PROGRAM OF STUDY

Natural Science Associate in Science (TOP 4902.00)

The Associate in Science Degree in Natural Science is an interdisciplinary degree program that focuses on the scientific study of the natural world with an emphasis in either life science or physical sciences. The program comprises core courses in chemistry and biology or chemistry and physics, a college-level mathematics requirement, and additional elective courses in biology or physical sciences.

To fulfill the requirements for this degree, students will complete the required courses and work with a counselor to determine the appropriate pattern of general education courses based on the student's individual educational goals.

Total Units: 18

Option 1: Life Science Emphasis

Core Requirements

1. Chemistry - one course in general chemistry for science majors.
   CHEM 120 General Chemistry 1 5

2. Biology - one course in general biology for science majors.
   BIOL 120 General Biology 4

3. Mathematics - one course in calculus or two courses in pre-calculus.
   MATH 120 Calculus 1 or
   MATH 106 College Algebra and
   MATH 108 Trigonometry 5-8

4. Elective courses to complete a minimum of 18 units:
   BIOL 218 Human Anatomy 5
   BIOL 219 Human Physiology 5
   BIOL 220 Microbiology 5
   BIOL 240 General Zoology 5
   BIOL 241 General Botany 5
   CHEM 121 General Chemistry 2 5
   PHYS 120 General Physics 1 4
   PHYS 140 Physics for Scientists & Engineers 1 4

Program Outcomes

- Communicate scientific information effectively through written or oral means.
- Demonstrate a proficiency of knowledge in molecular biology and genetics.
- Communicate chemical and physical processes at the molecular level and how they relate to the macroscopic environment.

Option 2: Physical Sciences Emphasis

Core Requirements

1. Chemistry – one course in general chemistry for science majors.
   CHEM 120 General Chemistry 1 5

2. Physics - one course in general physics or physics for science majors.
   PHYS 120 General Physics 1 or
   PHYS 140 Physics for Scientists & Engineers 1 4

3. Mathematics - one course in calculus or two courses in pre-calculus.  
MATH 120  Calculus 1 or  
MATH 106  College Algebra and  
MATH 108  Trigonometry  

4. Elective courses to complete a minimum of 18 units:  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>CHEM 121</td>
<td>General Chemistry 2</td>
<td>5</td>
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<tr>
<td>CHEM 240</td>
<td>Organic Chemistry 1</td>
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<tr>
<td>CHEM 241</td>
<td>Organic Chemistry 2</td>
<td>4</td>
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<tr>
<td>PHYS 121</td>
<td>General Physics 2</td>
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<tr>
<td>PHYS 240</td>
<td>Physics for Scientists &amp; Engineers 2</td>
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<td>PHYS 241</td>
<td>Physics for Scientists &amp; Engineers 3</td>
<td>4</td>
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<td>BIOL 110</td>
<td>Survey of Biology</td>
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<tr>
<td>BIOL 120</td>
<td>General Biology</td>
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<td>GEOL 110+111</td>
<td>Physical Geology and Physical Geology Laboratory</td>
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<td>ASTR 110</td>
<td>Descriptive Astronomy</td>
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<tr>
<td>ASTR 111</td>
<td>Practical Astronomy</td>
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</table>

Program Outcomes

- Communicate chemical and physical processes at the molecular level and how they relate to the macroscopic environment.
- Solve both qualitative and quantitative chemistry problems while demonstrating the reasoning clearly and completely.
- Solve quantitative problems while demonstrating a thorough understanding of physical laws.