

Division of Medical Sciences

Ph.D. Programs at Harvard Medical School

# First Meeting of Half Courses

## Spring Term 2014-2015

**Online Registration:** January 21-26, 2015

### **Study Card Days:**

Harold Amos Graduate Student Lounge, TMEC Room 442

9:30 AM – 4:00 PM

- Wednesday, January 28 (G3's and above)
- Thursday, January 29 (G1's and G2's)

*Final day to turn in Study Cards to Cambridge in Dudley House: Friday, January 30*

**Add Course Deadline: Monday, March 9**

**Drop Course Deadline: Tuesday, March 24**

### **Holidays:**

Martin Luther King Day: Monday, January 19

President's Day: Monday, February 16

Spring Recess: March 14-22

*For information:* Call **617-432-4134** or email **dms\_courses@hms.harvard.edu**

**DIVISION OF MEDICAL SCIENCES**  
**Ph.D. Programs at Harvard Medical School**  
**2014-2015 Half Course Offerings**

**BCMP 201. Biological Macromolecules: Structure, Function and Pathways – Will not be offered**

Catalog Number: 5068

*Stephen C. Harrison (Medical School), Stephen C. Blacklow (Medical School), and Peter K. Sorger (Medical School)*

**\*BCMP 213. Behavioral Pharmacology – Will not be offered**

Catalog Number: 4782 Enrollment: Limited to 15.

*Jack Bergman (Medical School) and Brian D. Kangas (Medical School)*

**BCMP 234. Cellular Metabolism and Human Disease**

Catalog Number: 9644 Enrollment: May be limited

*Thomas Michel (Medical School) and members of the Department*

**BCMP 236. Modern Drug Discovery: from principles to patients - (New Course)**

Catalog Number: 84345

*Nathanael Gray (Medical School), Timothy J. Mitchison (Medical School) and members of the Department*

**Cell Biology 201. Molecular Biology of the Cell**

Catalog Number: 1044

*Danesh Moazed (Medical School)*

**Cell Biology 207. Developmental Biology: Molecular Mechanisms of Vertebrate Development**

Catalog Number: 2044 Enrollment: Limited to 25.

*Andrew B. Lassar (Medical School), John G. Flanagan (Medical School), Wolfram Goessling (Medical School), Jordan A. Kreidberg (Medical School), Sean Megason (Medical School), Trista Elizabeth North (Medical School), Ramesh Shivdasani (Medical School), Jessica Whited (Medical School), and Malcolm Whitman (Dental School)*

**Cell Biology 212. Biology of the Cancer Cell**

Catalog Number: 4169

*David A. Frank (Medical School) and Jean J. Zhao (Medical School)*

**Cell Biology 225. Hormonally Active Pollutants and Human Disease – Will not be offered**

Catalog Number: 94802

*Joan V. Ruderman (Medical School)*

**\*DRB 331. Critical Analysis and Experimental Approaches in Developmental Biology (January Course)**

Catalog Number: 22543, Enrollment: Limited to 16

*Paola Arlotta 6703, and members of the Department*

**Genetics 216. Advanced Topics in Gene Expression – Expected to be given in 2015-2016**

Catalog Number: 2244

*Robert E. Kingston (Medical School) and Fred Winston (Medical School)*

**Genetics 219. Inheritance and Weird Stuff – Expected to be given in 2015-2016**

Catalog Number: 14189

*Chao-Ting Wu (Medical School) and Kami Ahmad (Medical School)*

**Genetics 228. Genetics in Medicine - From Bench to Bedside**

Catalog Number: 9840

*Christopher Holmes Newton-Cheh (Medical School)*

**HBTM 200. Principles and Practice of Human Pathology**

Catalog Number: 10575 Enrollment: Enrollment may be limited

*Scott Benjamin Lovitch (Medical School)*

**Immunology 202. Advanced Principles of Immunology**

Catalog Number: 5674

*D. Branch Moody (Medical School) and Martin E. Hemler (Medical School)*

**Immunology 204. Critical Readings for Immunology**

Catalog Number: 9563

*Duane Wesemann*

**\*Immunology 301. Immunology Seminar**

Catalog Number: 4971 Enrollment: Limited to 20.

*Michael C. Carroll (Medical School) 2050 and William Nicholas Haining (Medical School) 6946*

**Microbiology 201. Molecular Biology of the Bacterial Cell**

Catalog Number: 38739

*David Z. Rudner (Medical School), Thomas G. Bernhardt (Medical School), Simon L. Dove (Medical School), and Ann Hochschild (Medical School)*

**\*Microbiology 210. Microbial Sciences: Chemistry, Ecology, and Evolution**

Catalog Number: 63006 Enrollment: Limited to 30.

*Michael S. Gilmore (Medical School)*

**Microbiology 213. Social Issues in Biology**

Catalog Number: 7905 Enrollment: Limited to 20.

*Jonathan R. Beckwith (Medical School)*

**Neurobiology 204. Neurophysiology of Central Circuits**

Catalog Number: 5603

*Richard T. Born (Medical School), Mark L. Andermann (Medical School), John A. Assad (Medical School)*

*School), Michael Tri Hoang Do (Medical School), Christopher D. Harvey (Medical School), Margaret S. Livingstone (Medical School) and Rachel I. Wilson (Medical School)*

**Neurobiology 211 (formerly Neurobiology 207 and Neurobiology 221). Molecular and Developmental Neurobiology – NEW COURSE**

Catalog Number: 87063

*Lisa Goodrich, Bob Datta, Michela Fagiolini, Chenghua Gu, Josh Kaplan, Pascal Kaeser, Maria Lehtinen and Beth Stevens*

**SHBT 202. Clinical Aspects of Hearing and Speech**

Catalog Number: 69294 Enrollment: Limited to 15. Minimum of 5

*Konstantina Stankovic (Medical School and MEEI)*

**\*SHBT 203. Anatomy of Speech and Hearing (January Course)**

Catalog Number: 17772 Enrollment: Limited to 12.

*Barbara C. Fullerton (Medical)*

**SHBT 204. Speech Communication**

Catalog Number: 47986 Enrollment: Limited to 20.

*Satrajit S. Ghosh (Medical School), Robert E. Hillman (Medical School), and other faculty*

**SHBT 205. Neural Coding and Perception of Sound**

Catalog Number: 63093 Enrollment: Limited to 20.

*Bertrand Delgutte (Medical School), M. Christian Brown (Medical School), John J. Guinan (Medical School), Jennifer R. Melcher (Medical School), and Daniel B. Polley (Medical School)*

**Virology 201. Virology**

Catalog Number: 1190

*Sean P.J. Whelan (Medical School), James M. Cunningham (Medical School), Michaela Gack (Medical School), and David Knipe (Medical School)*

***OTHER COURSES OF INTEREST:***

**Biophysics 205. Computational and Functional Genomics**

Catalog Number: 6777 Enrollment: Limited to 20.

*Martha L. Bulyk (Medical School), Suzanne Gaudet (Medical School), and Shamil R. Sunyaev (Medical School)*

**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)*

## *Biological Chemistry and Molecular Pharmacology*

### **BCMP 234. Cellular Metabolism and Human Disease**

Catalog Number: 9644 Enrollment: May be limited

*Thomas Michel (Medical School) and members of the Department*

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

Cellular and organismal metabolism, with focus on interrelationships between key metabolic pathways and human disease states. Genetic and acquired metabolic diseases and functional consequences. Interactive lectures and critical reading conferences are integrated with clinical encounters.

*Note:* Advanced undergraduate students may join on a limited-enrollment basis with permission of the course director.

*Prerequisites:* Knowledge of introductory biochemistry, genetics, and cell biology required (MCB 52 and 54 or equivalent); one year of organic chemistry.

### **Spring 2015**

**Meeting dates:** Monday, Wednesday, Friday, 9-10:30 am

**First Meeting:** Monday, January 26, 2015

**Final Meeting:** On or before Wednesday, May 6, 2015

**Location:** TMEC 250 (\**Note:* 2/11 and 2/25 sessions will meet in TMEC 109)

**Course Director:** Thomas Michel, [thomas\\_michel@harvard.edu](mailto:thomas_michel@harvard.edu)

**Associate Course Director and Curriculum Fellow:** Joya Mukerji, [joya\\_mukerji@hms.harvard.edu](mailto:joya_mukerji@hms.harvard.edu)

**BCMP 236. Modern Drug Discovery: from principles to patients - (New Course)**

Catalog Number: 84345

*Nathanael Gray (Medical School), Timothy J. Mitchison (Medical School) and members of the Department*

*Half course (spring term). Tu., Th., 3:30–5.*

This course will familiarize students with central concepts in drug action and therapeutics at the level of molecules, cells, tissues and patients. These concepts and methods are central to modern drug development and regulatory evaluation. In the 1st half of the course we will cover drug-target interactions, Pharmacokinetics and Pharmacodynamics at a quantitative level, the clinical trials process, biomarkers and new frontiers in Therapeutic development. The 2nd half will focus on modern approaches to therapeutic discovery and development, both small molecules and protein based. Examples are drawn from numerous unmet medical needs including cancer, HIV, neurodegenerative and infectious diseases. The course will include computational exercises and a MATLAB workshop.

*Note:* This course is a reworking of the BCMP 309qc and 307qc quarter courses.

**Spring 2015**

**Meeting Dates:** January 29, February 3, 5, 10, 12, 17, 19, 24, 26, March 3, 5, 10, 12, 24, 26, 31  
April 2, 7, 9, 14, 16, 21, 23, 28, 30, May 5,7,12

**First Meeting:** Thursday, January 29, 2015

**Final Meeting:** Tuesday, May 12, 2015

**Location:** TMEC 126

**Course Directors:** Tim Mitchison, [timothy\\_mitchison@hms.harvard.edu](mailto:timothy_mitchison@hms.harvard.edu); Nathanael Gray, [nathanael\\_gray@dfci.harvard.edu](mailto:nathanael_gray@dfci.harvard.edu)

**Course Manager:** Stuart Ferguson, [stuart\\_ferguson@hms.harvard.edu](mailto:stuart_ferguson@hms.harvard.edu)

**Curriculum Fellow:** Catherine Dubreuil, [catherine\\_dubreuil@hms.harvard.edu](mailto:catherine_dubreuil@hms.harvard.edu)

## *Cell Biology*

### **Cell Biology 201. Molecular Biology of the Cell**

Catalog Number: 1044

*Danesh Moazed (Medical School)*

*Half course (spring term). M., W., 10:30-12, and sections F., at 10:30-12.*

CB201 is a graduate level course intended to teach critical concepts in cell biology and expose students to current and quantitative approaches in cell biology research. Topics include molecular basis of cellular dynamics, subcellular compartmentalization, protein trafficking, chromosome biology and epigenetics, regulated ubiquitin-proteasome pathways, cell cycle logic, cytoskeleton dynamics, motors, signal transduction, cell-cell interactions, programmed cell death, and metabolism.

*Note:* The learning objectives for this course are: To understand the core concepts and questions in cell biology as well as the evolving approaches and methodologies in the field; to apply a conceptual understanding of cell biology to critically analyze and integrate primary scientific literature; to design experiments utilizing current tools and techniques to answer fundamental questions in the field. Offered jointly with the Medical School as CB 713.0.

*Prerequisite:* Class will be taught with the expectation that students have prepared on the level of Alberts et al.

### **Spring 2015**

**First Meeting:** Monday, January 26, 2015

**Final Meeting:** Friday, May 1, 2015

**Location:** Building C, Cannon Room

**Course Director:** Danesh Moazed, [danesh\\_moazed@hms.harvard.edu](mailto:danesh_moazed@hms.harvard.edu)

**Curriculum Fellows:** Christopher Wood, [christopher\\_wood@hms.harvard.edu](mailto:christopher_wood@hms.harvard.edu) and Abha Ahuja, [abha\\_ahuja@hms.harvard.edu](mailto:abha_ahuja@hms.harvard.edu)

**Cell Biology 207. Developmental Biology: Molecular Mechanisms of Vertebrate Development**

Catalog Number: 2044 Enrollment: Limited to 25.

*Andrew B. Lassar (Medical School), John G. Flanagan (Medical School), Wolfram Goessling (Medical School), Jordan A. Kreidberg (Medical School), Sean Megason (Medical School), Trista Elizabeth North (Medical School), Ramesh Shivdasani (Medical School), Jessica Whited (Medical School), and Malcolm Whitman (Dental School)*

*Half course (spring term). M., Th., 2–4.*

Analyzes the developmental programs of frog, chick, zebrafish, and mouse embryos, emphasizing experimental strategies for understanding the responsible molecular mechanisms that pattern the vertebrate embryo. Morphogenesis, organogenesis, stem cells and regeneration will also be discussed.

*Note:* Offered jointly with the Medical School as CB 710.0. Includes lectures and conference sessions in which original literature is discussed in depth. Short research proposals are required in lieu of exams.

**Spring 2015**

**First Meeting:** Monday, January 26, 2015

**Final Meeting:** Thursday, May 14, 2015

**Location:** TMEC 309

**Course Head:** Andrew B. Lassar, [andrew\\_lassar@hms.harvard.edu](mailto:andrew_lassar@hms.harvard.edu)

**Web site:** <http://cb207.med.harvard.edu/>

user name: cb207; password: gastrula



## **Cell Biology 212. Biology of the Cancer Cell**

Catalog Number: 4169

*David A. Frank (Medical School) and Jean J. Zhao (Medical School)*

*Half course (spring term). M., W., 12:30-2:00.*

This semester long course takes a molecular approach to examine the basis of human cancer. The main concepts that we will cover include: Cancer genetics and epigenetics, tumor suppressor genes and oncogenes, signal transduction, DNA damage and repair, angiogenesis, metastasis and invasion, apoptosis, cancer stem cells, and tumor immunology and immunotherapy. Lectures will be delivered by experts in the various fields to provide an integrated perspective on past, current, and future approaches in cancer biology research. In addition, students will participate in workshops in which they will delve more deeply into the primary literature of several of these topics.

*Note:* Given alternate years with Cell Biology 211.

*Prerequisite:* Advanced biochemistry, molecular genetics, and cell biology.

### **Spring 2015**

**First Meeting:** January 26, 2015

**Final Meeting:** April 29, 2015

**Location:** TMEC 250

**Course Head:** David Frank, [david\\_frank@dfci.harvard.edu](mailto:david_frank@dfci.harvard.edu)

**Curriculum Fellow:** Megan Mittelstadt, [megan\\_mittelstadt@hms.harvard.edu](mailto:megan_mittelstadt@hms.harvard.edu)

**\*DRB 331. Critical Analysis and Experimental Approaches in Developmental Biology (January Course)**

Catalog Number: 22543, Enrollment: Limited to 16  
Paola Arlotta 6703, and members of the Department

*Half course (spring term). M. through Sa., 10:30–6, January 5-January 21, 2015.*

This course will provide a survey of major topics and contemporary research in developmental and regenerative biology. Students will rotate in the laboratories of DRB faculty across the Harvard campuses and affiliated hospitals. Students engage with faculty and gain hands on experience in a variety of model systems, techniques and research areas. Each day of the course will consist of a lecture followed by hands-on laboratory activities and interactive discussions. Students will be required to complete the lab experience and the following assignments: lead two chalk-talk format paper presentations, and write one 5-6 page research proposal.

*Note:* Intensive January course.

**Schedule**

**Tentative Topics include:**

1. Matt Pecot: Neural circuit Assembly in the Drosophila nervous system
2. Jennifer Waters: Imaging theory and Practice
3. Trista North & Wolfram Goessling: Vessel Development in Zebrafish
4. Jay Rajagopal: Lung regeneration
5. Ya-Chieh Hsu: Mammalian Skin and Hair follicle regeneration
6. Jeffrey Macklis: Neurogenesis in Mammalian Central Nervous System
7. Kiran Musunuru: Human genetic studies
8. Jessica Whited: Regeneration of vertebrate limbs (axolotl)
9. Amar Sahay: Learning and memory in mammals
10. Additional Faculty: Matt Harris, Vicki Rosen and Kristin White

Location and exact schedule along with background readings and detailed information for each day will be posted on the course iSite.

**January Session 2015**

**Meeting Dates:** January 5 – January 21, 2015

**Time:** 10:30 AM – 6:00 PM. \*\*Please note, some sessions may run until 7:00 PM.

**First Meeting:** Monday, January 5, 2015, 5:00 PM

**First Meeting Location:** Sherman Fairchild G62, Cambridge campus

**Course Head:** Paola Arlotta, [paola\\_arlotta@hms.harvard.edu](mailto:paola_arlotta@hms.harvard.edu)

**Curriculum Fellow:** Abha Ahuja, [abha\\_ahuja@hms.harvard.edu](mailto:abha_ahuja@hms.harvard.edu), 414-467-8348

## Genetics

### **Genetics 228. Genetics in Medicine - From Bench to Bedside**

Catalog Number: 9840

*Christopher Holmes Newton-Cheh (Medical School)*

*Half course (spring term). F., 2–5.*

Focus on translational medicine: the application of basic genetic discoveries to human disease. Will discuss specific genetic disorders and the approaches currently used to speed the transfer of knowledge from the laboratory to the clinic.

*Note:* Course will include patient presentations and lectures by investigators known for their work in a specific disease area. Course will be held at MGH (transportation provided to MGH). Offered jointly with the Medical School as GN 711.0. For more information visit the [Massachusetts General Hospital](#).

*Prerequisite:* Genetics 201 or equivalent.

#### **Spring 2015**

**First Meeting:** Friday, January 30, 2015

**Final Meeting:** Friday, April 24, 2015

**Location:** Simches Research Building, 3.120. Simches Research Center, MGH, 3rd floor.

Transportation will be provided from Vanderbilt Hall at 1:30 PM.

**Course Head:** Christopher Holms Newton-Cheh, [cnewtoncheh@partners.org](mailto:cnewtoncheh@partners.org)

**Course Contact:** David Sweetser

## *Human Biology and Translational Medicine*

### **HBTM 200. Principles and Practice of Human Pathology**

Catalog Number: 10575 Enrollment: Enrollment may be limited  
*Scott Benjamin Lovitch (Medical School)*

*Half course (spring term). Tu., 9–11, Th., 9–1. EXAM GROUP: 2*

Overview of human pathology, emphasis on mechanisms of disease and modern diagnostic technologies. Integrated lectures, labs, and student-driven term project leading to formal presentation on a medical, socioeconomic, or technological issue in human pathology.

*Note: Jointly offered with HMS as HT035.0*

### **Spring 2015**

**First Meeting:** Tuesday, February 3, 2015

**Final Meeting:** Thursday, May 14, 2015

**Location:** Lectures (Tu/Th 9-11): TMEC 333. Labs (Th 11-1): TMEC 202-3/6/7 (2nd floor skills area).

**Course Head:** Scott Lovitch, slovitch@partners.org

## *Immunology*

### **Immunology 202. Advanced Principles of Immunology**

Catalog Number: 5674

*D. Branch Moody (Medical School) and Martin E. Hemler (Medical School)*

*Half course (spring term). Tu., Th., 1:30–4.*

Continuation of Immunology 201 as an intensive core course in fundamentals of immune system, emphasis of physiological roles of immune cells in vivo. Classes taught by experts in their fields; involve critical reading of primary literature.

*Note:* Offered jointly with the Medical School as IM 712.0.

*Prerequisite:* Immunology 201 or its equivalent.

### **Spring 2015**

**First Meeting:** Tuesday, January 27, 2015

**Final Meeting:** Tuesday, May 5, 2015

**Final Examination:** Thursday, May 12, 2015

**Location:** Modell Center, 2nd floor conference room, Room 258

**Course Head:** D. Branch Moody, [bmoody@partners.org](mailto:bmoody@partners.org); Martin Hemler, [martin\\_hemler@dfci.harvard.edu](mailto:martin_hemler@dfci.harvard.edu)

## **Immunology 204. Critical Readings for Immunology**

Catalog Number: 9563

Duane Wesemann (Medical School)

*Half course (spring term). Th., 10-1.*

Original research articles from fields including immunology, biochemistry, genetics, and cell and developmental biology will be critically analyzed in an intensive small group format. Grading will be based on class participation and oral presentations.

*Note:* Required for first-year immunology students, open to second-year immunology students. No auditors. Offered jointly with the Medical School as IM 703.0.

### **Spring 2015**

**First Meeting:** Thursday, January 29, 2015

**Final Meeting:** Thursday, May 7, 2015

**Location:** Jeffery Modell Immunology Center, Fred S. Rosen Lecture Hall, Room 100A

**Course Head:** Duane Wesemann, [dwesemann@research.bwh.harvard.edu](mailto:dwesemann@research.bwh.harvard.edu)

**\*Immunology 301. Immunology Seminar**

Catalog Number: 4971 Enrollment: Limited to 20.

*Michael C. Carroll (Medical School) 2050 and William Nicholas Haining (Medical School) 6946*

*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, and limited to, first-year Immunology graduate students.

**Spring 2015**

**First Meeting:** Wednesday, January 28, 2015

**Final Meeting:** Wednesday, May 6, 2015

**Location:** Jeffery Modell Immunology Center, Fred S. Rosen Lecture Hall, Room 100A

**Course Head:** Michael C. Carroll, michael.carroll@chi006Cdrens.harvard.edu

## *Microbiology and Immunobiology*

### **Microbiology 201. Molecular Biology of the Bacterial Cell**

Catalog Number: 38739

*David Z. Rudner (Medical School), Thomas G. Bernhardt (Medical School), Simon L. Dove (Medical School), and Ann Hochschild (Medical School)*

*Half course (spring term). Tu., Th., 10–12.*

This course is devoted to bacterial structure, physiology, genetics, and regulatory mechanisms. The class consists of lectures and group discussions emphasizing methods, results, and interpretations of classic and contemporary literature.

### **Spring 2015**

**First Meeting:** Tuesday, January 27 2015

**Final Meeting:** Thursday, May 7, 2015

**Location:** NRB 1031

**Course Head:** David Z. Rudner, [david\\_rudner@hms.harvard.edu](mailto:david_rudner@hms.harvard.edu)

**Curriculum Fellow:** Zofia Gajdos, [zofia\\_gajdos@hms.harvard.edu](mailto:zofia_gajdos@hms.harvard.edu), 617-432-1871



**\*Microbiology 210. Microbial Sciences: Chemistry, Ecology, and Evolution**

Catalog Number: 63006 Enrollment: Limited to 30.

Michael S. Gilmore (Medical School)

*Half course (spring term). F., at 8:30, F., 9:45–11:45.*

This is an interdisciplinary graduate-level and advanced undergraduate-level course in which students explore topics in molecular microbiology, microbial diversity, and microbially-mediated geochemistry in depth. This course will be taught by faculty from the Microbial Sciences Initiative. Topics include the origins of life, biogeochemical cycles, microbial diversity, and ecology.

*Note:* Also offered as Organismic and Evolutionary Biology 290.

*Prerequisite:* For advanced undergraduates, Life Sciences 1a and 1b are required, or permission of instructor. MCB 52 is recommended.

**Spring 2015**

**First Meeting:** Friday, January 30, 2015

**Final Meeting:** Friday, April 24, 2015

**Meeting times & Locations:**

8:30 -9:30 am: MSI Chalktalks, (<http://www.msi.harvard.edu/fridays.html>)

Location: Harvard Center for the Environment (HUCE) – (Conf room 310, 24 Oxford St, 3rd floor)  
(15 min break at 9:30 to transition to new room)

9:45 -11:45 am: Faculty Lectures and Discussion

Location: Shaler Seminar Room Rm 413 – (Geological Museum, 24 Oxford St, 4rd floor)

**Course Head:** Michael S. Gilmore, [michael\\_gilmore@meei.harvard.edu](mailto:michael_gilmore@meei.harvard.edu)

**Teaching Assistant:** Samantha Wellington, [swellington@fas.harvard.edu](mailto:swellington@fas.harvard.edu)

**Microbiology 213. Social Issues in Biology**

Catalog Number: 7905 Enrollment: Limited to 20.

*Jonathan R. Beckwith (Medical School)*

*Half course (spring term). Th., 1–4.*

Discussion course on topics selected from the following: history, philosophy of science; evolution vs. creationism; genetics and race; women and science; genetic testing; science journalism; genetics and criminality; science in wartime; scientists and social responsibility; theater and the public presentation of science.

*Note:* Offered jointly with the Medical School as MG 722.0. Alternates yearly between the Longwood and the Cambridge Campuses.

*Prerequisite:* Some background in genetics.

**Spring 2015**

**First Meeting:** Thursday, January 29, 2015

**Final Meeting:** Thursday, April 30, 2015

**Location:** Biological Laboratories, Room 1075, Harvard University, Cambridge Campus

**Course Head:** Jonathan R. Beckwith, [jon\\_beckwith@hms.harvard.edu](mailto:jon_beckwith@hms.harvard.edu)

## *Neurobiology*

### **Neurobiology 204. Neurophysiology of Central Circuits**

Catalog Number: 5603

*Richard T. Born (Medical School), Mark L. Andermann (Medical School), John A. Assad (Medical School), Michael Tri Hoang Do (Medical School), Christopher D. Harvey (Medical School), Margaret S. Livingstone (Medical School) and Rachel I. Wilson (Medical School)*

*Half course (spring term). M., W., 10–12.*

This course introduces major themes and fundamental concepts underlying current research in systems neuroscience. Each week covers a different theme, and draws on research from different sensorimotor modalities and model organisms.

*Note:* Offered jointly with the Medical School as NB 721.0.

*Prerequisite:* Neurobiology 200 or with permission of instructor.

### **Spring 2015**

**First Meeting:** Wednesday, January 28, 2015

**Final Meeting:** Monday, April 27, 2015

**Location:** Goldenson Building, Room 229

**Course Head:** Richard Born, richard\_born@hms.harvard.edu, 617-432-1307

**Course Wiki:** <https://wiki.med.harvard.edu/NB204/Circuits2015>

**Neurobiology 211 (formerly Neurobiology 207 and Neurobiology 221). Molecular and Developmental Neurobiology – NEW COURSE**

Catalog Number: 87063

*Lisa Goodrich, Bob Datta, Michela Fagiolini, Chenghua Gu, Josh Kaplan, Pascal Kaeser, Maria Lehtinen and Beth Stevens*

*Half course (spring term). T., Th., F., 9-11.*

Integrated introduction to the molecular events that govern development and function of neural circuits. Topics include neurogenesis, circuit assembly, synaptic transmission, and the associated signaling pathways. Lectures, discussion of primary literature, and original research proposal.

**Spring 2015**

**First Meeting:** Tuesday, January 27

**Final Meeting:** Friday, April 24

**Location:** Goldenson 422\*\* (\*\*Location has changed from WAB 236 to Goldenson 422 as of 1/14/2015)

**Course Head:** Lisa Goodrich, [Lisa\\_Goodrich@hms.harvard.edu](mailto:Lisa_Goodrich@hms.harvard.edu)

## *Speech and Hearing Bioscience and Technology*

### **SHBT 202. Clinical Aspects of Hearing and Speech**

Catalog Number: 69294 Enrollment: Limited to 15. Minimum of 5  
*Konstantina Stankovic (Medical School and MEEI)*

*Half course (spring term). M., W., 5–7. Clinical observations Mon-Fri 8-3.*

Clinical approach to speech and hearing disorders as practiced by physicians, audiologists, speech clinicians, rehabilitation specialists, bioengineers. Includes observation of patient care in clinic and operating room, audiology/balance disorders experience, lectures and discussion groups.

*Note:* Offered jointly with HST 724 at MIT. Classes to be held at the Massachusetts Eye and Ear Infirmary (MEEI)

*Prerequisite:* Anatomy of Speech and Hearing, Acoustics of Speech and Hearing or permission of the course director

### **Spring 2015**

**First Meeting:** Tuesday, January 27, 2015, 7:00 A.M.\*\*

\*\* *Please note difference in first meeting time.*

**Final Exam:** Tuesday, May 12, 2015

**Location:** MEEI, 4th floor conference room (243 Charles St., Boston)

**Course Heads:** Konstantina Stankovic, [konstantina\\_stankovic@meei.harvard.edu](mailto:konstantina_stankovic@meei.harvard.edu)

**Course Contact:** Barbara Beckman Beard, [bbbeard@meei.harvard.edu](mailto:bbbeard@meei.harvard.edu)

**\*SHBT 203. Anatomy of Speech and Hearing – (January Course)**

Catalog Number: 17772 Enrollment: Limited to 12.

Barbara C. Fullerton (Medical School), James Tracey Heaton (Medical School), and James Bradley Kobler (Medical School)

Half course (spring term). Lecture: M.-F., 9:30- 10:30 am, Lab: M.- F., 10:30-1:30 pm.

This course covers anatomy of the head and neck, with cadaver dissection, stressing structures important in speech and hearing. Lecture topics also include basic neuroanatomy, imaging, surgery, and cancer of head and neck.

*Note:* This is an intensive January Course. Offered jointly with MIT as HST 718. Classes to be held at the Harvard Medical School campus (HMS)

*Prerequisite:* Introductory biology or equivalent and permission of the course director.

**Schedule (UPDATED 12/11)**

<b>DATE</b>	<b>LECTURE- 9:30 am</b>	<b>LAB- 10:30 am-1:30 pm</b>	<b>LOCATION</b>
Mon., 1/5	Introduction Heaton	Thorax (lab 1) ; Kobler, BF	HMS, 443MEC
Tues., 1/6	Anat of respiration- Heaton	Thorax, II (lab 1, cntd.) ; Kobler, BF	HMS, 443MEC
Wed., 1/7	Anatomy of neck I- Fullerton	Neck I (lab 2) ; BF; Kobler	HMS, 443MEC
Thurs., 1/8	Anat of neck II- Fullerton	Neck II (lab 2, cntd.) ; BF, Kobler	HMS, 443MEC
Fri., 1/9	Cranial cavity/nerves I Fullerton	Cranial cavity (lab 3) ; BF	HMS, 443 MEC
Mon., 1/12	Temporal bone – ROSOWSKI	9:30-11 am- bone specimens, no lab	MEEI: 4th fl. Conf
Tues., 1/13	Anatomy of face- Fullerton	Face (lab 4) Fullerton	HMS, 443MEC
Wed., 1/14	Brain I – Fullerton	Brain lab I- human brain ; Fullerton	MEEI: 4th fl. Conf
Thurs., 1/15	Anatomy of jaw- Fullerton	Infratemporal fossa (lab 5); BF, Kobler	HMS, 443MEC
Fri., 1/16	Brain II- Fullerton	Brain lab II- human brain; BF; ?	MEEI: 4th fl. Conf
Mon., 1/19	<b>HOLIDAY- MLK DAY</b>		
Tues., 1/20	Cranial nerves II/eye? Fullerton	Infratemp. fossa, TMJ (lab 5 cntd); BF, Kobler	HMS, 443MEC

Wed., 1/21	Larynx & phonation- Kobler	Fresh cow larynx lab -	Kobler	HMS, 443MEC
Thurs., 1/22	Oral cavity,pharynx- Heaton	Oral cavity, pharynx, larynx (lab 7);	JTH	HMS, 443MEC
Fri., 1/23 8:30 am	Functional anatomy of vocal tract- STEPP	Pharynx, larynx, (lab 7, cntd);	JTH, JK	HMS, 443MEC
Mon., 1/26	Neural control of speech- Heaton	Lecture 9:30-11; student models 11-12:30 pm		HMS, 443MEC
Thurs.,1/29	EXAM	TIME TO BE DETERMINED- 12:30 or 1 pm		HMS, 443 MEC
<b>DATE</b>	<b>LECTURE- 9:30 am</b>	<b>LAB- 10:30 am-1:30 pm</b>		<b>HMS, 109 MEC</b>

### **January Session 2015**

**Meeting Dates:** January 5-30, 2015 (*subject to change*)

**Time:** 9:30 – 11:00 AM (lecture); 11:00 AM – 1:00 PM (lab)

**First Meeting:** Monday, January 5, 2015

**Examination Date:** Friday, January 30

**Location:** TMEC 443; **Exam Location:** TMEC 109

**Course Instructors:** Barbara Fullerton ([Barbara\\_fullerton@meei.harvard.edu](mailto:Barbara_fullerton@meei.harvard.edu)), James Kobler, James Heaton

**Guest lecturers:** Joe Perkell, John Rosowski

**SHBT 204. Speech Communication**

Catalog Number: 47986 Enrollment: Limited to 20.

*Satrajit S. Ghosh (Medical School), Robert E. Hillman (Medical School), and other faculty*

*Half course (spring term). Tu., Th., 11–12:30.*

Survey of human speech communication. Acoustic theory of speech production; physiologic and acoustic descriptions of phonetic features, prosody, voice and speech perception and speech motor control. Applications to recognition, synthesis and speech disorders.

*Note:* Offered jointly with MIT course HST.710. Classes to be held at MIT.

*Prerequisite:* Background equivalent to MIT HST.714.

**Spring 2015**

**First Meeting:** Tuesday, February 3, 2015

**Final Meeting:** Tuesday, May 5, 2015

**Final Papers Due:** Friday, May 15, 2015

**Location:** MIT, Room 36-156 (50 Vassar St., Cambridge)

**Course Head:** Dr. Satrajit Ghosh, [satra@mit.edu](mailto:satra@mit.edu)

**Course Instructor:** Robert E. Hillman, [hillman.robert@mgh.harvard.edu](mailto:hillman.robert@mgh.harvard.edu)



**SHBT 205. Neural Coding and Perception of Sound**

Catalog Number: 63093 Enrollment: Limited to 20.

*Bertrand Delgutte (Medical School), M. Christian Brown (Medical School), John J. Guinan (Medical School), Jennifer R. Melcher (Medical School), and Daniel B. Polley (Medical School)*

*Half course (spring term). M., W., 9:30–11:30, Occasional lab on Friday. EXAM GROUP: 2, 3, 4*

Neural structures and mechanisms mediating the detection, localization and recognition of sounds. General principles are conveyed by theme discussions of auditory masking, sound localization, musical pitch, cochlear implants, cortical plasticity and auditory scene analysis.

*Note:* Offered jointly with MIT HST.723J.

*Prerequisite:* Neurobiology 200 or Permission of the instructor.

**Spring 2015**

**First Meeting:** Monday, January 26, 2015

**Final Meeting:** Wednesday, May 6, 2015

**Location:** MEEI, 4th floor conference room (243 Charles St., Boston)

**Course Head:** Bertrand Delgutte, [bertrand\\_delgutte@meei.harvard.edu](mailto:bertrand_delgutte@meei.harvard.edu)

## *Virology*

### **Virology 201. Virology**

Catalog Number: 1190

*Sean P.J. Whelan (Medical School), James M. Cunningham (Medical School), Michaela Gack (Medical School), and David Knipe (Medical School)*

*Half course (spring term). M., W., 2:30–4.*

The course focuses on the following areas of virology: (i) epigenetic regulation, (ii) RNA virus replication mechanisms, (iii) innate responses to viral infection, (iv) inhibition of viral infection. The course will comprise lectures as well as reviewing literature that describes fundamental breakthroughs relevant to these areas. Within those areas, the class will read and discuss papers dealing with virus structure, replication, pathogenesis, evolution, emerging viruses, chronic infection, innate and adaptive immunity, anti-viral drugs/vaccines. Special emphasis will be placed on preparing students to critically evaluate the literature, formulate hypotheses and design experiments.

*Note:* Course format will be lectures, literature-based critical reading and discussion. Prepare and defend a written research proposal. Offered jointly with the Medical School as MG 723.0.

*Prerequisite:* Virology 200. Graduate standing and permission required.

### **Spring 2015**

**First Meeting:** Monday, January 26, 2015

**Final Meeting:** Wednesday, May 13, 2015

**Location:** TMEC 426

**Course Heads:** Sean Whelan, sean\_whelan@hms.harvard.edu and James M. Cunningham, jcunningham@rics.bwh.harvard.edu

## *Other courses of interest*

### **Biophysics 205. Computational and Functional Genomics**

Catalog Number: 6777 Enrollment: Limited to 20.

*Martha L. Bulyk (Medical School), Suzanne Gaudet (Medical School), and Shamil R. Sunyaev (Medical School)*

*Half course (spring term). M., W., 2:30–4. Enrollment: Limited to 20.*

This is an upper-level critical paper reading and discussion course in the areas of experimental and computational functional genomics. Introductory lectures will be interspersed within the topic blocks, with most of the meeting time devoted to critical discussion of assigned journal articles. Students will be responsible for presenting assigned articles throughout the semester and for leading class discussions of those articles. There will be written and oral presentations of final student proposals at the end of the term.

*Prerequisite:* Molecular biology and introductory statistics. Harvard BS 50 or BS 52 or the equivalent. Permission of the instructors is required.

### **Spring 2015**

**First Meeting:** Monday, January 26, 2015

**Final Meeting:** Wednesday, May 6, 2015

**Course Location:** Folin Wu room, Building C, HMS

**Course Head:** Martha L. Bulyk, [mlbulyk@receptor.med.harvard.edu](mailto:mlbulyk@receptor.med.harvard.edu)

**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., Fr., 3:30–5:00. 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.

**Course Contact:** Meaghan Fay, [Meaghan\\_fay@hms.harvard.edu](mailto:Meaghan_fay@hms.harvard.edu) and Samantha Reed, [Samantha\\_Reed@hms.harvard.edu](mailto:Samantha_Reed@hms.harvard.edu)