

## Biological Systems Engineering — Lower Division Requirements

Units, Course	Qtr	Sugg. Qtr	Course Title	Prerequisites: *C- or better required, MTC = May Take Concurrently	
<b>ENGLISH COMPOSITION</b>					
_____ 4, UWP 1/Y/V	F W S	1	Expository Writing	ELWR Satisfied	
<b>MATHEMATICS</b>					
_____ 4, MAT 21A	F W S	1	Calculus	Placement Exam	
_____ 4, MAT 21B	F W S	2	Calculus	MAT 21A	
_____ 4, MAT 21C	F W S	3	Calculus	MAT 21B	
_____ 4, MAT 21D	F W S	4	Vector Analysis	MAT 21C	
_____ 3, MAT 22A	F W S	5	Linear Algebra	MAT 21C    ENG 6 (MTC)	
_____ 3, MAT 22B	F W S	6	Differential Equations	MAT 22A	
<b>GENERAL CHEMISTRY</b>					
_____ 5, CHE 2A	F W	2	General Chemistry	Placement Exam	
_____ 5, CHE 2B	W S	3	General Chemistry	CHE 2A	
<b>PHYSICS</b>					
_____ 5, PHY 9A	F	S	3	Classical Physics	MAT 21B
_____ 5, PHY 9B	F W	4	Classical Physics	MAT 21C    MAT 21D (MTC)    PHY 9A	
_____ 5, PHY 9C	W S	5	Classical Physics	MAT 21D    MAT 22A (MTC)    PHY 9B	
<b>BIOLOGICAL SCIENCES</b>					
_____ 5, BIS 2A	F W S	4	Essentials of Life		
<b>ENGINEERING SCIENCE</b>					
_____ 4, EBS 1	F	1	Foundations of Bio. Sys. Engr.		
_____ 4, <i>ENG 6 or</i> <i>ECS 32A</i>	F W S	2	Engineering Problem Solving	MAT 21A *    MAT 21B (MTC)	
_____ 4, ENG 17	F W S	6	Circuits	Placement Exam	
_____ 4, ENG 35	F W S	4	Statics	MAT 21C	
_____ 4, EBS 75	W	5	Prop. of Matls. in Bio. Sys.	PHY 9A*    MAT 21D (MTC)	
_____ 4, EBS 75	W	5	Prop. of Matls. in Bio. Sys.	BIS 2A    PHY 9C (MTC)	
<b>ORAL COMMUNICATION (Select one)</b>					
_____ 4, <i>CMN 1</i> <i>ENG 3</i>	F W S	6	Intro. to Public Speaking Interpersonal Comm. Competence	ELWR Satisfied	
_____ 4, <i>CMN 1</i> <i>ENG 3</i>	F W S	6	Intro. to Public Speaking Interpersonal Comm. Competence	ELWR Satisfied	
<b>ORGANIC CHEMISTRY</b>					
_____ 2, CHE 8A	F	S	7	Organic Chemistry	CHE 2B*
_____ 4, CHE 8B	F W	8	Organic Chemistry	CHE 8A/118A	

### GEs (32+)

Arts and Humanities (12-20)

Social Sciences (12-20)

Domestic Diversity (3)

Am. Cultures, Gov. and History (3)

World Cultures (3)

## Biological Systems Engineering — Upper Division Requirements

Units, Course	Qtr	Sugg. Qtr	Course Title	Prerequisites: *C- or better required, MTC = May Take Concurrently
<b>STATISTICS</b>				
___ 4, STA 100	F W S	7	Applied Statistics for Biological Scientists	MAT 21B*
<b>ENGINEERING TOPICS</b>				
___ 3, ENG 100	F W S	8	Electronic Circuits & Systems	ENG 17
___ 4, ENG 102	F W S	7	Dynamics	MAT 22B*      ENG 35*
___ 4, ENG 103	F W S	8	Fluid Mechanics Fundamentals	MAT 22B*      ENG 35*      PHY 9B*
___ 4, ENG 104	F W S	9	Mechanics of Materials	MAT 22B*      ENG 35*
___ 4, ENG 105	F W S	7	Thermodynamics	MAT 22B*      PHY 9B*
___ 3, ENG 106	W	11	Engineering Economics	
___ 4, EBS 125	S	9	Heat & Mass Transfer in Biological Sys.	EBS 75      ENG 103      ENG 105
___ 4, EBS 127	F	10	Mass Transfer & Kinetics	EBS 125
___ 4, EBS 130	W	8	Dyn Model of Proc in Bio Sys	MAT 22B*      ENG 6      EBS 75
___ 4, EBS 165	F	10	Bioinstrumentation and Control	ENG 100
___ 3, EBS 170A	F	10	Engr Design & Prof. Respon.	EBS 1      ENG 102      ENG 104
___ 2,1, EBS 170B, BL	W	11	Engr Projects: Design	EBS 170A; concurrent enrollment in EBS 170BL
___ 2,1, EBS 170C, CL	S	12	Engr Projects: Design Eval.	EBS 170B; concurrent enrollment in EBS 170CL

### Biological Systems Engineering Elective (EBS)

**Minimum of 4 Units**

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

### Engineering Electives

**Minimum of 8 Units**

\_\_\_ Select eight units from any upper division courses within the College of Engineering **EXCEPT** ECI 123, 188; ENG 160; courses numbered 191-197, 199 (ENG 190 may only be taken for 2 units of engineering elective credit).

**Acceptable subject codes: ENG, EBS, BIM, ECH, ECM, EMS, ECI, ECS, EEC, EME, EAE**

### Biological Science Electives

**Minimum of 9 Units**

\_\_\_ Select nine units from any upper division course with the College of Biological Sciences **EXCEPT** BIS 132; EVE 175; EXB 102, 112, 115, 120, 121, 124, 125, 148; and all courses number 190-199.

The following courses may also be taken as biological sciences electives: BIS 2B, BIS 2C; ABT 161; ANS 118, 143, 144, 146; ATM 133; AVS 100; CHA 101, 101L; ENT 100; ENH 102; ESM 120; ESP 100, 110, 155; ETX 101, 131; FST 102A, 104L, 119, 128, 159; IDI 141; SSC 100; WFC 121.

**Acceptable subject codes: BIS, MCB, EVE, EXB, MIC, NPB, PLB**

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**Students may choose other upper division courses with substantial biological content offered by the College of Agricultural and Environmental Sciences; email [BAEAdvising@ucdavis.edu](mailto:BAEAdvising@ucdavis.edu) with a syllabus and short explanation about why the course should be considered for biological science elective credit for approval before registering.**

### Upper Division English Composition (must pass course with C- or higher)

**Select one from the following:**

___ 4, UWP 101	F W S	8--10	Advanced Composition	UWP 1; Upper Division Standing
___ 4, UWP 102E	F W S	8--10	Writing in Engineering	UWP 1; Upper Division Standing
___ 4, UWP 104A	F W S	8--10	Business Reports & Technical Communications	UWP 1; Upper Division Standing
___ 4, UWP 104T	F W S	8--10	Technical Writing	UWP 1; Upper Division Standing
___ 4, UWP 104E	F W S	8--10	Writing in the Professions: Science	UWP 1; Upper Division Standing
___ 4, UWP 104F	F W S	8--10	Writing in the Health Profession	UWP 1; Upper Division Standing