

# Plan of Study for the Mechanical and Materials Science and Engineering Track of AB Engineering Sciences Concentration

Effective for Students Declaring the Concentration after August 1, 2025

NAME: \_\_\_\_\_

CLASS: \_\_\_\_\_

EMAIL: \_\_\_\_\_

DATE: \_\_\_\_\_

This Plan of Study Form is for a (*Circle One*):

DECLARATION

REVISION

**Please list your selected concentration courses in the schedule below:**

Fall 1	Spring 1	Fall 2	Spring 2	Fall 3	Spring 3	Fall 4	Spring 4

REQUIRED COURSES	Selected Courses
<p><b>Mathematics (2-4 courses)</b></p> <p><i>Begin according to placement:</i></p> <ul style="list-style-type: none"> <li>• Math 1a – Intro to Calculus 1(or Math Ma &amp; Mb)</li> <li>• Math 1b – Intro to Calculus 2</li> <li>• Math 21a – Multivariable Calculus</li> <li>• Math 21b – Linear Algebra &amp; Differential Equations</li> </ul>	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>
<p><b>Physics (2 courses)</b></p> <ul style="list-style-type: none"> <li>• PS 12a – Mechanics and Statistical Physics (or Physics 15a or 16, or AP 50a)</li> <li>• PS 12b – Electromagnetism and Quantum Physics (or Physics 15b or AP50b)</li> </ul>	<ul style="list-style-type: none"> <li>•</li> <li>•</li> </ul>
<p><b>Computer Science (1 course) <i>Select one:</i></b></p> <ul style="list-style-type: none"> <li>• AM 10 – Computing w/Python for Scientists &amp; Engineers</li> <li>• SCI 5 – Intro to Computation for Contemporary Science</li> <li>• CS 32 – Computational Thinking and Problem Solving</li> <li>• CS 50 – Intro to Computer Science 1</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>

<b>Applied Mathematics</b> <ul style="list-style-type: none"> <li>• AM 105 - Ordinary &amp; Partial Differential Equations</li> </ul>	•
<b>Mechanical Engineering Core</b> <ul style="list-style-type: none"> <li>• ES 120 – Intro to the Mechanics of Solids</li> <li>• ES 123 – Intro to Fluid Mechanics</li> <li>• ES 125 – Mechanical Systems</li> <li>• ES 181 – Engineering Thermodynamics</li> <li>• ES 190 – Intro to Materials Science &amp; Engineering</li> </ul>	• • • • •
<b>Electronics*</b> (1 course)  Select one - see list on page 3	•
<b>Engineering Electives*</b> (2 courses)  Select two - see list on page	• •

\* For courses co-listed in another department, students must enroll in the Engineering Sciences offering. No more than three of Engineering Sciences 6, 50, 51, and 53 can count toward concentration credit.

Required Signatures:

\_\_\_\_\_  
Student

\_\_\_\_\_  
Date

\_\_\_\_\_  
Assistant/Director of Undergraduate Studies

\_\_\_\_\_  
Date

This plan *does* / *does not* meet the ABET distribution requirements.

\_\_\_\_\_  
Associate Dean for Education

\_\_\_\_\_  
Date

## Electronics

- ES 50 – Intro to Electrical Engineering
- ES 152 AND CS 141
  - If both ES 152 and CS 141 are taken, the second course can count as an Engineering Elective

## Engineering Electives

*Only if taken during Freshman or Sophomore years:*

- *ESE 6 – Introduction to Environmental Science & Engineering*
- *ES 53 – Quantitative Physiology as a Basis for Bioengineering*
  
- AP 195 – Intro to Solid State Physics
- BE 110 - Physiological Systems Analysis
- CHEM 160 – Quantum Chemistry
- ESE 109 – Earth Resources and the Environment
- ES 51 – Computer Aided Machine Design
- ES 105hfr – Humanitarian Design Projects (*must be taken twice*)
- ES 96 – Engineering Problem Solving & Design Project
- ES 128 - Computational Solid and Structural Mechanics
- ESE 131 – Introduction to Physical Oceanography and Climate
- ESE 132 - Introduction to Meteorology and Climate
- ES 151 – Applied Electromagnetism
- ES 156 - Signals and Communications
- ES 159 – Intro to Robotics
- ESE 160 - Space Science and Engineering
- ESE 162 - Hydrology
- ESE 166 – State of the Art Instrumentation in Environmental Sciences
- ES 170 – Engineering Quantum Mechanics
- ES 173 – Intro to Electronic & Photonic Devices
- ES 175 – Photovoltaic Devices
- ES 177 – Photonic & Electronic Device Laboratory
- ES 183 – Intro to Heat Transfer
- ES 192 – Material Selection & Design
- PHYS 143a – Quantum Mechanics 1
- ES 190 - Introduction to Materials Science and Engineering
- ES 155 - Systems and Control
- ES 231 - Energy Technology
- ES 220 - Fluid Dynamics
- ES 240 - Solid Mechanics

### Prerequisite Planning Table for the ES AB - Mech Track

	Typically Offered	Math	Physics	Other
<i>Required Courses</i>				
ES 120	Spring	<b>21a, Co: 21b</b>	<b>A</b>	
ES 123	Spring	<b>21a, b</b>	<b>A</b>	
ES 125	Fall	<b>21a, 21b</b>	<b>A</b>	
ES 181	Fall		<b>A</b>	
ES 190	Spring	<b>21a, b</b>	<b>A, B</b>	
<i>Selected Electives</i>				
ES 50	Spring	<b>1a, b</b>	<b>Co: B</b>	<i>AM 10</i>
ES 152	Fall			
ES 153	Fall & Spring			
CS 141	Spring			
ES 155	Fall			
ES 192	Spring	<i>21a, 21b</i>		

<sup>1</sup>Courses listed as Recommended Preparation, and not an enforced prerequisite, are shown in italics

<sup>2</sup>Courses marked with a "Co:" may be taken as a co-requisite

<sup>3</sup>Equivalent courses are accepted for prerequisites (e.g., Phys 15a, PS 12a, or AP50a all count for Physics A)