Plan of Study for the Mechanical and Materials Science and Engineering Track of AB Engineering Sciences Concentration
Effective for Students Declaring the Concentration after July 1, 2019

DATE: ________________  NAME: __________________________

CLASS: ________________  EMAIL: __________________________

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

<table>
<thead>
<tr>
<th>REQUIRED COURSES</th>
<th></th>
<th>Semester (Fall/Spring Year)</th>
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<tbody>
<tr>
<td><strong>Mathematics Required</strong> 4 courses</td>
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<tr>
<td>Math 1a – Intro to Calculus 1 (or Math Ma &amp; Mb)</td>
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<tr>
<td>Math 1b – Calculus, Series, and Differential Equations</td>
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<tr>
<td>Math 21a – Multivariable Calculus</td>
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<td>(or AM 21a or 23a)</td>
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<tr>
<td>Math 21b – Linear Algebra &amp; Differential Equations</td>
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<td>(or AM 21b or 23b)</td>
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<td><strong>Physics</strong> 2 courses</td>
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<tr>
<td>PS 12a – Mech from an Analytic, Num &amp; Exp Perspective</td>
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<td>(or Physics 15a or 16, AP 50a)</td>
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<tr>
<td>PS 12b – E &amp; M from an Analytic, Num &amp; Exp Perspective</td>
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<tr>
<td>(or Physics 15b or AP50b)</td>
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<tr>
<td><strong>Computer Science</strong> CIRCLE ONE</td>
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<tr>
<td>CS 50 – Intro to Computer Science 1</td>
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<td>CS 51 – Intro to Computer Science 2</td>
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<td>CS 61 – Systems Programming &amp; Machine Organization</td>
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<td><strong>Sophomore Forum</strong></td>
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<tr>
<td><strong>Applied Mathematics</strong> See list on page 3</td>
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<tr>
<td><strong>Mechanical Engineering Core</strong></td>
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<tr>
<td>ES 120 – Intro to the Mechanics of Solids</td>
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<td>ES 123 – Intro to Fluid Mechanics &amp; Transport Processes</td>
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<td>ES 125 – Mechanical Systems</td>
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<td>ES 181 – Engineering Thermodynamics</td>
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<td>ES 190 – Intro to Materials Science &amp; Engineering</td>
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<tr>
<td>REQUIRED COURSES</td>
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<tr>
<td><strong>Electronics</strong>* See list on page 3</td>
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<tr>
<td><strong>Engineering Electives</strong> See list on page 3</td>
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</table>

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

Student Signature

________________________________________                     Date: ______________

Associate Director of Undergraduate Studies

________________________________________                     Date: ______________

Adviser indicate if a petition is needed: Yes ____ No ____

Director of Undergraduate Studies

________________________________________                     Date: ______________
**Applied Mathematics**
- AM 104 – Series Expansions & Complex Analysis
- AM 105 – Ordinary & Partial Differential Equations
- AM 108 – Nonlinear Dynamical Systems
- AM 111 – Intro to Scientific Computing
- AM 120 – Applied Linear Algebra and Big Data

**Electronics**
- ES 54 – Electronics for Engineers
- ES 153 – Laboratory Electronics
- ES 152 AND CS 141
  - o 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 50 – Introduction to Electrical Engineering
- ES 53 – Quantitative Physiology as a Basis for Bioengineering

- AP 195 – Intro to Solid State Physics
- BE 110 - Physiological Systems Analysis
- Chemistry 160 – Quantum Chemistry
- ESE 109 – Earth Resources and the Environment
- ES 51 – Computer Aided Machine Design
- ES 91hfr – 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 173 – Intro to Electronic & Photonic Devices
- ES 175 – Photovoltaic Devices
- ES 177 – Photonic & Electronic Device Laboratory
- Physics 143a – Quantum Mechanics 1