Biomedical Engineering – Program Map: Bioimaging Focus Area

Semester 1

| Chem I / Lab CHEM:1110 | Engr Math I MATH:1550 | Intro Engr Prob Solving ENGR:1100 | Rhetoric RHET:1030 | Engr Success First Year ENGR:1000 |

Semester 2

| Chem II / Lab CHEM:1120 | Engr Math II MATH:1560 | Engr Math III MATH:2550 | Physics I / Lab PHYS:1611 | Intro Engr Computing ENGR:1300 | BME Forum BME:1010 |

Semester 3

| Foundations of Biology / Lab BIOL:1411 | Engr Math IV MATH:2560 | Statics ENGR:2110 | Elec Circuits ENGR:2120 | Thermo ENGR:2130 or *Intro AI & Mach Learning ENGR:3110* | BME Prof Seminar BME:2010 |

Semester 4

| Human Physiology HHP:3500 or Quantitative Physiology BME:2260 | Biostatistics BIOS:4120 or STAT:3510 | Systems, Instrum, & Data Acquisition / Lab BME:2200 | Bioimaging & Bioinformatics / Lab BME:2210 | Comp in Engr ENGR:2730 |

Semester 5

| Cell Biology for Engr / Lab BME:2400 | Biomaterials & Biomechanics / Lab BME:2500 | Medical Imaging Physics BME:5210 | Digital Image Processing ECE:5480 | Cultural Perspectives, Values, and Society |

Semester 6

| Focus Area Elective #1 | Focus Area Elective #2 | Focus Area Elective #3 | Intro to Software Design ECE:3330 | Be Creative |

Semester 7

| BME Senior Design I BME:4910 | Focus Area Elective #4 | Focus Area Elective #5 | Focus Area Elective #6 | Approved GEC course |

Semester 8

| BME Senior Design II BME:4920 | Physics II / Lab PHYS:1612 | Focus Area Elective #7 | Approved GEC course | Approved GEC course |

Legend:
- Math & Science Courses
- Required Engineering Courses
- Focus Area Required Courses
- General Education Courses
- Engineering Core Courses
- Biomedical Core Courses
- Focus Area Elective Courses
- Seminars

*If ENGR:3110 is not offered in Fall, it can be taken the following Spring. Students who want to take ENGR:3110 and not ENGR:2130 can take ENGR:2730 Computers in Engineering in Semester 3 and ENGR:3110 in Semester 4. At least two Focus Area Electives must be from the list of Engineering Topics.

Last updated 10/11/24

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Bioimaging Required Courses

BME:5210	Medical Imaging Physics	F	P: BME:2200, BME:2210
ENGR:2730	Computers in Engineering	F/S	P: ENGR:1300
ECE:3330	Intro to Software Design	F/S	P: ENGR:2730
ECE:5480	Digital Image Processing	F	P: BME:2200 or ECE:2400

Bioimaging Electives (Focus Area, Minor, or Certificate)

Engineering Topics (must choose two)

BME:5200	Biomedical Signal Processing	S §§	
BME:5240	Deep Learning in Medical Imaging	F	P: ENGR:3110 (formerly ENGR:2995); ECE:5480 recommended
ECE:5330	Graph Algorithms & Combinatorial Optimization	S	P: ECE:3330
ECE:5450	Machine Learning	F	P: BME:2200 or ECE:2400
ECE:5490	Multidimensional Image Analysis Tools & Techniques	S §§	P: ECE:5480 and (ECE:3330 or CS:2820)

Suggested Electives

BME:5251	Advanced Biosystems	F §	P: BME:2200
BME:5441	Numerical & Statistical Methods for Bioengr	F §	P: MATH:2560 and MATH:2550
CS:2210	Discrete Structures	All	
CS:2230	Data Structures	All	P: ENGR:2730 or CS:1210
ECE:5460	Digital Signal Processing	F	P: ECE:3400
HHP:1100	Human Anatomy	All	
MATH:3800	Elementary Numerical Analysis	F/S	P: (MATH:2550 or MATH:2700) and (MATH:1560 or MATH:1860)

Pre-Medicine Electives

**BIOL:1412	Diversity of Form & Function	All	P: BIOL:1411 w/min C-
CHEM:2210	Organic Chemistry I	All	P: CHEM:1120 w/min C-
CHEM:2220	Organic Chemistry II	All	P: CHEM:2210 w/min C-
CHEM:2410	Organic Chemistry Lab	All	P: CHEM:1120 w/min C-, CHEM:2210 w/min C-; C: CHEM:2220
BMB:3110	Biochemistry	All	See MyUI for requirements
BIOL:2512	Fundamental Genetics	All	P: BIOL:1411 w/min C-, CHEM:1110; Recommended: CHEM:2210

**   Pre-medicine students should check with their Pre-medicine advisor regarding the need for this course.

§   Offered in academic years with odd fall and even spring semesters

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Note: At least two electives must be from the list of Engineering Topics. Electives not listed above may be approved via the Plan of Study form.

Please check MyUI for the current course offerings and pre/corequisites.

See the BME Bioimaging Focus Area web page for a link to a guide for courses with machine learning content.

Last updated (10/7/24)