

Sample Biological Systems Engineering Academic Plan – Entering Major After Spring 2019

Fall Year 1 - 15 units			Winter Year 1 - 17 units			Spring Year 1 - 17 units		
4	MAT 21A		4	MAT 21B	MAT 21A	4	MAT 21C	MAT 21B
4	EBS 1		5	CHE 2A		5	PHY 9A	MAT 21B
4	UWP 1		4	ENG 6	MAT 21A; MAT 21B*	5	CHE 2B	CHE 2A
3	GE	<u>SS or AH; AGCH, DD, or WC</u>	4	ENG 3	<u>SS</u>	3	GE	<u>SS or AH; AGCH, DD, or WC</u>
Fall Year 2 - 17 units			Winter Year 2 - 17 units			Spring Year 2 - 16 units		
4	MAT 21D	MAT 21C	4	MAT 27A	9 MAT units; ENG 6*	4	MAT 27B	MAT 21C; MAT 27A
5	PHY 9B	PHY 9A; MAT 21D*	5	PHY 9C	PHY 9B; MAT 21D; MAT 22A*	4	ENG 17	MAT 22B*; PHY 9C
5	BIS 2A		4	EBS 75	BIS 2A; PHY 9C*	4	ENG 35	PHY 9A; MAT 21D*
3	GE	<u>SS or AH; AGCH, DD, or WC</u>	4	GE	<u>SS or AH; AGCH, DD, or WC</u>	4	GE	<u>SS or AH; AGCH, DD, or WC</u>
Fall Year 3 - 14-16 units			Winter Year 3 - 15 units			Spring Year 3 - 16 units		
2/4	CHE 8A/118A	CHE 2B; (CHE 2C for 118A)	4	CHE 8B/118B	CHE 8A/118A	4	ENG 104	ENG 35; MAT 22B
4	STA 100	MAT 21B	3	ENG 100	ENG 17	4	EBS 125	EBS 103; ENG 105; BIS 2C
4	ENG 102	ENG 35; MAT 22B	4	ENG 103	PHY 9B; MAT 22B; ENG 35	4	GE	<u>SS or AH; AGCH, DD, or WC</u>
4	ENG 105	MAT 22B; PHY 9B	4	EBS 130	MAT 22B; ENG 6; EBS 75	4	BIS/ENG/EBS elective	
Fall Year 4 - 15 units			Winter Year 4 - 16 units			Spring Year 4 - 14 units		
4	EBS 127	EBS 125	3	ENG 106		1	EBS 170C	EBS 170B
4	EBS 165	ENG 100	2	EBS 170B	EBS 170A	2	EBS 170CL	EBS 170C*
3	EBS 170A	EBS 1; ENG 102; ENG 104	1	EBS 170BL	EBS 170B*	4	GE	<u>SS or AH; AGCH, DD, or WC</u>
4	BIS/ENG/EBS elective		4	UWP 1XX	UWP 1	7	BIS/ENG/EBS elective	
			6	BIS/ENG/EBS elective				

*Pre-requisites are strictly enforced. *Pre-requisite may be taken concurrently.*

BSE degree requirements meet most of you GE requirements, but not all. Most students will need the following:

- 9-20 units of Arts & Humanities (AH) topical breadth
- 5-20 units of Social Sciences (SS) topical breadth
- 3 units of American Cultures, Governance & History (ACGH) core literacy
 - 3 units of Domestic Diversity (DD) core literacy
 - 3 units of World Cultures (WC) core literacy

Possible Electives for BSE Students

Electives allow you to tailor the major to your own professional and academic goals. The basic elective requirements are below:

- 4 units from any upper division EBS course EXCEPT EBS 189 or EBS 199
- 8 units from any upper division ENG, EBS, BIM, ECM, ECH, EMS, ECI, ECS, EEC, EME, or EAE course...
 - ...**EXCEPT** ECI 123; ECS 188; ENG 103, 160, and all 190-197, 199 courses.
- 9 units from any upper division BIS, MCB, EVE, EXB, MIC, NPB, or PLB course...
 - ...**OR** ABT 161; ANS 118, 143, 144, 146; ATM 133; AVS 100; CHA 101, 101L; ENT 100; ENH 102; ESM 120, 182; ESP 100, 110, 155; ETX 101, 131; FST 102A, 104L, 119, 120, 128, 159; IDI 141; PLS 110A; SSC 100; WFC 121.
 - ...**EXCEPT** BIS 132; EVE 175; EXB 102, 112, 115, 120, 121, 124, 125, 148; and all 190-199 courses.

Biological Systems Engineering is a broad major with many possible areas of specialization*, with some examples below.

Biotechnology Engineering	Agricultural and Natural Resources Engineering	Food Engineering
<p>Biotechnology involves the handling and manipulation of living organisms or their components to produce useful products. Students specializing in biotechnology engineering integrate analysis and design with applied biology to solve problems in renewable energy production, large-scale biotechnical production, control of biological systems, and bio-based materials production.</p> <p>Recommended electives:</p> <ul style="list-style-type: none"> • Biological science: BIS 101, 102, 103; MIC 102; MCB 120L; PLB 113 • Bio systems engineering: EBS 161 • Engineering: ECH 161B, 161C, 161L; ECI 149, 150, 153; ENG 180; EME 161, 163 	<p>With the world population expected to grow over the next several decades, major concerns lie with meeting the needs of agriculture and with the sustainable use of limited natural resources. Students specializing in agricultural and natural resources engineering combine analysis and design with applied biology to solve problems in producing, transporting, and processing biological products leading to food, fiber, energy, pharmaceuticals, and other human needs.</p> <p>Recommended electives:</p> <ul style="list-style-type: none"> • Biological science: BIS 102; PLB 111; ENT 100; ANS 143, 144, 146; PLS 101, 114; MIC 120; NPB 101; ABT 163; SSC 100; WFC 120; ETX 101; ESP 100; HYD 124 • Bio systems engineering: EBS 128 • Engineering: BIM 109, 116; ECI 141, 142, 144, 145, 148A, 171; ENG 111, 180 	<p>Producing the food we eat every day constitutes the largest industrial sector of the U.S. economy, and this production involves the work of engineers in a wide variety of food industries, both at home and around the world. Students specializing in food engineering design food processes and operate equipment and facilities for production of high quality, safe, and nutritious food with minimal impact of these operations on the environment.</p> <p>Recommended electives:</p> <ul style="list-style-type: none"> • Biological sciences: BIS 101, 102, 103; ESP 110; ETX 101, FST 104, 104L, 119, 128; PLS 172 • Bio systems engineering: EBS 161 • Engineering: ECH 157; EME 171, 172

* Following the recommended electives for a specialization does not result in specialization or concentration notation on your transcript or diploma.