# OCEANOGRAPHY - 5-YEAR BACHELOR OF SCIENCE AND MASTER OF OCEAN AND SCIENCE TECHNOLOGY

## Program Requirements

### First Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td>CHEM 119</td>
<td>Fundamentals of Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>ENGL 104</td>
<td>Composition and Rhetoric</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>GEOS 101</td>
<td>Introduction to the Geosciences</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>MATH 151</td>
<td>Engineering Mathematics I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>OCNG 251 &amp; OCNG 252</td>
<td>Oceanography and Oceanography Laboratory</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Credit Hours</strong></td>
<td></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td>BIOL 111</td>
<td>Introductory Biology I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>CHEM 120</td>
<td>Fundamentals of Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>MATH 152</td>
<td>Engineering Mathematics II</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>American history</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Credit Hours</strong></td>
<td></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

### Second Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td>BIOL 112</td>
<td>Introductory Biology II</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>OCNG 203</td>
<td>Communicating Oceanography</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>PHYS 206 &amp; PHYS 226</td>
<td>Newtonian Mechanics for Engineering and Science and Physics of Motion Laboratory for the Sciences</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>STAT 211</td>
<td>Principles of Statistics I</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Creative arts</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Credit Hours</strong></td>
<td></td>
<td><strong>15</strong></td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td>COMM 203 or COMM 205</td>
<td>Public Speaking or Communication for Technical Professions</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>OCNG 330</td>
<td>Geological Oceanography</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>PHYS 207 &amp; PHYS 227</td>
<td>Electricity and Magnetism for Engineering and Science and Electricity and Magnetism Laboratory for the Sciences</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>American history</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Credit Hours</strong></td>
<td></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

### Third Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td>GEOS 470</td>
<td>Data Analysis Methods in Geosciences</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>OCNG 456 or OCNG 469</td>
<td>MATLAB Programming for Ocean Sciences or Python for Geosciences</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Government/Political science</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Theme elective</td>
<td></td>
<td>2-3</td>
</tr>
<tr>
<td></td>
<td>Theme requirement</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Credit Hours</strong></td>
<td></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td>OCNG 303</td>
<td>Professional Communication in Oceanography</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>OCNG 320</td>
<td>Biological Oceanography</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>OCNG 340</td>
<td>Chemical Oceanography</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>OCNG 443</td>
<td>Oceanographic Field and Laboratory Methods</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Theme elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Credit Hours</strong></td>
<td></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

### Fourth Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td>OCNG 608</td>
<td>Physical Oceanography</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>OCNG 655</td>
<td>Experimental Design and Analysis in Oceanography</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Government/Political science</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Social and behavioral sciences</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Theme elective</td>
<td></td>
<td>2-3</td>
</tr>
<tr>
<td></td>
<td>Technical elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Credit Hours</strong></td>
<td></td>
<td><strong>18</strong></td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td>OCNG 657</td>
<td>Data Methods and Graphical Representation in Oceanography</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Select one of the following:</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>OCNG 620</td>
<td>Biological Oceanography</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>OCNG 630</td>
<td>Geological Oceanography</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>OCNG 640</td>
<td>Chemical Oceanography</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Language, philosophy and culture</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Technical elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Theme elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Semester Credit Hours</strong></td>
<td></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

### Fifth Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Name</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td>OCNG 604</td>
<td>Ocean Observing Systems</td>
<td>3</td>
</tr>
</tbody>
</table>
The program includes a total of 156 hours with 6 hours being applied toward both the Bachelor of Science in Oceanography and the Master of Ocean Science and Technology.

### Oceanography - 5-Year Bachelor of Science and Master of Ocean and Science Technology

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCNG 656</td>
<td>MATLAB Programming for Ocean Sciences</td>
<td>3</td>
</tr>
<tr>
<td>or OCNG 669</td>
<td>Python for Geosciences</td>
<td>4</td>
</tr>
</tbody>
</table>

- Advanced specialized OCNG graduate course 3
- Advanced specialized OCNG graduate course 3

#### Spring

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCNG 603</td>
<td>Communicating Ocean Science</td>
<td>3</td>
</tr>
<tr>
<td>OCNG 661</td>
<td>Advanced Oceanographic Data Analysis and Communication</td>
<td>3</td>
</tr>
</tbody>
</table>

- Advanced specialized OCNG graduate course 3
- Advanced specialized OCNG graduate course 3

- Semester Credit Hours 12

**Total Semester Credit Hours 150**

1. A grade of C or better is required.
2. Select one of the following tracks: Marine Ecological Processes, Marine Chemistry & Geochemistry, Ocean Climate, Ocean Observing Science and Technology.
3. If Marine Chemistry & Geochemistry track is chosen, this will be 4 credits instead of 3 credits.
4. Students will not be permitted to receive credit for both the 400- and 600-level versions of certain courses because the content and learning outcomes are too similar (OCNG 404/OCNG 604; GEOS 470/OCNG 655).
5. If Marine Chemistry & Geochemistry track is chosen, this will be 2 credits instead of 3 credits.
6. Applied toward both the Bachelor of Science in Oceanography and the Master of Ocean Science and Technology.

Any of the required courses may be taken during the Summer Sessions to diminish the heavy semester loads during Years 2 and 3.

The program includes a total of 156 hours with 6 hours being applied toward both the Bachelor of Science in Oceanography and the Master of Ocean Science and Technology.
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 308</td>
<td>Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Select 12 hours from the following:</strong></td>
<td>12</td>
</tr>
<tr>
<td>ATMO 201</td>
<td>Weather and Climate</td>
<td></td>
</tr>
<tr>
<td>ATMO 203</td>
<td>Weather Forecasting Laboratory</td>
<td></td>
</tr>
<tr>
<td>ATMO 324</td>
<td>Physical and Regional Climatology</td>
<td></td>
</tr>
<tr>
<td>ATMO 441</td>
<td>Satellite Meteorology and Remote Sensing</td>
<td></td>
</tr>
<tr>
<td>GEOG 442</td>
<td>Past Climates</td>
<td></td>
</tr>
<tr>
<td>GEOS 442</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATMO 201</td>
<td>Weather and Climate</td>
<td></td>
</tr>
<tr>
<td>ATMO 203</td>
<td>Weather Forecasting Laboratory</td>
<td></td>
</tr>
<tr>
<td>ATMO 251</td>
<td>Weather Observation and Analysis</td>
<td></td>
</tr>
<tr>
<td>GEOG 361</td>
<td>Remote Sensing in Geosciences</td>
<td></td>
</tr>
<tr>
<td>OCNG 350</td>
<td>Marine Pollution</td>
<td></td>
</tr>
<tr>
<td>OCNG 456</td>
<td>MATLAB Programming for Ocean Sciences</td>
<td></td>
</tr>
<tr>
<td>OCNG 469</td>
<td>Python for Geosciences</td>
<td></td>
</tr>
<tr>
<td>OCNG 491</td>
<td>Research (limit to 3 credits)</td>
<td></td>
</tr>
<tr>
<td>PHYS 221</td>
<td>Optics and Thermal Physics</td>
<td></td>
</tr>
<tr>
<td>STAT 212</td>
<td>Principles of Statistics II</td>
<td></td>
</tr>
<tr>
<td>STAT 407</td>
<td>Principles of Sample Surveys</td>
<td></td>
</tr>
</tbody>
</table>

Total Semester Credit Hours 18

**Ocean Observing Science and Technology Theme**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 212</td>
<td>Principles of Statistics II</td>
<td>3</td>
</tr>
<tr>
<td>OCNG 404</td>
<td>Ocean Observing Systems</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Select 12 hours from the following:</strong></td>
<td>12</td>
</tr>
<tr>
<td>ATMO 201</td>
<td>Weather and Climate</td>
<td></td>
</tr>
<tr>
<td>ATMO 203</td>
<td>Weather Forecasting Laboratory</td>
<td></td>
</tr>
<tr>
<td>ATMO 251</td>
<td>Weather Observation and Analysis</td>
<td></td>
</tr>
<tr>
<td>GEOG 361</td>
<td>Remote Sensing in Geosciences</td>
<td></td>
</tr>
<tr>
<td>OCNG 350</td>
<td>Marine Pollution</td>
<td></td>
</tr>
<tr>
<td>OCNG 456</td>
<td>MATLAB Programming for Ocean Sciences</td>
<td></td>
</tr>
<tr>
<td>OCNG 469</td>
<td>Python for Geosciences</td>
<td></td>
</tr>
<tr>
<td>OCNG 491</td>
<td>Research (limit to 3 credits)</td>
<td></td>
</tr>
<tr>
<td>STAT 407</td>
<td>Principles of Sample Surveys</td>
<td></td>
</tr>
</tbody>
</table>