

Division of Medical Sciences

Ph.D. Programs at Harvard Medical School

PRELIMINARY

Quarter Courses

Fall Semester

2009-2010

(Updates will be posted on the new website:
<https://nanosandquarters.hms.harvard.edu/>)

Fall Term 1st session Dates: September 8, 2009 – October 30, 2009

Fall Term 2nd session Dates: November 2, 2009 - December 18, 2009

For Information Call: 617-432-0162

**Division of Medical Sciences
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What Is A Quarter Course?

A quarter course is a half semester course that focuses on a specific topic, usually in the area of expertise of the faculty. Two or more faculty members who have complementary interests run some courses.

Quarter courses are required to meet for at least 7 or 8 sessions during the semester. Classes typically meet for one 2-hour session per week. Meeting times may be arranged at the initial session for convenience of faculty and students.

There are optimally 5 to 10 graduate students from DMS in each course. If space permits, medical students and post-docs may enroll with the faculty's permission. Everyone is required to read the assigned papers and no auditing without participation should be allowed.

From 2-4 related papers are assigned for each session. Sometimes these include a review article for background along with the primary papers. Some sessions start with a short introduction by the faculty or a designated student.

Quarter courses composed of primary lectures are also offered and differ from standard full semester courses in that they deal with a specific focused topic.

Students should be aware that they must take two quarter courses to receive a satisfactory grade on their grade report. Students are required to register for quarter courses on their study cards only when they are scheduled to take the **second** quarter course.

Please Note: If a quarter course meeting time needs to be rescheduled for any reason, it will be determined by the instructor after consultation with the students of that course.

Division of Medical Sciences

Summary of Quarter Courses Fall 2009

Fall Term 1st Session Dates: September 8, 2009 – October 30, 2009

Fall Term 2nd Session Dates: November 2, 2009 - December 18, 2009

Cell Biology 300. Intracellular transport – Second Session

Director: Victor Hsu, 617-525-1103, vhsu@rics.bwh.harvard.edu

Co-director: Sanja Sever, 617-724-8922, ssever@partners.org

Cell Biology 300. Belief options for a practicing scientist – Second Session

Andrius Kazlauskas andrius.kazlauskas@schepens.harvard.edu

Genetics 300: Cancer Genetics and Genomics – First Session

Raju Kucherlapati, rkucherlapati@partners.org

HBTM 300. Concept-Centered Teaching – First Session

Julia Khodor, 617-821-9104, jkhorod@partners.org

Immunology 300. Autoimmunity – Second Session

Kai Wucherpfennig, 617-632-3086, Kai_Wucherpfennig@dfci.harvard.edu

Course led by Kai Wucherpfennig and Vijay Kuchroo

Neurobiology 300: How Neuronal Circuits Store, Represent and Recall Visual Information – Second Session

Gabriel Kreiman, 617-919-2530, gabriel.kreiman@childrens.harvard.edu

Neurobiology 300: Biochemistry and Biology of Neurodegenerative Diseases – Second Session

Michael Wolfe, 617-525-5511, mwolfe@rics.bwh.harvard.edu

Pathology 300. Biology of Aging: Molecular mechanisms and disease – First Session

Marcia Haigis, marcia_haigis@hms.harvard.edu

David Sinclair, david_sinclair@hms.harvard.edu

Keith Blackwell, keith.blackwell@joslin.harvard.edu

Virology 330. Advanced Topics in Virology – Second Session

Alan N. Engelman, 617-632-4361, alan_engelman@dfci.harvard.edu

Cell Biology 300. Intracellular transport

Director: Victor Hsu, 617-525-1103, vhsu@rics.bwh.harvard.edu

Co-director: Sanja Sever, 617-724-8922, ssever@partners.org

Intracellular transport shuttles proteins and membrane among the different compartments within the cell. This process plays an essential role in a wide variety of physiologic events, and also propagates pathogenic mechanisms leading to diseases. This course will select key elements of intracellular transport for detailed analysis, explore some interdisciplinary areas to exemplify key roles played by intracellular transport, and also provide practical guides for morphologic and biochemical experimentation in this field.

Second Session, Fall 2009

Meeting dates: Nov 4, 11, 18, 25, Dec 2, 9, 16.

Time: Wednesdays, 2:00 – 4:00 p.m.

First Meeting: Wednesday, November 4, 2:00 p.m. Smith Bldg., Room 546

Location: Smith Building, Room 546 (located at the Dana Farber Cancer Institute)

Class size: Minimum of 5 students required for course to be held.

To sign up for this course please go to <https://nanosandquarters.hms.harvard.edu/> and click the log in link at the bottom of the page to create a new account. Follow the instructions to enroll. Please [e-mail](#) me with any questions.

Cell Biology 300. Belief options for a practicing scientist

Andrius Kazlauskas ak@eri.harvard.edu

While scientific approaches effectively explain the natural world, they fail to resolve moral, ethical and social questions. These latter issues are part of the scientist's world and at times even one's research project. This quarter course will compare and contrast common belief options to grapple with theological questions that face scientists. We will read excerpts from a number of authors (such as F. Collins, C.S. Lewis, S. Freud, R. Dawkins, S. Harris) that address how one comes to faith and what that faith can look like. We will also discuss issues that are typically at the interface between religion and faith such as evolution and the use of stem cells in research. There will be a total of 6 meetings that will consist of student-led discussion based on the types of readings described above. While there will not be any exams, successful completion of the course will include writing a final paper/thesis making a case for which of the belief options is best suited for a scientist.

Second Session, Fall 2009

Meeting Dates: Oct 30, Nov 6, 13, 20, Dec 4, 11

Time: 3:00 – 5:00 p.m.

First Meeting: Friday October 30, 3:00 p.m. TMEC Bldg., Room 445

Location: TMEC Bldg., Room 445

Class size: limited to 10.

To sign up for this course please go to <https://nanosandquarters.hms.harvard.edu/> and click the log in link at the bottom of the page to create a new account. Follow the instructions to enroll. Please [e-mail](#) me with any questions.

Genetics 300: Cancer Genetics and Genomics

Raju Kucherlapati, rkucherlapati@partners.org

This quarter course will address the genetic mechanisms underlying cancer, including both inherited predisposition and acquired alterations and how each contributes to the pathogenesis of disease. We will also discuss how advances in genetic and genomic technologies have led to breakthroughs in new mutation discovery, prediction, prevention, early detection and treatment. The course format will be a combination of lectures and paper discussions, culminating in student presentations.

Outline of Sessions

1. Introduction to cancer as a genetic disease
Familial cancer syndromes/tumor predisposition
2. Computational methods used in cancer genetics
3. Chromosomal alterations in cancer and methods of detection
4. Aberrant signaling pathways in cancer and methods of detection
5. Whole-genome analysis of cancer
Association studies, data analysis, large-scale projects
6. Genetic approaches to the development of therapies
Rational therapy
Pharmacogenetics
7. Risk assessment, prediction, and prevention
8. Data analysis discussion and policy forum

First Session, Fall 2009

Meeting Dates: Sept. 10*, 14, 21, 28, Oct. 5, 13*, 19, 26.

Time: Mondays, 1:00 - 4:00 p.m. (note day changes on September 10 and October 13)

First Meeting: Thursday, September 10, 1:00 p.m. TMEC Bldg., Room 209

Location: First meeting to be held in TMEC Bldg., 209; all subsequent class meetings will be held in NRB Room 254

*Please note that class is moved from Monday to Thursday on September 10 and from Monday to Tuesday on October 13 due to the Labor Day and Columbus Day holidays.

To sign up for this course please go to <https://nanosandquarters.hms.harvard.edu/> and click the log in link at the bottom of the page to create a new account. Follow the instructions to enroll. Please [e-mail](#) me with any questions.

HBTM 300. Concept-Centered Teaching

Julia Khodor, 617-821-9104, jkhodor@partners.org

Research in science education shows that the greatest obstacle to student learning is the failure to identify and confront the misconceptions with which students enter a class or those that they acquire during their studies. In Concept-Centered Teaching, participants will read and discuss primary literature in science education, focusing on a number of teaching methods aimed at increasing students' ability to learn, retain, and integrate new material.

This course provides framework for thinking about teaching in a comprehensive, deliberative and rigorous way, and would be a great addition for anyone interested in teaching as a component of a future career.

Week 1	What is understanding? Teaching for understanding
Week 2	Confronting student misconceptions
Week 3	Breaking down complex material into basic concepts
Week 4	Cooperative/group learning
Week 5	Case studies
Week 6	Concept-based laboratories and lecture connections
Week 7	Assessment and student self-assessment
Week 8	Teaching evolution/Wrap-up

First Session, Fall 2009

Meeting Dates: Wednesdays, September 9, 16, 23, 30, October 7, 14, 21, 28

Time: 2:00 – 4:00 p.m.

First Meeting: Wednesday, September 9, 2:00 p.m.

Location: TMEC Bldg., Room 334

Class size: 10, if more are interested she may raise the limit – please add yourself to a waitlist if limit is reached.

To sign up for this course please go to <https://nanosandquarters.hms.harvard.edu/> and click the log in link at the bottom of the page to create a new account. Follow the instructions to enroll. Please [e-mail](#) me with any questions.

Immunology 300. Autoimmunity

Kai Wucherpfennig, 617-632-3086, Kai_Wucherpfennig@dfci.harvard.edu

Course led by Kai Wucherpfennig and Vijay Kuchroo

This course will focus on basic immunological mechanisms of autoimmune diseases, with an emphasis on recent advances in the field. At each session, we will focus on a particular topic and discuss three important publications.

Specific topics will include:

Session 1: General concepts of T cell mediated autoimmunity

Session 2: Th17 cells as autoimmune effector T cells

Session 3: Protective mechanisms from autoimmunity: Regulatory T cells

Session 4: Protective mechanisms from autoimmunity: Central and peripheral tolerance

Session 5: B cell mediated autoimmunity and T cell – B cell collaboration

Session 6: Genetics of autoimmunity

Session 7: Treatment of human autoimmune diseases

Second Session, Fall 2009

Meeting Dates: November 2, 9, 16, 23, 30, December 7, 14

Time: Mondays, 4:00 - 6:00 p.m.

First Meeting: Monday, November 10, 4:00 p.m. Modell Center, 2nd floor conference room

Location: Modell Center, 2nd floor conference room

To sign up for this course please go to <https://nanosandquarters.hms.harvard.edu/> and click the log in link at the bottom of the page to create a new account. Follow the instructions to enroll. Please [e-mail](#) me with any questions.

Neurobiology 300: Visual object recognition

Gabriel Kreiman, 617-919-2530, gabriel.kreiman@childrens.harvard.edu
<http://klab.tch.harvard.edu>

Visual object recognition is essential for most everyday tasks including navigation, reading and socialization. Visual pattern recognition is also of high importance for many applications including analysis of clinical images, face or landmark recognition in security tasks and automatic navigation. In spite of the enormous increase in computational power over the last decade, humans still outperform the most sophisticated engineering algorithms in visual recognition tasks. This course will examine how circuits of neurons in visual cortex process, represent and recall information. The course will cover the following topics: architecture of visual cortex, lesion studies, physiological experiments in humans and animals, computational models of visual object recognition and subjective perception.

Topics:

1. November 3: Introduction to pattern recognition. Why is vision difficult? Overview of key questions in the field.
2. November 10: Visual input. Natural image statistics. The retina, LGN and primary visual cortex.
3. November 17: Lesion studies in humans and animals.
4. November 24: Adventures into terra incognita: Physiology beyond primary visual cortex.
5. December 1: Electrical stimulation in visual cortex.
6. December 8: Computational models of visual object recognition.
7. December 15: Towards understanding subjective visual perception.

Class web site:

http://klab.tch.harvard.edu/academia/classes/hms_neuro300_vision/index.html

<http://tinyurl.com/vision-class>

Second Session, Fall 2008

Meeting Dates: November 3, 10, 17, 24, December 1, 8, 15

Time: Tuesdays, 10:00 – 11:00 a.m.

First Meeting: Tuesday, November 3, 10:00 a.m.

Location: Center for Life Science (CLS) building, 13th floor seminar room
(3 Blackfan Circle, see directions on web page)

To sign up for this course please go to <https://nanosandquarters.hms.harvard.edu/> and click the log in link at the bottom of the page to create a new account. Follow the instructions to enroll. Please [e-mail](#) me with any questions.

Neurobiology 300: Biochemistry and Biology of Neurodegenerative Diseases

Michael Wolfe, 617-525-5511, mwolfe@rics.bwh.harvard.edu

The abnormal processing, folding and assembly of proteins is linked to an increasing number of neurodegenerative diseases. This course integrates biochemistry and biology to provide a broad perspective on neurodegeneration. We will examine the chemistry, biochemistry, enzymology, and structural biology of proteins involved in neurodegeneration. In addition, we will discuss aberrant metabolism of disease-associated proteins and address aspects of the etiology, pathology, diagnosis, and treatment of selected neurodegenerative diseases (Alzheimer's, Huntington's, Parkinson's, ALS, and prion diseases). The course is thus appropriate for students in the Neuroscience and BBS programs, as well as for others with interests in the area. Each session will begin with a brief introduction to the topic, followed by critical analysis and discussion of key publications.

Topics:

1. Common themes in neurodegenerative diseases
2. Biochemistry and biology of Alzheimer's disease
3. Diagnostic and therapeutic approaches to Alzheimer's disease
4. Huntington's disease
5. Parkinson's disease
6. ALS
7. Prion diseases

Second Session, Fall 2009

Meeting Dates: Tuesdays, November 3, 10, 17, and 24, December 1, 8, 15

Time: Tuesdays, 3:30 – 5:30 p.m.

First Meeting: Tuesday, November 3, 3:30 p.m. TMEC Bldg., Room 448

Location: TMEC Bldg., Room 448

To sign up for this course please go to <https://nanosandquarters.hms.harvard.edu/> and click the log in link at the bottom of the page to create a new account. Follow the instructions to enroll. Please [e-mail](#) me with any questions.

PATH 300. Biology of Aging: Molecular mechanisms and disease

Marcia Haigis, marcia_haigis@hms.harvard.edu

David Sinclair, david_sinclair@hms.harvard.edu

Keith Blackwell, keith.blackwell@joslin.harvard.edu

This quarter course will explore the molecular mechanisms of aging and the connections between aging and age-related diseases, such as diabetes and neurodegeneration. We will discuss pathways that increase the lifespan of model organisms, including insulin signaling, SIR2, TOR signaling, and calorie restriction. We will also discuss the potential for aging research to lead to new drugs to treat a variety of diseases. Students will be responsible for reading and critically discussing relevant papers each week. Papers for the discussion will be taken from classic and current literature. Class participation is required and enrollment is limited to 12 students.

Proposed sessions include:

1. Introduction to aging research
2. Insulin signaling and other pathways that regulate aging
3. Role of mitochondria in aging
4. Calorie restriction
5. Sirtuins and NAD⁺
6. Stem cells and aging
7. Aging and the brain
8. Potential for interventions

First Session, Fall 2008

Meeting Dates: Tuesdays, September 15, 22, 29, October 6, 13, 20, 27, November 3

Time: 9:00 – 11:00 a.m.

First Meeting: Tuesday, September 15, 2009, 9:00 a.m. NRB Room 933

Location: NRB Room 933

Class Size: 12

To sign up for this course please go to <https://nanosandquarters.hms.harvard.edu/> and click the log in link at the bottom of the page to create a new account. Follow the instructions to enroll. Please [e-mail](#) me with any questions.

Virology 330. Advanced Topics in Virology

Alan N. Engelman, 617-632-4361, alan_engelman@dfci.harvard.edu

Critical evaluation of virology-related papers reporting a seminal contribution, strong methodological approaches or, in some cases, due to errors in methodology or author interpretation. Requirements include written critiques and class participation.

Note: Offered in the month of January. Please sign up for the course on your fall term study card.

Second Session, January 2010

Meeting Date: Tuesdays and Thursdays, January 5, 7, 12, 14, 19, 21, and 26.

Time: 5:00 - 6:30 p.m.

First Meeting: Tuesday, January 5, 2010, 5:00 p.m.

Last Meeting: Tuesday, January 26, 2010

Location: TBA, will be e-mailed to enrolled students

To sign up for this course please go to <https://nanosandquarters.hms.harvard.edu/> and click the log in link at the bottom of the page to create a new account. Follow the instructions to enroll. Please [e-mail](#) me with any questions.