

2019 BME Graduate Curriculum Menus

Suggested foundational courses

Course Number	Course Title	Credits
MATH 425/PLSC 561	Statistics/Statistics for Biological Research or Similar Course	3
BME 503	Biological Numerical Methods (MatLab)	3
ME 529	Application of Linear Algebra in Engineering Systems	3
ME 533	Dynamics	3
ME 536	Continuum Mechanics	3
COSC 565	Survey of Programming Languages	3
	Total Credit Hours	18

BME option for thesis option MS

Course Number	Course Title	Credits
BME 500**	Master's Research and Thesis	6
ME/BME 5XX	Select from the BME List of Electives	6
BME 595	Seminar	1
	Minimum Total Credit Hours	18+13

BME option for non-thesis MS (Option I)

Course Number	Course Title	Credits
ME/BME 5XX	Select from the BME List of Electives	12
	Minimum Total Credit Hours	18+12

BME option for non-thesis MS with project (Option II)

Course Number	Course Title	Credits
BME 590*	Selected Biomedical Engineering Problems	3-6
ME/BME 5XX	Select from the BME List of Electives	9-6
	Minimum Total Credit Hours	18+13

BME PhD

Course Number	Course Title	Credits
BME 600***	Doctoral Research and Dissertation	26
BME 601***	Doctoral Research Methodology	3
BME 595	Seminar	1
ME/BME 5XX	Select from the BME List of Electives	18
ME/BME 6XX	Select from the BME List of Electives	6
	Minimum Total Credit Hours	18+54

*Alternative for non-thesis MS; **Master's thesis option; ***Doctoral degree

Requirements for a Biomedical Engineering MS

https://catalog.utk.edu/preview_program.php?catoid=25&poid=10769

Requirements for a Biomedical Engineering PhD

https://catalog.utk.edu/preview_program.php?catoid=25&poid=10770

BME List of Electives

Course		Pre-requisites
BME 521	Applied Quantitative Physiology	BME 503
BME 531	Advanced Biomechanics I	ME 231
BME 631	Advanced Biomechanics II	ME 531
	Advanced Biomechanics III	ME 631
BME 632	Biomechanics Design	ME 531
BME 599	Modeling and Simulation of Human Movement	
ME 547	Linear Control Systems Design	ME 451
ME 586	Mechanics of Robotic Manipulators	ME 451 or equivalent; ME 533 and ME 529 (Co-requisites)
ME 587	Dynamic Modeling and Simulation	ME 363
ME 605	Mechatronics II	ME 505
ME 647	Nonlinear Control Systems	ME 547
ME 686	Human-Robot Systems	ME 586
ME 687	Control of Robotic Manipulators	ME 586
ME 599	Stochastic Processes in Mechanical Systems	
ME 599	Mobile Robotics	
BME/ME599	Brain Machine Interaction	
NE 535	Radio and Nuclear Chemistry	
NE 551	Radiation Protection	
NE 567	Medical Physics I	
NE 568	Medical Physics II	NE 567
BME 574	Medical Imaging	BME 503
BME 575	Luminescent Materials for Theranostics	PHYS 411
BME 678	Magnetic nanoparticles – From Fabrication to Clinical Applications	BME 578; MSE 567
BME 505	All Things Carbon	
BME 511	Biotransport Processes	BME 503
BME 560	Tissue Engineering and Regenerative Medicine	
ME 524	Fracture Mechanics	
BME 578	Advanced Biomaterials: Biological Applications of Nanomaterials	
BME 588	Cell and Tissue-Biomaterials Interaction	
ME 599	Non-destructive evaluation	
BME 679	Mechanics for Dental Materials	ME 524, 530 or 559
AE/ME 559	Advanced Mechanics of Materials I	ME 321

BME Electives by Track – all course 3 credits (Pre-requisites- see above)**Biomechanics Track**

BME 521	Computational Cell Biology (Zhao)
BME 531	Advanced Biomechanics I (Komistek)
BME 631	Advanced Biomechanics II (Komistek)
BME 632	Biomechanics Design (Komistek)
BME 599	Modeling and Simulation of Human Movement (Reinbolt)

Robotics Track

ME 547	Linear Control Systems Design (Rucker)
ME 586	Mechanics of Robotic Manipulators (Hamel)
ME 587	Dynamic Modeling and Simulation (DeSmidt)
ME 605	Mechatronics II
ME 647	Nonlinear Control Systems
ME 686	Human-Robot Systems (Hamel)
ME 687	Control of Robotic Manipulators (Rucker)
ME 599	Stochastic Processes in Mechanical Systems
ME 599	Mobile Robotics
BME/ME599	Brain Machine Interaction (Zhao)

Theranostics Track

NE 535	Radio and Nuclear Chemistry (Schweitzer – CHM?)
NE 551	Radiation Protection
NE 567	Medical Physics I
NE 568	Medical Physics II
BME 574	Medical Imaging (Mahfouz)
BME 575	Luminescent Materials for Theranostics (Johnson)
BME/ME599	Brain Machine Interaction (Zhao)
BME 678	Magnetic nanoparticles – From Fabrication to Clinical Applications (Johnson)

Materials Track

BME 505	All Things Carbon (Johnson)
BME 511	Biotransport Processes (Sarles)
ME 524	Fracture Mechanics (Abedi)
BME 560	Tissue Engineering and Regenerative Medicine (Hanrahan)
BME 578	Advanced Biomaterials: Biological Applications of Nanomaterials (Johnson)
BME 588	Cell and Tissue-Biomaterials Interaction (Hanrahan)
ME 599	Non-destructive evaluation (Vaidya)
BME 679	Mechanics for Dental Materials (Johnson)
AE/ME 559	Advanced Mechanics of Materials I