Plan of Study for the Mechanical 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 Mechanical 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 – Intro to Calculus 2	1.00			
Math 21a – Multivariable Calculus	1.00			
Math 21b – Linear Algebra & Differential Equations	1.00			
Probability & Statistics (if you started in Math 1b or later) CIRCLE ONE AM 101 - Statistical Inference for Scientists & Engineers ES 150 – Probability with Engineering Applications STAT 110 - Introduction to Probability	1.00			
Applied Mathematics (if you started in AM/Math 21a or later) See list on page 4 1.	1.00			
Physics				
PS 12a – Mech from an Analytic, Num & Exp Perspective (or Physics 15a or 16, AP 50a)		1.00		
PS 12b – E & M from an Analytic, Num & Exp Perspective (or Physics 15b or AP50b)		1.00		
Chemistry/Advanced Science See list on page 3 1. 2.		1.00 1.00		
Computer Science CIRCLE ONE AM 10 – Computing for Sci & Eng CS 50 – Intro to Computer Science 1			1.00	
Sophomore Forum				

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)
Electronics CIRCLE ONE ES 50 – Intro to Electrical Engineering or ES 153 – Laboratory Electronics or ES 152 AND CS 141			1.00	_____
Mechanical Engineering Core 7 courses *Select either the Mechanical or the Thermal Systems Track*				
Mechanical Systems Track† *Required* ES 51 - Computer Aided Machine Design ES 120 - Intro to the Mechanics of Solids ES 125 – Mechanical Systems ES 123 – Intro to Fluids or ES 181 – Engineering Thermo *Track Elective* *Choose 3 from ES 123, 128, 159, 181, 183, 192* 1. _____ 2. _____ 3. _____ *Thermal Systems*† *(CIRCLE ONE)* ES 181 – Eng Thermo or ES 183 - Intro to Heat Transfer			 1.00 1.00 1.00 1.00 1.00 1.00 1.00 	 _____ _____ _____ _____ _____ _____ _____
Thermal Systems Track *Required* ES 181 – Engineering Thermodynamics ES 183 – Intro to Heat Transfer ES 120 - Intro to Mech of Solids or ES 123 – Intro to Fluids ES 51 - Comp Aided Machine Design or ES 125 – Mech Sys *Track Elective* *Choose 3 from ES 51, 120, 123, 125, 173, 190, 192* 1. _____ 2. _____ 3. _____			 1.00 1.00 1.00 1.00 1.00 1.00 1.00	 _____ _____ _____ _____ _____ _____ _____
General Engineering Elective See list on page 4 1.			1.00	_____
Engineering Design ES 96 – Engineering Problem Solving & Design Project* or ES 227 – Medical Device Design* ES 100hf – Engineering Design Projects			1.00 1.00	_____ _____
TOTALS	**/4**	**/4**	**/12**	

†*At least one course in Thermal Systems must be included (ES 181 or ES 183) but this may also be counted as Required or Elective course.*

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

Student Signature

_____ Date: _____

Associate/Director of Undergraduate Studies Signature

_____ Date: _____

This plan does/does not meet the ABET distribution requirements

Student Affairs Office

_____ Date: _____

Applied Mathematics

- AM 104 – Series Expansions & Complex Analysis
- AM 105 – Ordinary & Partial Differential Equations
- AM 106 – Applied Algebra
- AM 107 – Graph Theory & Combinatorics
- AM 108 – Nonlinear Dynamical Systems
- AM 120 - Applicable Linear Algebra & Big Data

Chemistry/Advanced Science

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
- Physics 15c – Wave Phenomena

Upper Level Courses

- CHEM 160 - Quantum Chemistry
- PHYS 19 – Intro to Theoretical Physics
- PHYS 125 – Widely Applied Physics
- PHYS 143a - Quantum Mechanics I
- PHYS 151 – Mechanics
- PHYS 153 – Electrodynamics

General Engineering Electives (*Incomplete List***)**

For courses that are co-listed in another department, students must enroll in the Engineering Sciences offering

Only if taken during Freshman or Sophomore years

- *ESE 6 – Environmental Science & Technology*
- *ES 53 – Quantitative Physiology as a Basis for Bioengineering*
- AP 195 - Intro to Solid State Physics
- BE 110 - Physiological Systems Analysis
- BE 128 – Intro to Biomedical Imaging & Systems
- CS 51 – Intro to Computer Science 2
- CS 61 – System Programming & Machine Organization
- CS 141 – Computing Hardware
- ES 91hfr – Humanitarian Design Projects (*must be taken twice*)
- ES 111 – Intro to Scientific Computing
- ES 115 – Mathematical Modeling
- ES 121 – Intro to Optimization: Models & Methods
- ES 128 - Computational Solid and Structural Mechanics
- ES 151 – Applied Electromagnetism
- ES 155 – System and Control
- ES 156 - Signals and Communications
- ES 159 – Introduction 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 - Introduction to Electronic and Photonic Devices
- ES 175 – Photovoltaic Devices
- ES 177 – Microfabrication Laboratory
- ES 190 – Intro to Material Science & Engineering
- ES 192 – Material Selection & Design
- ES 231 – Energy Technology

Prerequisite Planning Table for the Mechanical Engineering SB

	Typically Offered	Math	Physics	Other
Required Courses				
ES 51	Fall & Spring			
ES 120	Spring	**21a, Co: 21b**	**A**	
ES 123	Spring	**21a,b**	**A**	
ES 125	Fall	**21a,b**	**A**	
ES 181	Fall		**A**	
ES 183	Spring	*21a*,**21b**	**A**	*ES 181*
ES 190	Fall	**21a,b**	**A,B**	
ES 192	Fall			
ES 96	Fall & Spring			**Junior Year**
ES 100HF	Fall-Spring			**ES 96 or 227**
Selected Electives				
ES 50	Spring			
ES 128				ES 120
ES 159	Fall		**A**	CS 50
ES 152	Fall	**1a,b**	**Co: B**	
ES 153	Fall & Spring			
ES 173	Fall	**1b**	**A,B**	
ES 227	Spring			*ES 51*
CS 141	Spring			*CS 50*

[1]Courses 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

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