First Meeting of Courses

Fall Semester

2013-14

Fall Semester Begins on: Tuesday, September 3, 2013

Study Card Days: TMEC 442

G3's and up: Wednesday, September 4, 2013

G1's and G2's: Thursday, September 5, 2013

Final Day to turn in Study Cards in Cambridge:

Tuesday, September 10, 2013

Last day to Add Courses for Fall Semester: Monday, October 21, 2013

Last day to Drop Courses for Fall Semester: Tuesday, October 29, 2013

Holidays:

Columbus Day: Monday, October 14, 2013

Tosteson Medical Education Center (TME) 435
260 Longwood Avenue
Boston, MA 02115

For Information Call: 617-432-0162
Email: dms@hms.harvard.edu

Biological and Biomedical Sciences (BBS)

BBS 230 (formerly Microbiology 230). Analysis of the Biological Literature

Catalog Number: 36968

Michael Demian Blower (Medical School), Dipanjan Chowdhury (Medical School), Stephen J. Elledge (Medical School), Jonathan M. G. Higgins (Medical School), Cammie Lesser (Medical School), Adrian Salic (Medical School), Andreas Herrlich (Medical School), Laurie Jackson-Grusby (Medical School)

Half course (fall term). Tu., Th., 3–6.

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 is available 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 5, 2013
Final Meeting: Thursday, December 5, 2013
Location: TMEC Building, Room 250
Course Heads: Michael Blower, mblower@molbio.mgh.harvard.edu, and Adrian Salic, adrian_salic@hms.harvard.edu

Biological Chemistry and Molecular Pharmacology (BCMP)

BCMP 200. Molecular Biology
Catalog Number: 5591
Joseph John Loparo (Medical School), Paul J. Anderson (Medical School), Lee Stirling Churchman (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 4, 2013
Final Meeting: Friday, December 6, 2013
Location: Building C, Cannon Room

Course Head: Joseph Loparo, joseph_loparo@hms.harvard.edu
Curriculum Fellow: Jason Heustis, ronald_heustis@hms.harvard.edu, (office) 617-432-5773

***BCMP 218. Molecular Medicine**

Catalog Number: 2049 Enrollment: Limited to 35.
George Q. Daley (Medical School), David E. Cohen (Medical School), and Irving M. London (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 10, 2013
Final Meeting: Tuesday, December 10, 2013
Location: HMS (TMEC 227), MIT (E25-117)
Course Head: George Daley , george.daley@childrens.harvard.edu

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

BCMP 230. Principles and Practice of Drug Development
Catalog Number: 1295
Stan Neil Finkelstein (Medical School) and Robert H. Rubin (Medical School)

Half course (fall term). Th., 3–6.

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 5, 2013
Final Meeting: Thursday, December 12, 2013
Location: MIT Building 4 (Whitaker Building), Room 163
Course Head: Stan Finkelstein , filkelstein@hcp.med.harvard.edu
Teaching Assistant: Abby Horn, abbyhorn@mit.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 Andrew Stephen Brack (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 only: Thursday, September 5, 2013, at 2:00 pm.
Location: First meeting only at HMS, TMEC Building, L-007
All future meetings: Fridays 2-5pm, at Simches Research Center, MGH, 3rd Floor Room 3.130 - Shuttle bus from Vanderbilt Hall to Simches departs at 1:30 p.m.
Final Meeting: Friday, December 6, 2013
Course Head: Iain A. Drummond, idrummond@partners.org

Genetics

Genetics 201. Principles of Genetics

Catalog Number: 4225

Fred Winston (Medical School), Thomas G. Bernhardt (Medical School), Maxwell G. Heiman (Medical School), Mitzi I. Kuroda (Medical School), and Steven A. McCarroll (Medical School)

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

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 4, 2013
Final Meeting: Wednesday, December 11, 2013
Location: Building C, Cannon Room
Course Head: Fred Winston, Winston@genetics.med.harvard.edu
Curriculum Fellow: Emily Gleason, Emily_gleason@hms.harvard.edu, 617-432-7203
Course Contact: Meghan Radden: mradden@genetics.med.harvard.edu, (617) 432-6505

Genetics 220. Molecular Biology and Genetics in Modern Medicine

Catalog Number: 4660

Anne Giersch (Medical School)

Half course (fall term). F., 8:30-12:30, Tu., 2-5.

This course will provide a firm foundation for understanding the relationship between molecular biology, developmental biology, genetics, genomics, bioinformatics, and medicine. The goal is to develop explicit connections between basic research, medical understanding, and the perspective of patients. During the course the principles of human genetics will be reviewed. Students will become familiar with the translation of clinical understanding into analysis at the level of the gene, chromosome and molecule, the concepts and techniques of molecular biology and genomics, and the strategies and methods of genetic analysis, including an introduction to bioinformatics. The course will extend beyond basic principles to current research activity in human genetics.

Note: Offered jointly with the Medical School as HT 160.

First Meeting: Friday, September 6, 2013
Final Meeting: Friday, November 22, 2013
Location: TMEC 209 (Fridays), MIT, 1-190 (Tuesdays)
Course Head: Anne Giersch, agiersch@partners.org

Human Biology and Translational Medicine

HBTM 201 (formerly Pathology 209). Tumor Pathophysiology and Transport Phenomena - A Systems Biology Approach
Catalog Number: 5934
Rakesh K. Jain (Medical School)

Half course (fall term). M., 5-7.

Tumor pathophysiology plays a central role in the growth, metastasis, detection, and treatment of solid tumors. Principles of transport phenomena are applied to develop a quantitative understanding of tumor biology and treatment.

Note: Given in alternate years. Offered jointly with the Medical School as PA 712.0. Classes held at MIT.

First Meeting: Monday, September 9, 2013
Final Meeting: Monday, December 2, 2013
Location: MIT, E25-117
Course Head: jain@steele.mgh.harvard.edu

HBTM 235 (formerly BCMP 235.). Principles of Human Disease: Physiology and Pathology
Catalog Number: 82892 Enrollment: Will be limited.
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.

Note: Course enrollment will be limited, with priority given to graduate students and a maximum of 10 undergraduates (priority given to seniors).
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 4, 2013
Final Meeting: Wednesday, December 4, 2013, and Final Exam Dec. 6-12
Location: NRB 350, Avenue Louis
Course Head: Connie Cepko, cepko@genetics.med.harvard.edu

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. EXAM GROUP: 15, 16

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: Tuesday, September 3, 2013
Final Meeting: Thursday, December 5, 2013
Location: Jeffrey Modell Immunology Center, Fred S. Rosen Lecture Hall, Room 100A
Course Head: Shannon Turley, shannon_turley@dfci.harvard.edu, Ulrich H. Von Andrian-Werburg, uva@hms.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 (discussion)

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 11, 2013
Final Meeting: Wednesday, December 11,, 2013
Location: Jeffrey Modell Immunology Center, Fred S. Rosen Lecture Hall, Room 100A
Course Head: Michael Carroll, michael.carroll@childrens.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. This course requires rental of a locker.
Lee Gehrke (Medical School)

Full course (fall term). Lectures, M., W., F., 1:30-2:30; laboratory, M., W., F., 2:30-6

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. The course has a minimum enrollment of 30. This course requires rental of a locker for two hundred and ten dollars. Offered jointly with the Medical School as HT010.

First Meeting: Wednesday, September 4, 2013
Final Meeting: Friday, December 13, 2013
Location: Bldg. D, Amphitheater
Course Head: Lee Gehrke, lee_gehrke@hms.harvard.edu, (617)253-7608

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

Microbiology and Immunobiology

Microbiology 202. Molecular Basis of Bacterial Pathogenesis and Host Response
Will Not be Offered this Fall
Catalog Number: 23632
John J. Mekalanos (Medical School), Michael S. Gilmore (Medical School), Marcia Goldberg (Medical School), Darren E. Higgins (Medical School), Suzanne Walker (Medical School), Stephen Lory (Medical School), Gerald Pier (Medical School), Eric J. Rubin (Medical School), and Michael Starnbach (Medical School)

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.

***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 3, 2013
Final Exam: Wednesday, December 18, 2013
Location: TMEC Bldg., 250
Course Head: Clyde S. Crumpacker, ccrumpac@bidmc.harvard.edu

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

Neurobiology

Neurobiology 200. Neurobiology

Catalog Number: 6062 Enrollment: Limited to 50.
John A. Assad (Medical School), Matthew P. Frosch (Medical School), Jeffrey Robb Holt (Medical School), Rosalind A. Segal (Medical School), and Ziv Williams (Medical School)

Half course (fall term). M., W., F., 9-12. EXAM GROUP: 2, 3, 4

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 course and permission of instructor.

First Meeting: Wednesday, September 4, 2013
Final Exam Meeting: Friday, December 20, 2013
Location: TMEC Bldg., 227
Course Head: John Assad , jassad@hms.harvard.edu, (617) 432-2804

***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 3, 2013
Final Meeting: Thursday, December 19, 2013
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: Monday, September 9, 2013
Final Meeting: Monday, December 9, 2013
Location: Biolabs 1075 (Cambridge)
Course Head: Gabriel Kreiman, gabriel.kreiman@childrens.harvard.edu , (617)919-2530

Speech and Hearing Bioscience and Technology (SHBT)

SHBT 200. Acoustics of Speech and Hearing
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., at 12, 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 154) or permission of the instructor

First Meeting: Wednesday, September 4, 2013
Final Meeting: Wednesday, December 11, 2013
Location: MIT (**Tu Th:** MIT 26-302; **Wed:** MIT 36-156)
Course Head: John Rosowski, john_rosowski@meei.harvard.edu

SHBT 201. Biology of the Inner Ear
Catalog Number: 75495 Enrollment: Limited to 12.
M. Charles Liberman (Medical School) and Stephane Maison (Medical School)

Half course (fall term). Tu., Th., 9–10:30, F. laboratory hours to be arranged. EXAM GROUP: 11, 12

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 3, 2013
Final Meeting: Tuesday, December 10, 2013
Location: Course meets in Room 432 (EPL Library), at the Massachusetts Eye and Ear Infirmary (MEEI).
Course Head: Charles Liberman, charles_liberman@meei.harvard.edu

SHBT 206 (formerly Pathology 205). Molecular Biology of the Auditory System
Catalog Number: 0211
Albert Edge

Half course (fall term). Tu., 4–6.

Advances in molecular biology of hearing. Topics: Transcriptional and post-translational regulation of gene expression; cell fate determination during inner ear development; inner ear stem cells and regenerative capacity in various species; use of genomics in investigations of the inner ear; critical genes for generating functional hair cells.

Note: Given in alternate years.
Prerequisite: Introductory courses in neurobiology and molecular biology are recommended.

First Meeting: Tuesday, September 17, 2013
Final Meeting: Tuesday, December 10, 2013
Location: EPL Library, Massachusetts Eye and Ear Infirmary (MEEI)
Course Head: Albert Edge, albert_edge@meei.harvard.edu

Virology

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

Half course (fall term). M., 1:30–3, W., 1:30–3:30.

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 4, 2013
Final Meeting: Wednesday, December 11, 2013
Location: TMEC Building, Room 333
Course Director: Max Nibert, max_nibert@hms.harvard.edu

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

Virology 202. Proposal Writing
Catalog Number: 6025
Michaela Gack (Medical School), Todd Allen (Medical School), Samuel D. Rabkin (Medical School), and Frederick C. Wang (Medical School)

Half course (fall term). W., 1:30–4:45

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 4, 2013
Final Meeting: Wednesday, November 6, 2013
Location: TMEC Building, Room 334
Course Director: Michaela Gack, Michaela_gack@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 201. Principles of Animal Development from a Systems Perspective
Catalog Number: 5148
Sean G. Megason (Medical School), Angela Depace (Medical School), and Marc W. Kirschner (Medical School)
Half course (spring term). Tu., Th., 2–3:30. EXAM GROUP: 16, 17
Intensive and critical analysis of systems approaches to circuits and principles controlling pattern formation and morphogenesis in animals. Students develop their own ideas and present them through mentored "chalk talks" and other interactive activities.

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

***Systems Biology 301qc. Studying Evolution through Models and Experiments**

Catalog Number: 31854

Roy Kishony (Medical School) 5501

Quarter course (spring term). M. through F., 10–12.

Intensive January course covering theoretical foundations in population genetics, genetic drift versus selection, identifying selection in genomes, advances in laboratory evolution experiments, with applications to key questions in systems biology and evolution.

Note: January 13, 2014 - January 24, 2014.

***Systems Biology 305qc. Practical Synthetic Biology**

Catalog Number: 22318

Pamela A. Silver (Medical School) 1595

Quarter course (spring term). M. through F., 4–6.

Synthetic biology is a new discipline that seeks to enable the predictable engineering of biological systems. According to one conception of synthetic biology, proteins and genetic regulatory elements are modular and can be combined in a predictable manner. In practice however, assembled genetic devices do not function as expected. The purpose of the course is to go beyond the textbook, first-pass description of molecular mechanisms and focus on details that are specifically relevant to engineering biological systems.

Note: January 13, 2014 - January 24, 2014 in Warren Alpert, RM 563.