Curriculum[1]

Course No.	Course name	Credits	Hours	Prerequisites	Semester
Mandatory courses[2]					
0510.5001	Differential and Integral Equations[3]	3	3	See School of Electrical Engineering	1,2
0510.5002	Functional Analysis	3	3	See School of Electrical Engineering	2
0510.6202	Estimation Theory	3	3	Random Signals and Noise	2
0553.5000	Departmental Seminar	-			1,2
Departmental courses[4]					
0553.5155	Artificial Biological Systems[3]	3	3	See course syllabus	1
0553.5332	Drug-Eluting Biomedical Implants	3	3	Biomaterials or Introduction to Materials Engineering	2
0553.5335	Natural-Based Polymers for Biomedical Applications	3	3	Biomaterials or Introduction to Materials Engineering	*
0553.5341	Biomechanics of the Respiratory System	3	3	Cellular Biology; Human Physiological Systems 2	*
0553.5344	Selected Topics in the Biomechanics of Biological Tissues	3	3	Cellular Biology; Human Physiological Systems 2; Cellular and Tissue Engineering	2
0553.5346	The Pathomechanics of Tissue Injury & Disease & the Mechano-Physiology of Healing	3	3	Biomechanics; Biomaterials; Cellular and Tissue Engineering	*

0553.5349	Control and Regulation of the Coronary Circulation	3	3	Human Physiological Systems 2	*
0553.5354	Biomechanics of the Reproductive System	3	3	Cellular Biology; Human Physiological Systems 2	1
0553.5360	Biomechanics of Bones	3	3	Cellular Biology; Human Physiological Systems 2	*
0553.5362	Physiology of Effort	3	3	Human Physiological Systems 2	2
0553.5370	Principles and Practices of Stem Cells for Clinical Implications	3	3	Human Physiological Systems 1&2	1
0553.5510	Advanced Optical Microscopy and its Applications in Biomedicine	3	3	Wave Propagation in Biological Tissue; Optics & Lasers in Medicine	2
0553.5512	Advanced Interferometric Imaging Methods	3	3	Optics & Lasers in Medicine	*
0553.5515	Advanced Topics in Computational and Systems Biology	3	3	Cellular Biology; Introduction to Probability & Statistics; Knowledge in MATLAB	*
0553.5517	Imaging and Engineering of Gene Expression	3	3	Probability & Statistics	*
0553.5519	Ultrasound Utilization in Medical Practice	3	3	Human Physiological Systems 1&2	2
0553.5525	Bioelectric & Neuroelectric Phenomena	3	3	Human Physiological Systems 2	*
0553.5527	Engineering Methods for Simulation and Measurement of	3	3	Electric Signals & Conduction in Cells	*

	Electrical Activities in the Heart				
0553.5530	Electrical Analog Models of Physiological Systems	3	3		*
0553.5532	Design of Biomedical Instrumentation	3	3	Optics & Lasers in Medicine; Wave Propagation in Biological Tissue; Optical Diagnostic Methods in Medicine (recommended)	2
0553.5535	Computer Vision – Medical Applications	3	3	Image Processing or Processing of Medical Images	*
0553.5548	Optical Methods of Medical Diagnosis	3	3	Wave Propagation in Biological Tissue	1
0553.5553	Advanced Topics in Biomedical Engineering: Mathematical Models of Heart Contraction	3	3		*
0553.5554	Advanced Topics in Biomedical Engineering: Medical Robotics	3	3		*
0553.5556	Advanced Topics in Medical Image Processing 1	3	3	Image Processing	*
0553.5560	Advanced Topics in Bio-Electronics	3	2	Bioelectric & Neuroelectric Phenomena; Analysis of Biological Signals	*
0553.5561	Advanced Topics in Medical Image Processing 2	3	3	Image Processing	*
0553.5562	Advanced Topics in Modeling Ion Channels and Nonlinear Electric Conduction	3	3	Electric Signals & Conduction in Cells; Optics & Lasers in Medicine	*

0553.5564	Applications in Modeling Dynamical Systems, Analysis and Control of Biological Systems	3	3	Biological Control Systems	2
0553.7000	Practical Ethics for STEM students[5]	3	3		2
0553.7999	Biomedical Engineering Research Seminar		3	For Final Project Track (no thesis)	1

[1] The curriculum includes mandatory courses and elective departmental courses
[2] Students must take 2 of the following courses in Mathematics. Supervisors may suggest replacing one of the 2 courses with another Mathematics courses of equal level.
[3] In the 1st semester the course will be taught in the English language.
[4] Students may take elective courses based on meeting the prerequisites and the supervisor's approval.
[5] **Course with non-engineering skills – 1 such course may be taken in the Thesis Track and 2 in the Final Project Track.** The course Ethics of Laboratory Animals grants no credit points for the MSc degree.
* Course not offered in the 2018-19 academic year

Equivalent Level courses

Selected courses from the undergraduate program defined as Equivalent Level Courses may be approved for MSc studies provided the student did not take the course or a similar course as an undergraduate.
No more than 6 credit points from equivalent level courses may be approved for MSc students in the Research Track and no more than 9 credit points in the Final Project Track.
Up to 2 courses may be taken outside the Department with the approval of the **thesis supervisor or the Academic Coordinator of MSc Studies.**

0555.3240	Wave Propagation in Biological Tissue	3	4	Equivalent Level	*
0555.4520	Medical Image Processing 2	3	4	Equivalent Level	2
0555.4540	Introduction to Computational and Systems Genomics	3	4	Equivalent Level	1
0555.4560	Electric Signals & Conduction in Cells	3	4	Equivalent Level	*
0555.4561	Continuous Monitoring of Physiological Parameters	3	4	Equivalent Level	1
0555.4570	An Introduction to Magnetic Resonance Imaging (MRI)[2]	3	4	Equivalent Level	2

0555.4630	Polymeric Biomaterials	3	4	Equivalent Level	2
0555.4650	Artificial Organs and Implants	3	4	Equivalent Level	2
0555.4711	Mechanics of Cells and Tissues	3	4	Equivalent Level	1
0555.4712	Introduction to Neuro-prostheses	3	4	Equivalent Level	1
0555.4715	Introduction to Gene Expression Modeling and Engineering, and IGEM	3	4	Equivalent Level	2
0555.4716	International Genetically Engineered Machine Course A	3	4	Equivalent Level	1
0555.4717	International Genetically Engineered Machine Course B	3	4	Equivalent Level	2
0581.5361	Biomaterials	3	3	See Department of Materials Science and Engineering	1
0510.7003	Scientific Writing in English[3]	None	2+2	Recommended for Track with Thesis	1,2

_____

[1] Equivalent Level – See BSc curriculum

[2] The course will be taught in the English language

[3] **Course with non-engineering skills – 1 such course may be taken in the Thesis Track and 2 in the Final Project Track.** The course Ethics of Laboratory Animals grants no credit points for the MSc degree.

* Course not offered in the 2018-19 academic year