

Genomics and Systems Biology Focus Area –
Upper-Level Engineering Courses – updated June, 2019
For BME Class of 2021 and beyond

EN.510.311	Structure of Materials	3
EN.510.316	Biomaterials I	3
EN.510.407	Biomaterials II: Host response and biomaterials applications	3
EN.520.315	Introduction to Processing of Audio and Visual Signals	3
EN.520.353	Control Systems	3
EN.520.372	Programmable Device Lab	3
EN.520.385	Signals, Systems and Machine Learning	3
EN.520.401	Basic Communication	3
EN.520.414	Image Processing & Analysis	3
EN.520.415	Image Process & Analysis II	3
EN.520.432	Medical Imaging Systems	3
EN.520.454	Control Systems Design	3
EN.520.465	Digital Communications I	3
EN.520.636	Feedback Control of Signaling Pathways	3
EN.530.327	Introduction to Fluid Mechanics	3
EN.530.343	Design and Analysis of Dynamical Systems	4
EN.530.414	Computer-Aided Design	3
EN.530.420	Robot Sensors/Actuators	4
EN.530.426	Biofluid Mechanics	3
EN.530.445	Introduction to Biomechanics	3
EN.530.446	Experimental Methods in Biomechanics	3
EN.530.448	Biosolid Mechanics	3
EN.540.303	Transport Phenomena I	3
EN.540.304	Transport Phenomena II	4
EN.540.400	Project in Design: Pharmacokinetics	3
EN.540.409	Dynamic Modeling and Control	4
EN.540.414	Computational Protein Structure Prediction and Design	3
EN.540.421	Project in Design: Pharmacodynamics	3
EN.553.361	Introduction to Optimization	4
EN.553.362	Introduction to Optimization II	4
EN.553.386	Scientific Computing: Differential Equations	4
EN.553.391	Dynamical Systems	4
EN.553.400	Mathematical Modeling and Consulting	4
EN.553.420	Introduction to Probability	4
EN.553.426	Introduction to Stochastic Processes	4
EN.553.430	Introduction to Statistics	4
EN.553.436	Data Mining	4
EN.553.450	Computational Molecular Medicine	4
EN.553.467	Deep Learning in Discrete Optimization	3
EN.580.418	Principles of Pulmonary Physiology	3
EN.580.430	Systems Pharmacology and Personalized Medicine	3

EN.580.431	Introduction to Computational Medicine I	3
EN.580.435	Applied Bioelectrical Engineering I	1.5
EN.580.436	Applied Bioelectrical Engineering II	1.5
EN.580.439	Models of the Neuron	4
EN.580.441	Cellular Engineering	3
EN.580.446	Physical Epigenetics	3
EN.580.447	Computational Stem Cell Biology	3
EN.580.448	Biomechanics of the Cell	3
EN.580.454	Methods in Nucleic Acid Sequencing	3
EN.580.471	Principles of Design: Biomedical Instrumentation	4
EN.580.472	Medical Imaging Systems	3
EN.580.473	Modern Biomedical Imaging Instrumentation and Techniques	3
EN.580.488	Foundations of Computational Biology & Bioinformatics	3
EN.580.491	Learning Theory	3
EN.580.571	Honors Biomedical Instrumentation	2
EN.580.625	Structure and Function of the Auditory and Vestibular Systems	3
EN.580.630	Theoretical Neuroscience	3
EN.601.448	Computational Genomics: Data Analysis	3
EN.601.465	Natural Language Processing	3
EN.601.475	Machine Learning	3
EN.601.476	Machine Learning: Data to Models	3
EN.601.482	Machine Learning: Deep Learning	3

Contact the department advising office for course additions.

Genomics and Systems Biology - 200-Level Engineering Courses

(maximum of 3 credits from this list may count in focus area)

EN.520.213	Circuits	4
EN.520.214	Signals & Systems I	4
EN.520.216	Introduction To VLSI	3
EN.601.226	Data Structures	4
EN.520.230	Mastering Electronics	3
EN.530.201	Statics and Mechanics of Materials	4
EN.530.215	Mechanics-Based Design	3

Genomics and Systems Biology Focus Area - Non Upper-Level Focus Area Courses

(maximum of 3 credits from this list may count in focus area)

AS.080.305	The Nervous System I	3
EN.580.112	BME Design Group	3
EN.580.211	BME Design Group	3
EN.580.212	BME Design Group	3
EN.580.311	BME Design Group	3
EN.580.312	BME Design Group	3
EN.580.411	BME Design Group	3
EN.580.412	BME Design Group	3

EN.580.580	Senior Design Project	3
EN.580.581	Senior Design Project	3

Students may use a maximum of 3 research credits as a non-upper-level engineering course.