BMB 509  Macromolecular Biophysics II – Ferguson (required course for BMB students)  
Tu/Th, 10:30 – 12:00 noon, 251 BRB II/III  
Prerequisites: BMB 508 or permission of instructor. 
This course introduces fundamental concepts in chemical kinetics and their application to problems in 
biochemistry such as protein folding and enzymology. There is an emphasis on dynamic processes in 
proteins and the techniques used to characterize them over a wide range of timescales. The latter half 
of the course focuses on emerging areas in biochemistry and biophysics including membrane 
biochemistry, single molecule methods and proteomics with an emphasis on mass spectrometry.

BMB 581  Techniques of Magnetic Resonance Imaging - Song  
(BE 581)  M/W, 5 - 6:30 p.m., 255 Anat-Chem Bldg.  
Detailed introduction to the physics and engineering of magnetic resonance imaging as applied to 
diagnostic medicine. Covered are magnetism, spin relaxation, spatial encoding principles, Fourier 
analysis, imaging pulse sequence and pulse design, contrast mechanisms, chemical shift, flow 
encoding, diffusion and perfusion and a discussion of the most relevant clinical applications.

BMB 601  Fundamentals of Magnetic Resonance - Reddy  
Tu/Th, 3:30 – 5:00 p.m., B1 Stellar-Chance Labs (01/09/13 to 03/04/13; ½ credit)  
This course introduces basic theoretical and experimental concepts of magnetic resonance and its 
applications in biochemistry, biology and medicine. Topics covered include description of the 
phenomenon of magnetic resonance, classical and quantum strategies to compute nuclear spin 
responses in liquids, solids and biological tissues, polarization transfer and multiple quantum effects 
and their applications in biomedicine. Nuclear spin relaxation in solid-state materials and in biological 
systems will be discussed. Concepts of magnetic resonance imaging, imaging strategies, image 
contrast, and diagnostic applications are discussed. The course includes several practicals dealing with 
the demonstration of NMR hardware and experiments to compute basic NMR parameters on high 
resolution and clinical MRI scanners. For further details of the course visit www.mmrcc.upenn.edu

BMB 622  Physical Principles of Mechano-Enzymes - Dominguez, Goldman, Grischchuk & 
Ostap  
Tu/Th, 3:30 – 5:00 p.m., 702 Clinical Res. Bldg.  (03/11/13 to 04/23/13; ½ credit)  
Prerequisite: Biochemistry  
This course will provide an introduction to the biochemical, structural, and mechanical properties of 
energy-transducing enzymes. We will emphasize the relationships of mechanical, thermal, and 
chemical forces in mechano-enzyme function.

BMB 624  Molecular and Physical Basis of Ion Channels – Kallen  
Days, time, location for class meeting to be announced; journal club Thursdays, 9:30 – 
10:30 a.m., Richards 5th Floor Library (1 semester course – half time; 1/2 credit)  
The course is a journal club format, targeted to graduate and MD/PhD students interested in ion 
channels from graduate programs in Physiology, Pathology, Neuroscience, Pharmacology, 
Biochemistry & Molecular Biophysics. It meets for one hour, once a week on alternate weeks and is 
coupled to the Ion Channel Journal Club, which also meets for one hour on the same alternate weeks 
(9:30-10:30 a.m., Thursdays, Richards 5th Floor library). A faculty member meets with students to 
discuss and review the contents of each selected article early in the week in preparation for the 
subsequent Journal Club presentation. This elective course is meant to introduce students to the latest 
advances in ion channel research and includes topics extending from biophysics, structure, and 
physiology to cell biology and medical applications.
BMB 650  Current Biochemical Topics – Black & Shorter (BMB students: course can be taken two times; can be counted only once for elective credit)
W, 12:15 – 1:30 p.m. (255 Anat-Chem); Th, 12 – 1:00 p.m. (Austrian Aud., CRB) Th, 1 – 2:00 p.m. (JF Library)
This is a discussion-based class in which students study, read, and present the published work of the invited Raiziss Rounds seminar speakers. The goal of the class is to develop the students’ ability to understand the rationale behind the experiments, critically analyze the work, communicate their thoughts to others, and to engage in focused scientific discourse. The Monday classes will run in a journal club format with students giving presentations of the papers for that week’s speaker. Thursday will be the noon seminar by the invited speaker, followed by lunch with the speaker.

BMB 700 Selected Topics in Chemistry – Petersson
CHEM700) Tu/Th, 9 – 10:30 a.m. (119 Chemistry Bldg)
PHRM630) Prerequisites: a strong background in undergraduate chemistry is required and at least one semester of biological chemistry is very desirable.
The course will focus on current topics in chemical biology, particularly experiments in which 1) chemical synthesis enables one to probe or control biological systems in novel ways or 2) manipulation of biological systems facilitates novel chemical syntheses. As the goal of the course is to familiarize students with innovative recent experimental approaches and to stimulate them to conceive of their own new methodology, students will be responsible for delivering presentations on topics selected from the literature and generating several novel research proposal ideas, one of which will be elaborated into a full proposal. The prepared seminar will allow students to explore topics not covered in Professor Petersson's lectures or to research one of those topics in more depth. The proposal will be evaluated for creativity, feasibility and impact.

BMB 705 Candidacy Exam Preparation Course – Lemmon, Marmorstein and Nelson (required course for second year BMB students)
M/F, 1:30 – 3:30 p.m. or 2:00 – 4:00 p.m. Exact schedule to be provided first day of class (302 Clinical Research Building) (01/11/13 to 03/29/13; ½ credit)
This course is designed for second year BMB students to prepare them for the Candidacy Exam, which must be completed in the spring semester of the second year.

BMB 699 Laboratory Rotation - Kohli (3 rotations are required of BMB students)
Supervised mini-projects for graduate students in BMB, seminar presentation required. Course offered fall, spring and summer semesters.
BMB 799 Independent Study (YRS 1-2)
BMB 999 Independent Study (YRS 3-5)