

Biomedical Data Science Focus Area –
Upper-Level Engineering Courses – updated June, 2019
For BME Class of 2021 and beyond

EN.520.385	Signals, Systems and Machine Learning	3
EN.520.414	Image Process and Analysis I	3
EN.520.415	Image Process and Analysis II	3
EN.520.432	Medical Imaging Systems	3
EN.520.435	Digital Signal Processing	3
EN.520.447	Information Theory	3
EN.520.473	Magnetic Resonance in Medicine	3
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.553.391	Dynamical Systems	4
EN.553.400	Mathematical Modeling and Consulting	4
EN.553.401	Introduction to Research	3
EN.553.413	Applied Statistics and Data Analysis	4
EN.553.420	Introduction to Probability	4
EN.553.426	Introduction to Stochastic Processes	4
EN.553.430	Introduction to Statistics	4
EN.553.433	Monte Carlo Methods	3
EN.553.436	Data Mining	4
EN.553.450	Computational Molecular Medicine	4
EN.553.463	Network Models in Operations Research	4
EN.553.472	Graph Theory	4
EN.553.492	Mathematical Biology	3
EN.553.720	Probability Theory I	4
EN.553.721	Probability Theory II	4
EN.553.730	Statistical Theory	4
EN.553.731	Statistical Theory II	4
EN.580.431	Introduction to Computational Medicine I	3
EN.580.437	Neuro Data Design I	4
EN.580.438	Neuro Data Design II	4
EN.580.439	Models of the Neuron	4
EN.580.446	Physical Epigenetics	3
EN.580.447	Computational Stem Cell Biology	3

EN.580.462	Representations of Choice	3
EN.580.480	Precision Care Medicine I	3
EN.580.481	Precision Care Medicine II	3
EN.580.488	Foundations of Computational Biology & Bioinformatics	3
EN.580.491	Learning Theory	3
EN.601.315	Databases	3
EN.601.318	Operating Systems	3
EN.601.320	Parallel Programming	3
EN.601.350	Introduction to Genomic Research	3
EN.601.402	Digital Health and Biomedical Informatics	1
EN.601.433	Introduction to Algorithms	3
EN.601.434	Randomized and Big Data Analysis	3
EN.601.443	Security and Privacy Computing	3
EN.601.447	Computational Genomics: Sequences	3
EN.601.448	Computational Genomics: Data Analysis	3
EN.601.455	Computer Integrated Surgery I	4
EN.601.456	Computer Integrated Surgery II	3
EN.601.457	Computer Graphics	3
EN.601.461	Computer Vision	3
EN.601.463	Algorithms for Sensor-Based Robotics	3
EN.601.464	Artificial Intelligence	3
EN.601.465	Natural Language Processing	3
EN.601.466	Information Retrieval and Web Agents	3
EN.601.475	Introduction to Machine Learning	3
EN.601.482	Machine Learning: Deep Learning	3
EN.601.485	Probabilistic Models of the Visual Cortex	3

Contact the department advising office for course additions.

200-Level Engineering Courses

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

EN.601.226	Data Structures	4
EN.601.233	Computer System Fundamentals	3

Non Upper-Level Focus Area Courses

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

AS.110.311	Methods of Complex Analysis	4
AS.110.405	Introduction to Real Analysis	4
AS.110.421	Dynamical Systems	4

AS.110.443	Fourier Analysis	4
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
EN.601.271	Automata & Computation Theory	3

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