

Curriculum Schedule

Bachelor of Science in Biosystems Engineering (ABET Accredited) 2007-2008

Biosystems engineers integrate mathematics, the biological, physical and engineering sciences with engineering design principles for producing and processing biological and agricultural products. These principles are applied to the design, analysis and construction of equipment, systems, and facilities for the efficient utilization of food, fiber and biochemical products. All programs utilize the latest in computer and microprocessing applications, sensor control systems, robotics, and biotechnology developments in their design objectives.

Required Curriculum:

First Semester		Second Semester	
Freshman Year (2006-2007)			
Course	Units	Course	Units
ENGR 102 (Intro to engineering).....	3	INDV/TRAD*	3
MATH 125 (Calculus with applications 1)	3	MATH 129 (Calculus with applications 2)	3
CHEM 103a (Fundamentals of chemistry 1).....	3	CHEM 103b (Fundamentals of chemistry 2).....	3
CHEM 104a (Fund. Tech. of chem 1 (lab))	1	CHEM 104b (Fund. Tech. of chem 2 (lab))	1
ENGL 101 (First Year Composition 1)	3	PHYS 141 (Introductory mechanics)	4
INDV/TRAD*	3	ENGL 102 (First Year Composition 2)	3
Total.....	16	Total.....	17
Sophomore Year (2007-2008)			
ABE 296a (Seminar in BE)	1	ABE 205 (Biosys Engin. Analt Skills Workshop)	3
CE 214 (Statics).....	3	AME 250 (Dynamics)	3
MATH 223 (Vector calculus).....	4	MATH 254 (Ordinary Differential Eqns).....	3
ABE 284 (Biosystems Transport Phen).....	3	MCB182 or MIC205A&L	4
MCB 181R&L or PLS 130.....	4	PHYS 241 (Intro. electricity and magnetism)	4
Total.....	15	Total.....	17
Junior Year (2008-2009)			
ABE 320 (Computer aided design)	3	ABE 423 (Dynamics of biological systems)	3
ABE 447 (Sensors and controls)	3	ABE 484 (Advanced biosystems transport)	3
CE 218 or AME 331 (Hydr. or Flu. mech.).....	3	ABE Elective**	3
CE 215 or AME 324A (Mech of materials)	3	ENGL 308 (Technical writing)	3
SIE 305 (Engin. Probability and Statistics).....	3	ENGR 211P (Engineering economics).....	1
Total.....	15	INDV/TRAD	3
		Total.....	16
Senior Year (2009-2010)			
ABE 496a (Seminar in Engr. Careers & Prof.) ...	1	ABE 498b (Biosystems Engineering Design 2)	3
ABE 498a (Biosystems Engineering Design 1)...	3	ABE Elective**	3
ABE Elective**	3	TECH Elective***	4
TECH Elective***	3	TECH Elective***	3
INDV/TRAD*	3	INDV/TRAD	3
INDV/TRAD*	3		
Total.....	16	Total.....	16

* INDV/TRAD courses must meet University general education requirements. One course must be recognized by the university as focusing on non-western culture, race, gender, or ethnicity. Tier 1 & 2 Ind. & Soc., Trad. & Cul., and GRCE course requirements are detailed on page 11.

**ABE Electives must contain elements of engineering design. See the following pages for a list of suitable courses.

***Technical electives depend upon area of emphasis and advisor's approval. Suggested technical electives are listed on following pages.

Curriculum Schedule – Pre-Med Track

Bachelor of Science in Biosystems Engineering (ABET Accredited) 2006-2007

Biosystems engineers integrate mathematics, the biological, physical and engineering sciences with engineering design principles for producing and processing biological and agricultural products. These principles are applied to the design, analysis and construction of equipment, systems, and facilities for the efficient utilization of food, fiber and biochemical products. All programs utilize the latest in computer and microprocessing applications, sensor control systems, robotics, and biotechnology developments in their design objectives.

Required Curriculum:

	First Semester			Second Semester	
Course	Units	Freshman Year (2006-2007)		Course	Units
ENGR 102 (Intro to engineering)	3			INDV/TRAD*	3
MATH 125 (Calculus with applications 1).....	3			MATH 129 (Calculus with applications 2)	3
CHEM 103a (Fundamentals of chemistry 1)	3			CHEM 103b (Fundamentals of chemistry 2)	3
CHEM 104a (Fund. Tech. of chem 1 (lab)).....	1			CHEM 104b (Fund. Tech. of chem 2 (lab)).....	1
ENGL 101 (First Year Composition 1)	3			PHYS 141 (Introductory mechanics)	4
INDV/TRAD*	3			ENGL 102 (First Year Composition 2)	3
Total.....	16			Total	17
		Sophomore Year (2007-2008)			
ABE 296a (Seminar in BE)	1			ABE 205 (Biosys Engin. Analt Skills Workshop)	3
CE 214 (Statics).....	3			AME 250 (Dynamics)	3
MATH 223 (Vector calculus).....	4			MATH 254 (Ordinary Differential Eqns).....	3
ABE 284 (Biosystems Transport Phen).....	3			CHEM 241b (Organic Chemistry)	3
CHEM 241a (Organic Chemistry)	3			CHEM 243b (Organic Chemistry Lab)	1
CHEM 243a (Organic Chemistry Lab)	1			PHYS 241 (Intro. electricity and magnetism)	4
Total.....	15			Total.....	17
		Junior Year (2008-2009)			
ABE 320 (Computer aided design)	3			ABE 423 (Dynamics of biological systems)	3
CE 218 or AME 331 (Hydr. or Flu. mech.).....	3			ABE 484 (Advanced biosystems transport)	3
CE 215 or AME 324A (Mech of materials)	3			ABE Elective**	3
SIE 305 (Engin. Probability and Statistics).....	3			ENGL 308 (Technical writing)	3
MCB 181R&L or PLS 130.....	4			ENGR 211P (Engineering economics).....	1
				MCB182 or MIC205A&L	4
Total.....	16			Total.....	17
		Senior Year (2009-2010)			
ABE 496a (Seminar in Engr. Careers & Prof.) ...	1			ABE 498b (Biosystems Engineering Design 2)	3
ABE 498a (Biosystems Engineering Design 1)....	3			ABE Elective**	3
ABE 447 (Sensors and controls)	3			TECH Elective***	2
ABE Elective**	3			INDV/TRAD*	3
INDV/TRAD*	3			INDV/TRAD*	3
INDV/TRAD*	3				
Total.....	16			Total.....	14

* INDV/TRAD courses must meet University general education requirements. One course must be recognized by the university as focusing on non-western culture, race, gender, or ethnicity. Tier 1 & 2 Ind. & Soc., Trad. & Cul., and GRCE course requirements are detailed on page 11.

**ABE Electives must contain elements of engineering design. See the following pages for a list of suitable courses.

***Technical electives depend upon area of emphasis and advisor's approval. Suggested technical electives are listed on following pages

Classes that satisfy ABE Electives

This list will evolve, check with your advisor.

- ABE 426 - Soil and Water Conservation Engineering
- ABE 455/7 – Soil and water resources engin
- ABE 456 - Irrigation Systems Design
- ABE 458 - Agricultural Drainage and Effluent Treatment
- ABE 459 - Design of Onsite Wastewater Treatment and Dispersal Systems
- ABE / WSM 467 - Advanced Watershed Hydrology
- ABE / CHEE 481A – Engineering of Biological Processes
- ABE / CHEE 481B - Bioprocess Engineering Applications
- ABE / CHEE 482 - Simulation of Biological Systems
- ABE / PLS 483 - Controlled Environment Systems
- ABE / MSE 486 – Cell / Tissue Interactions with Biomaterials
- ABE / AME 489 - Engin Props and Micro/Nano Technologies for Biological Systems
- ABE / PLS 475A - Physiology of Plant Production under Controlled Environment
- ABE 497C - Greenhouse Pest Management: Methods and Practice

Technical Electives

Below is a list of suitable technical electives. This list is not exhaustive. Check with your advisor before taking any electives to make sure that these courses meet your academic objectives.

- CHEM 241a/243a Organic Chemistry 1
- CHEM 241b/243b Organic Chemistry 2
- BIOC 460 - General Protein and Gen Metabolic Biochemistry
- BIOC 461- General Nucleic Acid Biochemistry
- BIOC 471A - Applied Molecular Genetics
- BIOC 473- Recombinant DNA Methods and Applications
- BME 410 - Biology for Biomedical Engineering
- BME 411 - Physiol. For Biomed. Engin.
- BME 416 - Principles of Biomedical Engineering
- BME 417 Data Analysis Biomed. Engin.
- BME 495C - Current Topics in Biomedical Engineering
- MSE 461 - Biol. & Synthetic Materials
- AME 416 - Material Selection
- AME 445 - Renewable Energy Systems
- AME 466 - Biomechanical Engineering
- MCB 428 Microbial Genetics
- MIC 421A Microbiological Techniques
- SWES 200 Soils
- SWES 440 Biodegradation of pollutants in soil
- CHEE 370 Water Sup. & Wastewater
- CHEE 371 Water & Wastewater Treat.
- HWR 407 Subsurface Hydrology
- SWES 470 Soil Physics
- SWES 443 Remote Sensing Applications
- SWES 330 Introduction to Remote Sensing
- SWES 453 Remote Sensing of the Environ.
- CE 322 - Water Resources Engineering
- CE 323 - Hydraulic Engineering and Design
- CE 478 - Introduction to Hazardous Waste Management
- CE 484 - Fundamentals of Industrial and Environmental Health
- PLS 306 - Crop Science and Production
- PLS 312 - Plant Genetics
- PLS 340 Intro. to Biotechnology