

# Natural Science

There are various programs under the Natural Science area. Refer to each individual program for an overview and suggested pathway(s) as each program may differ.

## Natural Science Degrees and Certificates

### Natural Science: Associate in Science Degree (Biological Sciences)

The purpose of the Associate in Science in Natural Science (A.S.N.S.) degree is to address the needs of students interested in science, technology, engineering, and mathematics (STEM). Students can use the A.S.N.S. degree to better market their science background or in preparation for transfer to a four-year institution. The A.S.N.S. in Biological Sciences provides a clear pathway to properly prepare students for transfer with core introductory courses and laboratories in chemistry, mathematics, and physics typically required in the first two years of a broad range of biological science baccalaureate degrees at four-year universities.

#### ***Biological Sciences Program Student Learning Outcomes (PSLOs) approved 03/01/2013:***

1. Analyze data effectively using currently available technology.
2. Communicate scientific ideas and principles clearly and effectively.
3. Analyze and apply fundamental mathematical, physical, and chemical concepts and techniques to scientific issues.
4. Apply fundamental concepts and techniques in their chosen natural science field of student, such as biology, chemistry, engineering, physics, etc.

### Fall (Semester 1)

| Course    | Course Title/Category  | Credits |
|-----------|--|---------|
| CHEM 161  | General Chemistry I  | 3       |
| CHEM 161L | General Chemistry Lab I  | 1       |
| MATH 241  | Calculus I   | 4       |
| SCI 170   | STEMinar: Science, Technology, Engineering, and Mathematics Seminar                  | 1       |
|           | Foundations: Global and Multicultural Perspectives (FG): Any FGA, FGB, or FGC course | 3       |
|           | Foundations: Written Communication (FW): Any FW course                               | 3       |

1. CHEM 161: This course fulfills the Diversification: Physical Sciences (DP) category.
2. CHEM 161L: This course fulfills the Diversification: Laboratory (science) (DY) category.
3. MATH 241: This course fulfills the Foundations: Quantitative Reasoning (FQ) category.
4. Foundations: Global and Multicultural Perspectives (FG): A total of 6 credits are required and are recommended to be completed in semesters 1 and 2. Any two courses with different FG designations are required.

## Spring (Semester 2)

| Course    | Course Title/Category  | Credits |
|-----------|--|---------|
| CHEM 162  | General Chemistry II   | 3       |
| CHEM 162L | General Chemistry II Laboratory  | 1       |
| MATH 242  | Calculus II  | 4       |
|           | Diversification: Social Sciences (DS): Any DS course                                 | 3       |
|           | Electives: Any 100-level or higher course (3 credits)                                | 3       |
|           | Foundations: Global and Multicultural Perspectives (FG): Any FGA, FGB, or FGC course | 3       |

1. Foundations: Global and Multicultural Perspectives (FG): A total of 6 credits are required and are recommended to be completed in semesters 1 and 2. Any two courses with different FG designations are required.

## Fall (Semester 3)

| Course    | Course Title/Category  | Credits |
|-----------|--|---------|
| BIOL 171  | Introduction to Biology I  | 3       |
| BIOL 171L | Introduction to Biology Laboratory I                             | 1       |
|           | PHYS 151 or PHYS 170   | 3-4     |
|           | PHYS 151L or PHYS 170L   | 1       |
|           | Diversification: Arts (DA), Humanities (DH), or Literatures (DL) | 3       |
|           | Electives: Any 100-level or higher course (3 credits)            | 3       |

1. BIOL 171: This course fulfills the Diversification: Biological Sciences (DB) category.

## Spring (Semester 4)

| Course    | Course Title/Category                                   | Credits |
|-----------|---|---------|
| BIOL 172  | Introduction to Biology II                              | 3       |
| BIOL 172L | Introduction to Biology Laboratory II                   | 1       |
|           | PHYS 152 or PHYS 272                                    | 3       |
|           | PHYS 152L or PHYS 272L                                  | 1       |
|           | Electives: Any 100-level or higher course (5-6 credits) | 5-6     |

## Graduation Requirements (to be satisfied within the 60-credit A.S. degree)

| Course | Course Title/Category  | Credits   |
|--------|--|-----------|
|        | Graduation Requirement: Writing Intensive (WI): At least 1 WI course |           |
|        | <b>Total Credits</b>   | <b>60</b> |

## Category Descriptions

Diversification: Arts (DA), Humanities (DH), or Literatures (DL)

Refer to the "Diversification and Foundations Course List" under the "Programs (Certificates and Degrees)" section of the catalog for a list of courses that will fulfill this category.

### Diversification: Social Sciences (DS): Any DS course

Refer to the "Diversification and Foundations Course List" under the "Programs (Certificates and Degrees)" section of the catalog for a list of courses that will fulfill this category.

### Foundations: Global and Multicultural Perspectives (FG): Any FGA, FGB, or FGC course

Refer to the "Diversification and Foundations Course List" under the "Programs (Certificates and Degrees)" section of the catalog for a list of courses that will fulfill this category.

### Foundations: Written Communication (FW): Any FW course

Refer to the "Diversification and Foundations Course List" under the "Programs (Certificates and Degrees)" section of the catalog for a list of courses that will fulfill this category.

### Graduation Requirement: Writing Intensive (WI): At least 1 WI course

Refer to the "Graduation Requirement Course List" under the "Programs (Certificates and Degrees)" section of the catalog for more information.

## Natural Science: Associate in Science Degree (Engineering)

The purpose of the Associate in Science in Natural Science (A.S.N.S.) degree is to address the needs of students interested in science, technology, engineering, and mathematics (STEM). Students can use the A.S.N.S. degree to better market their science background or in preparation for transfer to a four-year institution. The A.S.N.S. in Engineering provides a clear pathway to properly prepare students for transfer with core introductory courses and laboratories in chemistry, mathematics, and physics typically required in the first two years of a broad range of Engineering baccalaureate degrees at four-year universities.

### ***Engineering Program Student Learning Outcomes (PSLOs) approved 03/01/2013:***

1. Analyze data effectively using currently available technology.
2. Communicate scientific ideas and principles clearly and effectively.
3. Analyze and apply fundamental mathematical, physical, and chemical concepts and techniques to scientific issues.
4. Apply fundamental concepts and techniques in their chosen natural science field of student, such as biology, chemistry, engineering, physics, etc.

## Fall (Semester 1)

| Course    | Course Title/Category  | Credits |
|-----------|--|---------|
| CHEM 161  | General Chemistry I  | 3       |
| CHEM 161L | General Chemistry Lab I  | 1       |
| MATH 241  | Calculus I   | 4       |
| SCI 170   | STEMinar: Science, Technology, Engineering, and Mathematics Seminar                  | 1       |
|           | Communication: Any FW course   | 3       |
|           | Foundations: Global and Multicultural Perspectives (FG): Any FGA, FGB, or FGC course | 3       |

1. CHEM 161: This course fulfills the Natural Environment category.
2. MATH 241: This course fulfills the Mathematics category.
3. Foundations: Global and Multicultural Perspectives (FG): A total of 6 credits are required and are recommended to be completed in semesters 1 and 3. Any two courses with different FG designations are required.

## Spring (Semester 2)

| Course   | Course Title/Category   | Credits |
|----------|---|---------|
| CHEM 162 | General Chemistry II  | 3       |
| MATH 242 | Calculus II   | 4       |
|          | ECON 130 or ECON 131  | 3       |
|          | EE 160 or ICS 111   | 3-4     |
|          | Cultural Environment: Three credits of any Humanities (DH) or Literatures (DL) course | 3       |

1. CHEM 162: This course fulfills the Natural Environment category.
2. MATH 242: This course fulfills the Mathematics category.
3. ECON 130 or ECON 131: Either course fulfills the Social Environment category.

## Fall (Semester 3)

| Course    | Course Title/Category  | Credits |
|-----------|--|---------|
| PHYS 170  | General Physics I  | 4       |
| PHYS 170L | General Physics I Lab  | 1       |
|           | MATH 245 (or MATH 243 and MATH 244)  | 4-6     |
|           | Electives: Any 100-level or higher course (3 credits)                                | 3       |
|           | Foundations: Global and Multicultural Perspectives (FG): Any FGA, FGB, or FGC course | 3       |

1. MATH 245 (or MATH 243 and MATH 244): This course fulfills the Mathematics category. If MATH 243 and MATH 244 are taken, both courses will fulfill the Mathematics category. MATH 244 is typically only offered in the spring semester and should be taken in semester 4 if MATH 243 and MATH 244 are taken in lieu of MATH 245.
2. PHYS 170: This course fulfills the Natural Environment category.
3. Electives: EE 213, EE 296, and ICS 111 are recommended to fulfill a portion of the required electives (8 credits).
4. Foundations: Global and Multicultural Perspectives (FG): A total of 6 credits are required and are recommended to be completed in semesters 1 and 3. Any two courses with different FG designations are required.

## Spring (Semester 4)

| Course   | Course Title/Category  | Credits |
|--|------------------------|---------|
| PHYS 272   | General Physics II     | 3       |
| PHYS 272L  | General Physics II Lab | 1       |
| Electives: Any 100-level or higher course (7-10 credits) |                        | 7-10    |

1. PHYS 272: This course fulfills the Natural Environment category.
2. Electives: EE 213, EE 296, and ICS 111 are recommended to fulfill a portion of the required electives (8 credits).

## Graduation Requirements (to be satisfied within the 60-credit A.S. degree)

| Course        | Course Title/Category  | Credits |
|---------------|--|---------|
|               | Graduation Requirement: Writing Intensive (WI): At least 1 WI course |         |
| Total Credits |  | 60      |

### Category Descriptions

#### Communication: Any FW course

Refer to the "Diversification and Foundations Course List" under the "Programs (Certificates and Degrees)" section of the catalog for a list of courses that will fulfill this category.

#### Cultural Environment: Three credits of any Humanities (DH) or Literatures (DL) course

Refer to the "Diversification and Foundations Course List" under the "Programs (Certificates and Degrees)" section of the catalog for a list of courses that will fulfill this category.

#### Foundations: Global and Multicultural Perspectives (FG): Any FGA, FGB, or FGC course

Refer to the "Diversification and Foundations Course List" under the "Programs (Certificates and Degrees)" section of the catalog for a list of courses that will fulfill this category.

#### Graduation Requirement: Writing Intensive (WI): At least 1 WI course

Refer to the "Graduation Requirement Course List" under the "Programs (Certificates and Degrees)" section of the catalog for more information.

# Natural Science: Associate in Science Degree (Physical Sciences)

The purpose of the Associate in Science in Natural Science (A.S.N.S.) degree is to address the needs of students interested in science, technology, engineering, and mathematics (STEM). Students can use the A.S.N.S. degree to better market their science background or in preparation for transfer to a four-year institution. The A.S.N.S. in Physical Sciences provides a clear pathway to properly prepare students for transfer with core introductory courses and laboratories in chemistry, mathematics, and physics typically required in the first two years of a broad range of Physical science baccalaureate degrees at four-year universities.

## ***Physical Sciences Program Student Learning Outcomes (PSLOs) approved 03/01/2013:***

1. Analyze data effectively using currently available technology.
2. Communicate scientific ideas and principles clearly and effectively.
3. Analyze and apply fundamental mathematical, physical, and chemical concepts and techniques to scientific issues.
4. Apply fundamental concepts and techniques in their chosen natural science field of student, such as biology, chemistry, engineering, physics, etc.

## Fall (Semester 1)

| Course    | Course Title/Category  | Credits |
|-----------|--|---------|
| CHEM 161  | General Chemistry I  | 3       |
| CHEM 161L | General Chemistry Lab I  | 1       |
| MATH 241  | Calculus I   | 4       |
| SCI 170   | STEMinar: Science, Technology, Engineering, and Mathematics Seminar                  | 1       |
|           | Foundations: Global and Multicultural Perspectives (FG): Any FGA, FGB, or FGC course | 3       |
|           | Foundations: Written Communication (FW): Any FW course                               | 3       |

1. CHEM 161: This course fulfills the Diversification: Physical Sciences (DP) category.
2. CHEM 161L: This course fulfills the Diversification: Laboratory (science) (DY) category.
3. MATH 241: This course fulfills the Foundations: Quantitative Reasoning (FQ) category.
4. Foundations: Global and Multicultural Perspectives (FG): A total of 6 credits are required and are recommended to be completed in semesters 1 and 2. Any two courses with different FG designations are required.

## Spring (Semester 2)

| Course   | Course Title/Category  | Credits |
|----------|--|---------|
| CHEM 162 | General Chemistry II   | 3       |
| MATH 242 | Calculus II  | 4       |
|          | CHEM, EE, or ICS Option  | 1-4     |
|          | Diversification: Social Sciences (DS): Any DS course                                 | 3       |
|          | Electives: Any 100-level or higher course (3 credits)                                | 3       |
|          | Foundations: Global and Multicultural Perspectives (FG): Any FGA, FGB, or FGC course | 3       |

1. Foundations: Global and Multicultural Perspectives (FG): A total of 6 credits are required and are recommended to be completed in semesters 1 and 2. Any two courses with different FG designations are required.

## Fall (Semester 3)

| Course    | Course Title/Category  | Credits |
|-----------|--|---------|
| PHYS 170  | General Physics I  | 4       |
| PHYS 170L | General Physics I Lab  | 1       |
|           | Diversification: Arts (DA), Humanities (DH), or Literatures (DL) | 3       |
|           | Electives: Any 100-level or higher course (6 credits)            | 6       |

## Spring (Semester 4)

| Course    | Course Title/Category                                  | Credits |
|-----------|--|---------|
| PHYS 272  | General Physics II                                     | 3       |
| PHYS 272L | General Physics II Lab                                 | 1       |
|           | Electives: Any 100-level or higher course (11 credits) | 11      |

## Graduation Requirements (to be satisfied within the 61-64-credit A.S. degree)

| Course | Course Title/Category  | Credits      |
|--------|--|--------------|
|        | Graduation Requirement: Writing Intensive (WI): At least 1 WI course |              |
|        | <b>Total Credits</b>   | <b>61-64</b> |

## Category Descriptions

### CHEM, EE, or ICS Option

Choose from the following:

CHEM 162L (1), EE 160 (4), ICS 111 (3)

### Diversification: Arts (DA), Humanities (DH), or Literatures (DL)

Refer to the "Diversification and Foundations Course List" under the "Programs (Certificates and Degrees)" section of the catalog for a list of courses that will fulfill this category.

### Diversification: Social Sciences (DS): Any DS course

Refer to the "Diversification and Foundations Course List" under the "Programs (Certificates and Degrees)" section of the catalog for a list of courses that will fulfill this category.

### Foundations: Global and Multicultural Perspectives (FG): Any FGA, FGB, or FGC course

Refer to the "Diversification and Foundations Course List" under the "Programs (Certificates and Degrees)" section of the catalog for a list of courses that will fulfill this category.

## Foundations: Written Communication (FW): Any FW course

Refer to the "Diversification and Foundations Course List" under the "Programs (Certificates and Degrees)" section of the catalog for a list of courses that will fulfill this category.

## Graduation Requirement: Writing Intensive (WI): At least 1 WI course

Refer to the "Graduation Requirement Course List" under the "Programs (Certificates and Degrees)" section of the catalog for more information.