# BIOCHEMISTRY – MAJOR (SCIENCE) – BACHELOR OF SCIENCE (HONOURS)

**BCHM-M-BSH**

**Subject:** Administered by the Department of Biomedical and Molecular Sciences.

**Plan:** Consists of 72.00 units as described below.

**Program:** The Plan, alone, or in combination with a Minor in another subject, and with sufficient electives to total 120.00 units, will lead to a Bachelor of Science (Honours) Degree.

**Note:** Requirements for this program have been modified. Please consult the 2022-2023 (https://www.queensu.ca/academic-calendar/archive/2022-2023/arts-science/) Calendar for the previous requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Complete the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 112</td>
<td>General Chemistry</td>
<td>6.00</td>
</tr>
<tr>
<td>B. Complete the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 102</td>
<td>Fundamentals of Biology: Molecular and Cell Biology</td>
<td>3.00</td>
</tr>
<tr>
<td>BIOL 103</td>
<td>Fundamentals of Biology: Organisms to Ecosystems</td>
<td>3.00</td>
</tr>
<tr>
<td>C. Complete 3.00 units from the following:</td>
<td>3.00</td>
<td></td>
</tr>
<tr>
<td>BCHM 102</td>
<td>Introduction to Biochemistry</td>
<td></td>
</tr>
<tr>
<td>PATH 120</td>
<td>Understanding Human Disease in the 21st Century</td>
<td></td>
</tr>
<tr>
<td>D. Complete the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CISC 151</td>
<td>Elements of Computing with Data Analytics</td>
<td>3.00</td>
</tr>
<tr>
<td>E. Complete the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCHM 218</td>
<td>Molecular Biology</td>
<td>3.00</td>
</tr>
<tr>
<td>F. Complete 3.00 units from the following:</td>
<td>3.00</td>
<td></td>
</tr>
<tr>
<td>BIOL 243</td>
<td>Introduction to Statistics</td>
<td></td>
</tr>
<tr>
<td>STAM 200</td>
<td>Introduction to Statistics</td>
<td></td>
</tr>
<tr>
<td>G. Complete the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 211</td>
<td>Main Group Chemistry</td>
<td>3.00</td>
</tr>
<tr>
<td>CHEM 212</td>
<td>Principles of Chemical Reactivity</td>
<td>3.00</td>
</tr>
<tr>
<td>CHEM 222</td>
<td>Methods of Structure Determination</td>
<td>3.00</td>
</tr>
<tr>
<td>CHEM 223</td>
<td>Organic Reactions</td>
<td>3.00</td>
</tr>
<tr>
<td>H. Complete the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCHM 313</td>
<td>Molecular Biochemistry</td>
<td>3.00</td>
</tr>
<tr>
<td>BCHM 315</td>
<td>Proteins and Enzymes</td>
<td>3.00</td>
</tr>
<tr>
<td>BCHM 316</td>
<td>Metabolism</td>
<td>3.00</td>
</tr>
<tr>
<td>BCHM 317</td>
<td>Introductory Biochemistry Laboratory</td>
<td>6.00</td>
</tr>
<tr>
<td>I. Complete the following:</td>
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<td></td>
</tr>
<tr>
<td>BCHM 441</td>
<td>Current Topics in Biochemistry</td>
<td>3.00</td>
</tr>
<tr>
<td>J. Complete 6.00 units from the following:</td>
<td>6.00</td>
<td></td>
</tr>
<tr>
<td>BCHM 410</td>
<td>Protein Structure and Function</td>
<td></td>
</tr>
<tr>
<td>BCHM 411</td>
<td>Advanced Molecular Biology</td>
<td></td>
</tr>
<tr>
<td>BCHM 432</td>
<td>The Molecular Basis of Cellular Function</td>
<td></td>
</tr>
</tbody>
</table>

## 2. Option

**A. Complete 6.00 units from the following course list: 6.00**

- BCHM List A

## 3. Supporting

**A. Complete the following:**

- MATH 130 | Mathematics for Biochemistry and Life Sciences | 3.00

**Electives**

<table>
<thead>
<tr>
<th>Elective Courses</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electives Courses</td>
<td>48.00</td>
</tr>
</tbody>
</table>

**Total Units**

| Total Units | 120.00 |

## 4. Substitutions

A. Students who have completed MATH 120 or MATH 121, may count 3.00 units towards Supporting 3.A. The other 3.00 units will be counted towards the student’s elective requirement.

B. Students who have completed PHYS 104, PHYS 106, or PHYS 118 may count 3.00 units towards Supporting 3.B. The other 3.00 units will be counted towards the student’s elective requirement.

## 5. Notes

A. Students who may wish later to change to a chemistry program should take one of PHYS 106 or PHYS 104; students who may wish later to change to a physics program should take PHYS 104.

B. Students wishing to take upper-year BIOL courses as electives should take BIOL 205 and BIOL 206 as electives.

C. Electives consisting of 3.00-6.00 units at the 300-level or above in any of ANAT, BIOL, CHEM, MICR, PHAR, PHGY with a laboratory component are recommended. Of these, CHEM 311; CHEM 398; CHEM 399 are strongly recommended.

D. A maximum of 6.00 units from courses offered by other Faculties and Schools may be counted toward the program.
and/or Plan requirements. This includes courses in COMM, LAW, NURS and courses in the Faculty of Engineering and Applied Science.

Biochemistry Course Lists

The following lists contain courses offered through other Departments. In accordance with Academic Regulation 2.6 (Access to Classes), students do not have enrolment priority in all of these courses. Access to these courses may only be made available during the Open Enrolment period, and then only if space permits.

BCHM_List_A

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANAT, CANC, CHEM, CRSS, DDHT, EPID, LISC, MICR, NSCI, PATH, PHAR, PHGY, and REPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCHM 370</td>
<td>Genetics and Genomics</td>
<td>3.00</td>
</tr>
<tr>
<td>BCHM 410</td>
<td>Protein Structure and Function</td>
<td>3.00</td>
</tr>
<tr>
<td>BCHM 411</td>
<td>Advanced Molecular Biology</td>
<td>3.00</td>
</tr>
<tr>
<td>BCHM 432</td>
<td>The Molecular Basis of Cellular Function</td>
<td>3.00</td>
</tr>
<tr>
<td>BCHM 482</td>
<td>Proteomics and Metabolomics</td>
<td>3.00</td>
</tr>
<tr>
<td>BIOL 205</td>
<td>Mendelian and Molecular Genetics</td>
<td>3.00</td>
</tr>
<tr>
<td>BIOL 206</td>
<td>Evolutionary Genetics</td>
<td>3.00</td>
</tr>
<tr>
<td>BIOL 212</td>
<td>Scientific Methods in Biology</td>
<td>3.00</td>
</tr>
<tr>
<td>BIOM 300</td>
<td>Modeling Techniques in Biology</td>
<td>3.00</td>
</tr>
<tr>
<td>BMED 470</td>
<td>Principles of ‘Oomics’</td>
<td>3.00</td>
</tr>
<tr>
<td>HLTH 323</td>
<td>Epidemiology</td>
<td>3.00</td>
</tr>
<tr>
<td>MATH 221</td>
<td>Vector Calculus</td>
<td>3.00</td>
</tr>
<tr>
<td>MATH 225</td>
<td>Ordinary Differential Equations</td>
<td>3.00</td>
</tr>
<tr>
<td>MATH 228</td>
<td>Complex Analysis</td>
<td>3.00</td>
</tr>
<tr>
<td>MATH 272</td>
<td>Applications of Numerical Methods</td>
<td>3.00</td>
</tr>
<tr>
<td>MATH 339</td>
<td>Evolutionary Game Theory</td>
<td>3.00</td>
</tr>
<tr>
<td>PHYS 206</td>
<td>Dynamics</td>
<td>3.00</td>
</tr>
<tr>
<td>PHYS 216</td>
<td>Introduction to Astrophysics</td>
<td>3.00</td>
</tr>
<tr>
<td>PHYS 242</td>
<td>Relativity and Quanta</td>
<td>3.00</td>
</tr>
<tr>
<td>PSYC 100</td>
<td>Principles of Psychology</td>
<td>6.00</td>
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<tr>
<td>PSYC 235</td>
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<td>6.00</td>
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<tr>
<td>PSYC 236</td>
<td>Introduction to Clinical Psychology</td>
<td>3.00</td>
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<tr>
<td>PSYC 251</td>
<td>Developmental Psychology</td>
<td>3.00</td>
</tr>
<tr>
<td>PSYC 271</td>
<td>Brain and Behaviour I</td>
<td>3.00</td>
</tr>
<tr>
<td>PSYC 323</td>
<td>Laboratory in Attention</td>
<td>3.00</td>
</tr>
<tr>
<td>PSYC 333</td>
<td>Human Sexuality</td>
<td>3.00</td>
</tr>
<tr>
<td>PSYC 353</td>
<td>Atypical Development</td>
<td>3.00</td>
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<tr>
<td>PSYC 355</td>
<td>Comparative Cognition: Cognitive Origins</td>
<td>3.00</td>
</tr>
<tr>
<td>PSYC 370</td>
<td>Brain and Behaviour II</td>
<td>3.00</td>
</tr>
</tbody>
</table>

The following courses cannot be used towards an Option requirement: ANAT 270, BCHM 270, CANC 497, MICR 270, PHAR 270/3.0*, PHGY 170, and any course numbered 499.