BMB 509  Structural and Mechanistic Biochemistry–Van Duyne *(required course for 1st year BMB students)* Tu/Th, 10:30 – 12:00 noon (251 BRB II/III); *first class, Th, Jan 15th*

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 567  Bioinorganic Chemistry - Dmochowski *(CHEM567)* M/W, 12:30 - 2:00 p.m. (2000 Vagelos); *first class, W, Jan 14th*

The course covers selected topics in bioinorganic chemistry; special emphasis is placed on dioxygen chemistry and electron transfer processes.  Course topics include: (i) oxygen uptake and utilization; (ii) diatomic oxygen transport; (iii) diatomic and monoatomic oxygen incorporation into substrates; (iv) metalloenzyme-catalyzed C-C bond formation; (v) the metalllobiochemistry of DNA; (vi) metal-sulfide proteins; (vii) manganese-containing metalloproteins; (viii) Photosystem II: light-driven electron transfer and the biological water-splitting reaction; (ix) biological electron transfer; (x) electron transfer theory; (xi) mechanisms of energy storage and release; and (xii) long-distance electron transfer reactions.

BMB 581  Techniques of Magnetic Resonance Imaging - Song *(BE 581)* M/W, 5 - 6:30 p.m. (255 Anat-Chem Bldg.); *first class, W, Jan 14th*

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 598  Tutorial - Sharp
Times to be arranged

The tutorial course is designed for in depth study of a specific topic through one on one meetings and discussions between the student and a selected BMB faculty member.  The intent of the course is to broaden the student's knowledge, thus the tutorial may not be taken with the student's current rotation advisor or thesis advisor.  Choice of faculty member and topic is by prior mutual arrangement between the student and faculty member, subject to approval by the course director.  Student and faculty member will typically meet for an hour or so 2-3 times a week.  The course may take the form of literature study, or where appropriate a mini-project (typically computer-based).  A tutorial can be used by students to become more deeply acquainted with the literature related to their thesis project or to help prepare students for their Candidacy Exam.  Upon completion of the tutorial, students must prepare a written description of the area studied (5-10 typewritten pages)

BMB 602  Imaging Biomarkers - Reddy  CANCELLED
Tu/Th, 2 – 3:30 p.m.,  First half of semester, ½ credit  (B1 Stellar-Chance Labs); *first class, Th, Jan 14th*

Introduction to principles of imaging based biomarkers for studying metabolic and functional integrity of biological tissues *in vivo*. Topics covered include, a general overview of multimodal imaging biomarkers and a special emphasis on theoretical and practical aspects of MRI biomarkers based on magnetic resonance relaxation, chemical exchange, and metabolic spectroscopy as well as functional responses and their applications in diagnostic imaging of different diseases.

BIOM 611  Biological Data Analysis - Feng *(required course for 1st year BMB students) ½ credit*
Class:  M, 3:30 – 4:30 p.m. (Class of '62, John Morgan)
Labs:  3:30 – 5:00 p.m. Tuesday to Friday (BRB 259); *first class, M., Jan 12th*
This course is required for all 1st year BGS students (except GCB students). It will provide an introduction to important topics in biostatistical concepts and reasoning and instructions on practices in data analysis. Specific topics include tools for describing and summarizing data; inference methods on population means and proportions; statistical hypothesis testing; group comparisons; simple linear regression; categorical data analysis; time to event data analysis; power and sample size in study designs. Labs will help students learn and implement the methods using R. Though there are some formulae and computational elements to the course, the emphasis is on interpretation, concepts, and applications.

**BMB 624 Molecular and Physical Basis of Ion Channels – Kallen**
W, 10 – 11 a.m. (1001 Stellar-Change Labs) and Th, 9:30 -10:30 a.m. (B400 Richards Bldg) – alternate weeks, full semester, ½ credit; first class, W., Jan 14th

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. A faculty member meets with students to discuss and review the contents of each selected article earlier 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 required elective credits)**
W, 12:15 – 1:30 p.m. (255 Anat-Chem); Th, 12 – 1:00 p.m. (Austrian Aud., CRB) Th, 1 – 2:30 p.m. (JF Library); organizational mtg, W Jan 14th; first class, W, Jan 21st

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 Wednesday classes will run in a journal club format with students giving presentations of the papers for that week’s speaker. Thursday The noon seminar by the invited speaker is on Monday, followed by lunch with the speaker.

**BMB 700-401 Selected Topics in Chemistry – Petersson**
Tu/Th, 9 – 10:30 a.m. (119 Chemistry Bldg); first class, Th, Jan 15th

This 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 –Marmorstein, Lynch and Nelson (required course for 2nd year BMB students)**
M/F, 1:00 – 3:00 p.m. (1001 Stellar-Change Labs); first class, F, Jan 16th

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 (BMB students are required to complete 3 rotations)**
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)**