# Plan of Study for the Electrical and Computer Engineering Track of AB Engineering Sciences Concentration

Effective for Students Declaring the Concentration after July 1, 2021

DATE: _____ NAME: _____

CLASS: _____ EMAIL: _____

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

| **REQUIRED COURSES**<br>(Circle course and % for course you are taking or plan to take in each category.) | **Semester**<br>(Fall/Spring Year) |
|---|---|
| **Mathematics Required** 4 courses<br>Math 1a – Intro to Calculus 1 (or Math Ma & Mb)<br>Math 1b – Calculus, Series, and Differential Equations<br>Math 21a – Multivariable Calculus<br>(or AM 21a or 23a)<br>Math 21b – Linear Algebra & Differential Equations<br>(or AM 21b or 23b)) | _____<br>_____<br>_____<br>_____ |
| **Physics** 2 courses<br>PS 12a – Mech from an Analytic, Num & Exp Perspective<br>(or Physics 15a, 16, or AP 50a)<br>PS 12b – E&M from an Analytic, Num & Exp Perspective<br>(or Physics 15b, or AP 50b) | _____<br>_____ |
| **Computer Science** CIRCLE ONE<br>CS 50 – Intro to Computer Science 1<br>CS 51 – Intro to Computer Science 2<br>CS 61 – Systems Programming & Machine Organization | _____ |
| **Sophomore Forum** | _____ |
| **Electrical Engineering Core**<br>ES 150 – Probability with Engineering Applications<br>ES 152 – Circuits, Devices, and Transduction<br>CS 141 – Computing Hardware<br>ES 155 – Systems and Control<br>ES 156 – Signals and Communications | _____<br>_____<br>_____<br>_____<br>_____ |

| | |
|---|---|
| **Engineering Electives*** See list on page 3<br>1.<br>2.<br>3.<br>4. | <br>_____<br>_____<br>_____<br>_____ |

* *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: _____

**Engineering Electives**

Students choosing to Concentrate in *Electrical and Computer Engineering* in the *Engineering Sciences A.B. Program* have a broad set of *Engineering Electives* which they may take to satisfy their degree requirements.

The following courses may serve as *Engineering Electives,* only if taken during the Freshman or Sophomore years. Only *one* of these courses may be used as an *Engineering Elective*:

- ESE 6 – Introduction to Environmental Science & Engineering
- ES 50 – Introduction to Electrical Engineering
- ES 53 – Quantitative Physiology as a Basis for Bioengineering

The following courses are intended to serve as a *sampling* of allowed *Engineering Electives.* Other courses may be allowed (including 200-level courses): students should confer with their *Concentration Advisors* to determine the suitability of a course as an *Engineering Elective.*

- AM 104 – Series Expansions & Complex Analysis
- AM 105 – Ordinary & Partial Differential Equations
- AM 108 – Nonlinear Dynamical Systems
- AP 195 – Intro to Solid State Physics
- Chemistry 160 – Quantum Chemistry
- BE 128 – Intro to Biomedical Imaging & Sys
- BE 129 – Intro to Bioelectronics
- CS 51 - Intro to Computer Science 2
- CS 143 - Computer Networks
- CS 144r – Networks Design Projects
- CS 148 – Design of VLSI Circuits & Systems
- CS 161 – Operating Systems
- CS 175 – Computer Graphics
- CS 249r – Tiny Machine Learning
- CS 283 - Computer Vision
- ES 51 – Computer Aided Machine Design
- ES 54 – Electronics for Engineers
- ES 91hfr – Humanitarian Design Projects (*must be taken twice*)
- ES 120 – Intro to the Mechanics of Solids
- ES 121 – Intro to Optimization: Models & Methods
- ES 123 - Introduction to Fluid Mechanics & Transport Processes
- ES 143 – Computer Vision
- ES 151 - Applied Electromagnetism
- ES 159 – Intro to Robotics
- ESE 160 - Space Science and Engineering
- 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 – Microfabrication Laboratory
- ES 181 – Engineering Thermodynamics
- ES 190 – Intro to Materials Science & Engineering
- PHYS 143a – Quantum Mechanics 1
- PHYS 153 – Electrodynamics

**Prerequisite Planning Table for the ES AB - ECE Track**

| | Typically Offered | Math | Chemistry | Physics | Other |
|---|---|---|---|---|---|
| *Required Courses* | | | | | |
| ES 150 | Spring | **21a, Co: 21b** | | | |
| ES 152 | Fall | **1a,b** | | **Co: B** | |
| CS 141 | Spring | | | | *CS 50* |
| ES 155 | Fall | **1a.b** | | | |
| ES 156 | Spring | **21a,b** | | | |
| *Selected Electives* | | | | | |
| AP 195 | Fall | | | | |
| BE 128 | Spring | **1b** | | **B** | |
| BE 129 | Spring | **1b** | **LS 1a**, *Chem 17* | **B** | |
| BE 130 | Spring | | | | |
| CS 61 | Fall | | | | *CS 50* |
| CS 143 | Fall | | | | *CS 50* |
| CS 144r | Spring | | | | *CS 51, 143, 181* |
| CS 146 | Fall | | | | CS 141 |
| CS 148 | Spring | | | | CS 141 |
| CS 189 | Spring | | | | *CS 51* |
| ES 50 | Spring | | | | |
| ES 151 | Spring | **21a** | | **A,B** | |
| ES 153 | Fall & Spring | | | | |
| ES 154 | Bracketed | | | | |
| ES 157 | Fall | **21a,b** | | | *ES 150 or 156* |
| ES 159 | Fall | | | **A** | CS 50 |
| ES 170 | Spring | **21a,b** | | | |
| ES 173 | Fall | **1b** | | **B** | |
| ES 176 | Bracketed | | | | |
| ES 177 | Spring | | | **A,B** | **ES 173** |

[1]Courses listed as Recommended Preparation, and not an enforced prerequisite, are shown in italics

[2]Courses marked with a "Co:" may be taken as a co-requisite

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