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

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/#policiesandrequirementstext), 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 Credit Requirement	30 credits
Minimum Residence Credit Requirement	16 credits
Minimum Graduate Coursework Requirement	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/).
Overall Graduate GPA Requirement	3.00 GPA required. 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/).
Other Grade Requirements	n/a
Assessments and Examinations	There are no degree-specific assessments and examinations outside of those given in individual courses.
Language Requirements	n/a

REQUIRED COURSES

Code	Title	Credits
2 semesters of B M E 701		**2**
Engineering courses in design, prototyping and manufacturing [1]		**9**
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 (CRISPR Genome Editing and Engineering Laboratory)	
B M E 602	Special Topics in Biomedical Engineering (Microfluidics and Rapid Prototyping)	
B M E 603	Special Topics in Bioinstrumentation and Medical Devices	
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		**6**
Must include at least one of the following two B M E courses:		
B M E 640	Medical Devices Ecosystem: The Path to Product	
B M E 740	Biomanufacturing 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	Weinert Applied Ventures in Entrepreneurship (WAVE)	
R M I 650	Sustainability, Environmental and Social Risk Management	
Other technical elective engineering courses [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 574	Data Science 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/ PHMCOL-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/ PEDIAT 705	Women and Leadership: Science, Health and Engineering	
Advanced design or research project		**3-6**
B M E 799	Advanced Independent Study	
Additional credits taken from the list above, chosen in consultation with advisor		**0-6**
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.

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.