**Natural Sciences (NS)**

**Liaison:** Mario Mediati (808-845-9201, mediati@hawaii.edu)

**Faculty:** Liberal Arts Faculty in Math, Sciences and other disciplines

**Program Mission:** The Associate of Science in Natural Sciences degree program will prepare students to transfer to baccalaureate STEM (Science, Technology, Engineering and Mathematics) programs with recognized and supported pathways.

**Program Description:** The Associate of Science in Natural Sciences (AS-NS) degree is designed for students planning to transfer to a science, technology, engineering or mathematics (STEM) baccalaureate degree program at a four-year institution in Hawai‘i or on the U.S. mainland.

**Program Learning Outcomes (PLOs):** Upon successful completion of the AS in Natural Sciences, students will be able to:

- Analyze data effectively using the most currently available technology.
- Communicate scientific ideas and principles clearly and effectively.
- Analyze and apply fundamental mathematical, physical and chemical concepts and techniques to scientific issues.
- Apply fundamental concepts and techniques in their chosen field of study, such as biology, chemistry, geology, and engineering.

**Program Requirements: Natural Science AS Degree - Biological Sciences Concentration**

<table>
<thead>
<tr>
<th>General Education Courses</th>
<th>AS Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundations Requirements ***:</td>
<td></td>
</tr>
<tr>
<td>ENG 100 - Composition I (FW)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 241 - Calculus I (FQ)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 215 - Applied Calculus I (FW) is also accepted.</td>
<td></td>
</tr>
<tr>
<td>Two courses from FGA, FGB, FGC, from two different groups</td>
<td>6</td>
</tr>
<tr>
<td>Diversification Requirements ***:</td>
<td></td>
</tr>
<tr>
<td>One course from DA, DH, DL</td>
<td>3</td>
</tr>
<tr>
<td>One course from DS</td>
<td>3</td>
</tr>
<tr>
<td>One course from DB, one course from DP, and one course from DY are fulfilled by Core Requirements courses. See Core Requirements section below.</td>
<td></td>
</tr>
</tbody>
</table>

**Focus Requirement**

One course should satisfy the HAP Focus Requirement

<table>
<thead>
<tr>
<th>Core Requirements*</th>
<th>AS Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 171 - Introduction to Biology I (Fulfills DB requirement)</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 171L - Introduction to Biology I Lab</td>
<td>1</td>
</tr>
<tr>
<td>BIOL 172 - Introduction to Biology II</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 172L - Introduction to Biology II Lab</td>
<td></td>
</tr>
<tr>
<td>CHEM 161 - General Chemistry I (Fulfills DP requirement)</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 161L - General Chemistry I Lab (Fulfills DY requirement)</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 162 - General Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 162L - General Chemistry II Lab</td>
<td>1</td>
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</tbody>
</table>

| Total | 19          |

| Total | 16          |
Liberal Arts Program  - Natural Sciences

Electives
Choose 25 credits from the following Science Electives and Other Electives, appropriate to Degree Concentration and intended baccalaureate pathway:

*** Indicates strongly recommended courses.
**** If you plan to transfer to a 4-year UH institution, we recommend that you take one year of Physics with labs.

<table>
<thead>
<tr>
<th>Science Electives*</th>
<th>AS Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG 100 - Introduction to Agricultural Sciences (3)</td>
<td></td>
</tr>
<tr>
<td>ASTR 110 - Survey of Astronomy (3)</td>
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<td>ASTR 110L - Survey of Astronomy Laboratory (1)</td>
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<tr>
<td>ATM 101 - Introduction to Meteorology (3)</td>
<td></td>
</tr>
<tr>
<td>ATM 101L - Introduction to Meteorology Lab (1)</td>
<td></td>
</tr>
<tr>
<td>BIOC 141 - Fundamentals of Biochemistry (3)</td>
<td></td>
</tr>
<tr>
<td>BIOC 142 - Elements of Biochemistry (3)</td>
<td></td>
</tr>
<tr>
<td>BIOL 123 - Hawaiian Environmental Science (3)</td>
<td></td>
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<tr>
<td>BIOL 124 - Environment and Ecology (3)</td>
<td></td>
</tr>
<tr>
<td>BIOL 124L - Environment and Ecology Lab (1)</td>
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<tr>
<td>BIOL 200 - Coral Reefs (3)</td>
<td></td>
</tr>
<tr>
<td>BIOL 265 - Ecology and Evolutionary Biology (3)</td>
<td></td>
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<tr>
<td>BIOL 265L - Ecology and Evolutionary Biology Lab (1)</td>
<td></td>
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<tr>
<td>BIOL 275*** - Cell and Molecular Biology (3)</td>
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<tr>
<td>BIOL 275L*** - Cell and Molecular Biology Lab (2)</td>
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<tr>
<td>BOT 101 - General Botany (3)</td>
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<tr>
<td>BOT 101L - General Botany Lab (1)</td>
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<tr>
<td>BOT/HWST 105 - Mea Kanu: Hawaiian Plants and their Uses (3)</td>
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<tr>
<td>BOT 130 - Plants in the Hawaiian Environment (3)</td>
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<tr>
<td>BOT 130L - Plants in the Hawaiian Environment Lab (1)</td>
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<tr>
<td>CE 270 - Applied Mechanics I (3)</td>
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<tr>
<td>CE 271 - Applied Mechanics II (3)</td>
<td></td>
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<tr>
<td>ERTH 101 - Introduction to Geology (3)</td>
<td></td>
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<tr>
<td>ERTH 101L - Introductory Geology Lab (1)</td>
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<td>EE 160 - Programming for Engineers (4)</td>
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<td>EE 211 - Basic Circuit Analysis I (4)</td>
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<td>EE 213 - Basic Circuit Analysis II (4)</td>
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<td>EE 296 - Sophomore Project (3)</td>
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<td>GEO 101L - The Natural Environment Lab (1)</td>
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<tr>
<td>MATH 242 - Calculus II (4)</td>
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<td>MICR 130 - General Microbiology (3)</td>
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<td>MICR 140L - General Microbiology Lab (2)</td>
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<tr>
<td>OCN 101 - Marine Option Program Seminar (1)</td>
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<tr>
<td>OCN 102 - Introduction to the Environment and Sustainability (3)</td>
<td>13</td>
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<tr>
<td>OCN 201 - Science of the Sea (3)</td>
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<tr>
<td>OCN 201L - Science of the Sea Lab (1)</td>
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<tr>
<td>PHYS 151**** - College Physics I (3)</td>
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<td>PHYS 151L**** - College Physics I Lab (1)</td>
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<tr>
<td>PHYS 152**** - College Physics II (3)</td>
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<td>PHYS 152L**** - College Physics II Lab (1)</td>
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<tr>
<td>PHYS 170**** - General Physics I (4)</td>
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<tr>
<td>PHYS 170L**** - General Physics I Lab (1)</td>
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<td>PHYS 272**** - General Physics II (3)</td>
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<td>PHYS 272L**** - General Physics II Lab (1)</td>
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<td>PHYL 141 - Human Anatomy and Physiology I (3)</td>
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<tr>
<td>PHYL 141L - Human Anatomy and Physiology I Lab (1)</td>
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<td>Other approved courses</td>
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<tr>
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Minimum Credits Required

* A grade of “C” or higher must be earned in all program-required courses and science electives; minimum 2.0 GPA.
** General Education Requirements for the AA degree are listed under DEGREES AND CERTIFICATES.
**Program Requirements: Natural Science AS Degree - Physical Sciences Concentration**

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</tr>
<tr>
<td>Focus Requirement</td>
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<tr>
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<tr>
<td>CHEM 162 - General Chemistry II</td>
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<tr>
<td>CHEM 162L - General Chemistry II Lab</td>
<td>1</td>
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<tr>
<td>MATH 242 - Calculus II</td>
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<tr>
<td>PHYS 151 - College Physics I</td>
<td>3-4</td>
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<tr>
<td>or PHYS 170 - General Physics I</td>
<td></td>
</tr>
<tr>
<td>PHYS 151L - College Physics I Lab</td>
<td>1</td>
</tr>
<tr>
<td>or PHYS 170L - General Physics I Lab</td>
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<tr>
<td>PHYS 152 - College Physics II</td>
<td>3</td>
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<tr>
<td>or PHYS 272 - General Physics II</td>
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<tr>
<td>PHYS 152L - College Physics II Lab</td>
<td>1</td>
</tr>
<tr>
<td>or PHYS 272L - General Physics II Lab</td>
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**Program Requirements: Natural Science AS Degree - Physical Sciences Concentration**

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<tr>
<td>CHEM 161L - General Chemistry I Lab (Fulfills DY requirement)</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 162 - General Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 162L - General Chemistry II Lab</td>
<td>1</td>
</tr>
<tr>
<td>MATH 242 - Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 151 - College Physics I</td>
<td>3-4</td>
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<tr>
<td>or PHYS 170 - General Physics I</td>
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</tr>
<tr>
<td>PHYS 151L - College Physics I Lab</td>
<td>1</td>
</tr>
<tr>
<td>or PHYS 170L - General Physics I Lab</td>
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<tr>
<td>PHYS 152 - College Physics II</td>
<td>3</td>
</tr>
<tr>
<td>or PHYS 272 - General Physics II</td>
<td></td>
</tr>
<tr>
<td>PHYS 152L - College Physics II Lab</td>
<td>1</td>
</tr>
<tr>
<td>or PHYS 272L - General Physics II Lab</td>
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</table>
Electives

Choose 17-18 credits from the following Science Electives and Other Electives, appropriate to Degree Concentration and intended baccalaureate pathway:

Science Electives*  
<table>
<thead>
<tr>
<th>Course Title</th>
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</tr>
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<tbody>
<tr>
<td>AG 100 - Introduction to Agricultural Sciences</td>
<td>(3)</td>
</tr>
<tr>
<td>ASTR 110 - Survey of Astronomy</td>
<td>(3)</td>
</tr>
<tr>
<td>ASTR 110L - Survey of Astronomy Laboratory</td>
<td>(1)</td>
</tr>
<tr>
<td>ATMO 101 - Introduction to Meteorology</td>
<td>(3)</td>
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<tr>
<td>ATMO 101L - Introduction to Meteorology Lab</td>
<td>(1)</td>
</tr>
<tr>
<td>BIOL 141 - Fundamentals of Biochemistry</td>
<td>(3)</td>
</tr>
<tr>
<td>BIOL 142 - Elements of Biochemistry</td>
<td>(3)</td>
</tr>
<tr>
<td>BIOL 100 - Human Biology</td>
<td>(3)</td>
</tr>
<tr>
<td>BIOL 101 - Biology and Society</td>
<td>(3)</td>
</tr>
<tr>
<td>BIOL 101L - Biology and Society Lab</td>
<td>(1)</td>
</tr>
<tr>
<td>BIOL 123 - Hawaiian Environmental Science</td>
<td>(3)</td>
</tr>
<tr>
<td>BIOL 124 - Environment and Ecology</td>
<td>(3)</td>
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<tr>
<td>BIOL 124L - Environment and Ecology Lab</td>
<td>(1)</td>
</tr>
<tr>
<td>BIOL 171 - Introduction to Biology I</td>
<td>(3)</td>
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<tr>
<td>BIOL 171L - Introduction to Biology I Lab</td>
<td>(1)</td>
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<tr>
<td>BIOL 172 - Introduction to Biology II</td>
<td>(3)</td>
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<tr>
<td>BIOL 172L - Introduction to Biology II Lab</td>
<td>(1)</td>
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<tr>
<td>CE 270 - Applied Mechanics I</td>
<td>(3)</td>
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<tr>
<td>ERTH 101 - Introduction to Geology</td>
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<td>EE 211 - Basic Circuit Analysis I</td>
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<td>EE 296 - Sophomore Project</td>
<td>(3)</td>
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<tr>
<td>GEO 101 - The Natural Environment</td>
<td>(3)</td>
</tr>
<tr>
<td>GEO 101L - The Natural Environment Lab</td>
<td>(1)</td>
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<tr>
<td>MATH 243 - Calculus III</td>
<td>(3)</td>
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<tr>
<td>MATH 244 - Calculus IV</td>
<td>(3)</td>
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<tr>
<td>MATH 140L - General Microbiology</td>
<td>(3)</td>
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<tr>
<td>MATH 140L - General Microbiology Lab</td>
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<tr>
<td>OCN 101 - Marine Option Program Seminar</td>
<td>(1)</td>
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<tr>
<td>OCN 102 - Introduction to the Environment and Sustainability</td>
<td>(3)</td>
</tr>
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<tr>
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<tr>
<td>PHIL 141 - Human Anatomy and Physiology I</td>
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<tr>
<td>PHIL 141L - Human Anatomy and Physiology I Lab</td>
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<td>PHIL 142 - Human Anatomy and Physiology II</td>
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<td>SCI 195V - Science, Technology, Engineering, and Mathematics (STEM) Research Experience</td>
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<td>ZOOL 101 - Principles of Zoology</td>
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<tr>
<td>Other approved courses</td>
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</table>

Other Electives  
<table>
<thead>
<tr>
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<td></td>
</tr>
</tbody>
</table>

Minimum Credits Required  
| Minimum Credits | 60 |

* A grade of “C” or higher must be earned in all program-required courses and science electives; minimum 2.0 GPA.

** General Education Requirements for the AA degree are listed under DEGREES AND CERTIFICATES.
**Program Requirements: Natural Science AS Degree - Engineering Concentration**

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**Focus Requirement**  
One course should satisfy the HAP Focus Requirement

**Core Requirements**  

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<tr>
<td>MATH 243 - Calculus III</td>
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<tr>
<td>MATH 244 - Calculus IV</td>
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<tr>
<td>PHYS 170 - General Physics I</td>
<td>4</td>
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<tr>
<td>PHYS 170L - General Physics I Lab</td>
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<tr>
<td>PHYS 272 - General Physics II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 272L - General Physics II Lab</td>
<td>1</td>
</tr>
</tbody>
</table>
| CE 270 - Applied Mechanics I (Statics) (3)  
or EE 211 - Basics Circuit Analysis I (4) | 3 or 4 |

**Electives**

Choose 7-8 credits from the following Science Electives and Other Electives, appropriate to Degree Concentration and intended baccalaureate pathway:  
*** indicates strongly recommended courses

<table>
<thead>
<tr>
<th>Science Electives*</th>
<th>AS Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG 100 - Introduction to Agricultural Sciences (3)</td>
<td></td>
</tr>
<tr>
<td>ASTR 110 - Survey of Astronomy (3)</td>
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<tr>
<td>ASTR 110L - Survey of Astronomy Laboratory (1)</td>
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<tr>
<td>ATMO 101 - Introduction to Meteorology (3)</td>
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<tr>
<td>ATMO 101L - Introduction to Meteorology Lab (1)</td>
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<tr>
<td>BIOC 141 - Fundamentals of Biochemistry (3)</td>
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<tr>
<td>BIOC 142 - Elements of Biochemistry (3)</td>
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<tr>
<td>BIOL 100 - Human Biology (3)</td>
<td>7-8</td>
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<tr>
<td>BIOL 101 - Biology and Society (3)</td>
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<tr>
<td>BIOL 101L - Biology and Society Lab (1)</td>
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<tr>
<td>BIOL 123 - Hawaiian Environmental Science (3)</td>
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<tr>
<td>BIOL 124 - Environment and Ecology (3)</td>
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<td>BIOL 124L - Environment and Ecology Lab (1)</td>
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<tr>
<td>BIOL 171 - Introduction to Biology I (3)</td>
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<td>BIOL 171L - Introduction to Biology I Lab (1)</td>
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<tr>
<td>BIOL 172 - Introduction to Biology II (3)</td>
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</tbody>
</table>
Science Electives continued*

- BIOL 172L - Introduction to Biology II Lab (1)
- BIOL 200 - Coral Reefs (3)
- BIOL 205 - Ecology and Evolutionary Biology (3)
- BIOL 265L - Ecology and Evolutionary Biology Lab (1)
- BIOL 275 - Cell and Molecular Biology (3)
- BIOL 275L - Cell and Molecular Biology Lab (2)
- BOT 101 - General Botany (3)
- BOT 101L - General Botany Lab (1)
- BOT/HWST 105 - Mea Kanu: Hawaiian Plants and their Uses (3)
- BOT 130 - Plants in the Hawaiian Environment (3)
- BOT 130L - Plants in the Hawaiian Environment Lab (1)
- CE 270*** - Applied Mechanics I (Statics) (3)
- CE 271*** - Applied Mechanics II (Dynamics) (3)
- ERTH 101 - Introduction to Geology (3)
- ERTH 101L - Introductory Geology Lab (1)
- ERTH 103 - Geology of the Hawaiian Islands (3)
- EE 211*** - Basics Circuit Analysis I (4)
- EE 212*** - Basics Circuit Analysis II (4)
- EE 296*** - Sophomore Project (3)
- GEO 101 - The Natural Environment (3)
- GEO 101L - The Natural Environment Lab (1)
- ICS 111 - Introduction to Computer Science I - Java (4)
- MICR 130 - General Microbiology (3)
- MICR 140L - General Microbiology Lab (2)
- OCN 101 - Marine Option Program Seminar (1)
- OCN 102 - Introduction to the Environment and Sustainability (3)
- OCN 201 - Science of the Sea (3)
- PHYS 151L - College Physics I Lab (3)
- PHYS 152 - College Physics II (3)
- PHYS 152L - College Physics II Lab (1)
- PHYS 174*** - General Physics III (3)
- PHYS 141 - Human Anatomy and Physiology I (3)
- PHYS 141L - Human Anatomy and Physiology I Lab (1)
- PHYS 142 - Human Anatomy and Physiology II (3)
- PHYS 142L - Human Anatomy and Physiology II Lab (1)
- SCI 295V - Science, Technology, Engineering, and Mathematics (STEM) Research Experience (1-3)
- ZOOL 101 - Principles of Zoology (4)
- ZOOL 200 - Marine Biology (3)
- ZOOL 200L - Marine Biology Lab (1)
- Other approved courses

Other Electives

- Any courses, including courses from the above Science Electives list.
- If you plan to transfer to a 4-year UH institution, we recommend that you take courses that fulfill the WI requirements, courses that fulfill the Hawaiian or Second Language (HSL) requirement, and/or courses that fulfill the additional DA/DH/DL and DS requirement. The additional DA/DH/DL course should be of a different group from the one used to fulfill the DA/DH/DL diversification requirement. The additional DS course should be of a different discipline from the one used to fulfill the DS diversification requirement.

** Minimum Credits Required ** 60

* A grade of “C” or higher must be earned in all program-required courses and science electives; minimum 2.0 GPA.

** General Education Requirements for the AA degree are listed under DEGREES AND CERTIFICATES.**