College of Engineering
Bachelor of Science in Engineering Science and Mechanics: Biomechanics Option
For Students Graduating in Calendar Year 2016

Freshman Year

Fall Semester			Spring Semester		
CHEM 1035 General Chemistry	3		ENGE 1114 Exploration of Engineering Design[1]	2	
CHEM 1045 General Chemistry Lab	1		ENGL 1106 First-Year Writing	3	
ENGE 1024 Engineering Exploration[1]	2		MATH 1206 Calculus	3	
ENGL 1105 First-Year Writing	3		MATH 1224 Vector Geometry	2	
MATH 1205 Calculus	3		PHYS 2305 Foundations of Physics I and Lab	4	
MATH 1114 Linear Algebra	2		Area 2/3 & 7 Liberal Education[2]	3	
Area 2/3 Liberal Education[2]	3				
TOTAL HOURS	17		TOTAL HOURS	17	

Sophomore Year

Fall Semester			Spring Semester		
ESM 2014 Professional Development Seminar ESM	1		ESM 2204 Mechanics of Deformable Bodies	3	
ESM 2104 Statics	3		ESM 2304 Dynamics	3	
CS Programming Course[3]	3		CS/MATH 3414 Numerical Methods	3	
MATH 2214 Intro to Diff Equations	3		ECE 3054 Electrical Theory	3	
MATH 2224 Multivariable Calculus	3		MSE 2034 Elements Materials Engr	3	
PHYS 2306 Foundations of Physics I and Lab	4		Area 2/3 Liberal Education[2]	3	
TOTAL HOURS	17		TOTAL HOURS	18	

Junior Year

Fall Semester			Spring Semester		
ESM 3234 Fluid Mech I-Control Volumes	3		ESM 3334 Fluid Mech II-Differential Analysis	3	
ESM 3124 Dyn II-Analytical & 3D Motion	3		ESM 3134 Dyn III-Vibration and Control	3	
ESM 3054 Mechanical Behavior of Materials	3		ESM 3154 Solid Mechanics	3	
ESM 3064 Mechanical Behavior Materials Lab	1		ESM 3444 Mechanics Laboratory	2	
ESM 3034 Fluid Mechanics Laboratory	1		ESM 3114 Prob Definition Scoping in Design	1	
MATH 4564 Operational Methods	3		MATH 4574 Vector and Complex Analysis	3	
BMES/BMVS 4064 Intro to Medical Physiology	3		Biomechanics Elective[4]	3	
TOTAL HOURS	17		TOTAL HOURS	18	

Senior Year

Fall Semester			Spring Semester		
ESM 4015 Creative Design and Project I	3		ESM 4016 Creative Design and Project II	3	
ESM 4734 Introduction to Finite Elements	3		Biomechanics Elective[4]	3	
STAT 4604 Statistical Methods for Engineers	3		Biomechanics Elective[4]	3	
Biomechanics Elective[4]	3		Area 2/3 Liberal Education[2]	3	
Thermodynamics Elective[5]	3		Area 6 Liberal Education	1	
TOTAL HOURS	15		TOTAL HOURS	13	

A TOTAL OF 132 SEMESTER HOURS ARE REQUIRED FOR GRADUATION.
An in-major (all ESM classes) GPA and overall GPA of 2.0 are required for graduation.

Eligibility for continued enrollment: To remain enrolled in the Engineering Science and Mechanics Department a student must meet the following conditions for satisfactory progress toward a BSESM degree: (1) after having completed 72 credit hours (including transfer, advanced placement, advanced standing, and credit by examination) must have completed ESM 2014, 2104, 2204, 2304, MATH 2214, 2224, and PHYS 2305, 2306; (2) maintain in-major GPA and an extended in-major (all ESM courses and MATH 2214, 2224, 4564, and 4574) GPA of 2.0 or better; (3) complete a minimum of 12 credits that apply toward the BSESM degree per academic year (including summer and winter sessions).

Statement on Pre-requisites: There are no hidden pre-requisites when courses are taken in the order shown on the checksheet. Some of the Biomechanics Elective courses may have pre-requisites which are not required for the degree. Consult the University Course Catalog or check with your advisor for more information.

Foreign Language Requirement: Students who did not complete 2 units of foreign language in high school must earn 6 credit hours of a college level foreign language, such credits to be in addition to those normally required for graduation.

[1] ENGE 1434 (5 cr.) may be substituted for ENGE 1024 and ENGE 1114.

[2] A total of 6 hours of Area 2 and 6 hours of Area 3 courses must be completed. Only selected courses can simultaneously satisfy both Area 2/3 & 7 requirements. Use extra care when selecting this course.

[3] CS Programming Course chosen from: CS 1044, CS 1064, or CS 1114. Students interested in a CS major or minor should take CS 1114.

[4] See attached list for approved Biomechanics Elective courses. Additional Biomechanics Elective courses may be possible with approval of the Director of Undergraduate Studies.

[5] Thermodynamics Elective chosen from: BSE 3154, ME 3134, or PHYS 3704 (Pre: PHYS 2305, PHYS 3324).

Approved Biomechanics Elective Courses (Choose 4):

ESM 4105-6: Engineering Analysis of Physiologic Systems
ESM 4204: Musculoskeletal Biomechanics and Biologic Control
ESM 4224: Biodynamics & Control
ESM 4245-6: Mechanics of Animal Locomotion
ESM 4304: Hemodynamics
ESM 5405-6: Clinical Internship in Biomedical Engineering
BMES 5024: Biomed Engineering and Human Disease
BMES 5174: Biomechancis Of Crash Injury Prevention
BMES 5304: Biological Transport Phenomena
CHE 4104: Process Materials
CHE 4544: Protein Separation Engineering
ECE 4580: Digital Image Processing
ECE 4624: Digital Signal Processing and Filter Design
ISE 3614: Human Factors and Ergonomics Engineering
ISE 3624: Industrial Ergonomics
ISE 4624: Work Physiology
MSE 4574: Biomaterials
ME 4034: Bio-inspired Technology
ME 4754: Impact Biomechanics
ME 4864: Micro/Nano-Robotics