First Meeting of Courses
Fall Semester
2012-2013

Study Card Days:
G3’s and up Thursday, September 6, 2012 (TMEC Bldg. Room 442)
All G years Friday, September 7, 2012 (TMEC Bldg. Room 442)
G1’s and G2’s Monday, September 10, 2012 (TMEC Bldg. Room 442)
Final day to turn in Study Cards in Cambridge – Tuesday, September 11, 2012

Add Deadline: Monday, October 22, 2012
Drop Deadline: Tuesday, October 30, 2012

Holidays:
Columbus Day: Monday, October 8, 2012
**Classes held on Veteran’s Day this year

For Information Call: 617-432-4134
Biological and Biomedical Sciences (BBS)

BBS 230 (formerly Microbiology 230). Analysis of the Biological Literature - (New Course)
Catalog Number: 36968
Michael Demian Blower (Medical School), Welcome W. Bender (Medical School), Michael Demian Blower (Medical School), Dipanjan Chowdhury (Medical School), Nika Danial (Medical School), Elaine A. Elion (Medical School), Stephen J. Elledge (Medical School), J. Wade Harper (Medical School), Elizabeth Petri Henske (Medical School), Jonathan M. G. Higgins (Medical School), Raghu Kalluri (Medical School), Jordan A. Kreidberg (Medical School), Cammie Lesser (Medical School), Danesh Moazed (Medical School), Adrian Salic (Medical School), David A. Sinclair (Medical School), Kevin Struhl (Medical School), Sheila Thomas (Medical School), David Marc Weinstock (Medical School), and Johnathan Whetstine (Medical School)


Students participate in intensive small group discussions focused on the critical analysis of basic research papers from a wide range of fields including biochemistry, cell and developmental biology, genetics, and microbiology. Papers are discussed in terms of their background, significance, hypothesis, experimental methods, data quality, and interpretation of results. Students will be asked to propose future research directions, to generate new hypotheses and to design experiments aimed at testing them.

Note: This course is required for first year BBS students. Students who are not first year BBS are welcome to contact the course director to determine if space and receive course materials in advance of class. For the midterm and final exams the students will be asked to submit written critiques of recent papers from the literature, with an emphasis on proposing new experimental directions to test the models proposed in the papers.

First Meeting: Thursday, September 6, 2012
Final Meeting: Thursday, December 6, 2012
Location: TMEC Bldg., 250
Course Heads: Michael Blower, mblower@molbio.mgh.harvard.edu, and Adrian Salic, adrian_salic@hms.harvard.edu
*BBS 301. Teaching Practicum*
Catalog Number: 77888
David L. Van Vactor (Medical School) 2089 and members of the Departments

Course for TAs currently teaching in an approved BBS Core Course. Goals of this course: to better prepare TAs for the course they are working on, and to teach skills in instruction and curriculum planning.

TAs should contact Johanna Gutlerner, johanna_gutlerner@hms.harvard.edu

* Indicates that this course requires faculty signature on study card.

**Biological Chemistry and Molecular Pharmacology (BCMP)**

**BCMP 200. Molecular Biology**
Catalog Number: 5591
Richard Ian Gregory (Medical School), Kami Ahmad (Medical School), Paul J. Anderson (Medical School), Joseph John Loparo (Medical School), Johannes Walter (Medical School), and Timur Yusufzai (Medical School)

Half course (fall term). M., W., F., 10:45-12:15.

An advanced treatment of molecular biology’s Central Dogma. Considers the molecular basis of information transfer from DNA to RNA to protein, using examples from eukaryotic and prokaryotic systems. Lectures, discussion groups, and research seminars.

Note: Offered jointly with the Medical School as BP 723.0.

Prerequisite: Intended primarily for graduate students familiar with basic molecular biology or with strong biology/chemistry background.

First Meeting: Wednesday, September 5, 2012
Final Meeting: Friday, December 14, 2012
Location: Bldg. C, Cannon Room
Course Head: Richard Gregory, rgregory@enders.tch.harvard.edu
Curriculum Fellow: Jason Heustis
Course Contact: Johanna Gutlerner, johanna_gutlerner@hms.harvard.edu

*BCMP 218. Molecular Medicine*
Catalog Number: 2049 Enrollment: Limited to 35.
Irving M. London (Medical School), David E. Cohen (Medical School), and George Q. Daley (Medical School)

Half course (fall term). Tu., 1–3.

A seminar on various human diseases and their underlying genetic or biochemical bases. Primary scientific papers discussed. Lectures by faculty and seminars conducted by students, faculty supervision.
Note: Faculty mentors will guide student-led discussions of the papers. Jointly offered with the Medical School as HT 140.

Prerequisite: Molecular Biology and Biochemistry.

First Meeting: Tuesday, September 11, 2012
Final Meeting: Tuesday, December 4, 2012
Location: HMS (MEC 227), MIT (E25-117)
Course Head: Irving London, imlondon@mit.edu

* Indicates that this course requires faculty signature on study card.

**BCMP 228. Macromolecular NMR**

Catalog Number: 3969

Gerhard Wagner (Medical School) and James J. Chou (Medical School)


Theory and practice of modern methods of macromolecular structure determination using multidimensional NMR.

Note: Given in alternate years. Offered jointly with the Medical School as BP 722.0. Classroom lectures on Mondays and Fridays. The course will include classroom lectures, practical training and hands-on problem solving. The latter includes basic aspects of spectrometer operation, computer-based assignment of protein NMR spectra and structure calculation.

First Meeting: Monday, September 10, 2012
Final Meeting: Friday, December 21, 2012
Location: TMEC Bldg., 227
Course Head: Gerhard Wagner, wagner@hms.harvard.edu

**BCMP 230. Principles and Practice of Drug Development**

Catalog Number: 1295

Stan Neil Finkelstein (Medical School) and Robert H. Rubin (Medical School)


Critical assessment of the major issues and stages of developing a pharmaceutical or biopharmaceutical. Drug discovery, preclinical development, clinical investigation, manufacturing and regulatory issues considered for small and large molecules. Economic considerations of the drug development process.

Note: Classes held at MIT.

First Meeting: Thursday, September 6, 2012
Final Meeting: Thursday, December 6, 2012
Location: MIT Building 4 (Whitaker Building), Room 163
**BCMP 235. Principles of Human Disease: Physiology and Pathology**
Catalog Number: 3769 Enrollment: Course enrollment will be limited, with priority given to graduate students and a maximum of 10 undergraduates (priority given to seniors).
Constance L. Cepko (Medical School), and members of the Medical School Faculty

*Half course (fall term). M., W., F., 9-10:30.*

This course covers the normal physiology and pathophysiology of selected organs, through lectures, readings, tutorials based on clinical cases, and patient presentations. Human biology is emphasized, with some examples also drawn from model organisms.

**Prerequisite:** Knowledge of introductory biochemistry, molecular biology, and cell biology required (MCB52 and MCB54 or equivalent and one year of organic chemistry for undergraduates).

First Meeting: Wednesday, September 5, 2012
Final Meeting: Wednesday, December 5, 2012
Location: NRB, 360
Course Head: Connie Cepko, cepko@genetics.med.harvard.edu
Curriculum Fellow: Catherine Dubreuil, catherine_dubreuil@hms.harvard.edu

**Cell Biology**

**Cell Biology 226. Concepts in Development, Self-Renewal, and Repair**
Catalog Number: 8747 Enrollment: Limited to 12.
Iain A. Drummond (Medical School) and N. Nanda Nanthakumar (Medical School)

*Half course (fall term). F., 2–5.*

Explores developmental mechanisms through the life cycle, contrasting pluripotency and cell fate restriction in embryos and adult tissues. In depth analysis of in vivo approaches, with emphasis on adult stem cells, tissue repair and self-renewal.

**Note:** Offered jointly with the Medical School as CB 721.0. For more information visit: Massachusetts General Hospital and select CB 226.

**Prerequisite:** Upper division cell biology or equivalent.

First Meeting for Course Sign-up: Thursday, September 6, 2 PM
First Meeting Location: TMEC Bldg., L-007
Final Meeting: Friday, December 7, 2012

**All future meeting location:** Simches Research Center, MGH, 3rd Floor Room 3.130 - Shuttle bus from Vanderbilt Hall to Simches departs at 1:30 p.m.
Course Head: Iain A. Drummond, idrummond@partners.org
Genetics

Genetics 201. Principles of Genetics
Catalog Number: 4225
Fred Winston (Medical School), Tom Bernhardt (Medical School), Maxwell G. Heiman (Medical School), Mitzi I. Kuroda (Medical School), and Steven A. McCarroll (Medical School)


An in-depth survey of genetics, beginning with basic principles and extending to modern approaches and special topics. We will draw on examples from various systems, including yeast, Drosophila, C. elegans, mouse, human and bacteria.
Note: Intended for first-year graduate students. Offered jointly with the Medical School as GN 701.0.

First Meeting: Wednesday, September 5, 2012
Final Meeting: Friday, December 7, 2012
Location: Bldg. C, Cannon Room
Course Head: Fred Winston, winston@genetics.med.harvard.edu
Curriculum Fellow: Leah Brault, lbrault@genetics.med.harvard.edu

Genetics 219. Inheritance and Weird Stuff
Catalog Number: 14189
Chao-Ting Wu (Medical School), Kami Ahmad (Medical School), Steven A. McCarroll (Medical School), and David Emil Reich (Medical School)

Half course (fall term). Tu., 10-1.

Focus on patterns of inheritance, including those that were once considered extraordinary but are now recognized as paradigms spanning fungi to humans. Expectations: questions, ideas, conversation during class. No tests, problem sets, or papers.
Prerequisite: Primarily for first-year graduate students, but is open to medical students and advanced undergraduates. A basic understanding of genetics recommended.

First Meeting: Tuesday, September 11, 2012
Final Meeting: Tuesday, November 27, 2012
Location: TMEC Bldg., 334
Course Head: Ting Wu, twu@genetics.med.harvard.edu
**Genetics 220. Molecular Biology and Genetics in Modern Medicine**  
Catalog Number: 4660  
Anne Giersch (Medical School)

*Half course (fall term). F., 9:30-12:30, Tu., 2-5.*

Scientific, clinical, ethical aspects of modern human genetics and molecular biology as applied to medicine. Covers genetic approaches and molecular underpinnings of inherited diseases, gene discovery, and cancer genetics, integrated with patient presentations, discussions.  
*Note:* Offered jointly with the Medical School as HT 160.

First Meeting: Friday, September 7, 2012  
Final Meeting: Friday, November 30, 2012  
Location:  
**Tuesdays:** MIT Building 1, room 190  
Campus map of building 1:  
[http://whereis.mit.edu/?q=56&zoom=16&lat=42.36344322967585&lng=-71.0898685453223&open=1&maptype=mit](http://whereis.mit.edu/?q=56&zoom=16&lat=42.36344322967585&lng=-71.0898685453223&open=1&maptype=mit)  
**Fridays:** TMEC Bldg., 209  
Course Head: Anne Giersch, agiersch@rics.bwh.harvard.edu

**Human Biology and Translational Medicine**

*Human Biology and Translational Medicine 340. (LHB). Disease-Centered Tutorial Clinics*  
Catalog Number: 8640 Enrollment: Limited to LHB students only.  
Jordan A. Kreidberg (Medical School) 2080

Course Head: Jordan A. Kreidberg, jordan.kreidberg@childrens.harvard.edu  
First/Final Meeting and Location: Contact the instructor

* Indicates that this course requires faculty signature on study card.

**Immunology**

*Immunology 201. Principles of Immunology*  
Catalog Number: 8337 Enrollment: Limited to 50.  
Shannon Turley (Medical School), Ulrich H. Von Andrian-Werburg (Medical School) and members of the Program in Immunology

*Half course (fall term). Tu., Th., 1:30-3, with section Tu., Th., 3-4.*
Comprehensive core course in immunology. Topics include a broad but intensive examination of the cells and molecules of the immune system. Special attention given to the experimental approaches that led to general principles of immunology.  

*Note:* Intended for students who have had prior exposure to immunology on the undergraduate level. In the absence of such exposure, students *must* obtain the permission of the Course Director. Offered jointly with the Medical School as IM 702.0.  

*Prerequisite:* A background in genetics and biochemistry strongly recommended.

First Meeting: September 4  
Final Meeting: November 27  
Location: Jeffrey Modell Immunology Center, Fred S. Rosen Lecture Hall, Room 100A  
Course Head: Ulrich H. Von Andrian-Werburg, uva@hms.harvard.edu, Shannon Turley, shannon_turley@dfci.harvard.edu

* Indicates that this course requires faculty signature on study card.

**Immunology 301. Immunology Seminar**  
Catalog Number: 4971 Enrollment: Limited to 20.  
*Michael C. Carroll (Medical School) and William Nicholas Haining (Medical School)*

*Half course (fall term; repeated spring term). W. 12:15-1:15 (lunch) and 3:30-5 (seminar).*

Gives students exposure to research topics in Immunology. Students prepare for the weekly seminar through readings, discussions, and preparing brief write-ups. These discussions are facilitated by members of the Committee on Immunology.  

*Note:* Required for first-year Immunology graduate students.

First Meeting: Wednesday, September 5, 2012  
Final Meeting: Wednesday, December 12, 2012  
Location: Jeffrey Modell Immunology Center, Fred S. Rosen Lecture Hall, Room 100A  
Course Head: Michael Carroll, carroll@idi.harvard.edu

* Indicates that this course requires faculty signature on study card.

**Medical Sciences**

*Medical Sciences 250ab. Human Functional Anatomy*  
Catalog Number: 6946 Enrollment: Limited to 52. Minimum 30.  
*Lee Gehrke (Medical School)*

*Full course (fall term). Lectures, M., W., F., 1:30-2:30; laboratory, M., W., F., 2:30-6; occasional review sessions at 12:15 pm preceding lecture.*

Lectures, detailed laboratory dissections, and prosections provide a thorough exploration of the gross structure and function of the human body. Fundamental principles of embryology and
bioengineering promote analytical approaches to understanding the body’s design. 

**Note:** Open to qualified graduate students with permission of the course director. Offered jointly with the Medical School as HT 010.

First Meeting: September 5  
Final Meeting: December 12  
Location: Bldg. D, Amphitheater  
Course Head: Lee Gehrke, lee_gehrke@hms.harvard.edu

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**Microbiology and Immunobiology**

**Microbiology 202. Molecular Basis of Bacterial Pathogenesis and Host Response**  
Catalog Number: 23632  
*John J. Mekalanos (Medical School), Michael Gilmore (Medical School), Marcia Goldberg (Medical School), Darren Higgins (Medical School), Stephen Lory (Medical School), Gerald Pier (Medical School), Eric Rubin (Medical School), Michael Starnbach (Medical School), Suzanne Walker (Medical School), Lee Wetzler (Boston University)*

*Half course (fall term). Tu., Th., 10–11:30.*

Overview of classic paradigms in bacterial-host interactions. Discussions of pathogenic strategies and mechanisms used by representative bacterial pathogens during infection and innate and adaptive host immune defenses. Emphasis on the analysis of published work.

First Meeting: Tuesday, September 4, 2012  
Final Meeting: Thursday, November 15, 2012  
Location: NRB, 1031B  
Course Head: John J. Mekalanos, john_mekalanos@hms.harvard.edu

*Microbiology 205. Mechanisms of Microbial Pathogenesis*  
Catalog Number: 2480  
Enrollment: Limited to 40.  
*Clyde S. Crumpacker II (Medical School) and members of the Department*

*Half course (fall term). Tu., Th., 8:30-1.*

The mechanisms of bacterial, mycoplasmal, fungal, and viral pathogenesis are covered. Topics are selected for intrinsic interest and cover the spectrum of pathophysiologic mechanisms of the infectious process. Emphasis on pathogenesis at the molecular level.  
**Note:** Offered jointly with the Medical School as HT 040.  
**Prerequisite:** A background course in molecular biology is strongly encouraged.

First Meeting: Tuesday, September 4, 2012  
Final Exam: Wednesday, December 19, 2012
Neurobiology

*Neurobiology 200. Neurobiology*
Catalog Number: 6062 Enrollment: Limited to 50.
Richard H. Masland (Medical School), John A. Assad (Medical School), David Lopes Cardozo (Medical School), David P. Corey (Medical School), Matthew P. Frosch (Medical School), Rosalind A. Segal (Medical School), and Ziv Williams (Medical School)

Half course (fall term). M., W., F., 9-12.

This is a comprehensive course in Neuroscience. Basic principles of organization and function of the nervous system will be discussed with frequent reference to pathophysiology of neurological and psychiatric disorders. Combining pathophysiology with basic neuroscience should provide physician/scientists and Ph.D. candidates with a dynamic picture of the rapidly evolving field of neuroscience and the experimental process from which the picture is derived, and all students should emerge with a greater awareness both of the applications of their work in alleviating disease, and of the ways that disease can provide insight into basic scientific questions. The course will span modern neuroscience from molecular neurobiology to perception and cognition, and will include the following major topics: Anatomy and Development of the Brain; Cell Biology of Neurons and Glia; Ion Channels and Electrical Signaling; Synaptic Transmission, Integration, and Chemical Systems of the Brain; Sensory Systems, from Transduction to Perception; Motor Systems; and Higher Brain Function (Memory, Language, Affective Disorders).

Note: Offered jointly with the Medical School as HT 130. Follows the Medical School calendar. Nine hours of lecture or lab/conference weekly.

Prerequisite: Introductory cell and molecular biology or with permission of instructor.

First Meeting: Wednesday, September 5, 9 AM
Final Meeting: Friday, December 14, 9 AM
Location: TMEC Bldg., 227
Course Head: Richard H. Masland, richard_masland@hms.harvard.edu

*Neurobiology 220. Cellular Neurophysiology*
Catalog Number: 2141
Bruce P. Bean (Medical School), Wade G. Regehr (Medical School), Bernardo L. Sabatini (Medical School), and Gary I. Yellen (Medical School)

Half course (fall term). Tu., Th., 9–12.

Introduction to the physiology of neurons, focusing on using electrophysiology and imaging to
study function of ion channels, generation of action potentials, and physiology of synaptic
transmission. Includes problem sets and reading of original papers.

*Note:* Offered jointly with the Medical School as NB 714.0.

*Prerequisite:* Introductory neurobiology.

First Meeting: Tuesday, September 4, 2012
Final Meeting: Tuesday, December 11, 2012
Location: Goldenson Bldg., room 122
Course Head: Bruce P. Bean, bruce_bean@hms.harvard.edu

* Indicates that this course requires faculty signature on study card.

**Neurobiology 230. Visual Object Recognition**

Catalog Number: 78454

Gabriel Kreiman (Medical School)

*Half course (fall term). M., 3:30–5:30.*

Examines how neuronal circuits represent information and how those circuits are implemented in
artificial intelligence algorithms. Topics: architecture of visual cortex, neurophysiology, visual
consciousness, computational neuroscience, models of pattern recognition and computer vision.

*Prerequisite:* Life Sciences 1a (or Life and Physical Sciences A) and Life Sciences 1b (or
equivalent). Recommended: Math (Maa/Mab, Math 1A,1B, Math 19 a or
equivalent). Physical Sciences 1. MCB 80.

First Meeting: *Wednesday, September 5, 2012 *special Wed. class
Final Meeting: Monday, December 10, 2012
Location: Cambridge Campus - Biolabs 1075
Course Head: Gabriel Kreiman, gabriel.kreiman@childrens.harvard.edu

**Speech and Hearing Bioscience and Technology**

**SHBT 200. Acoustics of Speech and Hearing - (New Course)**

Catalog Number: 60388 Enrollment: Limited to 20. Must have a minimum of 5 students

John J. Rosowski (Medical School) and Christopher A. Shera (Medical School)

*Half course (fall term). W., 12-1, Tu., Th., 1–2:30.*

Discusses limitations that the speech production and hearing systems impose on the sounds we
produce and sense. Focuses on acoustic cues used in sound localization, speech production
mechanisms, the mechanics of sound reception and perception.

*Note:* This course is taught in consort with 6.551J/HST.714J at the Massachusetts Institute of Technology. Classes will be held at MIT.

*Prerequisite:* Mathematical methods in science (Applied Mathematics 21a or Mathematics 21a)
or equivalent. Rigid body mechanics (Physics 11A), or electrical circuits (Engineering Science
SHBT 201. Biology of the Inner Ear - (New Course)
Catalog Number: 75495 Enrollment: Limited to 12.
* M. Charles Liberman (Medical School) and Ruth Anne Eatock (Medical School)*

*Half course (fall term). Tu., Th., 9–10:30, F. laboratory hours to be arranged.*

Normal biology, biophysics, physiology and morphology of the inner ear, its sensory innervation and efferent control systems, and the mechanisms underlying sensorineural hearing loss and balance disorders. Material is presented through lectures, laboratory exercises and discussions of the primary literature.

*Prerequisite:* Introductory neurobiology recommended

First Meeting: Tuesday, September 4, 9 AM
Final Meeting: Thursday, December 20, 2012
Location: TMEC Bldg., 340
Course Head: Charles Liberman, Charles_Liberman@meei.harvard.edu
**Virology**

*Virology 200. Introduction to Virology*
Catalog Number: 6075 Enrollment: Limited to 20.
Max L. Nibert (Medical School), Michaela U. Gack (Medical School), Elliott D. Kieff (Medical School), David M. Knipe (Medical School), Karl Münger (Medical School), and Priscilla Yang (Medical School)


Introduction to virology. The lecture component reviews the basic principles of virology and introduces the major groups of human viruses. Weekly discussion groups critically analyze selected papers from the literature.

*Note:* There will be a final project consisting of a proposal based on laboratory rotations (for Virology, BBS, or Immunology Program students) or a final paper based on a topic from the literature. Offered jointly with the Medical School as MG 705.0.

First Meeting: Wednesday, September 5, 2012
Final Meeting: Monday, December 10, 2012
Location: TMEC Bldg., 334
Course Head: Max Nibert, max_nibert@hms.harvard.edu

* Indicates that this course requires faculty signature on study card.

Catalog Number: 6025
David T. Evans (Medical School), Todd Allen (Ragon Institute, MGH), Galit Alter (Ragon Institute, MGH), Michaela Gack (Medical School), Samuel D. Rabkin (Medical School), and Frederick C. Wang (Medical School)

Half course (fall term). W., 1:30–4:30.

Students will write, present, and evaluate research proposals in the areas of virus replication, viral pathogenesis and treatment and prevention of viral infections.

*Note:* Offered jointly with the Medical School as MG 724.0.

*Prerequisite:* General background in biochemistry and virology.

First Meeting: Wednesday, September 5, 1:30 PM
Final Meeting: Wednesday, November 7, 1:30 PM
Location: TMEC Bldg., 340
Course Head: David T. Evans, david_evans@hms.harvard.edu
Other courses of interest:

**Systems Biology 200. Dynamic and Stochastic Processes in Cells**
Catalog Number: 8701
Johan M. Paulsson (Medical School) and Jeremy M. Gunawardena (Medical School)

*Half course (fall term). Tu., Th., 10-11:30, and a weekly section to be arranged. EXAM GROUP: 12, 13*

Rigorous introduction to (i) dynamical systems theory as a tool to understand molecular and cellular biology (ii) stochastic processes in single cells, using tools from statistical physics and information theory.

*Note:* Students planning to take both quarter courses (SB303 and 304) must enroll in this as a half course on their study card as SysBio200 for now and in the future. Students who take one half of this quarter can NOT ever take the other half for credit.  
*Prerequisite:* College-level calculus.

**Systems Biology 204. Biomolecular Engineering and Synthetic Biology**
Catalog Number: 71179
Peng Yin (Medical School), George M. Church (Medical School), William Shih (Medical School), and Pamela A. Silver (Medical School)

*Half course (fall term). M., W., 2–3:30. EXAM GROUP: 7, 8*

A course focusing on the rational design, construction, and applications of nucleic acid- and protein-based synthetic molecular and cellular machinery and systems. Students are mentored to produce substantial term projects.  
*Note:* See http://sb204.net for details