M.S. in Biomedical Engineering

Program Requirements

Thesis Option

Code	Title	Credits
Five courses selected from list of BME mandatory courses (see below for complete list)		15
One graduate course in physiology or equivalent		3
One graduate course in experimental design, statistics, or clinical studies		3
BME 701 Master's Thesis		6
Any approved elective		3
BME 791	Graduate Seminar (required for two semesters)	0
Total Credits		30

Non-Thesis Option

Code	Title	Credits
Five courses selected from list of BME mandatory courses (see below for complete list)		15
One graduate course in physiology or equivalent		3
One graduate course in experimental design, statistics or clinical studies		3
Three approved electives		9
BME 791	Graduate Seminar (required for two semesters)	0
Total Credits		**30**

MS Curriculum Mandatory Courses

1. Admitted students who have not previously taken an upper level physiology course will be required to take BME 669 Engineering Physiology or an equivalent course as one of their required graduate courses.

2. In addition, students must meet a statistics requirement. They may choose one course from the following preapproved statistics courses: MATH 660 Introduction to statistical Computing with SAS and R, MATH 661 Applied Statistics, MATH 663 Introduction to Biostatistics, IE 604 Advanced Engineering Statistics.

All graduate students must additionally **select five** courses from the following list:

Code	Title	Credits
BME 651	Principles of Tissue Engineering	3
BME 652	Cellular and Molecular Tissue Engineering	3
BME 653	Micro/Nanotechnologies for Interfacing Live Cells	3
BME 654	Cardiovascular Mechanic	3
BME 661	Neural Engineering	3
BME 668	Medical Imaging Systems	3
BME 670	Introduction to Biomechanical Engineering	3
BME 671	Biomechanics of Human Structure and Motion	3
BME 672	Biomaterials	3
BME 673	Biorobotics	3
BME 674	Principles of Neuromuscular Engineering	3
BME 675	Computer Methods in Biomedical Engineering	3
BME 676	Computational Biomechanics	3
BME 678	Design of Orthopedic Implants	3
BME 679	Advanced Design of Orthopedic Implants	3
BME 680	BioMEMS Design and Applications	3
BME 687	Design of Medical Instrumentation	3
BME 688	Virtual Biomedical Instrument	3

Elective Courses

The remaining three courses can be selected from any of the BME courses offered. For students taking the MS Thesis Option, two semesters of thesis count as two elective courses.

Other Notes

Students may take up to two courses outside the department, including the statistics course.

Seminars

M.S. students are required to register for the 0 credit graduate seminar in each of a minimum of two semesters. This is a non-additive credit (i. e. it does not count toward the 30 required credits), however participation in the seminar is required for graduation. Graduate seminars are offered weekly during the semesters and include guest speakers as well as NJIT graduate students. The Department also maintains lists of seminars in other departments and in neighboring institutions that are of interest to biomedical engineering. Part-time graduate students may request a waiver of this requirement.

Thesis Requirement

The Thesis Option **requires** a six (6) credit thesis. Because biomedical engineering exists at the intersection of several traditional engineering and computing fields, and the biological and medical sciences, the thesis demonstrates the student's ability to define a problem, plan two semesters of independent work in an interdisciplinary environment, and execute a research and/or design that meets NJIT's standards for a Masters Thesis. The thesis document conforms to the format of the Office of Graduate Studies and is evaluated by a committee of three members, two of whom must be from the NJIT biomedical faculty. External members from industry, medicine or other universities are encouraged. An oral defense before the committee and the departmental community is also required. All NJIT theses are archived in the University Library and are available via the Library's web site.

Thesis topics are selected by the student in consultation with faculty and other potential advisors. Thesis content can include a research study, the development/design of new technology including software, or the design, execution and evaluation of an experiment. A thesis may be conducted in an NJIT laboratory or in another institutional or industrial facility. The individual nature of the work must be clearly identifiable, as should its novelty and importance to biomedical engineering.

In cases where the intellectual property of an industrial sponsor may be in conflict with the public presentation of the thesis or its availability through the NJIT Library, special arrangements can be made by the M.S. Program Director to protect the firm's property.