

# **Recommended Courses**

## **For Pursuing Engineering After Carleton**

Although there are no official pre-engineering courses, the courses listed below are recommended for students interested in pursuing engineering after Carleton. The courses listed in this document are not exhaustive, nor should they be taken as strict requirements for pursuing engineering beyond Carleton. You should not feel as if you need to sacrifice your Carleton experience in order to take these courses. If you have particular questions about recommended courses as they relate to your future career path, please contact the pre-engineering advisor.

### **General Courses for all types of engineering:**

- i. MATHEMATICS
  - The full sequence of Calculus (MATH 101 or 111, MATH 120, MATH 210 or 211)
  - Differential Equations (MATH 241)
- ii. PHYSICS
  - Mechanics and Thermodynamics (PHYS 131 and 152 – Fall Term only)  
Note: PHYS 131 is a 1<sup>st</sup> 5-week course and PHYS 152 is a 2<sup>nd</sup> 5-week course both taught in the fall. Students can also take 143 and 144 to cover PHYS 131, but must still take PHYS 152.  
*Students majoring in Physics at Carleton should take PHYS 131 and PHYS 151 (not 152), or the equivalent PHYS 143 or 144, and PHYS 346. PHYS 152 can be taken, but will not fulfill the applied physics requirement for the major.*
  - Electricity, Magnetism, and Optics (PHYS 165)  
*Students majoring in Physics at Carleton should take PHYS 235 and either PHYS341 or PHYS344 as an applied physics course. PHYS 165 can be taken but does not count towards the physics majors.*
- iii. CHEMISTRY
  - General Chemistry I (CHEM 123)  
or
  - Principles of Environmental Chemistry (CHEM 128)
- iv. LAB REQUIREMENT
  - At least one term of physics and chemistry labs.
- v. COMPUTER SCIENCE\*\*
  - Introduction to Computer Science (CS 111)
  - Data Structures (CS 201)  
*\*\*Graduate programs may require programming in JAVA, Matlab, or C. Taking Data Structures will give you the necessary background to program in JAVA. If you would like to learn Matlab or C, you will need to seek opportunities to do that on your own.*
- vi. HUMANITIES AND SOCIAL SCIENCES
  - Principles of Economics (ECON 111)

- Courses that develop your oral and written presentation/communication skills including but not limited to ENGL 109

### **Additional coursework recommended for specific areas of engineering**

If you happen to know what type of engineering you are interested in pursuing, you may want to specifically consider the courses listed under each type of engineering in addition to the general courses specified. Although some courses recommended for a particular field are general, others are specific to where you would like to go within the discipline.

#### **APPLIED MATHEMATICS or APPLIED PHYSICS**

##### **MATHEMATICS**

- Ordinary Differential Equations (MATH 241)

##### **PHYSICS**

- Any Applied Physics Course

##### **OTHER SCIENCE**

- One or more introductory chemistry, biology, or geology course based on your area(s) of interest
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#### **BIOMEDICAL ENGINEERING**

##### **MATHEMATICS**

- Ordinary Differential Equations (MATH 241)
- Linear Algebra (MATH 232)
- Probability (MATH 265)
- Introduction to Statistical Inference (STAT 250)

##### **PHYSICS**

- Fluids and Waves (PHYS 145)
- Medical Physics (PHYS 261-not taught on a regular basis)

##### **CHEMISTRY**

- General Chemistry II (CHEM 230)
- Organic Chemistry I (CHEM 233)

##### **BIOLOGY**

- Introduction to Molecular and Cellular Biology (BIO 125)
  - Environmental Biology (BIO 126)
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#### **CHEMICAL ENGINEERING**

##### **MATHEMATICS**

- Ordinary Differential Equations (MATH 241)
- Linear Algebra (MATH 232)

##### **CHEMISTRY**

- Principles of Environmental Chemistry (CHEM 128)
  - General Chemistry II with lab (CHEM 230)
  - Organic Chemistry I with lab (CHEM 233)
  - Organic Chemistry II with lab (CHEM 234)
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## **CIVIL ENGINEERING**

### **MATHEMATICS**

- Ordinary Differential Equations (MATH 241)
- Linear Algebra (MATH 232)

### **ENGINEERING MECHANICS**

- Topics In Advanced Classical Mechanics (PHYS 355)
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## **COMPUTER ENGINEERING**

### **MATHEMATICS**

- Ordinary Differential Equations (MATH 241)
- Linear Algebra (MATH 232)

### **COMPUTER SCIENCE**

- Data Structures in JAVA (CS 201)
  - Mathematics of Computer Science (CS 202)
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## **EARTH AND ENVIRONMENTAL ENGINEERING**

### **MATHEMATICS**

- Ordinary Differential Equations (MATH 241)
- Linear Algebra (MATH 232)

### **CHEMISTRY**

- General Chemistry II with lab (CHEM 230)
- Organic Chemistry I (CHEM 233)

### **PHYSICS**

- Fluids and Waves (PHYS 145 or PHYS 341)
- Materials Science (PHYS 260)

### **BIOLOGY**

- Introduction to Molecular and Cellular Biology (BIO 125)

### **GEOLOGY**

- Introduction to Environmental Geology (GEOL 120)
  - Energy and the Environment (GEOL 215)
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## **ELECTRICAL ENGINEERING**

### **MATHEMATICS**

- Ordinary Differential Equations (MATH 241)
- Linear Algebra (MATH 232)

### **PHYSICS**

- Classical and Quantum Waves (PHYS 341 or PHYS 344 and PHYS 335)
- Electronics and Lab (PHYS 343)

### **COMPUTER SCIENCE**

- Introduction to Computer Science (CS 111)
  - Data Structures (CS 201)
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## **MATERIALS SCIENCE AND ENGINEERING**

### **PHYSICS**

- Physics of Soft Matter (PHYS 238)
- Materials Science (PHYS 260)
- Classical and Quantum Waves (PHYS 341-preferred or PHYS 344 and PHYS 335)
- Solid-State Physics (PHYS 354)

### **CHEMISTRY**

- General Chemistry II with lab (CHEM 230)

### **MATHEMATICS**

- Ordinary Differential Equations (MATH 241)
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## **MECHANICAL ENGINEERING**

### **MATHEMATICS**

- Ordinary Differential Equations (MATH 241)
- Linear Algebra (MATH 232)

### **PHYSICS**

- Topics In Advanced Classical Mechanics (PHYS 355)
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