HONOURS BSC IN BIOLOGY - CELLULAR/MOLECULAR 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

Co-operative education is available with this program.

The extended French stream is available with this program.

Requirements for this program have been modified. Please consult the 2017-2018 calendars (http://catalogue.uottawa.ca/en/archives) for the previous requirements.

3 optional course units in English (ENG) at the 1000 or 2000 level 3 Units
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
BCH 2333 Introduction to Biochemistry 3 Units
BIO 2129 Ecology 3 Units
BIO 2133 Genetics 3 Units
BIO 2135 Animal Form and Function 3 Units
BIO 2137 Introduction to Plant Science: Biodiversity to Biotechnology 3 Units
CHM 2120 Organic Chemistry II 3 Units
MAT 2379 Introduction to Biostatistics 3 Units
BIO 4920 Seminar I Evaluating Science 1.5 Units
BIO 4921 Seminar II Developing and Communicating Science 1.5 Units

Cellular/Molecular Option - Block A
BIO 3153 Cell Biology 3 Units
BIO 3170 Molecular Biology 3 Units
BIO 4009 Honours Research 9 Units

Cellular/Molecular Option - Block B
3 course units from: 3 Units
BIO 3151 Molecular Biology Laboratory
BIO 3152 Cell Biology Laboratory

Cellular/Molecular Option - Block C
6 course units from: 6 Units
BCH 3120 General Intermediary Metabolism
BIO 3102 Molecular Evolution
BIO 3119 Population Genetics
BIO 3124 General Microbiology
BIO 3126 General Microbiology Laboratory
BIO 3147 Developmental Biology
BIO 3360 Computational Tools for Biological Sciences
BCH 4172 Topics in Biototechnology
BIO 4115 Topics in Molecular Genetics
BIO 4140 Plant Developmental Biology
BIO 4144 Plant Biochemistry and Molecular Biology
BIO 4145 Eukaryotic Microbiology
BIO 4158 Applied Biostatistics
BIO 4175 Membrane Physiology
BIO 4537 Génétique évolutive humaine
BPS 3101 Genomics
BPS 4104 Bioinformatics Laboratory

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 9 Units

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

24 elective course units 24 Units

Total: 120 Units

Note(s)

1. Within your program of study, you must complete a minimum of 15 course units at the 3000 or 4000 level with a laboratory component. A complete list of courses having a laboratory component can be found below. Please note: if a course listed below has already been used to fulfill a compulsory or optional requirement in your program listed above, these course units count towards this total of 15 units.

This message is intended for students registered in the Faculty of Science. If the components of your program of study require common compulsory courses, you will have to replace the units as follows:

1. 1000-level courses must be replaced with elective course units;
2. 2000-level courses and above must be replaced with optional course units from either discipline at the same level or above.

Please note that all programs in the Faculty of Science require a minimum of 12 elective course units from the Faculty of Arts, the Faculty of Education, the Faculty of Law, the Faculty of Social Sciences or the Telfer School of Management. Once you have decided on the replacement courses, please inform the Office of Undergraduate Programs of the Faculty of Science by email at infosci@uOttawa.ca so that we may amend your Academic Advisement accordingly.

**List of Optional Courses**

**List of Optional Courses with a Laboratory Component**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>BIM 4316</td>
<td>Modern Bioanalytical Chemistry</td>
<td>3 Units</td>
</tr>
<tr>
<td>BIO 3103</td>
<td>Field Biology</td>
<td>3 Units</td>
</tr>
<tr>
<td>BIO 3126</td>
<td>General Microbiology Laboratory</td>
<td>3 Units</td>
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<tr>
<td>BIO 3137</td>
<td>Experiments in Animal Physiology</td>
<td>3 Units</td>
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<tr>
<td>BIO 3146</td>
<td>Ecophysiology of Plants</td>
<td>3 Units</td>
</tr>
<tr>
<td>BIO 3151</td>
<td>Molecular Biology Laboratory</td>
<td>3 Units</td>
</tr>
<tr>
<td>BIO 3152</td>
<td>Cell Biology Laboratory</td>
<td>3 Units</td>
</tr>
<tr>
<td>BIO 3154</td>
<td>Population and Community Ecology</td>
<td>3 Units</td>
</tr>
<tr>
<td>BIO 3158</td>
<td>Vertebrate Zoology</td>
<td>3 Units</td>
</tr>
<tr>
<td>BIO 3310</td>
<td>Plant Systematics and Diversity</td>
<td>3 Units</td>
</tr>
<tr>
<td>BIO 3333</td>
<td>Entomology</td>
<td>3 Units</td>
</tr>
<tr>
<td>BIO 3334</td>
<td>Invertebrate Zoology</td>
<td>3 Units</td>
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<tr>
<td>BIO 3360</td>
<td>Computational Tools for Biological Sciences</td>
<td>3 Units</td>
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<tr>
<td>BIO 3924</td>
<td>Biology of Algae and Fungi</td>
<td>3 Units</td>
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<td>BIO 4004</td>
<td>Honours Research</td>
<td>3 Units</td>
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<tr>
<td>BIO 4009</td>
<td>Honours Research</td>
<td>9 Units</td>
</tr>
<tr>
<td>BIO 4122</td>
<td>Experiments in Animal Behaviour</td>
<td>3 Units</td>
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<tr>
<td>BIO 4148</td>
<td>Phylogenetic Systematics</td>
<td>3 Units</td>
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<tr>
<td>BIO 4150</td>
<td>Spatial Ecology</td>
<td>3 Units</td>
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<tr>
<td>BIO 4156</td>
<td>Freshwater Ecology</td>
<td>3 Units</td>
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<tr>
<td>BIO 4158</td>
<td>Applied Biostatistics</td>
<td>3 Units</td>
</tr>
<tr>
<td>BIO 4910</td>
<td>Field Course in Ecology</td>
<td>3 Units</td>
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<tr>
<td>BPS 4104</td>
<td>Bioinformatics Laboratory</td>
<td>3 Units</td>
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<tr>
<td>BPS 4127</td>
<td>Advanced Techniques in Biosciences</td>
<td>3 Units</td>
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