

B.S. in Biomedical Engineering

Four-Year Plan

Catalog Year 2013-2014

Below is the *advised sequence* of courses for this degree program.

The official degree requirements can be found in the University General Catalog.

Course Number and Title	Units	Prerequisites
1ST SEMESTER		
MATH 122A/B or MATH 125 Calculus I with Applications	5/3	Appropriate Math Placement
CHEM 151 General Chemistry I	4	
ENGL 101 First-Year Composition	3	
ENGR 102 Introduction to Engineering	3	Concurrent enrollment or completion of MATH 122B or MATH 125
Tier I General Education	3	
2ND SEMESTER		
MATH 129 Calculus II	3	MATH 122B or 125 with C or better
CHEM 152 General Chemistry II	4	CHEM 151
PHYS 141 Introductory Mechanics	4	MATH 122B or MATH 125; Concurrent enrollment in MATH 129
ENGL 102 First-Year Composition	3	ENGL 101
Tier I General Education	3	
3RD SEMESTER		
ABE 284 Biosystems Thermal Engineering (Fall Only)	3	MATH 129; PHYS 141
BME 295C Challenges in Biomedical Engineering (Fall Only)	1	
CE 214 Statics	3	PHYS 141; MATH 129
MATH 223 Vector Calculus	4	MATH 129 with C or better
MCB 181 R/L Introductory Biology I and Laboratory	4	
4TH SEMESTER		
ABE 205 Engineering Analytic Computer Skills (Spring Only)	3	
MATH 254 Intro to Ordinary Differential Equations	3	MATH 129 with C or better
PHYS 241 Introductory Electricity and Magnetism	4	PHYS 141
PSIO 201 Human Anatomy and Physiology I	4	
Tier I General Education	3	

Biosensors Track

Course Number and Title	Units	Prerequisites
Advanced Standing is required for 3xx and 4xx courses (See advisor for requirements)		
5TH SEMESTER		
ECE 207 Elements of Electrical Engineering	3	PHYS 241; Completion or concurrent enrollment MATH 254
PSIO 202 Human Anatomy and Physiology II or ECOL 182 R/L Introductory Biology 2 and Laboratory	4	For PSIO 202: PSIO 201
CE 218 or AME 331 Fluid Mechanics	3	For CE 218: CE 214. For AME 331: ABE 284; PHYS 141; MATH 254
AME 301 Engineering Analysis (Fall Only)***	3	CE 218
Tier I General Education	3	
6TH SEMESTER		
BME 330 Biomedical Instrumentation (Spring Only)	4	ECE 207; PSIO 201
ABE 423 Biosystems Analysis and Design (Spring Only)***	3	
SIE 305 Introduction to Engineering Probability and Statistics	3	MATH 129
ABE 489B Bio Micro/Nanotechnology Applications	3	CHEM 152 or MSE 110
Technical Elective	3	
7TH SEMESTER		
ENGR 498A Senior Capstone (Fall Only)	3	Senior status
BME 497G Clinical Rotation (Fall Only)	1	BME 330
ABE 447 Sensors and Controls (Fall Only)	3	CHEM 152 or MSE 110
AME 489A Fabrication Techniques for Micro-and Nanodevices	3	ECE 207 or ABE 447
ABE 486 Biomaterial-Tissue Interactions	3	CHEM 152
Technical Elective	3	
8TH SEMESTER		
ENGR 498B Senior Capstone (Spring Only)	3	Senior status
BME 480 Translational Biomedical Engineering (Spring Only)	3	
AME 488 Micro and Nano Transducer Physics and Design	3	ECE 207 or ABE 447; AME 250
Technical Elective	3	
Tier II General Education	3	

***AME 301 or ABE 423 required. One semester will be filled with a Tier II Gen. Ed.

*Tier I and II General Education Courses must meet University general education requirements. One course must be recognized by the university as meeting the Diversity Requirement.

Biomechanics Track

Course Number and Title	Units	Prerequisites
Advanced Standing is required for 3xx and 4xx courses (See advisor for requirements)		
5TH SEMESTER		
ECE 207 Elements of Electrical Engineering	3	PHYS 241; Completion or concurrent enrollment MATH 254
PSIO 202 Human Anatomy and Physiology II or ECOL 182 R/L Introductory Biology 2 and Laboratory	4	For PSIO 202: PSIO 201
CE 218 or AME 331 Fluid Mechanics	3	For CE 218: CE 214. For AME 331: ABE 284; PHYS 141; MATH 254
AME 301 Engineering Analysis (Fall Only)***	3	CE 218
Tier I General Education	3	
6TH SEMESTER		
BME 330 Biomedical Instrumentation (Spring Only)	4	ECE 207; PSIO 201
ABE 423 Biosystems Analysis and Design (Spring Only)***	3	
SIE 305 Introduction to Engineering Probability and Statistics	3	MATH 129
AME 466 Biomechanical Engineering	3	
Technical Elective	3	
7TH SEMESTER		
ENGR 498A Senior Capstone (Fall Only)	3	Senior status
BME 497G Clinical Rotation (Fall Only)	1	BME 330
ABE 447 Sensors and Controls (Fall Only)	3	CHEM 152 or MSE 110
AME 324A Mechanical Behavior of Engineering Materials	3	CE 214
AME 302 Numerical Methods	4	AME 301; MATH 254
Technical Elective	3	
8TH SEMESTER		
ENGR 498B Senior Capstone (Spring Only)	3	Senior status
BME 480 Translational Biomedical Engineering (Spring Only)	3	
AME 483 Micro Biomechanics	3	AME 230 or ABE 284; MATH 223; AME 324A
Technical Elective	3	
Tier II General Education	3	

***AME 301 or ABE 423 required. One semester will be filled with a Tier II Gen. Ed.

*Tier I and II General Education Courses must meet University general education requirements. One course must be recognized by the university as meeting the Diversity Requirement.

Biomaterials Track

Course Number and Title	Units	Prerequisites
Advanced Standing is required for 3xx and 4xx courses (See advisor for requirements)		
5TH SEMESTER		
ECE 207 Elements of Electrical Engineering	3	PHYS 241; Completion or concurrent enrollment MATH 254
PSIO 202 Human Anatomy and Physiology II or ECOL 182 R/L Introductory Biology 2 and Laboratory	4	For PSIO 202: PSIO 201
CE 218 or AME 331 Fluid Mechanics	3	For CE 218: CE 214. For AME 331: ABE 284; PHYS 141; MATH 254
AME 301 Engineering Analysis (Fall Only)***	3	CE 218
Tier I General Education	3	
6TH SEMESTER		
BME 330 Biomedical Instrumentation (Spring Only)	4	ECE 207; PSIO 201
ABE 423 Biosystems Analysis and Design (Spring Only)***	3	
SIE 305 Introduction to Engineering Probability and Statistics	3	MATH 129
CHEM 241A Lectures in Organic Chemistry <u>and</u> CHEM 243A Organic Chemistry Laboratory I	4	CHEM 152
Technical Elective	3	
7TH SEMESTER		
ENGR 498A Senior Capstone (Fall Only)	3	Senior status
BME 497G Clinical Rotation (Fall Only)	1	BME 330
ABE 447 Sensors and Controls (Fall Only)	3	CHEM 152 or MSE 110
MSE 461 Biological and Synthetic Materials (Fall Only)	3	CHEM 151
ABE 486 Biomaterial-Tissue Interactions (Fall Only)	3	CHEM 152
Technical Elective	3	
8TH SEMESTER		
ENGR 498B Senior Capstone (Spring Only)	3	Senior status
BME 480 Translational Biomedical Engineering (Spring Only)	3	
ABE 481B Cell and Tissue Engineering (Spring Only)	3	MATH 254
Technical Elective	3	
Tier II General Education	3	

***AME 301 or ABE 423 required. One semester will be filled with a Tier II Gen. Ed.

*Tier I and II General Education Courses must meet University general education requirements. One course must be recognized by the university as meeting the Diversity Requirement.