



Department of Biomedical Engineering

Elective Options

Medical Devices and Imaging Track

Have You Considered Continuing Your Education?

If you are an undergraduate student at NJIT, you may be eligible to pursue a master's or PhD program here!

Requisites:

- Your GPA should be higher than 3.0 for BS/MS
- Your GPA should be higher than 3.5 for BS/PhD



Interested? Find more about this opportunity [HERE](#)

Engineering Electives

Description:

- Minimum two electives required
- You can choose up to 4 engineering electives and 2 will count as science electives!

Course	Credits	Description	Prerequisites
Biomechanics Courses			
BME 385	3	Cell & Biomaterials Engineering Laboratory	MATH 112, PHYS 121 BME 304 and (MATH 279 or MATH 333)
BME 420	3	Advance Biomaterials Science	BME 302, BME 304, and MTSE 301

Science Electives

Description:

- Minimum two electives required
- You can also choose your science electives from the engineering electives list on the left.

Course	Credits	Description	Prerequisites
Chemistry			
CHEM 244 & CHEM 244A	3	Organic Chemistry II (CHEM 244) & Laboratory (244A)	CHEM 243
CHEM 473	3	Biochemistry	CHEM 244 Or CHEM 245

BME 422	3	Biomaterials Characterization	MATH 112, PHYS 121, BME 304 and MTSE 301
BME 427	3	Biotransport	MATH 222, AND (BME 303 OR R120:102 OR BIOL 201)
BME 430	3	Fundamentals of Tissue Engineering	BME 302, (BME 303 or R120:102 or BIOL 201), BME 304, MATH 222, MTSE 301
Medical Devices Courses			
BME 352	3	Biomedical Thermodynamics	
BME 321	3	Advance Mechanics for BME	BME 302
MECH 236 AND BME 601	3	Dynamics (2 credits) and BME 601 (1 credit) online seminar	BME 302
BME 351	3	Introduction to BioFluid Mechanics	BME 302, MECH 236, and (MECH 320 or BME321)
BME 451	3	Biomechanics I	MECH 236 and BME 321

Mathematics			
MATH 3XX/4XX	3	Upper Level Mathematics Courses	
Materials Science and Engineering			
MTSE 301	3	Material Science & Engineering	PHYS 111 & PHYS 121 and CHEM 125 & CHEM 126 and MATH 111 & MATH 112
Physics			
PHYS 350	3	Biophysics I	PHYS 121
PHYS 451	3	Biophysics of Electricity and Radiation	PHYS 103 or PHYS 121
Industrial Engineering			
IE 355	3	Human Factors in IE	Restriction: Junior standing

BME 452	3	Mechanical Behavior and Performance of Biomaterials	BME 302, BME 304, MATH 222, (MATH 279 or MATH 333), and BME 321
ENGR 3XX/4XX	3	-Grand Challenges Program -Drone Science Fundamentals -Engineering Application of Data Science (Honors)	
BME 491	3	BME Research & Independent Study I	Restrictions: -Approved requirements for credits -Research thesis required, -Professor permission
BME 492	3	Research and Independent Study II	BME 491 Restrictions: -Approved requirements for credits

IE 449	3	Industrial Robotics	CS 101, PHYS 121 Junior or Senior Standing
IE 439	3	Deterministic Model in Operations Research	MATH 112
IE 455	3	Robotics and Programmable Logic Controllers	Restrictions: Junior or Senior Standing
IE 335	3	Engineering Cost Analysis and Control	Restrictions: Junior standing
IE 447	3	Legal Aspects of Engineering	Restrictions: Junior or Senior Standing
IE 460	3	Measuring Techniques and Quality Control	understanding of basic probability
CS 350	3	Intro to Computer Systems	CS 280

			-Research thesis required -Professor permission
Graduate Courses			
BME 651	3	Principles of Tissue Engineering	
BME 676	3	Computational Biomechanics	
BME 678	3	Design of Orthopedic Implants	
BME 673	3	Bio-robotics	
BME 674	3	Principles of Neuromuscular Engineering	
BME 670	3	Intro to Biomechanical Engineering	
BME 671	3	Biomechanics of Human Structure and Motion	
BME 688	3	Virtual Biomedical Instrument	
BME 698ST	3	Advanced Virtual Biomedical Instrumentation	

IE 463	3	Invention and Entrepreneurship	Restriction: Junior or Senior standing or permission of instructor
IE 334	3	Engineering Economy and Capital Investment	Restriction: Junior or Senior standing
Graduate Courses			
MATH 661	3	Applied Statistics	

Various			
<u>OPSE 301</u>	3	Introduction to Optical Science and Engineering	
<u>OPSE 310</u>	3	Virtual Instrumentation	
<u>OPSE 402</u>	3	High Power Laser and Photonics Applications	
<u>MET 304</u>	3	Applied Fluid Mechanics	

NJIT COMPLETE CATALOGS:

- [Biomedical Engineering Undergraduate](#)
- [Biomedical Engineering Graduate](#)