University of Alberta  University of Alberta Calendar 2022-2023

Major Subject (42 units plus supporting or prerequisite courses) [Augustana]

Biology

- 3 units additional in Biology at the 400-level.
- 12 units in senior Biology, at least 6 units of which must be at the 300- or 400-level.

6 units in evolution and cell biology:

- AUBIO 111 - Functional Biology
- AUBIO 212 - Evolution and Biodiversity

9 units in cell biology, ecology, and genetics:

- AUBIO 230 - Molecular Cell Biology
- AUBIO 253 - Ecological Interactions
- AUBIO 260 - Principles of Genetics

3 units in botany:

- AUBIO 323 - Plant Biology

3 units in biodiversity: one of

- AUBIO 374 - Microbiology
- AUBIO 394 - Comparative Invertebrate Zoology
- AUBIO 395 - Vertebrate Form and Function

3 units in developmental biology:

- AUBIO 338 - Developmental Biology

3 units in history and theory of biology:

- AUBIO 411 - History and Theory of Biology

Prerequisite courses: 6 units in chemistry:

- AUCHE 110 - General Chemistry I
- AUCHE 250 - Synthesis I

Supporting course: 3 units in statistics:
- **AUSTA 215** - Statistical Methods for the Natural Sciences

**Note:**

Students must take **EDSE 355** during the IPT, which is normally offered in both the Fall and Winter Terms. Students must take **EDSE 451** and **EDSE 455** during the APT, which are normally offered in both the Fall and Winter Terms.

**Chemistry**

- 21 units in additional senior Chemistry, at least 6 units of which must be at the 300- or 400-level.

**6 units in general chemistry:**

- **AUCHE 110** - General Chemistry I
- **AUCHE 212** - General Chemistry II

**3 units in analytical chemistry:**

- **AUCHE 220** - Analysis I

**3 units in inorganic chemistry:**

- **AUCHE 230** - Structure and Bonding

**3 units in organic chemistry:**

- **AUCHE 250** - Synthesis I

**3 units in physical chemistry:**

- **AUCHE 279** - Physical Chemistry

**3 units in Selected Topics in Chemistry: one of**

- **AUCHE 405** - Selected Topics in Chemistry
- AUCHE 485

**Prerequisite courses: 3 units in elementary calculus:**

- **AUMAT 110** - Elementary Calculus I
- **AUMAT 116** - Calculus Concepts and Modelling

**Note:**

Students must take **EDSE 355** during the IPT, which is normally offered in both the Fall and Winter Terms. Students must take **EDSE 451** and **EDSE 455** during the APT, which are normally offered in both the Fall and Winter Terms.

**General Sciences**

- 9 units in Physics, including at least 3 units at the 200-level.
- 6 units in Biology, Chemistry, Mathematics, or Physics at the 300- or 400-level
- 3 units in senior Biology, Chemistry, Mathematics, Physics, senior science courses in Environmental Studies or Geography [see Classification of Courses (1)], or AUSTA 215.

9 units in biology:

- 3 units in Biology at the 200-level
- AUBIO 111 - Functional Biology
- AUBIO 212 - Evolution and Biodiversity

9 units in chemistry:

- AUCHE 110 - General Chemistry I
- AUCHE 212 - General Chemistry II
- AUCHE 250 - Synthesis I

6 units in elementary calculus:

- AUMAT 110 - Elementary Calculus I OR
- AUMAT 116 - Calculus Concepts and Modelling

- AUMAT 112 - Elementary Calculus II

Note:

Students must take EDSE 355 during the IPT, which is normally offered in both the Fall and Winter Terms. Students must take EDSE 451 and EDSE 455 during the APT, which are normally offered in both the Fall and Winter Terms.

Mathematical Sciences

- 3 units in additional senior Computing Science or Mathematics.
- 3 units in additional Mathematics at the 300- or 400-level.

3 units in computing science:

- AUCSC 211

6 units in elementary calculus:

- AUMAT 110 - Elementary Calculus I OR
- AUMAT 116 - Calculus Concepts and Modelling

- AUMAT 112 - Elementary Calculus II

6 units in linear algebra:

- AUMAT 120 - Linear Algebra I
- AUMAT 220 - Linear Algebra II

6 units in intermediate calculus:
- **AUMAT 211 - Intermediate Calculus I**
- **AUMAT 212 - Intermediate Calculus II**

### 3 units in group theory:
- **AUMAT 229 - Introduction to Group Theory**

### 3 units in discrete mathematics:
- **AUMAT 250 - Discrete Mathematics**

### 3 units in geometry:
- **AUMAT 260 - Foundations of Geometry**

### 3 units in history and theory of mathematics:
- **AUMAT 480 - History of Mathematics and Physics**

### 3 units in statistics:
- **AUSTA 215 - Statistical Methods for the Natural Sciences**

**Notes**

1. Because **AUCSC 113** is a prerequisite for AUCSC 211, Mathematical Sciences majors should select **AUCSC 113** to satisfy the general requirement in computing.
2. Students must take **EDSE 337** during the IPT, which is normally offered in both the Fall and Winter Terms. Students must take **EDSE 451** and **EDSE 437** during the APT, which are normally offered in Winter Term only.
3. **EDSE 439** and **EDSE 442** are recommended as Education electives.

### Mathematics and Physics

- 3 units in additional Physics at the 300- or 400-level.
- 6 units in additional senior Mathematics or Physics, selected such that the major includes at least 24 units in Physics.

### 6 units in elementary calculus:
- **AUMAT 110 - Elementary Calculus I** OR
- **AUMAT 116 - Calculus Concepts and Modelling**
- **AUMAT 112 - Elementary Calculus II**

### 6 units in intermediate calculus:
- **AUMAT 211 - Intermediate Calculus I**
- **AUMAT 212 - Intermediate Calculus II**

### 3 units in applied mathematics:
- AUMAT 315 - Complex Variables
- AUMAT 330 - Ordinary Differential Equations
- AUMAT 340
- AUPHY 340

**9 units in introductory physics:**

- AUPHY 110
- **AUPHY 120** - Introductory Physics
- **AUPHY 250** - Electricity and Magnetism

**3 units in relativity and quantum mechanics:**

- AUPHY 260 - Introduction to Relativity and Quantum Mechanics

**3 units in advanced physics laboratory:**

- AUPHY 391 - Advanced Laboratory I

**3 units in history of mathematics and physics:**

- AUMAT 480 - History of Mathematics and Physics
- AUPHY 480 - History of Physics and Mathematics

**Note:**

Students must take **EDSE 355** during the IPT, which is normally offered in both the Fall and Winter Terms. Students must take **EDSE 451** and **EDSE 455** during the APT, which are normally offered in both the Fall and Winter Terms.

**Physical Sciences**

- 6 units in additional Biology, Chemistry, Mathematics, or Physics at the 300- or 400-level.
- 3 units in additional senior Computing Science or Mathematics.

**6 units in general chemistry:**

- AUCHE 110 - General Chemistry I
- AUCHE 212 - General Chemistry II

**3 units in organic chemistry:**

- AUCHE 250 - Synthesis I

**6 units in senior chemistry from**

- AUCHE 220 - Analysis I
- AUCHE 230 - Structure and Bonding
- AUCHE 279 - Physical Chemistry

**9 units in introductory physics:**
- AUPHY 110
- AUPHY 120 - Introductory Physics
- AUPHY 250 - Electricity and Magnetism

3 units in relativity and quantum mechanics:
- AUPHY 260 - Introduction to Relativity and Quantum Mechanics

3 units in advanced physics laboratory:

3 units in history of physics:
- AUPHY 480 - History of Physics and Mathematics

Prerequisite courses: 9 units in calculus:
- AUMAT 110 - Elementary Calculus I OR
- AUMAT 116 - Calculus Concepts and Modelling
- AUMAT 112 - Elementary Calculus II
- AUMAT 211 - Intermediate Calculus I

Notes

1. AUMAT 212 is a corequisite for AUPHY 310 and AUPHY 350. Due to the number of Mathematics prerequisites for this major, it is suggested that the Physical Sciences major be taken in combination with a Mathematics minor.
2. Students must take EDSE 355 during the IPT, which is normally offered in both the Fall and Winter Terms. Students must take EDSE 451 and EDSE 455 during the APT, which are normally offered in both the Fall and Winter Terms.