Biomedical Engineering – Program Map: Bioimaging Focus Area

Semester	Course 1	Course 2	Course 3	Course 4	Course 5	Seminar
1	Principles Chem I / Lab **CHEM:1110** *(Math & Science)*	Engr Calculus I **MATH:1550** *(Math & Science)*	Intro Engineering Problem Solving **ENGR:1100** *(Engineering Core)*	Rhetoric **RHET:1030** *(Gen Ed)*	—	
2	Principles Chem II / Lab **CHEM:1120** *(Math & Science)*	Engr Calculus II **MATH:1560** *(Math & Science)*	Engr Matrix Algebra **MATH:2550** *(Math & Science)*	Physics I / Lab **PHYS:1611** *(Math & Science)*	Intro Engr Computing **ENGR:1300** *(Engineering Core)*	BME Forum **BME:1010**
3	Foundations of Biology / Lab **BIOL:1411** *(Math & Science)*	Engr Diff Equations **MATH:2560** *(Math & Science)*	Statics **ENGR:2110** *(Required Engineering)*	Electrical Circuits **ENGR:2120** *(Required Engineering)*	Thermo **ENGR:2130** or *Intro AI & Machine Learning **ENGR:3110** *(Required Engineering)*	BME Prof Seminar **BME:2010**
4	Fund Human Physiology **HHP:2400** or **BME:3260** Quantitative Physiology *(Math & Science)*	Biostatistics **BIOS:4120** or **STAT:3510** *(Math & Science)*	Systems, Instrum, & Data Acquisition / Lab **BME:2200** *(Biomedical Core)*	Bioimaging & Bioinformatics / Lab **BME:2210** *(Biomedical Core)*	Computers in Engineering **ENGR:2730** *(Focus Area Required)*	
5	Cell Biology for Engr / Lab **BME:2400** *(Biomedical Core)*	Biomaterials & Biomechanics / Lab **BME:2500** *(Biomedical Core)*	Medical Imaging Physics **BME:5210** *(Focus Area Required)*	Digital Image Processing **ECE:5480** *(Focus Area Required)*	Cultural Perspectives, Values, & Society *(Gen Ed)*	
6	Focus Area Elective #1	Focus Area Elective #2	Focus Area Elective #3	Intro to Software Design **ECE:3330** *(Focus Area Required)*	Be Creative *(Gen Ed)*	
7	BME Senior Design I **BME:4910** *(BME Core)*	Focus Area Elective #4	Focus Area Elective #5	Focus Area Elective #6	Approved Gen Ed course	
8	BME Senior Design II **BME:4920** *(BME Core)*	Physics II / Lab **PHYS:1612** *(Math & Science)*	Focus Area Elective #7	Approved Gen Ed course	Approved Gen Ed course	

*If ENGR:3110 is not 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 10/29/2025

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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; ECE:5480 recommended
ECE:5330	Graph Algorithms & Combinatorial Optimization	See MyUI	P: ECE:3330
ECE:5450	Machine Learning	F	P: BME:2200 or ECE:2400
ECE:5490	Multidimensional Image Analysis Tools & Techniques	See MyUI	P: ECE:5480 and (ECE:3330 or CS:2820)
+ENGR:3110	Intro to AI & Machine Learning in Engr	S	P: ENGR:1300; C: MATH:2550

Suggested Electives

BME:5251	Advanced Biosystems	See MyUI	P: BME:2200
BME:5441	Numerical & Statistical Methods for Bioengr	F §	P: MATH:2560 and MATH:2550
ECE:5460	Digital Signal Processing	F	P: ECE:3400
CS:2210	Discrete Structures	All	
CS:2230	Data Structures	All	P: ENGR:2730 or CS:1210
HHP:2100	Human Anatomy	All	
HHP:4250	Human Pathophysiology	S	P: HHP:2400 or HHP:3500 or HHP:3550
HHP:4260	Respiratory Pathophysiology	S	P: HHP:2400 or HHP:3500 or HHP:3550
MATH:3550	Engineering Vector Calculus	F/S	P: MATH:1560 & (MATH:2550 or MATH:2700); C: MATH:2560
MATH:3800	Introduction to Numerical Methods	F/S	P: (MATH:2550 or MATH:2700) and (MATH:1560 or MATH:1860)
+ENGR:2130	Thermodynamics	ALL	P: PHYS:1611 and CHEM:1110; C: MATH:1560
BME:3995	Undergraduate Research in BME	F/S	See MyUI for requirements

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

+ Bioimaging students can take ENGR:3110 as an Engineering Topic if they take ENGR:2130 as a required engineering course or take ENGR:2130 as focus area elective if they take ENGR:3110 as a required engineering course.

** 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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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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