

Plan of Study for the Biomedical Sciences & Engineering Track
of the Engineering Sciences AB Concentration
Effective for Students Declaring the Concentration after August 1, 2022

NAME: _____

CLASS: _____

EMAIL: _____

DATE: _____

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

REQUIRED COURSES (Circle or fill-in for courses planned in each category.)	Semester (FA/SP Year)
Mathematics (2-4 courses) <i>Begin according to placement:</i> Math 1a – Introduction to Calculus I (or Math Ma & Mb) Math 1b – Calculus, Series, and Differential Equations Math 21a – Multivariable Calculus (or Math 22a or 23b, or Applied Math 21a or 22b) Math 21b – Linear Algebra and Differential Equations (or Math 22b or 23a, or Applied Math 21b or 22a)	
Physics (2 courses) PS 12a - Mechanics and Statistical Physics (or AP 50a or Physics 15a or 16) PS 12b - Electromagnetism and Quantum Physics (or AP50b or Physics 15b)	
Chemistry/Life Sciences (1 course) Life Sciences 1a – An Integrated Introduction to the Life Sciences (or Life & Physical Sciences A – Foundational Chemistry and Biology)	
Computer Science (1 course) CS 50 – Introduction to Computer Science I (or CS 51 – Introduction to Computer Science II or CS 61 – Systems Programming & Machine Organization or AM 10 - Computing w/ Python for Scientists and Engineers or CS 32 – Computational Thinking and Problem Solving)	
Sophomore Forum <i>Required, non-credit.</i>	
Bioengineering Core: Physiology & Modeling (2 courses) ES 53 – Quantitative Physiology as a Basis for Bioengineering BE 110 – Physiological Systems Analysis	

REQUIRED COURSES (Circle or fill-in for courses planned in each category.)	Semester (FA/SP Year)
<p>Subtrack-specific Courses (4 courses)</p> <p><i>Select one Subtrack:</i></p> <ul style="list-style-type: none"> • <i>Mechanical Subtrack</i> <ul style="list-style-type: none"> ○ ES 120 – Intro to the Mechanics of Solids ○ ES 123 – Intro to Fluid Mechanics ○ ES 181 – Engineering Thermodynamics ○ <i>One from:</i> <ul style="list-style-type: none"> ES 54 – Electronics for Engineers ES 153 – Laboratory Electronics • <i>Electrical Subtrack</i> <ul style="list-style-type: none"> ○ ES 150 – Intro to Probability with Engineering Applications ○ ES 50 – Intro to Electrical Engineering (or ES 153 (or both ES 152 & CS 141)) ○ To reach 4 courses: 1-2 of BE 128- Biomedical Imaging Systems, BE 129 – Bioelectronics, BE 130 – Neural Control of Movement, BE 131 – Neuroengineering, or ES 157 – Biological Signal Processing • <i>Chemical & Materials Subtrack</i> <ul style="list-style-type: none"> ○ ES 123 – Intro to Fluid Mechanics ○ ES 181 – Engineering Thermodynamics ○ BE 191 – Intro to Biomaterials (<i>preferred</i>) (or ES 190 – Intro to Materials Science & Eng.) ○ PS 1 – Chemical Bonding, Energy, & Reactivity 	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>Approved Electives (<i>2 courses from the list below</i>)</p> <p>Engineering Sciences 51, 91r (one term only), 120, 123, 128, 157, 181, 190, 221, 227, 228, 240</p> <p>Biomedical Engineering 121, 125, 128, 129, 130, 131, 160, 191</p> <p>Either Applied Mathematics 101 or Engineering Sciences 150</p> <p>One from Engineering Sciences 50, 152, or 153</p> <p>Physics 136, 140, 143a, 151, 153</p> <p>One from Physical Sciences 1, 10, 11, Chemistry 17 or 20</p> <p>Applied Mathematics 104 or 105</p>	<p>_____</p> <p>_____</p>

Required Signatures:

Student

Date

Associate/Director of Undergraduate Studies (BME)

Date

Prerequisite Planning Table for the ES AB - Biomedical Sciences & Engineering Track

	Typically Offered	Math	Biology / Chemistry	Physics	Other
<i>Required Courses</i>					
ES 53	Fall			Co: A or B	
BE 110	Fall	<i>21a,b</i>		<i>B</i>	<i>ES 53</i>
<i>Selected Electives</i>					
BE 121	Fall	21b	LS 1a,1b	A,B	ES 53, Co: BE 110
BE 125	Spring		<i>LS1a, Chem 17</i>		
BE 128	Spring	1b		B	
BE 129	Spring	1b	LS 1a, Chem 17	B	
BE 130	Spring				
BE 131	Fall	1b		B	
BE 191	Fall	1b	LS1a or LPSa		
CS 141	Spring				<i>CS50</i>
ES 54	Spring				
ES 120	Spring	21a, Co: 21b		A	
ES 123	Spring	21a,b		A	
ES 150	Spring	21a, Co:21b			
ES 152	Fall	1a,b		Co: B	
ES 153	Fall & Spring				
ES 157	Fall	21a,b			<i>ES 150 or 156</i>
ES 181	Fall			A	
ES 190	Fall	21a,b		A,B	
ES 227	Spring				<i>ES 51 or ES 50</i>

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

²Courses marked with "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)