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:2995*	BME Prof Seminar BME:2010

Semester 4

Human Physiology HHP:3500 or BME:2260 Quantitative Physiology	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	Intro to Software Design ECE:3330	Diversity & Inclusion

Semester 6

Focus Area Elective #1	Focus Area Elective #2	Focus Area Elective #3	Digital Image Processing ECE:5480	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:2995 is not offered in Fall, it can be taken the following Spring. Students who want to take ENGR:2995 and not ENGR:2130 can take ENGR:2730 Computers in Engr in Semester 3 and ENGR:2995 in Semester 4.
At least two Focus Area Electives must be from the list of Engineering Topics.

Last updated 03/20/24

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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: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-, BIOL:1412 or PSY:2701 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
§§   Offered in academic years with even fall and odd spring semesters
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.
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