

# Joint Programs in Chemistry and Biology

- a) Advanced Major in Chemistry and Biology    b) Advanced Major in Biology and Chemistry  
 c) Honours in Chemistry and Biology            d) Honours in Biology and Chemistry

## Joint Advanced Major Program (Chemistry and Biology)

Science A Chemistry	42 credits: Required courses: CHEM 101/102 <input type="checkbox"/> or 121/122 <input type="checkbox"/> , CHEM 221/222 <input type="checkbox"/> , CHEM 231 <input type="checkbox"/> , CHEM 245 <input type="checkbox"/> , CHEM 265 <input type="checkbox"/> , CHEM 325 <input type="checkbox"/> <b>Regular joint program:</b> CHEM 232 <input type="checkbox"/> , CHEM 361 <input type="checkbox"/> , CHEM 362 <input type="checkbox"/> , 6 credits from CHEM 421 <input type="checkbox"/> , CHEM 422 <input type="checkbox"/> , 451 <input type="checkbox"/> , CHEM 452 <input type="checkbox"/> , plus a 3-cr CHEM elective _____ <input type="checkbox"/> <b>OR</b> <b>Biochemistry concentration:</b> CHEM 255 <input type="checkbox"/> , 9 credits from: CHEM 355 <input type="checkbox"/> , CHEM 442 <input type="checkbox"/> , CHEM 451 <input type="checkbox"/> , CHEM 452 <input type="checkbox"/> plus 6-cr CHEM elective _____ <input type="checkbox"/> ( <i>CHEM 361/362 recommended</i> ) In addition, students must complete the junior and senior seminars (391 <input type="checkbox"/> and 491 <input type="checkbox"/> ) - non-credit courses.
Science B Biology	36 credits: Required courses: BIOL 111 <input type="checkbox"/> , BIOL 112 <input type="checkbox"/> , BIOL 201 <input type="checkbox"/> , BIOL 202 <input type="checkbox"/> , BIOL 204 <input type="checkbox"/> , BIOL 395 <input type="checkbox"/> <b>Regular joint program:</b> CHEM 255 <input type="checkbox"/> , BIOL 203 <input type="checkbox"/> , plus 12-cr BIOL elective with at least 3-cr at the 400 level _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> <b>OR</b> <b>Biochemistry option:</b> BIOL 315 <input type="checkbox"/> , BIOL 317 <input type="checkbox"/> , BIOL 425 <input type="checkbox"/> , plus 6-cr from BIOL 390(6) <input type="checkbox"/> , BIOL 402(3) <input type="checkbox"/> , BIOL 404(3) <input type="checkbox"/> , BIOL 417(3) <input type="checkbox"/> , BIOL 419(3) <input type="checkbox"/> , and a 3-cr BIOL elective _____ <input type="checkbox"/>
Science C Physics	6 credits: PHYS 121 <input type="checkbox"/> and PHYS 122 <input type="checkbox"/>
Arts X	12 credits: in a single Humanities or Social Science discipline. _____ <input type="checkbox"/> _____ <input type="checkbox"/>
Arts Y	6 credits: in a second Humanities or Social Science discipline. _____ <input type="checkbox"/>
Approved electives	12 credits: MATH 106 <input type="checkbox"/> , MATH 107 <input type="checkbox"/> , STAT 231 <input type="checkbox"/> , STAT 331 <input type="checkbox"/>
Open elective	6 credits: Arts or Science elective(s) _____ <input type="checkbox"/> ( <i>CHEM 232 recommended for Biochemistry concentration</i> )

### Grade requirements:

- Overall average of 65% or better in the first two years
- Grades of 65% or better in each Advanced Majors (Science A and B) course
- General average of 70% or better in each of the final two years
- Averages of 70% or better in the Advanced Majors courses (for Science A and for Science B) in each of the final two years

## Joint Advanced Major Program (Biology and Chemistry)

Science A Biology	<p>42 credits:</p> <p>Required courses: BIOL 111 <input type="checkbox"/>, BIOL 112 <input type="checkbox"/>, BIO 201 <input type="checkbox"/>, BIO 202 <input type="checkbox"/>, BIO 203 <input type="checkbox"/>, BIOL 204 <input type="checkbox"/>, BIOL 395 <input type="checkbox"/></p> <p><b>Regular joint program:</b> CHEM 255 <input type="checkbox"/> and            18-cr BIOL electives with at least 3-cr at the 400 level (<i>BIO 315 &amp; 317 recommended</i>)            _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/></p> <p><b>OR</b></p> <p><b>Biochemistry concentration:</b> BIOL 315 <input type="checkbox"/>, BIOL 317 <input type="checkbox"/>, BIOL 425 <input type="checkbox"/>, and            9-cr from BIOL 390(6) <input type="checkbox"/>, 402 (3) <input type="checkbox"/>, 404(3) <input type="checkbox"/>, 417(3) <input type="checkbox"/>, 419 (3) <input type="checkbox"/>            and a 3-cr BIOL elective: _____ <input type="checkbox"/></p> <p>In addition, students must complete the senior seminars (BIOL 491 <input type="checkbox"/>) - non-credit course.</p>
Science B Chemistry	<p>36 credits:</p> <p>Required courses: CHEM 101/102 <b>or</b> 121/122 <input type="checkbox"/>, CHEM 221/222 <input type="checkbox"/>, CHEM 231 <input type="checkbox"/>, CHEM 232 <input type="checkbox"/>, CHEM 245 <input type="checkbox"/>, CHEM 265 <input type="checkbox"/></p> <p><b>Regular joint program:</b> CHEM 361 <input type="checkbox"/>, CHEM 362 <input type="checkbox"/>, and a 6-cr CHEM elective _____ <input type="checkbox"/></p> <p><b>OR</b></p> <p><b>Biochemistry option:</b> CHEM 255 <input type="checkbox"/>, CHEM 355 <b>or</b> 442 (with 341) <input type="checkbox"/>, and a 6-cr CHEM elective _____ <input type="checkbox"/></p>
Science C Physics	<p>6 credits: PHYS 101/102 <input type="checkbox"/> <b>or</b> PHYS 121/122 <input type="checkbox"/></p>
Arts X	<p>12 credits: in a single Humanities or Social Science discipline. _____ <input type="checkbox"/> _____ <input type="checkbox"/></p>
Arts Y	<p>6 credits: in a second Humanities or Social Science discipline. _____ <input type="checkbox"/></p>
Approved electives	<p>12 credits: MATH 106 <input type="checkbox"/>, MATH 107 <input type="checkbox"/>, STAT 231 <input type="checkbox"/>, STAT 331 <input type="checkbox"/></p>
Open elective	<p>6 credits: Arts or Sciences elective(s) _____ <input type="checkbox"/> _____ <input type="checkbox"/></p>

### Grade requirements:

- Overall average of 65% or better in the first two years
- Grades of 65% or better in each Advanced Majors (Science A and B) course
- General average of 70% or better in each of the final two years
- Averages of 70% or better in the Advanced Majors courses (for Science A and for Science B) in each of the final two years

## Joint Honours Program (Chemistry and Biology)

Science A Chemistry	<p>48 credits:            Required courses: CHEM 101/102 <input type="checkbox"/> or 121/122 <input type="checkbox"/>, CHEM 221/222 <input type="checkbox"/>, CHEM 231 <input type="checkbox"/>, CHEM 232 <input type="checkbox"/>, CHEM 245 <input type="checkbox"/>, CHEM 265 <input type="checkbox"/>,            CHEM 361 <input type="checkbox"/>, CHEM 362 <input type="checkbox"/>, CHEM 325 <input type="checkbox"/>, CHEM 493 <input type="checkbox"/></p> <p><b>Regular joint program:</b> 6 credits from CHEM 331, CHEM 332, CHEM 341, CHEM 342 _____ <input type="checkbox"/>            6 credits from CHEM 421, CHEM 422, CHEM 451, CHEM 452 _____ <input type="checkbox"/></p> <p><b>OR</b></p> <p><b>Biochemistry concentration:</b> CHEM 255 <input type="checkbox"/>, plus 9-cr from: CHEM 355, CHEM 341, CHEM 342, CHEM 451, CHEM 452            _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/></p> <p>In addition, students must complete the junior and senior seminars (391 <input type="checkbox"/> and 491 <input type="checkbox"/>) - non-credit courses.</p>
Science B Biology	<p>36 credits:            Required courses: BIOL 111 <input type="checkbox"/>, BIOL 112 <input type="checkbox"/>, BIOL 201 <input type="checkbox"/>, BIOL 202 <input type="checkbox"/>, BIOL 204 <input type="checkbox"/>, BIOL 395 <input type="checkbox"/></p> <p><b>Regular joint program:</b> CHEM 255 <input type="checkbox"/>, BIOL 203 <input type="checkbox"/>,            12-cr BIOL elective with at least 3-cr at the 400 level (<i>BIOL 315 &amp; 317 recommended</i>)            _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/></p> <p><b>OR</b></p> <p><b>Biochemistry option:</b> BIOL 315 <input type="checkbox"/>, BIOL 317 <input type="checkbox"/>, BIOL 425 <input type="checkbox"/>, plus            6-cr from BIOL 390(6) <input type="checkbox"/>, BIOL 402(3) <input type="checkbox"/>, BIOL 404(3) <input type="checkbox"/>, BIOL 417(3) <input type="checkbox"/>, BIOL 419(3) <input type="checkbox"/>,            and a 3-cr BIOL elective _____ <input type="checkbox"/></p>
Science C Physics	6 credits: PHYS 121 <input type="checkbox"/> and PHYS 122 <input type="checkbox"/>
Arts X	12 credits: in a single Humanities or Social Science discipline. _____ <input type="checkbox"/> _____ <input type="checkbox"/>
Arts Y	6 credits: in a second Humanities or Social Science discipline. _____ <input type="checkbox"/>
Approved electives	12 credits: MATH 106 <input type="checkbox"/> , MATH 107 <input type="checkbox"/> , STAT 231 <input type="checkbox"/> , STAT 331 <input type="checkbox"/>

### Grade requirements:

- Overall average of 75% or better in each of the first two years
- 70% or better in each Honours course (Science A and B) with overall averages of 75% for each of Science A and Science B courses
- Overall averages of 75% or better in each of the final two years
- Normally 70% or better in each Honours course (Science A & B) with overall averages of 75% for each of Science A and Science B courses in the final two years

## Joint Honours Program (Biology and Chemistry)

Biology Science A	<p>48 credits:</p> <p>Required courses: BIOL 111 <input type="checkbox"/>, BIO112 <input type="checkbox"/>, BIOL 201 <input type="checkbox"/>, BIOL 202 <input type="checkbox"/>, BIOL 203 <input type="checkbox"/>, BIOL 204 <input type="checkbox"/>, BIOL 395 <input type="checkbox"/>, BIOL 493 <input type="checkbox"/></p> <p><b>Regular joint program:</b> CHEM 255 <input type="checkbox"/>, 21-cr BIOL elective with at least 3-cr at the 400 level (<i>BIOL 315 &amp; 317 recommended</i>)</p> <p>_____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/></p> <p>_____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/></p> <p><b>OR</b></p> <p><b>Biochemistry option:</b> BIOL 315 <input type="checkbox"/>, BIOL 317 <input type="checkbox"/>, BIOL 425 <input type="checkbox"/>,</p> <p>plus 12-cr from BIOL 390 <input type="checkbox"/>, BIOL 402 <input type="checkbox"/>, BIOL 404 <input type="checkbox"/>, BIOL 417 <input type="checkbox"/>, BIOL 419 <input type="checkbox"/>, and</p> <p>a 3-cr BIOL elective _____ <input type="checkbox"/></p> <p>In addition, students must complete the senior seminars (BIOL 491 <input type="checkbox"/>) - non-credit course.</p>
Chemistry Science B	<p>36 credits:</p> <p>Required courses: CHEM 101/102 <b>or</b> 121/122 <input type="checkbox"/>, CHEM 221/222 <input type="checkbox"/>, CHEM 231 <input type="checkbox"/>, CHEM 232 <input type="checkbox"/>, CHEM 245 <input type="checkbox"/>, CHEM 265 <input type="checkbox"/></p> <p><b>Regular joint program:</b> CHEM 361 <input type="checkbox"/>, CHEM 362 <input type="checkbox"/>, and 6-cr of CHEM electives _____ <input type="checkbox"/></p> <p><b>OR</b></p> <p><b>Biochemistry concentration:</b> CHEM 255 <input type="checkbox"/>, CHEM 355 <b>or</b> CHEM 442 <input type="checkbox"/>, plus 6-cr CHEM electives _____ <input type="checkbox"/></p>
Physics Science C	<p>6 credits: PHYS 101/102 <input type="checkbox"/> <b>or</b> PHYS 121/122 <input type="checkbox"/></p>
Arts X	<p>12 credits: in a single Humanities or Social Science discipline. _____ <input type="checkbox"/> _____ <input type="checkbox"/></p>
Arts Y	<p>6 credits: in a second Humanities or Social Science discipline. _____ <input type="checkbox"/></p>
Approved electives	<p>12 credits: MATH 106 <input type="checkbox"/>, MATH 107 <input type="checkbox"/>, STAT 231 <input type="checkbox"/>, STAT 331 <input type="checkbox"/></p>

### Grade requirements:

- Overall average of 75% or better in each of the first two years
- 70% or better in each Honours course (Science A and B) with overall averages of 75% for each of Science A and Science B courses
- Overall averages of 75% or better in each of the final two years
- Normally 70% or better in each Honours course (Science A & B) with overall averages of 75% for each of Science A and Science B courses in the final two years