MSBME Advising Worksheet *(rev. 1/4/24)*

<table>
<tr><td rowspan="4">Focus Areas</td><td colspan="3">Biomaterials</td></tr>
<tr><td colspan="3">For students with an interest in biomaterials for the development of constructs with polymers and stem cells for tissue regeneration (heart, chronic wounds, bone, central nervous system); nanoparticles for treating several types of cancer and atherosclerosis. Emphasis is placed on the selection of biomaterials and cell types to optimize tissue regeneration, diseased tissue targeting and treatment.</td></tr>
<tr><td colspan="3">Required Courses (13 credit hours):</td></tr>
<tr><td colspan="3" align="center">BME 6421 Biotransport ▪ BME 6440 Biomaterials
BME 6450 Tissue Engineering & Regenerative Medicine ▪ BME 6460 Nanomedicine Fundamentals</td></tr>
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Orthopedic and Medical Devices
For students interested in aspects of medical devices such as the design and manufacturing of orthopedic implants, biomechanics and modeling, or human factors of medical instrumentation and devices. Biomechanics, and biocompatibilities of devices that aim to improve the quality of life of patients with conditions such as trauma, degenerative disease, fractures, and joint arthritis, with the goal to restore functionality and mobility and reduce pain, while considering patient safety and product usability.

Required Courses (17 credit hours):

BME 6440 Biomaterials ▪ BME 6550 Bioinstrumentation ▪ BME 6980 Design of Medical Devices
BME 7210 Orthopedic and Prosthetic Engineering OR BME 7220 Experimental Orthopaedic Engineering
BME 7371 Failure Analysis of Medical Devices

Course/Semester/Credits

IHE 6150*	Advanced Probability & Statistics for Engineers* (m)	F	3
BME 6310*	Ergonomics*	F	3
BME 6421	Biotransport	S	3
BME 6440	Biomaterials	F	4
BME 6450	Tissue Engineering & Regenerative Medicine (alternates w/BME 6460)	S	3
BME 6460	Nanomedicine Fundamentals (alternates w/ BME 6450)	F	3
BME 6550	Bioinstrumentation	F	4
BME 6703	Medical Imaging	F	4
BME 6850*	Six Sigma for Engineers*	F	3
BME 6980	Design of Medical Devices	F	3
BME 7210	Orthopaedic & Prosthetic Engineering	F	3
BME 7220	Experimental Orthopaedic Engineering	S	3
BME 7371	Failure Analysis of Medical Devices	S	3
BME 7380	From Neurons to Behavior in Health & Disease	S	3
BME 7850*	Lean Process Improvement for Engineers*	S	3
BME 7980	Special Topics	TBA	3
BME 6990/7990	Independent Study in BME (max 4 cr)	F/S/R	1-4
IHE 6300*	Fundamentals of Human Factors Engineering*	F	3
IHE 6320*	Human-System Interaction & Design Thinking Principles*	S	3
IHE 6400*	Engineering Economy*	F	3
IHE 6510*	Computer Applications in IHE*	S	3
IHE 6830*	Engineering Project Management & Applications*	R	3
IHE 7020*	Systems Engineering & Analysis*	S	3
IHE 7300*	Research Methods in HFE* (m)	S	3
IHE 7340*	User Experience Design for Mobile Computing*	F	3
IHE 7510*	Data Mining* (m)	F	3
IHE 7810*	Engineering Health Systems*	TBA	3

(label: Course options)

MSBME program of study requirements	
Minimum 30 credit hours total, to include:	24 cr minimum BIE Department coursework, 9 or more of which must be 7000-level 6 cr minimum math/statistics-intensive coursework; 4 cr max independent study ▪ 8 cr max thesis

(m) = approved math/stats course; MTH/STT/CS courses also fulfill requirement   * = offered in class and online

Students who earn credit for the 4000-level section of a course listed above are ineligible to earn credit for the 6000-level section.