MS in Bioengineering Course Requirements and Electives

Please note that the curriculum outlined below is a guide. All students must meet with their academic advisor to develop a plan of study.

All students are required to take four of the five core courses listed below. Engineering Math ENGR 5011 must be one of the core courses taken:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGR 5011</td>
<td>Engineering Mathematics I</td>
<td>Required</td>
</tr>
<tr>
<td>BIOE 5737</td>
<td>Systems Physiology for Engineers</td>
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<tr>
<td>BIOE 5719</td>
<td>Introduction to Bioengineering</td>
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<tr>
<td>BIOE 5721</td>
<td>Cell Biology for Engineers</td>
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<tr>
<td>BIOL 5312</td>
<td>Biostatistics</td>
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</table>

The remainder of didactic credits are electives, to be selected in consultation with your academic advisor based on your bioengineering focus. Courses with non-engineering/non-science (specifically, not ENGR, BIOE, MEE, EE, CEE, BIOL, CHEM, BMSC) course codes must be related to your bioengineering focus, are limited to two total, and require approval of your advisor. Additional non-engineering/non-science courses of interest must be approved by your academic advisor.

Suggested Electives: (not inclusive)

Engineering

- ENGR 5117 Experimental Methods (3 s.h.)
- ENGR 5012 Engineering Math II (3 s.h.)

Bioengineering

- BIOE 5301 Biosignals (3 s.h.)
- BIOE 5311 Entrepreneurial Studies in Regenerative Medicine (3 s.h.)
- BIOE 5321 Biosensors (3 s.h.)
- BIOE 5421 Bionanotechnology (3 s.h.)
- BIOE 5741 Biomaterials for Engineers (3 s.h.)
- BIOE 5333 Applied Biospectroscopy (3 s.h.)
- BIOE 5451 Biomedical Imaging (3 s.h.)
- BIOE 5461 Principles of Tissue and Regenerative Engineering (3 s.h.)
- BIOE 5501 Regenerative Engineering (3 s.h.)

Mechanical Engineering

- MEE 5732 Tissue Biomechanics (3 s.h.)
- MEE 5731 Cardiovascular Fluid Dynamics (3 s.h.)
- MEE 5734 Forensic Biomechanics (3 s.h.)
Electrical Engineering

- EE 5612 Advanced Microprocessor Systems (3 s.h.)
- EE 5514 Digital Signal Processing Analysis (3 s.h.)
- EE 5314 Microelectronics (3 s.h.)
- EE 8514 Applications in Digital Signal Processing (3 s.h.)
- EE 5514 Digital Image Processing (3 s.h.)

Civil & Environmental Engineering

- CEE 5701 Principles of Transport (3 s.h.)
- CEE 5703 Mathematical Modeling (3 s.h.)

Biology

- BIOL 5312 Biostatistics (3 s.h.)
- BIOL 5433 Advanced Techniques in Microscopy (3 s.h.)
- BIOL 5475 General Biochemistry (3 s.h.)
- BIOL 5501 Analytical Biotechnology (3 s.h.)
- BIOL 5505 Ethics Regulation and Policy in Biotechnology (2 s.h.)
- BIOL 8250 (seminar) Biomimetics and Bioinspiration (3 s.h.)
- BIOL 8250 (seminar) Stem Cells and Regeneration (3 s.h.)

Chemistry

- CHEM 5201 Physical Methods in Organic Chemistry (3 s.h.)
- CHEM 5401 Biochemistry (3 s.h.)
- CHEM 8501 Polymer Chemistry (3 s.h.)
- CHEM 8601 Analytical Separations (3 s.h.)

Biomedical Sciences (Medical School)

- BMSC 8001 Introduction to Biochemistry and Molecular Biology I (3 s.h.)
- BMSC 8002 Introduction to Cell Biology and Immunology (3 s.h.)
- BMSC 8003 Introduction to Molecular and Cell Biology (3 s.h.)
- BMSC 8004 Molecules to Cells (3 s.h.)

Kinesiology

- KINS 5202 Skeletal Biomechanics (3 s.h.)

Physical Therapy

- PHTH 9620. Human Movement Science I: Neural Factors (3 s.h.)
  - Instrumentation and Motion Analysis (3 s.h.)
- PHTH 9624. Human Movement Science II: Mechanics and Models (3 s.h.)
- PHTH 9627. Neural Regulation of Posture and Movement (3 s.h.)
- PHTH 9645. Advanced Musculoskeletal Anatomy (3 s.h.)

Students completing the thesis option must complete 24 semester hours of course work and 6 semester hours of thesis. Students completing the project option must complete 27 semester hours of course work and 3 semester hours of a research project. Students completing the non-research option, with the permission of the department, are required to take 30 semester hours of course work.