

## Engineering at Union – The First Year

All of the engineering majors require 40 courses for graduation, so we recommend that students take 10 courses per year. If you have AP credits, we still recommend taking 10 courses the first year. You will need to officially declare a specific engineering major (Biomedical Engineering (BME), Computer (CpE), Electrical (EE) or Mechanical (ME)) by the 6<sup>th</sup> week of the **Spring** term. The following table summarizes the courses that should be taken the first year. It shows the 4<sup>th</sup> course in the Winter, but this could be taken in the Spring term if desired.

| FALL TERM   | WINTER TERM     | SPRING TERM   |
|-------------|-----------------|---------------|
| Math        | Math            | Math          |
| ESC100      | PHY120          | PHY121        |
| Fall Option | Winter Option 1 | Spring Option |
|             | Winter Option 2 |               |

### Mathematics and Physics

Most students will take five courses of math and physics, and the particular courses will depend on your math placement exam results. If you place high enough to start in MTH 113 or MTH 115, you will have an additional elective or two your first year, which some students use to take advanced math courses. Below are five possible lists of Mathematics and Physics courses that you could take during your first year:

- MTH 105, 112, 115, PHY 120, 121
- MTH 110, 112, 115, PHY 120, 121
- MTH 113 (or AP credits for MTH 110, 112), IMP 120, 121 (4 course credits, same material as MTH 115, 117, PHY 120, 121)
- MTH 113, 115, PHY 120, 121 (and possibly MTH 117)
- MTH 115, PHY 120, 121 (and possibly MTH 117, 130)

### Option Courses

#### 1) First Year Preceptorial (FYP)

This is required for all Union students as part of the General Education program.

#### 2) Chemistry

CHM 101 or an equivalent is required by ME and BME. ME students should take it in their first year. The Chemistry department requires that you take an on-line placement examination to be placed in one of the introductory courses.

#### 3) Computer Science

All engineering majors must take one of the following introductory CSC courses: CSC 103, 104, 105, 106, 107 or 108. CpE and EE students should take this course in their first year; BME and ME students may be able to complete this in their first year but typically take it later in their curricula.

#### 4) Biology

BIO 104 is required for BME majors.

#### 5) Engineering

ECE 101 (The Joy of Electronics) is required for EE majors in the first year. It is offered in the Spring term. MER 101 (Engineering Graphics) is required by ME; it is offered in Winter and Spring and should be taken in the first year. BME majors are required to take BME 101 (Graphics and Image Processing for Biomedical Systems) in the Spring term.

#### 6) Mathematics

MTH 197 or 199 is required for CpE students. MTH 197 is appropriate as a first year course.

### 7) Common Curriculum options

Additional options should be chosen to satisfy the Common Curriculum requirements. Consult with your advisor to select courses that will support your academic goals such as study abroad, a double major, or a minor.

To plan your options, refer to the table below to see when course options are offered.

| Fall                                              | Winter                                             | Spring                                                           |
|---------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------|
| First Year Preceptorial                           | First Year Preceptorial                            |                                                                  |
| CHM 101 Introductory Chemistry I                  | CHM 101 Introductory Chemistry I                   | CHM 101 Introductory Chemistry I                                 |
| CHM 110 Introductory Chemistry: Accelerated       |                                                    |                                                                  |
| CSC 10x Introduction to Computer Science          | CSC 10x Introduction to Computer Science           | CSC 10x Introduction to Computer Science                         |
| BIO 104 Cellular Foundations of Life              | BIO 104 Cellular Foundations of Life               | BIO 104 Cellular Foundations of Life                             |
| MTH 105 Differential Calculus with Pre-calc       | MTH 105 Differential Calculus with Pre-calc        |                                                                  |
| MTH 110 Calculus I - Differential                 | MTH 110 Calculus I - Differential                  |                                                                  |
|                                                   | MTH 112 Calculus II - Integral                     | MTH 112 Calculus II - Integral                                   |
| MTH 113 AP Calculus                               |                                                    |                                                                  |
| MTH 115 Calculus III                              | MTH 115 Calculus III                               | MTH 115 Calculus III                                             |
| MTH 117 Calculus IV                               | MTH 117 Calculus IV                                | MTH 117 Calculus IV                                              |
| MTH 197 Discrete Mathematics for Computer Science |                                                    |                                                                  |
| PHY 120 Matter in Motion                          | PHY 120 Matter in Motion                           | PHY 120 Matter in Motion                                         |
| PHY 121 Principles of Electromagnetics            | PHY 121 Principles of Electromagnetics             | PHY 121 Principles of Electromagnetics                           |
|                                                   | IMP 120 Integrated Math/Physics (2 course credits) | IMP 121 Integrated Math/Physics (2 course credits)               |
|                                                   | MER 101 Engineering Graphics                       | MER 101 Engineering Graphics                                     |
|                                                   |                                                    | ECE 101 Joy of Electronics                                       |
|                                                   |                                                    | BME 101 Graphics and Image Processing for Biomedical Engineering |

- Detailed advising guides for the BME, CpE and EE majors as well as sample schedules are available here: [https://www.union.edu/ecbe/ecbe\\_advising](https://www.union.edu/ecbe/ecbe_advising)
- A [mechanical engineering degree planner](#) is located at the ME [courses and requirements](#) website (major tab).