

BIOMEDICAL ENGINEERING: BIOMEDICAL INNOVATION, DESIGN, AND ENTREPRENEURSHIP, MS

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum degree requirements (<https://guide.wisc.edu/graduate/#requirements>) and policies (<https://guide.wisc.edu/graduate/#policies>), in addition to the program requirements listed below.

NAMED OPTION REQUIREMENTS MODE OF INSTRUCTION

Face to Face	Evening/ Weekend	Online	Hybrid	Accelerated
Yes	No	No	No	Yes

Mode of Instruction Definitions

Accelerated: Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

Evening/Weekend: Courses meet on the UW-Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

Face-to-Face: Courses typically meet during weekdays on the UW-Madison Campus.

Hybrid: These programs combine face-to-face and online learning formats. Contact the program for more specific information.

Online: These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

CURRICULAR REQUIREMENTS

Requirement Detail

Minimum	30 credits
Credit	
Requirement	

Minimum	16 credits
Residence	
Credit	
Requirement	
Minimum	15 credits must be graduate-level coursework. Refer to the Graduate School: Minimum Graduate Coursework (50%) Requirement policy: https://policy.wisc.edu/library/UW-1244 (https://policy.wisc.edu/library/UW-1244/).
Graduate	
Coursework	
Requirement	
Overall	3.00 GPA required.
Graduate	
GPA	Refer to the Graduate School: Grade Point Average (GPA) Requirement policy: https://policy.wisc.edu/library/UW-1203 (https://policy.wisc.edu/library/UW-1203/).
Requirement	
Other Grade	n/a
Requirements	
Assessments	There are no degree-specific assessments and examinations outside of those given in individual courses.
and	
Examinations	
Language	n/a
Requirements	

REQUIRED COURSES

Code	Title	Credits
Seminar		
Students must complete 2 semesters of the following course:		2
B M E 701	Seminar in Biomedical Engineering	
Engineering Courses in Design, Prototyping and Manufacturing		
Relevant courses include: ¹		9
B M E/M E 414	Orthopaedic Biomechanics - Design of Orthopaedic Implants	
B M E/E C E 462	Medical Instrumentation	
B M E/E C E 463	Computers in Medicine	
B M E 511	Tissue Engineering Laboratory	
B M E 601	Special Topics in Biomedical Engineering (Design for Rehabilitation)	
B M E 602	Special Topics in Biomedical Engineering	
B M E 603	Special Topics in Bioinstrumentation and Medical Devices	
B M E 604	Special Topics in Biomedical Imaging and Optics	
B M E/M E 605	Special Topics in Biomechanics	
B M E 606	Special Topics in Biomaterials, Cellular and Tissue Engineering	
B M E/I SY E 662	Design and Human Disability and Aging	
M E 449	Redesign and Prototype Fabrication	
M E 549	Product Design	
M E/I SY E 641	Design and Analysis of Manufacturing Systems	
I SY E 415	Introduction to Manufacturing Systems, Design and Analysis	
I SY E 517	Decision Making in Health Care	

I SY E 552	Human Factors Engineering Design and Evaluation
I SY E 557	Human Factors Engineering for Healthcare Systems
I SY E 602	Special Topics in Human Factors
I SY E 603	Special Topics in Engineering Analytics and Operations Research
I SY E 604	Special Topics in Manufacturing and Supply Chain Management
I SY E 606	Special Topics in Healthcare Systems Engineering
INTEREGR 477	Tools for Prototyping and Manufacturing

General Business, Entrepreneurship and Strategic Innovation Courses

Complete two courses, with at least one of the B M E courses, from the following relevant courses: 6

B M E 640	Medical Devices Ecosystem: The Path to Product
B M E 740	Biomufacturing Entrepreneurship
GEN BUS 310	Fundamentals of Accounting and Finance for Non-Business Majors
GEN BUS 311	Fundamentals of Management and Marketing for Non-Business Majors
M H R/A A E 540	Intellectual Property Rights, Innovation and Technology
M H R 715	Strategic Management of Innovation
M H R 722	Entrepreneurial Management
M H R 734	Venture Creation
M H R 738	Wisconsin Applied Ventures in Entrepreneurship (WAVE)
R M I 650	Sustainability, Environmental and Social Risk Management

Technical Elective Engineering Courses

Relevant courses include:¹ 0-6

B M E/M E 415	Biomechanics of Human Movement
B M E/PHM SCI 430	Biological Interactions with Materials
B M E/M E 505	Biofluidics
B M E 510	Introduction to Tissue Engineering
B M E 520	Stem Cell Bioengineering
B M E/MED PHYS 535	Introduction to Energy-Tissue Interactions
B M E 545	Engineering Extracellular Matrices
B M E 550	Introduction to Biological and Medical Microsystems
B M E 556	Systems Biology: Mammalian Signaling Networks
B M E/CBE 560	Biochemical Engineering
B M E/MED PHYS 573	Mathematical Methods in Medical Physics
B M E/MED PHYS 578	Non-Ionizing Diagnostic Imaging
B M E/M E 615	Tissue Mechanics

B M E/MED PHYS/PHM COL-M/PHYSICS/RADIOL 619	Microscopy of Life
B M E/CHEM/MED PHYS 750	Biological Optical Microscopy
B M E/E C E/MED PHYS 778	Machine Learning in Ultrasound Imaging
CBE 540	Polymer Science and Technology
E C E/COMP SCI/I SY E 524	Introduction to Optimization
E C E/COMP SCI 533	Image Processing
E C E/COMP SCI/M E 539	Introduction to Artificial Neural Networks
I SY E 515	Engineering Management of Continuous Process Improvement
M E 514	Polymer Additive Manufacturing
M E 563	Intermediate Fluid Dynamics
M E/E M A 570	Experimental Mechanics
M E 573	Computational Fluid Dynamics
M E 748	Optimum Design of Mechanical Elements and Systems
M S & E 521	Advanced Polymeric Materials
MED PHYS 674	Data Science in Medical Physics
MED PHYS/PEDIAT 705	Women and Leadership: Science, Health and Engineering

Advanced Design or Research Project

Complete the following course: 3-6

B M E 799	Advanced Independent Study
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Additional credits taken from the lists above

Choose in consultation with advisor 1-10

Total Credits 30

¹ At least 6 credits in "Engineering courses in design, prototyping, manufacturing" and/or "Technical elective engineering courses" need to be from biomedical engineering courses.

Other Policy

Students in this program may not take courses outside the prescribed curriculum without faculty advisor and program director approval. Students in this program cannot enroll concurrently in other undergraduate or graduate degree programs.