Plan of Study for the Electrical Engineering SB 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

The S.B. Program in Electrical Engineering must contain at least 20 half courses: 4 half-courses in mathematics, 4 half-courses in basic sciences, and 12 half-courses in engineering topics. Plans of Study will not be considered final until this form has been signed. The signature of this form ensures that the proposed plan meets the ABET distribution requirements.

REQUIRED COURSES (Circle course and % for course you are taking or plan to take in each category.)	**Math**	**Science**	**Engr. Topics**	**Semester** (Fall/Spring Year)
Mathematics Required				
Math 1a – Intro to Calculus 1 (or Math Ma & Mb)	1.00			
Math 1b – Calculus, Series, and Differential Equations	1.00			
Math 21a – Multivariable Calculus	1.00			
Math 21b – Linear Algebra & Differential Equations	1.00			
Mathematics Elective (if you started in AM/Math 21a) 1.	1.00			
Probability and Statistics				
ES 150 – Probability with Engineering Applications	1.00			
Physics				
PS 12a – Mech from an Analytic, Num & Exp Perspective (or Physics 15a, 16, or AP 50a)		1.00		
PS 12b – E&M from an Analytic, Num & Exp Perspective (or Physics 15b, or AP 50b)		1.00		
Science Electives See list on page 3				
1.		1.00		
2.		1.00		
Computer Science CIRCLE ONE				
CS 50 – Intro to Computer Science 1			1.00	
CS 51 – Intro to Computer Science 2				
CS 61 – Systems Programming & Machine Organization				

Sophomore Forum				
Electrical Engineering Core ES 152 – Circuits, Devices, and Transduction CS 141 – Computing Hardware ES 155 – Systems and Control ES 156 – Signals and Communications			 1.00 1.00 1.00 1.00	 _____ _____ _____ _____
Electrical Engineering Electives* See list on page 3 *Students should consult an advisor to select an appropriate set of Electrical/Engineering Electives* 1. 2. 3.			 1.00 1.00 1.00	 _____ _____ _____
Engineering (or Additional Electrical) Electives* See list on page 3 1. 2.			 1.00 1.00	 _____ _____
Engineering Design ES 96 – Engineering Problem Solving & Design Project* ES 100hf – Engineering Design Projects			 1.00 1.00	 _____ _____
TOTALS	**/4**	**/4**	**/12**	

***** *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. ES 96 or ES 227 must be taken in the junior year, prior to taking ES 100hf.*

Student signature

_____ Date: _____

Associate/Director of Undergraduate Signature

_____ Date: _____

This plan does/does not meet the ABET distribution requirements

_____ Date: _____

Student Affairs Office

Mathematics Electives

- AM 104 – Series Expan & Complex Analysis
- AM 105 – Ordinary & Partial Diff Eqs
- AM 106 – Applied Algebra
- AM 107 – Graph Theory & Combinatorics
- AM 108 – Nonlinear Dynamical Systems
- AM 120 – Applied Lin Algebra & Big Data

Science Electives

Introductory Courses

- LS 1a - Intro to the Life Sciences
  or LPS A – Foundational Chem & Bio
- PS 11 – Found & Frontiers of Modern Chem
  or PS 1 - Chem Bonding, Energy, & Reactivity
- PS 10 - Quantum & Stat Found of Chem
- PHYS 15c – Wave Phenomena

Upper Level Courses

- CHEM 160 - Quantum Chemistry
- PHYS 143a - Quantum Mechanics I
- PHYS 143b - Quantum Mechanics II
- PHYS 153 – Electrodynamics
- PHYS 181 – Stat Mech & Thermodynamics

Electrical Engineering Electives

ES 50 can only be taken for concentration credit during freshman or sophomore year. Not more than two from: ES 50 or ES 54 (formerly ES 52), CS 61, ES 170.

- AP 195 – Intro to Solid State Physics
- BE 128 – Intro to Biomedical Imaging & Sys
- BE 129 – Intro to Bioelectronics
- BE 130 – Neural Control of Movement
- BE 131- Neuroengineering
- CS 61 - System Program & Machine Org
- CS 143 – Computer Networks
- CS 144r – Networks Design Projects
- CS 146 – Computer Architecture
- CS 148 – Design of VLSI Circuits & Systems
- CS 189 – Autonomous Multi-Robot Systems
- CS 249r – Tiny Machine Learning
- ES 50 – Intro to Electrical Engineering
- ES 54 – Electronics for Engineers
- ES 143 – Computer Vision
- ES 151 – Applied Electromagnetism
- ES 153 – Laboratory Electronics
- ES 154 – Electronic Devices & Circuits
- ES 157 – Biological Signal Processing
- ES 159 – Intro to Robotics
- ES 170 – Engineering Quantum Mechanics
- ES 173 – Intro to Electronic & Photonic Dev
- ES 175 – Photovoltaic Devices
- ES 176 – Intro to MEMS
- ES 177 – Micro Fabrication Laboratory

Engineering Electives *(Incomplete List)*

For courses that are co-listed in another department, students must enroll in the Engineering Sciences offering
ESE 6 and ES 53 can only be taken for concentration credit during freshman or sophomore year

- BE 191 – Intro to Biomaterials
- CS 51 – Intro to Comp Science 2
- CS 124 – Data Structures & Algorithms
  - ***or*** CS 125 – Algorithms & Complexity
- CS 175 – Computer Graphics
- CS 179 - Design of Usable Interactive Sys
- CS 181 – Machine Learning
- CS 182 – Artificial Intelligence
- CS 187 – Computational Linguistics
- ESE 6 – Intro to Environmental Sci & Eng
- ES 51 – Computer Aided Machine Design
- ES 53 – Quant Physiology or Bioengineering
- ES 91hfr - Humanitarian Design Projects (*must be taken twice*)
- ES 111 – Intro to Scientific Computing
- ES 115 – Mathematical Modeling
- ES 121 – Intro to Optimization
- ES 120 – Intro to the Mechanics of Solids
- ES 123 – Intro to Fluid Mech & Transport
- ES 125 – Mechanical Systems
- ES 128 – Comput. Solid & Structural Mech.
- ESE 160 – Space Science & Engineering
- ESE 166 - State of the Art Instrumentation in Env Sci
- ES 190 – Intro to Materials Sci & Eng
- ES 231 – Energy Technology

Prerequisite Planning Table for the Electrical Engineering SB

	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**			
ES 96	Fall & Spring				**Junior Year**
ES 100HF	Fall-Spring				**ES 96**
Selected Electives					
AP 195	Fall				*Quant Mech*
BE 128	Spring	**1b**		**B**	
BE 129	Spring	**1b**	**LS 1a,** *Chem 17*	**B**	
BE 130	Spring				
BE 131	Fall				
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 54	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**		**A,B**	
ES 175	Spring			**A,B**	**ES 173**
ES 176	Bracketed			**A,B**	
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)