Course Requirements for BME Students in the Biomolecular Pharmacology Program

2014-15

Year 1 Fall (12-16 cr)
ENG BE 605 Molecular Bioengineering (4 cr)
GMS PM 701 Molecular Neurobiology and Pharmacology I (2 cr) M, 3-5 pm
GMS PM 710 Laboratory Techniques in Modern Pharmacology (2 cr)
ENG BME curriculum elective #1 (500 or 700 level BE course, 4 cr)
(The math course requirement is deferrable to Year 2 Fall for BME/Biomolecular Pharmacology students only. Students are advised to contact Dr. Klapperich to determine which math course is most appropriate so as to best fit into first year schedule. A list of approved electives is available here: http://www.bu.edu/bme/files/2014/07/Courses-that-Fulfill-the-BME-Math-Requirement.pdf)

Year 1 Spring (14 cr)
ENG BE 606 Quantitative Physiology for Engineers (4 cr)
BE 792 Critical Literature Review (2 cr)
GMS PM 702 Molecular Neurobiology and Pharmacology II (2 cr) M, 3-5 pm
GMS PM 710 Laboratory Techniques in Modern Pharmacology (2 cr)
ENG BME curriculum elective #2 (500 or 700 level BE course, 4 cr)

Year 2 Fall (10 cr)
GMS PM 801 Systems Pharmacology & Therapeutics I (2 cr) M 1-3 pm
ENG BME elective #3 (500 or 700 level BE course, 4 cr)
*Math course requirement (4 cr).

Year 2 Spring (4 cr)
GMS PM 802 Systems Pharmacology & Therapeutics II (2 cr) M 1-3 pm
GMS PM 810 Current Topics in Pharmacological Sciences (2 cr) W 12 pm -1:30 pm (lunch provided), Seminar 2-3 pm (Biomolecular Pharmacology requirement for this course may be satisfied by completion of ENG BE 792 Critical Literature Review)

Year 2 or Year 3 Fall and Spring (8 cr)
BE 801, 802 Teaching Practicum, two semesters (4 cr each semester)
ENG BME elective #4-5 (500 or 700 level BE or technical elective course, 4 cr); Pharmacology required courses above satisfy this requirement.

Students are also expected to attend pharmacology seminars on Wednesdays at 2 pm and participate in the Pfizer 7-week research rotation the summer after the first year at BU.
Descriptions of BME Required Courses

ENG BE 605 Molecular Bioengineering

Provides engineering perspectives on the building blocks of living cells and materials for biotechnology. Focuses on origins and synthesis in life and the laboratory, including biological pathways for synthesis of DNA, RNA and proteins; transduction, transmission, storage and retrieval of biological information by macromolecules; polymerase chain reaction, restriction enzymes, DNA sequencing; energetics of protein folding and trafficking; mechanisms of enzymatic catalysts and receptor-ligand binding; cooperative proteins, multi-protein complexes and control of metabolic pathways; generation, storage, transmission and release of biomolecular energy; and methods for study and manipulation of molecules which will include isolation, purification, detection, chemical characterization, imaging and visualization of structure. 4 cr, 1st sem.

ENG BE 606 Quantitative Physiology for Engineers

Course in human physiology for biomedical engineering students. Fundamentals of cellular and systems physiology, including the nervous, muscular, cardiovascular, respiratory, renal, gastrointestinal, endocrine and immune systems. Quantitative and engineering approaches will be applied to understanding physiological concepts. 4 cr, 2nd sem.

ENG BE 792 Critical Literature Review

Peer-reviewed publications in the area of biomedical engineering will be critically evaluated. Scientific ethics and the process of review and publication of manuscripts will be discussed. The classes will be a mix of didactic information and group discussion. Methodological issues covered will include study design, techniques used, and interpretation of research findings. Students completing this course will understand the principles underlying preparation and publication of scientific manuscripts and will be able to apply these principles as they read the scientific literature. 2 cr, 2nd sem.