physiology II
BIO 3303 Animal Physiology I
BIO 3305 Cellular Physiology

and 9 optional course units in biology (BIO), biopharmaceutical science (BPS) or environmental science (EVS), ITI 1120, BCH 3120, BCH 3125, BCH 3356, BCH 4122, BCH 4125, BCH 4188 with at least 3 of the 9 optional course units at the 3000 or 4000 level

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BIO 4119</td>
<td>Topics in Respiratory Physiology</td>
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<tr>
<td>BIO 4120</td>
<td>Animal Adaptations</td>
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<tr>
<td>BIO 4127</td>
<td>Comparative Endocrinology</td>
</tr>
<tr>
<td>BIO 4140</td>
<td>Plant Developmental Biology</td>
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<tr>
<td>BIO 4144</td>
<td>Plant Biochemistry and Molecular Biology</td>
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<tr>
<td>BIO 4152</td>
<td>Animal Energetics</td>
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<td>BIO 4175</td>
<td>Membrane Physiology</td>
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<td>BIO 4302</td>
<td>Comparative Biomechanics</td>
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<td>BIO 4351</td>
<td>Neural Basis of Animal Behaviour</td>
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<tr>
<td>BIO 4551</td>
<td>Physiologie évolutive et écophysiologie</td>
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<tr>
<td>BPS 3102</td>
<td>Principles of Toxicology and Pharmacology</td>
</tr>
<tr>
<td>BPS 4123</td>
<td>Phytomedicines and Natural Product Drugs</td>
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**Optional Courses**

- 3 optional course units in English (ENG) at the 1000 or 2000 level: 3 Units
- 9 elective course units offered by the Faculty of Arts, the Faculty of Education, the Faculty of Law, the Faculty of Social Sciences or the Telfer School of Management: 9 Units

**Elective Courses**

- 15 elective course units: 15 Units

Total: 120 Units