**CHEMISTRY (BS)**

**Exploration and Discovery**

Students majoring in the BS in Chemistry select either the General or Environmental Chemistry option. The BS in Chemistry (both options) follows guidelines established by the American Chemical Society. The program includes a required undergraduate research and/or internship experience for both options and prepares students for admission to graduate and professional schools, as well as employment as professional chemists.

**Degree Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Major Requirements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CH 1010</td>
<td>Majoring and Working in Chemistry</td>
<td>0.5</td>
</tr>
<tr>
<td>CH 1050</td>
<td>Laboratory Safety</td>
<td>1</td>
</tr>
<tr>
<td>CH 2010</td>
<td>The Literature and Ethics of Chemistry</td>
<td>0.5</td>
</tr>
<tr>
<td>CH 2250</td>
<td>Techniques in Laboratory Chemistry</td>
<td>2</td>
</tr>
<tr>
<td>CH 2335</td>
<td>General Chemistry I (QRCO)</td>
<td>4</td>
</tr>
<tr>
<td>CH 2340</td>
<td>General Chemistry II</td>
<td>4</td>
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<tr>
<td>CH 3011</td>
<td>Introduction to Research in Chemistry</td>
<td>1</td>
</tr>
<tr>
<td>CH 3035</td>
<td>Biochemistry I (INCO,INCP)</td>
<td>4</td>
</tr>
<tr>
<td>CH 3210</td>
<td>Integrated Laboratory Experience</td>
<td>2</td>
</tr>
<tr>
<td>CH 3370</td>
<td>Organic Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CH 3380</td>
<td>Organic Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>CH 3400</td>
<td>Instrumental Analysis (TECO)</td>
<td>4</td>
</tr>
<tr>
<td>CH 3410</td>
<td>Physical Chemistry: Thermodynamics and Kinetics</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>(WRCO)</td>
<td></td>
</tr>
<tr>
<td>CH 3465</td>
<td>Physical Chemistry: Quantum Mechanics and Spectroscopy</td>
<td>4</td>
</tr>
<tr>
<td>CH 3500</td>
<td>Inorganic Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>CH 4531</td>
<td>Senior Research</td>
<td>3</td>
</tr>
<tr>
<td>or CH 4600</td>
<td>Internship</td>
<td></td>
</tr>
<tr>
<td>PH 2410</td>
<td>University Physics I</td>
<td>4</td>
</tr>
<tr>
<td>&amp; PH 2430</td>
<td>and Physics Laboratory I</td>
<td></td>
</tr>
<tr>
<td>PH 2420</td>
<td>University Physics II</td>
<td>4</td>
</tr>
<tr>
<td>&amp; PH 2440</td>
<td>and Physics Laboratory II</td>
<td></td>
</tr>
</tbody>
</table>

**Calculus**

Complete one Calculus sequence from the following:

- MA 2490  | Applied Calculus I (QRCO)                          | 8       |
- & MA 2500 | and Applied Calculus II (QRCO)                     |         |
- MA 2550  | Calculus I (QRCO)                                  |         |
- & MA 2560 | and Calculus II (QRCO)                             |         |

**General Education** (https://coursecatalog.plymouth.edu/general-education/)

| EN 1400  | Composition                                        | 4       |
| IS 1115  | Tackling a Wicked Problem                          | 4       |
| CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI) | 3-4     |

**Environmental Chemistry Option of BS Chemistry**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Option Requirements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CH 3600</td>
<td>Environmental Chemistry (INCO,INCP)</td>
<td>4</td>
</tr>
</tbody>
</table>

**Environmental Electives**

Complete at least nine credits from the following:

- BI 3210  | Tropical Biology                                  | 9       |
- BI 3240  | Conservation (DICO,GACO,INCO,INCP)                |         |
- BI 3260  | Freshwater Ecology                                 |         |
- BI 4050  | Ecology (QRCO,WRCO)                               |         |
- BI 4800  | Current Environmental Issues                       |         |
- BU 3220  | Business and the Environment                       |         |
- EPL 3100 | Environmental Planning                             |         |
- ESP 2100 | Introduction to Environmental Science and Policy I |         |
- ESP 3000 | Environmental Field Studies                        |         |
- ESP 3300 | Soils and Environmental Change                     |         |
- ESP 4550 | Environmental Science and Policy Seminar (WRCO)    |         |
- ESP 4710 | Science Colloquium Series                         |         |

**Total Credits**

120

1  Directions should total 16-17 credits because SIDI is waived for BS Chemistry, Environmental Chemistry Option and General Option.

120
GE 2002 Human Geography
GE 3030 Urban Geography
GE 3300 Introduction to Hydrology
MT 4150 Air Quality (INCO,INCP)

General Education (https://coursecatalog.plymouth.edu/general-education/)
Electives 9-11
Total Credits 22-24

General Option of BS Chemistry
This is a traditional chemistry degree intended for students who desire greater flexibility in their program of study.

Course Title Credits
Option Electives
CH 3000/4000 level Chemistry elective (not CHDI) 4

General Education (https://coursecatalog.plymouth.edu/general-education/)
Electives 18-20
Total Credits 22-24

1 Science in Secondary School (CH 4330) does not satisfy any 3000/4000 level Chemistry elective.

Recommended Course Sequence
Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

To complete the bachelor’s degree in 4 years, you must successfully complete a minimum of 15 credits each semester or have a plan to make up credits over the course of the 4 years. For example, if you take 14 credits one semester, you need to take 16 credits in another semester. Credits completed must count toward your program requirements (major, option, minor, certificate, general education or free electives).

Required Options in this Major
Complete one option

Environmental Chemistry Option of BS Chemistry
Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

Course Title Credits
Year One
EN 1400 Composition 4
IS 1115 Tackling a Wicked Problem 4
CH 1010 Majoring and Working in Chemistry 0.5
CH 1050 Laboratory Safety 1
CH 2250 Techniques in Laboratory Chemistry 2
CH 2335 General Chemistry I (QRCO) 4
CH 2340 General Chemistry II 4
Complete one Calculus Sequence from the following: 8
MA 2490 Applied Calculus I (QRCO)
& MA 2500 and Applied Calculus II (QRCO)
MA 2550 Calculus I (QRCO)
& MA 2560 and Calculus II (QRCO)

CTDI (https://coursecatalog.plymouth.edu/general-education/#CTDI) Creative Thought Direction 3-4

Year Two
CH 2010 The Literature and Ethics of Chemistry 0.5
CH 3370 Organic Chemistry I 4
CH 3380 Organic Chemistry II 4
PH 2410 & PH 2430 University Physics I and Physics Laboratory I 4
PH 2420 & PH 2440 University Physics II and Physics Laboratory II 4
PPDI (https://coursecatalog.plymouth.edu/general-education/#PPDI) Past and Present Direction 3-4
SSDI (https://coursecatalog.plymouth.edu/general-education/#SSDI) Self and Society Direction 3-4
Directions (choose from CTDI, PPDI, SSDI) (https://coursecatalog.plymouth.edu/general-education/) 4-8

Credits 26.5-32.5

Year Three
CH 3011 Introduction to Research in Chemistry 1
CH 3035 Biochemistry I (INCO,INCP) 4
CH 3210 Integrated Laboratory Experience 2
CH 3600 Environmental Chemistry (INCO,INCP) 2 4
DICO (https://coursecatalog.plymouth.edu/general-education/#DICO) Diversity Connection 3-4
GACO (https://coursecatalog.plymouth.edu/general-education/#GACO) Global Awareness Connection 3-4
WECO (https://coursecatalog.plymouth.edu/general-education/#WECO) Wellness Connection 3-4

Environmental Electives 2
Complete at least nine credits from the following: 9
BI 3210 Tropical Biology
BI 3240 Conservation (DICOGACO,INCO,INCP)
BI 3260 Freshwater Ecology
BI 4050 Ecology (QRCO,WRCO)
BI 4800 Current Environmental Issues

Credits 20-23

Years Three and Four
CH 3400 Instrumental Analysis (TECO) 4
CH 3410 Physical Chemistry: Thermodynamics and Kinetics (WRCO) 4
CH 3465 Physical Chemistry: Quantum Mechanics and Spectroscopy 4
CH 3500 Inorganic Chemistry 4

Environmental Electives Complete at least nine credits from the following: 9
BI 3210 Tropical Biology
BI 3240 Conservation (DICOGACO,INCO,INCP)
BI 3260 Freshwater Ecology
BI 4050 Ecology (QRCO,WRCO)
BI 4800 Current Environmental Issues

Credits
BU 3220  Business and the Environment  
EPL 3100  Environmental Planning  
ESP 2100  Introduction to Environmental Science and Policy I  
ESP 3000  Environmental Field Studies  
ESP 3300  Soils and Environmental Change  
ESP 4550  Environmental Science and Policy Seminar (WRCEO)  
ESP 4710  Science Colloquium Series  
GE 2002  Human Geography  
GE 3030  Urban Geography  
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BU 3220  Business and the Environment  
EPL 3100  Environmental Planning  
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ESP 3300  Soils and Environmental Change  
ESP 4550  Environmental Science and Policy Seminar (WRCEO)  
ESP 4710  Science Colloquium Series  
GE 2002  Human Geography  
GE 3030  Urban Geography  
GE 3300  Introduction to Hydrology  
MT 4150  Air Quality (INCO,INCP)  

General Option of BS Chemistry
Check all course descriptions for prerequisites before planning course schedule. Course sequence is suggested but not required.

Course  Title  Credits
Year One  
EN 1400  Composition  4
CH 1010  Majoring and Working in Chemistry  0.5
IS 1115  Tackling a Wicked Problem  4
CH 1050  Laboratory Safety  1
CH 2250  Techniques in Laboratory Chemistry  2
CH 2335  General Chemistry I (QRCO)  4
CH 2340  General Chemistry II  4
Complete one Calculus Sequence from the following:  8
MA 2490 & MA 2500  Applied Calculus I (QRCO) and Applied Calculus II (QRCO)  4
MA 2550 & MA 2560  Calculus I (QRCO) and Calculus II (QRCO)  4
CTDI (https:// coursecatalog.plymouth.edu/ general-education/ #CTDI)  3-4

Credits  30.5-31.5

Year Two  
CH 2010  The Literature and Ethics of Chemistry  0.5
CH 3370  Organic Chemistry I  4
CH 3380  Organic Chemistry II  4
PH 2410 & PH 2430  University Physics I and Physics Laboratory I  4

Credits  25

Year Four  
CH 4531  Senior Research  3
CH 4600  or Internship  3
Electives  9-11

Credits  12-14

Total Credits  120

1 Directions should total 16-17 credits because DI is waived for BS Chemistry, General Option.
2 Required for the Option