

**İZMİR INSTITUTE OF TECHNOLOGY
GRADUATE SCHOOL
DEPARTMENT OF BIOENGINEERING
CURRICULUM OF THE GRADUATE PROGRAMS**

M.Sc. in Bioengineering

Core Courses

BE 500	M.Sc. Thesis	(0-1)NC ECTS 26
BE 598	Research Seminar*	(0-2)NC ECTS 9
BE 501	Principles of Bioengineering I	(3-0)3 ECTS 9
BE 502	Principles of Bioengineering II	(3-0)3 ECTS 9
BE 503	Research and Ethics in Bioengineering	(3-0)3 ECTS 9
BE 8xx	Special Studies	(8-0)NC ECTS 4

*All M.S. students must register Seminar course until the beginning of their 4th semester.

Total credit (min.): 21

Number of courses with credit (min.): 7

Total ECTS credit (min.): 120

Ph.D. in Bioengineering

Core Courses

BE 600	Ph.D. Thesis	(0-1)NC ECTS 26
BE 698	Research Seminar*	(0-2)NC ECTS 9
BE 503	Research and Ethics in Bioengineering**	(3-0)3 ECTS 9
BE 504	Advanced Bioengineering	(3-0)3 ECTS 9
BE 505	Advanced Physiology	(3-0)3 ECTS 8
BE 8xx	Special Studies	(8-0)NC ECTS 4

*In order to graduate, doctoral students are required to successfully complete their seminar courses by one semester prior to their graduation.

**If this course is already taken during M.Sc., one additional elective course is required instead.

Total credit (min.): 21 (for students with M.Sc. degree)

Number of courses with credit (min.): 7 (for students with M.Sc. degree)

Total ECTS credit (min.): 240 (for students with M.Sc. degree)

Total credit (min.): 42 (for students with B.Sc. degree)

Total credit (min.) : 42 (for students with B.S. degree)

Number of courses with credit (min): 14 (for students with B.Sc. degree)

Total ECTS credit (min.): 300 (for students with B.Sc. degree)

Elective Courses

BE 511	Statistics for Bioengineers	(3-0)3 ECTS 8
BE 512	Biomolecular Engineering	(3-0)3 ECTS 8
BE 513	Bioprocess Engineering	(3-0)3 ECTS 8
BE 514	Fundamentals of Medical Engineering	(3-0)3 ECTS 8
BE 515	Nanoscale Bioengineering	(3-0)3 ECTS 8
BE 516	Biomedical Device Technologies	(3-0)3 ECTS 8
BE 531	Introduction to Biomaterials Science	(3-0)3 ECTS 8
BE 532	Protein Engineering Principles	(3-0)3 ECTS 8
BE 533	Biopolymers	(3-0)3 ECTS 8
BE 534	Macromolecular Science and Engineering	(3-0)3 ECTS 8
BE 535	Drug Delivery Systems	(3-0)3 ECTS 8
BE 536	Bioprinting	(3-0)3 ECTS 8
BE 537	Personalized Medicine	(3-0)3 ECTS 8
BE 538	Neuroengineering	(3-0)3 ECTS 8

BE 539	Synthetic Biology	(3-0)3 ECTS 8
BE 540	Bioimaging Techniques	(3-0)3 ECTS 8
BE 541	Biophotonics	(3-0)3 ECTS 8
BE 542	Cellular Mechanobiology	(3-0)3 ECTS 8
BE 543	Biomicroscopy	(3-0)3 ECTS 8
BE 544	BioMEMS: Fabrication Technologies and Applications	(3-0)3 ECTS 8
BE 545	Microfluidics	(3-0)3 ECTS 8
BE 546	Stem Cell Biology and Technology	(3-0)3 ECTS 8
BE 547	Tissue Engineering and Regenerative Medicine	(3-0)3 ECTS 8
BE 548	3D Cell Culture	(3-0)3 ECTS 8
BE 549	Nanomedicine	(3-0)3 ECTS 8
BE 550	Biosensors and Diagnostic Tools	(3-0)3 ECTS 6
BE 551	Fundamentals of Biophysical Protein Characterization	(3-0)3 ECTS 8
BE 552	Protein Engineering and Design	(3-0)3 ECTS 6
BE 553	Bone and Dental Tissue Engineering	(3-0)3 ECTS 8
BE 555	Vascularization in Tissue Engineering	(3-0)3 ECTS 8
BE 556	Nanotoxicology	(3-0)3 ECTS 6
BE 558	Visual Communication in Biomedical Research	(3-0)3 ECTS 8
BE 571	Advanced Bioprocess Engineering	(3-0)3 ECTS 8
BE 572	Advanced Biomaterials	(3-0)3 ECTS 8
BE 573	Advanced Biomechanics	(3-0)3 ECTS 8
BE 574	Downstream Processing of Natural Products	(3-0)3 ECTS 8
BE 575	Structural Characterization I	(3-0)3 ECTS 8
BE 576	Enzyme Design and Biotransformations	(3-0)3 ECTS 8
BE 577	Drug Design	(3-0)3 ECTS 8
BE 578	Computation for Bioengineers	(3-0)3 ECTS 8
BE 579	Molecularly Engineered Biomaterials	(3-0)3 ECTS 8
BE 580	Astrobiology	(3-0)3 ECTS 8
BE 581	Biomolecular Kinetics and Cellular Dynamics	(3-0)3 ECTS 8
BE 582	Biomedical Information Technologies	(3-0)3 ECTS 8
BE 583	Bioinorganic Chemistry	(3-0)3 ECTS 8
BE 584	Molecular Dynamics Methods	(3-0)3 ECTS 8
BE 585	Machine Learning for Computational Biochemistry	(3-0)3 ECTS 8
BE 587	Antibody Engineering	(3-0)3 ECTS 8
BE 586	Structural Characterization II	(3-0)3 ECTS 8
BE 591	Special Topics in Bioengineering	(3-0)3 ECTS 8