

BIOLOGICAL SYSTEMS ENGINEERING ~ LOWER DIVISION REQUIREMENTS

Units	Course	Qtr	Usually Taken	Title	Prerequisites	(COI=Consent of Instructor) (MTC=May take concurrently)
MATHEMATICS						
4	MAT 21A	F, W, S	1	Calculus	Appropriate score on PreCalc Qual. Exam	
4	MAT 21B	F, W, S	2	Calculus	MAT 21A or 21AH	
4	MAT 21C	F, W, S	3	Calculus	MAT 16C, 17C, 21B or 21BH	
4	MAT 21D	F, W, S	4	Vector Analysis	MAT 21C or 21CH	
3	MAT 22A	F, W, S	5	Linear Algebra	9 units of college math; ENG 6 or 22AL (MTC)	
3	MAT 22B	F, W, S	6	Differential Equations	MAT 21C and 22A or 67	
PHYSICS						
5	PHY 9A	F, S	3	Classical Physics	MAT 21B	
5	PHY 9B	F, W	4	Classical Physics	PHY 9A, MAT 21C and 21D (MTC)	
5	PHY 9C	W, S	5	Classical Physics	PHY 9B; MAT 21D and 22A (MTC)	
GENERAL CHEMISTRY						
5	CHE 2A	F, W	2	General Chemistry	Appropriate scores on CDE & PDE	
5	CHE 2B	W, S	3	General Chemistry	CHE 2A or 2AH	
BIOLOGICAL SCIENCES						
5	BIS 2A	F, W, S	4	Essentials of Life		
5	BIS 2B	F, W, S	5	Prin. of Ecology & Evolution	BIS 2A	
5	BIS 2C	F, W, S	6	Biodiversity & the Tree of Life	BIS 2B	
ENGINEERING SCIENCE						
4	EBS 1	F	1	Foundations of Bio. Sys. Engr.	Restricted to BSE Majors	
4	ENG 6	F, W, S	2	Application of Computers	MAT 16A or 21A w/C- or better MAT 16B or 21B (MTC)	
4	ENG 35	F, W, S	4	Statics	MAT 21D (MTC), PHY 9A, ECI 19 or ENG 6 recomm.	
4	ENG 17	F, S	6	Circuits	MAT 22A w/C- or better, MAT 22B (MTC) and PHY 9C w/C- or better	
4	EBS 75	W	5	Prop. of Matls. in Bio. Sys.	BIS 2A and PHY 9C (MTC)	
ENGLISH COMPOSITION						
4	UWP 1/Y/V	F, W, S	1	Expository Writing	ELWR Satisfied	
ORAL COMMUNICATION Select 1 course to satisfy Oral Communication.						
_____	4	CMN 1	F, W, S	6	Intro. to Public Speaking	ELWR Satisfied (RECEIVE GE WRITING)
_____	4	ENG 3	F, W, S		Intro to Engineering Design	ELWR Satisfied (RECEIVE GE - SS)

MINIMUM UPPER DIVISION UNITS REQUIRED: 72

MINIMUM UNITS REQUIRED FOR MAJOR: 185

Freshman = 00.00 - 44.99 units
Sophomore = 45.00 - 89.99 units
Junior = 90.00 - 134.99 units
Senior = 135.0 + units

Staff Academic Adviser
 Lauren Lirio Mendoza
 2038 Bainer Hall
 (530) 752-1451
 llmendoza@ucdavis.edu

Faculty Academic Adviser
 Professor Tina Jeoh
 2044 Bainer Hall
 (530) 752-1020
 tjeoh@ucdavis.edu

BIOLOGICAL SYSTEMS ENGINEERING ~ UPPER DIVISION REQUIREMENTS

Units/	Course	Qtr Taken	Qtr	Title	Prerequisites	(COI=Consent of instructor) (MTC=May take concurrently)
MATH/STATISTICS AND BASIC SCIENCES						
	2/4 CHE 8A/118A	7	F, S/F,W	Organic Chem/O Chem for Life Sci.	CHE 2B w/C- or better	
	4 CHE 8B/118B	8	F, W/F,S	Organic Chem/O Chem for Life Sci.	CHE 8A / CHE 118A	
	4 STA 100	7	F, W, S	Applied Statistics for Biological Scientists	MAT 16B or equivalent	
ENGINEERING TOPICS						
	3 ENG 100	8	W, S	Electronic Circuits & Systems	ENG 17 w/C- or better	
	4 ENG 102	7	F, W, S	Dynamics	ENG 35 and MAT 22B; Restricted to COE students	
	4 ENG 104	9	F, W, S	Mechanics of Materials	ENG 35 and MAT 22B; Restricted to COE students	
	4 ENG 105	7	F, W, S	Thermodynamics	MAT 22B and PHY 9B; Restricted to COE students	
	3 ENG 106	11	W	Engineering Economics	Upper division standing in Engineering	
	4 ENG 103	8	W	Fluid Mechanics Fundamentals	PHY 9B	
	4 EBS 125	9	S	Heat & Mass Transfer in Biological Sys.	EBS 103, ENG 105, BIS 2A/2B/2C	
	4 EBS 127	10	F	Mass Transfer & Kinetics	EBS 125	
	4 EBS 130	8	W	Dyn Model of Proc in Bio Sys	MAT 22B, ENG 6, EBS 75	
	4 EBS 165	10	F	Bioinstrumentation and Control	ENG 100 and ENG 6 or ECS 30	
	3 EBS 170A	10	F	Engr Design & Prof. Respon.	EBS 1, ENG 102 and 104	
	2,1 EBS 170B, BL	11	W	Engr Projects: Design	EBS 170A; concurrent enrollment in EBS 170BL	
	1,2 EBS 170C, CL	12	S	Engr Projects: Design Eval.	EBS 170B, BL; concurrent enrollment in EBS 170CL	

BIOLOGICAL SYSTEMS ENGINEERING ELECTIVE (EBS):

MINIMUM OF 4 UNITS

There are many possible areas of concentration in Biological Systems Engineering; our faculty have active research activities in all of these areas:

Agricultural Engineering
Biomechanics
Bioprocessing

Biotechnology
Forest Engineering
Aquacultural Engineering

Ecological Systems Engineering
Food Engineering
Bioenergy

Select four units from any upper division EBS courses not otherwise required for the major, with the exception of EBS 189-199.

ENGINEERING ELECTIVES:

MINIMUM OF 3 UNITS

All upper division courses offered by the College of Engineering may be taken as engineering electives **except the following**: ECI 123; ECS 188; ENG 103, ENG 160; and all courses numbered 190-197 and 199 (except ENG 190, which may be taken for 2 units of engineering elective credit).

BIOLOGICAL SCIENCE ELECTIVES:

MINIMUM OF 3 UNITS

All upper division courses in the College of Biological Sciences (*with the exception of BIS 132; EVE 175; EXB 102, 112, 115, 118 through 149L; MIC 100 and all courses numbered 190-199*) may be used as biological sciences electives. The following courses may also be taken as biological sciences electives: ABT 161; ANS 118, 143, 144, 146; ATM 133; AVS 100; CHA 101, 101L; ENT 100; ENH 102; ESPM 120, 182, 185 (*offered at UC Berkeley*); ESP 100, 110, 155; ETX 101,131; FST 102A, 104L, 119, 120, 128, 159; IDI 141; PLS 110A; SSC 100; WFC 121.

Students may choose other upper division courses with substantial biological content offered by the College of Agricultural and Environmental Sciences; consultation with a BSE faculty adviser and approval by petition is required.

UPPER DIVISION ENGLISH COMPOSITION Select one course from the following: (must pass course with C- or higher)

_____	4	UWP 101	8-10	F, W, S	Advanced Composition	UWP 1 or ENL 3; Upper Division Standing
_____	4	UWP 102B	8-10	F, W, S	Writing in Biological Sciences	UWP 1 or ENL 3; Upper Division Standing
_____	4	UWP 102E	8-10	F, W, S	Writing in Engineering	UWP 1 or ENL 3; Upper Division Standing; UD students in COE
_____	4	UWP 102F	8-10	S	Writing in Food Science and Technology	UWP 1 or ENL 3; Upper Division Standing
_____	4	UWP 102G	8-10	S	Writing: Bioregion	UWP 1 or ENL 3; Upper Division Standing
_____	4	UWP 104A	8-10	F, W, S	Business Reports & Technical Communications	UWP 1 or ENL 3; Upper Division Standing
_____	4	UWP 104E	8-10	F, W, S	Writing in the Professions: Science	UWP 1 or ENL 3; Upper Division Standing
_____	4	UWP 104F	8-10	F, W, S	Writing in the Health Profession	UWP 1 or ENL 3; Upper Division Standing