

Biosystems Engineering BS Curriculum – Main Campus

General Education Requirements	Course	23 Units
First Year Composition 1	ENGL 101, or ENGL 107, or ENGL 109H	3
First Year Composition 2	ENGL 102, or ENGL 108	3
General Education, Natural Science	Chem 151 or MCB 181	
General Education, Artist		3
General Education, Social Scientist		3
General Education, Humanist		3
General Education, Building Connections 1		3
General Education, Building Connections 2		3
General Education, Building Connections 3	CE 301	
Bookend University Gen Eds		2
General Science & Math Core	Course	40-42 Units
Calculus I	MATH 122A/B, or MATH 125	5/3
Calculus II	MATH 129	3
Vector Calculus	MATH 223	4
Differential Equations	MATH 254	3
Probability and Statistics	SIE 305, or AREC 239	3
General Chemistry I	CHEM 151, or CHEM 161/163	4
General Chemistry II	CHEM 152, or CHEM 162/164	4
Physics I	PHYS 141, or PHYS 161H	4
Physics II	PHYS 241, or PHYS 261H	4
Biology I	MCB 181R/L, or PLS 240	4
Biology II	ECOL 182R/L, or MIC 205A/L, or PSIO 201	4
Engineering Science Core	Course	21 Units
Intro to Engineering	ENGR 102A/B, or ENGR 102	3
Statics	CE 214	3
Fluid Mechanics	CE 218, or AME 331	3
Mechanics of Materials	AME 324A	3
Engineering Management	SIE 265	3
Senior Capstone Design I	ENGR 498A, or BE 498A	3
Senior Capstone Design II	ENGR 498B, or BE 498B	3
Biosystems Engineering Core	Course	20 Units
Intro to Biosystems Engineering	BE 201	2
Engineering Analytic Computer Skills	BE 205	3
Intro to Computer-aided Design	BE 221, or BE 220	3
Biosystems Thermal Engineering	BE 284	3
Intro to Biosystems Analytics	BE 310	4
Biosystems Analysis and Design	BE 423	3
Sensors & Controls	BE 447	3
Career Preparation	Course	5 Units
Technical Writing	CE 301	3
Seminar in Engineering Careers & Professionalism	BE 496A	1
Internship	BE 493	2
Engineering/Technical Electives	Course	9 Units
Technical Electives	see list	9
Design Electives	Course	9 Units
Design Electives	see list	9
Total		128

Design & Technical Elective Suggestions for Selected Emphasis Areas

Controlled Environment Agriculture

Technical Electives (Choose 9 units)	Course	Units
Aquaculture	ACBS 456	3
Aquaponics Engineering	BE 444	3
Intro to Hydroponics (with optional lab)	BE 217R/L	3/1
Advanced Hydroponic Crop Production (with optional lab)	BE 350 R/L	
Applied Plant Physiology	PLS 475A	3
Greenhouse Pest Management: Methods and Practice	ENTO 497C	3
(BE) Design Electives (Choose 9 units)	Course	Units
Aquaponics Design	BE 334	3
Applied Instrumentation for Controlled Environment Agriculture	BE 479	3
Controlled Environment Systems	BE 483	3
Irrigation Systems Design	BE/CE 456	3
Integrated Engineered Solutions in the Food-Water-Energy Nexus	BE 482	3

Digital Agriculture

Technical Electives (Choose 12 units)	Course	Units
Embedded Comp. Sys. (Mechatronics)	SIE 370	3
Biosystems Analytics	BE 434	3
Agronomy Foundations	ASM 490 or PLS 497	3
Applied Plant Physiology	PLS 475A	3
(BE) Design Electives (Choose 9 units)	Course	Units
Precision Observation with Drones	BE 385	3
Soil and Water Resources Engineering	BE 455	3
Remote Sensing Data and Methods	BE 485	3

Water Resources

Technical Electives (Choose 9 units)	Course	Units
Hydrology	CE/ATMO/HYDR 423	3
Wastewater Treatment Design System	CHEE/CE 476B	3
Hydraulic Engineering and Design	CE 323	4
Remote Sensing Data and Methods	BE 485	3
Applications of Geographic Information Systems	RNR 403	3
Watershed Management	WSM 462	3
(BE) Design Electives (Choose 9 units)	Course	Units
Watershed Engineering	BE 426	3
Computer Applications in Hydraulics	BE/CE 427	3
Control of Erosion Processes	BE 428	3
Ecological Systems Engineering	BE 430	3
Soil and Water Resources Engineering	BE 455	3
Irrigation Systems Design	BE 456	3
Wastewater Treatment Operations and Reuse	BE 458	3
Design of Onsite Wastewater Treatment and Dispersal Systems	BE 459	3

Pre-Health / Pre-Medical

Technical Electives (Choose 9 units)	Course	Units
Biochemistry	BIOC 384	3
Biomechanical Engineering	AME/BME 466	3
Biomedical Imaging	BME 416	3
Medical Device Design	BME 310	3
Nanoscience and Nanotechnology for Biomedical Engineers	BME 485	3
Microbiology for Engineers	CHEE 477R	3
Organic Chemistry	CHEM 241 A	3
(BE) Design Electives (Choose 9 units)	Course	Units
Engineering of Biological Processes	BE/CHEE 481A	3
Cell and Tissue Engineering	BE/CHEE 481B	3
Biomaterial-Tissue Interactions	BE/BME 486	3
Fabrication Techniques for Micro- and Nanodevices	BE/AME 489B	3