**LIBERAL ARTS PROGRAM - NATURAL SCIENCES**

**LIASON:** Mario Mediati (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**

**Program Prerequisites:** ENG 100 or ESL 23, OR Placement in ENG 100; MATH 25 or Placement in MATH 103

**Recommended Prep:** Summer Bridge program to complete MATH 103 prior to program entry

**General Education Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>AS Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 100: Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 124: Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>Two courses from FGA, FGB, FGC</td>
<td>6</td>
</tr>
</tbody>
</table>

**Diversification Requirements:**

- Select three Diversification courses below; two courses should also satisfy the Writing Intensive (WI) Focus Requirement, and one course should also satisfy the HAP Focus Requirement.
- Select an additional 3 credits if the DB/DP course is used to fulfill an Elective requirement, to satisfy the total minimum of 60 credits required for this degree.

<table>
<thead>
<tr>
<th>Course</th>
<th>AS Credits</th>
</tr>
</thead>
<tbody>
<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 or DP</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>22</strong></td>
</tr>
</tbody>
</table>

**Core Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>AS Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 171: Introduction to Biology I</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>1</td>
</tr>
<tr>
<td>CHEM 161: General Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 161L: General Chemistry I Lab</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>PHYS 151: College Physics I or PHYS 170: General Physics I</td>
<td>3-4</td>
</tr>
<tr>
<td>PHYS 151L: College Physics I Lab or PHYS 170L: General Physics I Lab</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 152: College Physics II or PHYS 272: General Physics II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 152L: College Physics II Lab or PHYS 272L: General Physics II Lab</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>24-25</strong></td>
</tr>
</tbody>
</table>
Electives* AS Credits
Choose 13-14 credits from the following electives, appropriate to Degree Concentration and intended baccalaureate pathway:
• AG 100 - Introduction to Agricultural Sciences (3)
• AG 199 - Special Topics in Agriculture (1)
• BIOL 141 - Fundamentals of Biochemistry (3)
• BIOL 142 - Elements of Biochemistry (3)
• BIOL 123 - Hawaiian Environmental Science (3)
• BIOL 124 - Environment and Ecology (3)
• BIOL 124L - Environment and Ecology Lab (1)
• 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)
• GEO 101 - The Natural Environment (3)
• GEO 101L - The Natural Environment Lab (1)
• GG 101 - Introduction to Geology (3)
• GG 101L - Introductory Geology Lab (1)
• GG 103 - Geology of the Hawaiian Islands (3)
• ATMO 101 - Introduction to Meteorology (3)
• ATMO 101L - Introduction to Meteorology Lab (1)
• MICR 130 - General Microbiology (3)
• MICR 140L - General Microbiology Lab (2)
• OCN 201 - Science of the Sea (3)
• OCN 201L - Science of the Sea Lab (1)
• ZOOL 101 - Principles of Zoology (4)
• ZOOL 200 - Marine Biology (3)
• ZOOL 200L - Marine Biology Lab (1)

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.

Program Requirements: Natural Science AS Degree - Physical Sciences Concentration
Program Prerequisites: ENG 100 or ESL 23, OR Placement in ENG 100; MATH 25 or Placement in MATH 103
Recommended Prep: Summer Bridge program to complete MATH 103 prior to program entry

General Education Courses AS Credits
Foundations Requirements **:
• ENG 100 - Composition I (FW) 3
• MATH 241 - Calculus I (FQ) 4
• Two courses from FGA, FGB, FGC 6
Diversification Requirements **:
Select three Diversification courses below; two courses should also satisfy the Writing Intensive (WI) Focus Requirement, and one course should also satisfy the HAP Focus Requirement.
Select an additional 3 credits if the DB/DP course is used to fulfill an Elective requirement, to satisfy the total minimum of 60 credits required for this degree.
• One course from DA, DH, DL 3
• One course from DS 3
• One course from DB or DP 3

13-14
Core Requirements* AS Credits
CHEM 161 - General Chemistry I 3
CHEM 161L - General Chemistry I Lab 1
CHEM 162 - General Chemistry II 3
CHEM 162L - General Chemistry II Lab 1
MATH 242 - Calculus II 4
PHYS 151 - College Physics I
or PHYS 170 - General Physics I 3-4
PHYS 151L - College Physics I Lab
or PHYS 170L - General Physics I Lab 1
PHYS 152 - College Physics II
or PHYS 272 - General Physics II 3
PHYS 152L - College Physics II Lab
or PHYS 272L - General Physics II Lab 1

Electives* AS Credits
Choose 17-18 credits from the following electives, appropriate to Degree Concentration and intended baccalaureate pathway:

- AG 100 - Introduction to Agricultural Sciences (3)
- AG 199 - Special Topics in Agriculture (1)
- ATMO 101 - Introduction to Meteorology (3)
- ATMO 101L - Introduction to Meteorology Lab (1)
- BIOC 141 - Fundamentals of Biochemistry (3)
- BIOC 142 - Elements of Biochemistry (3)
- BIOL 123 - Hawaiian Environmental Science (3)
- BIOL 124 - Environment and Ecology (3)
- BIOL 124L - Environment and Ecology Lab (1)
- 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)
- GEO 101 - The Natural Environment (3)
- GEO 101L - The Natural Environment Lab (1)
- GG 101 - Introduction to Geology (3)
- GG 101L - Introductory Geology Lab (1)
- GG 103 - Geology of the Hawaiian Islands (3)
- MICR 130 - General Microbiology (3)
- MICR 140L - General Microbiology Lab (2)
- OCN 201 - Science of the Sea (3)
- OCN 201L - Science of the Sea Lab (1)
- ZOOL 101 - Principles of Zoology (4)
- ZOOL 200 - Marine Biology (3)
- ZOOL 200L - Marine Biology Lab (1)

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.

Cost of Textbooks/Supplies: The cost of textbooks and supplies is approximately $300 per semester for full-time students.
**Program Requirements: Natural Science AS Degree - Engineering Concentration**

Program Prerequisites: ENG 100 or ESL 23, OR Placement in ENG 100; MATH 25 or Placement in MATH 103

**Recommended Prep:** Summer Bridge program to complete MATH 103 prior to program entry

<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>Two courses from FGA, FGB, FGC</td>
<td>6</td>
</tr>
</tbody>
</table>

| Diversification Requirements **: | |
| Select three Diversification courses below; two courses should also satisfy the Writing Intensive (WI) Focus Requirement, and one course should also satisfy the HAP Focus Requirement. | |
| Select an additional 3 credits if the DB/DP course is used to fulfill an Elective requirement, to satisfy the total minimum of 60 credits required for this degree. | |
| One course from DA, DH, DL | 3 |
| One course from DS | 3 |
| One course from DB or DP | 3 |

| Total Credits | 22 |

<table>
<thead>
<tr>
<th>Core Requirements *</th>
<th>AS Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 161 - General Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 161L - General Chemistry I Lab</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 162 - General Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>EE 160 - Programming for Engineers</td>
<td>4</td>
</tr>
<tr>
<td>MATH 242 - Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 243 - Calculus III</td>
<td>3</td>
</tr>
<tr>
<td>MATH 244 - Calculus IV</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 170 - General Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 170L - General Physics I Lab</td>
<td>1</td>
</tr>
<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>
<tr>
<td>CE 270 - Applied Mechanics I (Statics) (3)</td>
<td>3</td>
</tr>
<tr>
<td>or EE 211 - Basics Circuit Analysis I (4)</td>
<td>3 or 4</td>
</tr>
</tbody>
</table>

| Total Credits | 33-34 |
Electives*  
Choose 4-5 credits from the following electives, appropriate to Degree Concentration and intended baccalaureate pathway; (** indicates strongly recommended courses)

- AG 100 - Introduction to Agricultural Sciences (3)
- ATMO 101 - Introduction to Meteorology (3)
- ATMO 101L - Introduction to Meteorology Lab (1)
- BIOC 141 - Fundamentals of Biochemistry (3)
- BIOC 142 - Elements of Biochemistry (3)
- BIOL 123 - Hawaiian Environmental Science (3)
- BIOL 124 - Environment and Ecology (3)
- BIOL 124L - Environment and Ecology Lab (1)
- 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)
- EE 211 - Basics Circuit Analysis I (4)
- EE 213 - Basics Circuit Analysis II (4)
- EE 296 - Sophomore Project (3)
- GEO 101 - The Natural Environment (3)
- GEO 101L - The Natural Environment Lab (1)
- GG 101 - Introduction to Geology (3)
- GG 101L - Introductory Geology Lab (1)
- GG 103 - Geology of the Hawaiian Islands (3)
- ICS 111 - Introduction to Computer Science I - Java (4)
- MICR 130 - General Microbiology (3)
- MICR 140L - General Microbiology Lab (2)
- OCN 201 - Science of the Sea (3)
- OCN 201L - Science of the Sea Lab (1)
- PHYS 151 - College Physics I (3)
- PHYS 151L - College Physics I Lab (3)
- PHYS 152 - College Physics II (3)
- PHYS 152L - College Physics II Lab (1)
- PHYS 274 - General Physics III (3)
- ZOOL 101 - Principles of Zoology (4)
- ZOOL 200 - Marine Biology (3)
- ZOOL 200L - Marine Biology Lab (1)

**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.