

Plan of Study for the Electrical Engineering SB Concentration

Effective for Students Declaring the Concentration after July 1, 2023

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 32 – Computational Thinking & Problem Solving				
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 <i>Students should consult an advisor to select an appropriate set of Electrical/Engineering Electives</i> 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 three 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
- CHEM 10 - Quantum & Stat Found of Chem
- PHYS 15c – Wave Phenomena
- ASTRO 16 – Stellar & Planetary Astro
- ASTRO 17 - Galactic & Extragalactic Astro

Upper Level Courses

- CHEM 160 - Quantum Chemistry
- PHYS 19 – Intro to Theoretical Physics
- PHYS 125 – Widely Applied Physics
- 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, CS 61, ES 170.

- AP 195A – 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 128 – Convex Optimization & App in ML
- CS 143 – Computer Networks
- CS 144r – Networks Design Projects
- CS 146 – Computer Architecture
- CS 148 – Design of VLSI Circuits & Systems
- CS 184 – Intro to Reinforcement Learning
- CS 189 – Autonomous Multi-Robot Systems
- CS 249r – Tiny Machine Learning
- ES 50 – Intro to Electrical Engineering
- ES 143 – Computer Vision
- ES 151 – Applied Electromagnetism
- ES 153 – Laboratory Electronics
- ES 154 – Electronic Devices & Circuits
- ES 157 – Biological Signal Processing
- ES 158 – Intro to Optimal Control & Estimation
- 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 105hfr – Humanitarian Design Projects (4 credits required)
- ES 111 – Intro to Scientific Computing
- ES 115 – Mathematical Modeling
- ES 121 – Intro to Optimization
- ES 120 – Intro to the Mechanics of Solids
- ES 125 – Mechanical Systems
- ESE 160 – Space Science & Engineering
- ESE 166 – State of the Art Instrument 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
<i>Required Courses</i>					
ES 150	Spring	21a, Co: 21b		Co: B	
ES 152	Fall	1a,b			
CS 141	Spring				<i>CS 50</i>
ES 155	Fall	1a,b			
ES 156	Spring	21a,b			
ES 96	Fall & Spring				Junior Year
ES 100HF	Fall-Spring				ES 96
<i>Selected Electives</i>					
AP 195A	Fall			<i>A,B,C</i>	<i>Quant Mech</i>
BE 128	Spring	1b		B	
BE 129	Spring				<i>ES 50/152</i>
BE 130	Spring				
BE 131	Fall				<i>ES 50/152 & LS</i>
CS 61	Fall				<i>CS 50</i>
CS 128	Spring	<i>21a,b</i>			<i>Python</i>
CS 143	Fall				<i>CS 50</i>
CS 144r	Spring				<i>CS 51, 143, 181</i>
CS 146	Fall				CS 141
CS 148	Spring				CS 141
CS 184	Fall	21b			ES 150
CS 189	Spring				<i>CS 51</i>
CS 249r	Fall				
ES 50	Spring				
ES 143	Spring	<i>21b</i>			<i>CS 51 or 61</i>
ES 151	Spring	21a		A,B	
ES 153	Bracketed				
ES 154	Spring				<i>ES 152</i>
ES 157	Fall	21a,b			<i>ES 150 or 156</i>
ES 158	Spring				<i>ES 155 121</i>
ES 159	Fall	21a,b		A	<i>CS 50</i>
ES 170	Spring	21a,b			
ES 173	Fall	1b		A,B	
ES 175	Spring			A,B	ES 173
ES 176	Fall			A,B	<i>LS 1a or PS 1</i>
ES 177	Spring			A,B	

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

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

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