HONOURS BSC IN BIOMEDICAL SCIENCE - NEUROSCIENCE OPTION

Biomedical Science is an interdisciplinary program that focuses on the fundamentals of human structure and function, as well as those of other animals. The first two years provide a background in human anatomy and psychology, in addition to more in-depth knowledge in basic sciences like biology, chemistry, biochemistry, and mathematics. At the end of second year, in addition to courses in biology and biochemistry, students may choose from an array of optional courses and obtain a minor in one of many programs offered, or they can choose an option within the biomedical sciences (Neuroscience, Cellular and Molecular Medicine, Bioanalytical Science, Medicinal Chemistry or Biostatistics). On graduation, they will be ready for more advanced research training or for admission to a professional program in human health.

Students in the Biomedical Sciences program are also eligible to participate in the Co-operative Education Programs.

Admission to this program is competitive and higher averages are required.

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 [here](http://catalogue.uottawa.ca/en/archives) for the previous requirements.

### Compulsory courses at the 1000 level

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANP 1105</td>
<td>Human Anatomy and Physiology I</td>
<td>3</td>
</tr>
<tr>
<td>ANP 1106</td>
<td>Human Anatomy and Physiology II</td>
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</tr>
<tr>
<td>BIO 1130</td>
<td>Introduction to Organismal Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 1140</td>
<td>Introduction to Cell Biology</td>
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<tr>
<td>CHM 1311</td>
<td>Principles of Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHM 1321</td>
<td>Organic Chemistry I</td>
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<tr>
<td>MAT 1330</td>
<td>Calculus for the Life Sciences I</td>
<td>3</td>
</tr>
<tr>
<td>MAT 1332</td>
<td>Calculus for the Life Sciences II</td>
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<tr>
<td>PHY 1322</td>
<td>Principles of Physics II</td>
<td>3</td>
</tr>
<tr>
<td>PSY 1101</td>
<td>Introduction to Psychology: Foundations</td>
<td>3</td>
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### Compulsory courses at the 2000 level

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>BCH 2333</td>
<td>Introduction to Biochemistry</td>
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</tr>
<tr>
<td>BIO 2133</td>
<td>Genetics</td>
<td>3</td>
</tr>
<tr>
<td>CHM 2120</td>
<td>Organic Chemistry II</td>
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</tr>
<tr>
<td>MAT 2379</td>
<td>Introduction to Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>PHI 2396</td>
<td>Biostats</td>
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### Compulsory courses at the 3000 level

<table>
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<tr>
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<th>Course</th>
<th>Units</th>
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<tbody>
<tr>
<td>BCH 3120</td>
<td>General Intermediary Metabolism</td>
<td>3</td>
</tr>
<tr>
<td>BIO 3124</td>
<td>General Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 3153</td>
<td>Cell Biology</td>
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</tr>
<tr>
<td>BIO 3170</td>
<td>Molecular Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 3303</td>
<td>Animal Physiology I</td>
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</tr>
<tr>
<td>BIO 3305</td>
<td>Cellular Physiology</td>
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</tr>
<tr>
<td>BIO 3350</td>
<td>Principles of Neurobiology</td>
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### Compulsory courses at the 4000 level

<table>
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<tr>
<th>Code</th>
<th>Course</th>
<th>Units</th>
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<tbody>
<tr>
<td>BIO 4175</td>
<td>Membrane Physiology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 4351</td>
<td>Neural Basis of Animal Behaviour</td>
<td>3</td>
</tr>
<tr>
<td>BIM 4920</td>
<td>Seminar I Evaluating Science</td>
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</tr>
<tr>
<td>BIM 4921</td>
<td>Seminar II Developing and Communicating Science</td>
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<tr>
<td>PHA 4107</td>
<td>Introductory Pharmacology - Drugs and Living Systems</td>
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### Optional courses

3 optional course units from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Units</th>
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<tbody>
<tr>
<td>PSY 1102</td>
<td>Introduction to Psychology: Applications</td>
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</tr>
<tr>
<td>PSY 2114</td>
<td>Lifespan Psychology</td>
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</table>

3 optional course units in English (ENG) at the 1000 or 2000 level, excluding ENG 1112 and ENG 1131

3 optional course units from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>BCH 3356</td>
<td>Molecular Biology Laboratory</td>
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</tr>
<tr>
<td>BIO 3151</td>
<td>Molecular Biology Laboratory</td>
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</table>

3 optional course units from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>PSY 3128</td>
<td>The Psychology of Ageing</td>
<td></td>
</tr>
<tr>
<td>PSY 3171</td>
<td>Psychopathology</td>
<td></td>
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</table>

One option from the following: 9 Units

#### Option 1: Honours Project

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>BIM 4009</td>
<td>Research Project - Biomedical Science</td>
<td></td>
</tr>
</tbody>
</table>

#### Option 2: Honours Project Substitution

3 optional course units from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 3360</td>
<td>Computational Tools for Biological Sciences</td>
<td></td>
</tr>
<tr>
<td>BIM 4316</td>
<td>Modern Bioanalytical Chemistry</td>
<td></td>
</tr>
<tr>
<td>BPS 4127</td>
<td>Advanced Techniques in Biosciences</td>
<td></td>
</tr>
</tbody>
</table>

and 6 optional course units at the 3000 or 4000 level from the list of optional courses

3 optional course units from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIM 4009</td>
<td>Research Project - Biomedical Science</td>
<td></td>
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</tbody>
</table>

3 optional course units at the 3000 or 4000 level offered by the Faculty of Science

15 elective course units 15 Units

Total: 120 Units

### List of Optional Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Units</th>
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<tbody>
<tr>
<td>ANP 1107</td>
<td>Human Anatomy and Physiology III</td>
<td>3</td>
</tr>
<tr>
<td>BCH 3125</td>
<td>Protein Structure and Function</td>
<td>3</td>
</tr>
<tr>
<td>BIO 4101</td>
<td>Human Genome Structure and Function¹</td>
<td>3</td>
</tr>
<tr>
<td>BIO 4122</td>
<td>Structural Biology of Proteins</td>
<td>3</td>
</tr>
<tr>
<td>BIO 4125</td>
<td>Cellular Regulation and Control</td>
<td>3</td>
</tr>
<tr>
<td>BCH 4188</td>
<td>Nucleic Acids - Structure and Functions</td>
<td>3</td>
</tr>
<tr>
<td>BIM 4103</td>
<td>Selected Topics in Biomedical Science</td>
<td>3</td>
</tr>
<tr>
<td>BIM 4316</td>
<td>Modern Bioanalytical Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>BIO 2135</td>
<td>Animal Form and Function</td>
<td>3</td>
</tr>
<tr>
<td>BIO 3137</td>
<td>Experiments in Animal Physiology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 3147</td>
<td>Developmental Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIO 3152</td>
<td>Cell Biology Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>BIO 3360</td>
<td>Computational Tools for Biological Sciences</td>
<td>3</td>
</tr>
</tbody>
</table>

¹ Includes BIOL 1004

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 4158</td>
<td>Applied Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>BPS 3101</td>
<td>Genomics</td>
<td>3</td>
</tr>
<tr>
<td>BPS 4101</td>
<td>Human Genome Structure and Function ¹</td>
<td>3</td>
</tr>
<tr>
<td>BPS 4103</td>
<td>Selected Topics in Biopharmaceutical Science</td>
<td>3</td>
</tr>
<tr>
<td>BPS 4105</td>
<td>Human Toxicology and Environmental Health</td>
<td>3</td>
</tr>
<tr>
<td>BPS 4127</td>
<td>Advanced Techniques in Biosciences</td>
<td>3</td>
</tr>
<tr>
<td>BPS 4131</td>
<td>Advanced Biopharmaceutical Science</td>
<td>3</td>
</tr>
<tr>
<td>PHS 3341</td>
<td>Physiology of Sensation, Regulation, Movement and Reproduction</td>
<td>3</td>
</tr>
<tr>
<td>PHS 3342</td>
<td>Physiological Regulation of Intake, Distribution, Protection and Elimination</td>
<td>3</td>
</tr>
</tbody>
</table>

Note(s):

¹ The courses BPS 4101 (http://catalogue.uottawa.ca/search/?P=BPS%204101), BCH 4101 (http://catalogue.uottawa.ca/search/?P=BCH%204101) cannot be combined for credits.