

Fall 2024 Quarter Courses (QC)

Referred to as "Half Term" in Academic Calendar

Fall Session 1 (Half-Term QC's): 09/03/24 – 10/21/24

Fall Session 2 (Half-Term QC's): 10/22/24 – 12/04/24

ENROLLMENT DEADLINES

Check-In Opens	August 13
Incoming Student Reg. Opens	August 19
Returning Student Add/Drop	August 19
Check-In Closes	September 3
Registration Deadline (incoming & returning students)	September 3
Full Term	September 3 – December 4
Fall 1 Opens	September 3
Fall 1 drop date	September 12
Fall 1 Closes	October 21
Fall 2 Opens	October 22
Fall 2 drop date	November 7
Fall 2 Closes	December 4

ACADEMIC CALENDAR

<https://registrar.fas.harvard.edu/gsas-academic-calendar>

REMINDERS

You **cannot register** for courses until all the holds have been lifted from your account. Information about registration holds and how to remove them can be found here: <https://registrar.fas.harvard.edu/enrollment#holds>.

Incoming Students: meet with your advisor or speak with your Program Admin regarding your course load so that advisors can lift the "Advising Hold" from your cart.

Check-In opens August 19 and closes September 3.

FAS Registrar Info: <https://registrar.fas.harvard.edu/check-in>

GSAS Info: <https://gsas.harvard.edu/policy/check-and-registration-resident-students>

Register for **16 credits is required** for full-time student status and health insurance eligibility **by the beginning of the term, Sept. 3**. Register by going to <https://my.harvard.edu/>

For questions, contact: dms_courses@hms.harvard.edu



BBS 330QC Critical Thinking and Research Proposal Writing

April Craft, Jessica Lehoczky

CELLBIO 306QC Teaching 100: The Theory & Science of Teaching

Taralyn Tan

HBTM 302QC Imaging and Microscopy Methods in Biology & Medicine

Lev Perelman

IMMUN 307QC Cancer Immunology

Kai Wucherpfennig, Stephanie Dougan, Philip Kranzusch, Judith Agudo

MED-SCI 300QC Responsible Conduct of Science (REQUIRED for G2 Students)

Rosalind Segal, Aimee Hollander

MED-SCI 302QC Responsible Conduct of Science Refresher (REQUIRED for G6 Students)

Rosalind Segal, Aimee Hollander

MED-SCI 309QC The Past in the Present: Race and Racism in Science and Health

Evelynn Hammonds, Deepali Ravel

NEUROBIO 306QC Quantitative Methods for Biologists (AUGUST BOOTCAMP)

Michael Springer, Richard T. Born, Ella R. Batty

NEUROBIO 308QC Thinking about Data: Statistics for the Life Sciences

Richard T. Born, Brian Healy

NEUROBIO 315QC Human Neuroanatomy & Neuropathology

Matthew Frosch, Jean Augustinack

NEUROBIO 319QC Neurobiology of Psychiatric Disease: From Bench to Bedside

William Carlezon, Kerry Ressler

NEUROBIO 325QC Advanced Topics in Sensory Neuroscience

David Ginty, Rachel Wilson, Michael Do

SHBT 301QC Introduction to Speech & Hearing Laboratories

Gwen Geleoc



Biological & Biomedical Sciences

BBS 330QC Critical Thinking and Research Proposal Writing

April Craft, Jessica Lehoczky

2 units

Meeting Dates:

Session 1 (in-person lecture): Thursday Sept 5, 2:00PM-3:30PM

Session 2 (in-person lecture): Thursday Sept 19, 2:00PM-3:30PM

Meeting Locations: NRB 350

A small group tutorial systematically guiding students in the writing of original, hypothesis-driven research proposals from initial topic selection through completion of a final draft.

Course Notes: This course is open to second year BBS students. Others need permission of the instructors. Dates, times and locations for Sessions 3 and 4 are determined by the faculty running the small group sessions. Session 1 (lecture) will be held early in Sept. Session 2 (lecture) will be held later in same month. Small group sessions 3 and 4 vary as scheduled by faculty instructors.

Enrollment Note: Students will submit preferences for small group sessions. Students will receive preferencing instructions after enrollment closes.

Recommended Prep: Check course [website](#) for downloadable material

Course Heads: April Craft, april.craft@childrens.harvard.edu, Jessica Lehoczky, jlehoczky@bwh.harvard.edu

Other instructors: Caroline Burns, Geoff Burns, William Pu, Christina Jacobsen, Mimi Bandopadhyay, Hong Chen, Christian Dibble, Roby Bhattacharyya, Yu-Hua Tseng, John (Sean) Clohessy, Allegra Petti, Sean Stowell



Cell Biology

CELLBIO 306QC: Teaching 100: The Theory & Science of Teaching

Taralyn Tan

2 units. Enrollment limited to 20 per section (total enrollment 40). Instructor consent required.

In-person section

W., 2:00pm - 4:00pm

Meeting Dates: September 18 – November 20

Meeting Location: TBD - Instructor to provide location

Remote section (only for Master's students)

W., 8:00am - 10:00am

Meeting Dates: September 18 – November 20

Meeting Location: Zoom information provided by instructor

Course materials to be released beginning Sept. 4. The course ends November 20.

For many graduate students and medical educators, teaching will be part of their career, whether as mentoring, formal classroom teaching, or teaching in the hospital. In addition, the theory and research evidence accumulating in the disciplines of cognitive psychology, neuroscience, and from STEM classrooms, has turned the question of “How do we best teach science and medicine?” into its own scientific discipline. The Theory and Science of Teaching focuses on understanding why certain teaching methods are effective by examining the scientific research and theoretical frameworks that support these methods. We will read and discuss foundational educational and cognitive psychology texts and primary literature, and then develop course materials that allow us to put these ideas into practice.

Class Note: Class will meet for 2 hours of synchronous discussion and learning activities each week. The remote section will meet Wednesdays from 8:00-10:00 am over Zoom and is reserved for master's students. The in-person section will meet Wednesdays from 2:00-4:00 pm in Longwood and is intended for PhD students who must take their classes in-person. The content of the sections will be the same and both will share identical asynchronous learning components. This will include watching videos, reading a variety of materials, participating in discussion boards, creating sample materials, and writing learning reflections. The synchronous and asynchronous components combine to meet the course objectives and are equally important to students' learning.



Class begins September 4th with the release of the first asynchronous module, which students will complete and discuss in short, individually scheduled small group meetings with the course instructor during the week of Sept. 11, prior to the start of synchronous class sessions. The first synchronous class meeting is September 18th. The course concludes with the final synchronous class session on November 20.

Course Note: The course has been designed as a companion to GENETIC 302QC: Teaching 101, but neither course is a prerequisite of the other.

Required Prep: Make It Stick, by Brown, Roediger and McDaniel is required pre-reading and should be completed before the first day of class on September 18. A required asynchronous 'module 0' will be released on Canvas on September 4.

Course Head: Taralyn Tan, Taralyn_Tan@hms.harvard.edu

Human Biology & Translational Medicine

HBTM 302QC Imaging and Microscopy Methods in Biology & Medicine

Lev Perelman

2 units. Enrollment limited to 15. Instructor consent required.

TH, 3:00pm - 5:00pm

Meeting Dates: September 12 – November 21

Meeting Location: TBD - Instructor to provide location

This quarter course will introduce students to modern imaging modalities used in biology and medicine, with emphasis on modalities most frequently employed in cellular and molecular biology. The course will offer an overview of the basic principles of light and electron microscopy and explain their resolution limits and sources of contrast. We will discuss modality-specific functionally relevant fluorescence molecular probes which can be used for live cell imaging. The course will provide a detailed review and theory of operation of modern advanced light microscopy techniques such as confocal, line-scanning, light sheet, STED, light scattering, multi-photon and superresolution microscopy. We will then discuss Raman and light scattering spectroscopy methods for monitoring induced pluripotent stem cell differentiation, genetic targeting in microscopy and CRISPR-based photoactivatable transcription systems and basic concepts of optogenetics. We will review specific optogenetic actuators and sensors, modern light delivery techniques and various applications from investigating brain functions to cardiac



optogenetics. We will also offer an overview of medical imaging techniques, such as ultrasound, X-ray CT, MRI, PET/SPECT, and ultrasound imaging, along with emerging optical imaging and spectroscopy methods. Lectures will be supplemented by visual demonstrations of the microscopy systems and hands-on laboratory work and discussions of the operation principles of those systems.

Course Head: Lev Perelman, lperelman@fas.harvard.edu

Immunology

IMMUN 307QC Cancer Immunology

Kai Wucherpfennig, Stephanie Dougan, Philip Kranzusch, Judith Agudo

Fall 2 QC

2 units. Enrollment limited to 20. Instructor consent required.

M, 4:00pm - 6:00pm

Meeting Dates: October 21 – December 9 (7 sessions)

Meeting Location: TBD - Instructor to provide location

There have been many exciting recent developments in the cancer immunology field, and multiple therapeutic approaches have shown efficacy against diverse types of cancer. This course will emphasize new mechanistic insights, specifically on the following topics: mechanisms of spontaneous protective anti-tumor immunity; key effector cell populations of anti-tumor immunity; innate immune pathways in tumor immunity; inflammation and tumor microenvironment; immunosuppressive mechanisms in tumor immunity; targeting of inhibitory receptors; cancer vaccines.

Course Note: Must be PhD student at Harvard or postdoctoral fellow

Course Head: Kai Wucherpfennig, kai_wucherpfennig@dfci.harvard.edu

Other Instructors: Dougan, Stephanie, Kranzusch, Philip, Agudo, Judith



Medical Sciences

MED-SCI 300QC Responsible Conduct of Science (REQUIRED for G2 students)

Rosalind Segal, Aimee Hollander

2 units

September 9, 2024 - the week of November 11, 2024 (total of 10wks)

Faculty Section Meeting Dates and Locations: 6 in-person (on-campus) classes, 90-minutes, see canvas page for dates and locations. Enroll in section during enrollment.

Zoom Lecture Dates: 4 live zoom lectures, 90-minutes, see canvas page for dates

This course is a required course for all DMS students and all who receive support from NIH training grants. The goal of this course is to inform students about the appropriate conduct of research and the many ethical and social problems that they may encounter during their research career in graduate school. The structure consists of highly interactive, in-person, small groups discussion sessions moderated by a faculty member, and live Zoom lectures. Issues discussed include (but are not limited to) experimental design and practices, equity in research, conflict of interest, research misconduct, interactions with members of the laboratory and the mentor, and the ethical role of the scientist in society.

To select your schedule for the 6 in-person classes, you must take action to enroll in the faculty member's section of your choice during the Registration period. Sections are first come, first serve. Once the section is filled, **it will be closed**. We recommend enrolling as soon as possible. You may need to adjust your schedule as needed in order to find a section that works. Please do not place yourself in the "place-holder" section. Anyone in the place-holder section will automatically be put into an open section. You will be emailed a document with all faculty scheduled sections and enrollment instructions.

Please visit the Fall 2024 RCoS canvas site [HERE](#), or paste the URL into your browser: <https://canvas.harvard.edu/courses/137109> for a list of faculty sections outlining dates, times and locations for each section and Zoom lecture registration links. You will need this information in order to enroll yourself into a section that works best for your schedule.

Grading & Attendance: You must attend a minimum of 7 of the 10 sessions to pass this course. This class is graded SAT/UNSAT. To view the grading & attendance policies, [CLICK HERE](#) [<https://canvas.harvard.edu/courses/137109/assignments/syllabus>].



Notes: This course is required for all current G2 students during the Fall semester. Please contact Bethany_Krevat@hms.harvard.edu, for inquiries. **Restricted to HILS graduate students within programs on the Longwood campus.**

Course Head: Rosalind Segal, Rosalind_Segal@dfci.harvard.edu

Co-Course Head: Aimee Hollander, Aimee_Hollander@hms.harvard.edu

Course Administrator: Bethany Krevat, Bethany_Krevat@hms.harvard.edu

MED-SCI 302QC Responsible Conduct of Science Refresher (REQUIRED for G6 students)

Rosalind Segal, Aimee Hollander

2 units

September 9, 2024 - the week of November 11, 2024 (total of 10wks)

Faculty Section Meeting Dates and Locations: 6 in-person (on-campus) classes, 90-minutes, see canvas page for dates and locations. Enroll in section during enrollment.

Zoom Lecture Dates: 4 live zoom lectures, 90-minutes, see canvas page for dates

This course is a required course for all DMS students and all who receive support from NIH training grants. The goal of this course is to inform students about the appropriate conduct of research and the many ethical and social problems that they may encounter during their research career in graduate school. The structure consists of highly interactive, in-person, small groups discussion sessions moderated by a faculty member, and live Zoom lectures. Issues discussed include (but are not limited to) experimental design and practices, equity in research, conflict of interest, research misconduct, interactions with members of the laboratory and the mentor, and the ethical role of the scientist in society.

To select your schedule for the 6 in-person classes, you must take action to enroll in the faculty member's section of your choice during the Registration period. Sections are first come, first serve. Once the section is filled, **it will be closed**. We recommend enrolling as soon as possible. You may need to adjust your schedule as needed in order to find a section that works. Please do not place yourself in the "place-holder" section. Anyone in the place-holder section will automatically be put into an open section. You will be emailed a document with all faculty scheduled sections and enrollment instructions.

Please visit the Fall 2024 RCoS canvas site [HERE](#), or paste the URL into your browser: <https://canvas.harvard.edu/courses/137109> for a list of faculty sections outlining dates, times and locations for each section and Zoom lecture registration links. You will need this information in order to enroll yourself into a section that works best for your schedule.



Grading & Attendance: You must attend a minimum of 7 of the 10 sessions to pass this course. This class is graded SAT/UNSAT. To view the grading & attendance policies, [CLICK HERE](https://canvas.harvard.edu/courses/137109/assignments/syllabus) [https://canvas.harvard.edu/courses/137109/assignments/syllabus].

Notes: This course is required for all current G6 students during the Fall semester. Please contact Bethany_Krevat@hms.harvard.edu, for inquiries. **Restricted to HILS graduate students within programs on the Longwood campus.**

Course Head: Rosalind Segal, Rosalind_Segal@dfci.harvard.edu

Co-Course Head: Aimee Hollander, Aimee_Hollander@hms.harvard.edu

Course Administrator: Bethany Krevat, Bethany_Krevat@hms.harvard.edu

MED-SCI 309QC The Past in the Present: Race and Racism in Science and Health

Evelynn Hammonds, Deepali Ravel

Fall 1 QC

2 units. Enrollment limited to 13. Instructor consent required.

M/W, 2:00pm – 3:30pm

Meeting Dates: September 4 – October 23

Meeting Location: HSPH- Instructor to provide location

This course will introduce public health and biomedical students to the historical context that has shaped and continues to shape contemporary health disparities in the United States. Scientific, medical and public health theory and practices emerged in the racialized society of the United States in the 18th century and have persisted from the past into the present day. The goal of the course is to provide foundational language, historical context, and analytical skills to support students' ability to identify and address race-based health disparities so evident in public health and medicine today that have been increasingly linked to current social justice aspects of public health and biomedical research and practices.

The goals of the course are to prepare students to:

- Describe the concept of race and how the scientific/health fields have contributed to its construction
- Describe the impacts of structural racism on the production of health disparities
- Describe how race as a population descriptor has been used in medicine and research in the past and the present
- Analyze how inaccurate assumptions about the biological basis of race can lead to research design and interpretation that creates or perpetuates racial health inequities
- Critically evaluate the specific ways your own field/discipline contributes to these inequities.
- Identify principles for designing research that does not perpetuate racism and racial health inequities



Course Head: Evelynn Hammonds, evelynn_hammonds@harvard.edu

Other Instructor: Deepali Ravel, Deepali_Ravel@hms.harvard.edu

Teaching Fellow: Constantine Psimopoulos, cpsimopoulos@hsph.harvard.edu

Neurobiology

NEUROBIO 306QC Quantitative Methods for Biologists (August bootcamp)

Michael Springer, Richard T. Born, Ella R. Batty

Fall 1 QC

2 units. Enrollment limited to 80. Instructor consent required.

M/W/F, 10:00am-4:00pm (one-hour break from 2pm-3pm) EST

T/Th, 2:00pm-4:00pm (drop-in/homework) EST

Meeting Dates: August 12 – August 23

Meeting Locations:

M/W/F: Maxwell Dworkin G115 Robert and Naida Lessin Forum (8/23 location, Pierce Hall 209)

T/TH: TBD - Instructor to provide location

The goal of this camp is to introduce you to programming in the PYTHON environment and to show you the power this provides for analyzing data and for gaining intuition about the behavior of complex systems through the use of numerical simulations. Some of you, upon encountering in the previous sentence words like “programming” and “numerical simulations,” will feel the cold hand of fear grip your stomach, because you have never done any programming and, in fact, have tried to avoid math as much as possible. If so, YOU ARE PRECISELY THE PERSON WE HAD IN MIND as we were planning the course. We are aiming to help you break through this barrier of darkness and fear into the radiant sunshine of quantitative enlightenment. The true beauty of PYTHON, as we will personally demonstrate, is that it allows people who are not mathematically adept (e.g. some of the instructors of this course) to use powerful numerical methods and visualization tools to gain an understanding of concepts that are very difficult to grasp analytically.

Course Notes: The camp is primarily designed for those of you with no prior programming experience. If you fit this description, you should definitely plan to take the course. It is critical to be familiar with a scientific programming language with which to improve your quantitative literacy throughout graduate school.



Sign up [here](#).

Please put this course on your fall term study card if you wish to receive credit for it.

Email [Jennie Epp@hms.harvard.edu](mailto:Jennie_Epp@hms.harvard.edu) with enquiries.

Course Instructors: Michael Springer, Michael_Springer@hms.harvard.edu, Rick Born, richard_born@hms.harvard.edu, Ella R. Batty, Eleanor_Batty@hms.harvard.edu

NEUROBIO 308QC Thinking about Data: Probability & Statistics for the Life Sciences

Richard T. Born, Brian Healy

Fall 1 QC

2 units

W, 5:00pm - 7:00pm

Meeting Dates: September 4 – October 23

Meeting Location: TBD - Instructor to provide location

Probability and statistics taught with an emphasis on using simulations and re-sampling methods to both analyze data and understand core statistical concepts. Prior to class, students will view online lectures from Dr. Brian Healy's biostatistics course. In class, we will focus on coding exercises to practice different approaches to analyzing real data sets, with an emphasis on resampling methods. Coding exercises may be carried out using either Python or MATLAB.

Course Notes: This course will use a flipped design in which students will view video lectures from Dr. Brian Healy's Biostatistics Certificate Course (offered through Catalyst) prior to in-class programming.

Prerequisite: Students are required to have some experience in programming in either Python or MATLAB. Neurobiology 306QC can fulfill this requirement.

Course Head: Richard Born, richard_born@hms.harvard.edu

Other Instructor: Brian Healy



NEUROBIO 315QC Human Neuroanatomy & Neuropathology

Matthew Frosch, Jean Augustinack

Fall 1 QC

2 units. Enrollment limited to 20. Instructor consent required.

M/W, 8:30am – 12:00pm

F, 8:30am – 10:30am

Meeting Dates: September 23 – October 28

Meeting Location: TMEC 209, TMEC 250 and associated tutorial rooms and lab spaces

This course will cover human neuroanatomy in depth, with an emphasis on the functional implications of structure and medical implications of lesions. Teaching occurs through lectures, small group sessions, brain dissection and homework assignments.

Course Notes: Restricted to Graduate Students only. This course is offered as part of HT130. Students may not co-register for both courses.

Course Heads: Matthew Frosch, mfrosch@mgh.harvard.edu, Jean Augustinack, jaugustinack@mgh.harvard.edu

NEUROBIO 319QC Neurobiology of Psychiatric Disease: From Bench to Bedside

William Carlezon, Kerry Ressler

Fall 1 QC

2 units

T/TH, 2:00pm-4:00pm

Meeting Dates: September 10 - October 17

Meeting Location: TBD - Instructor to provide location

To provide clinical insight and critical analysis of basic and translational science approaches necessary for students to approach psychiatric disorders as scientific problems, and thus contribute future research work with clinical relevance. Each pair of lectures presents 1) basic neuroscience approaches to the neural circuitry, cell and molecular biology underlying disease, followed by 2) clinical neuroscience, genetics, neuroimaging, etc., including case studies of the disorders.



The lectures will focus on a range of psychiatric disorders, neural systems underlying behavior, and translational approaches to novel interventions, while providing insight on disease characteristics, current, novel and translationally-informed treatments, gene vs. environmental risk factors, animal models, and gaps in knowledge across the field. There will also be laboratory-based sessions (organized visits to McLean Hospital) to demonstrate examples of basic and human laboratory approaches to the study and treatment of psychiatric illness.

This course intends to provide students with:

- a current understanding of the neurobiology of a range of psychiatric diseases
- insight into the clinical information and therapeutic needs driving basic science
- hypotheses on disease pathophysiology
- an ability to critically apply translational neurobiology concepts to basic science work
- an appreciation for evolving priorities at major (federal) granting agencies
- a strong foundation for performing future scientific work with clinical relevance

Course Notes: Review papers of advanced readings will be provided in advance. **Classes will be held on the Longwood Campus, with two classes held at McLean Hospital on 9/27 and 10/1.**

Recommended Prep: Review papers in advance.

Course Heads: Bill Carlezon, bcarlezon@mclean.harvard.edu, Kerry Ressler, kressler@mclean.harvard.edu

Additional Instructors: Chris McDougle, MD, CMCDOUGLE@mgh.harvard.edu, Diego Pizzagalli, PhD, dap@mclean.harvard.edu, Daniel Dillon, PhD, ddillon@mclean.harvard.edu, Laura Germine, PhD, LGERMINE@MCLEAN.HARVARD.EDU, Marisa Silveri, PhD, msilveri@mclean.harvard.edu, Sabina Berretta, MD, sberretta@mclean.harvard.edu, Scott Lukas, PhD, slukas@mclean.harvard.edu, Dost Ongur, MD, PhD, DONGUR@PARTNERS.ORG, Brad Ruzicka, MD, PhD, wruzicka@mclean.harvard.edu, Emily Newman, PhD, ENEWMAN5@MCLEAN.HARVARD.EDU, Erin Hisey, PhD, EHISEY@PARTNERS.ORG, Caroline Palavicino-Maggio, PhD, CPALAVICINOMAGGIO@MCLEAN.HARVARD.EDU, Justin Baker, MD, PhD, JTBAKER@PARTNERS.ORG, Ipsit Vahia, MD, MPH, IVAHIA@MCLEAN.HARVARD.EDU

NEUROBIO 325QC Advanced Topics in Sensory Neuroscience

David Ginty, Rachel Wilson, Michael Do

Fall 1 QC

2 units. Instructor consent required.

M/F, 10:00am – 11:30am

Meeting Dates: September 6 – November 1



Meeting Location: Armenise 108 (instructor to confirm location prior to course start)

Animals sense stimuli with diverse physical properties in their environments, from chemical cues such as odorants to mechanical cues such as light touch. This course explores how properties of molecules, cells, and circuits enable detection and perception across a wide variety of stimuli. Through discussion of primary literature, we will cover basic concepts in sensory transduction, information coding, and functional organization of sensory systems, with examples across systems, including specialized senses such as electroreception. We will also examine how sensory signals interact with each other and how sensory systems are embedded in tight feedback loops for appropriate motor control. This class offers students an opportunity to discuss and synthesize cutting edge work in sensory neuroscience.

Course Notes: Course offered every other year

Recommended Prep: Before enrolling in this course, students should have taken NB215A and NB215B or equivalent

Course Heads: David Ginty, david_ginty@hms.harvard.edu, Rachel Wilson, rachel_wilson@hms.harvard.edu, Michael Do, mdo@fas.harvard.edu

Speech & Hearing Bioscience Technology

SHBT 301QC Introduction to Speech & Hearing Laboratories

Gwen Geleoc

2 units

Meeting Dates: Contact instructor

Meeting Location: Contact instructor

Short research presentations by faculty in the Speech and Hearing Bioscience and Technology to help students select a laboratory for research rotations. Some meetings include an on-site laboratory visit.

Course Head: Gwen Geleoc, Gwenaelle.Geleoc@childrens.harvard.edu

