HARVARD
DIVISION OF MEDICAL SCIENCES

Quarter Courses
Fall 2020

Enrollment deadlines

Full Term Quarter Course

Check-in opens	July 27 – Aug 17
Enrollment	Aug 17-Aug 26
Add/drop no fee	Sept 21
Last day to add	Oct 19
Last day to drop, no WD	Nov 2

Quarter Course Session 1 Sept 2- Oct 16

Add no fee	Sept 14
Drop no fee	Sept 21
Last day to WD	Oct 16

Quarter Course Session 2 Oct 19- Dec 3

Enrollment	Oct 23
Add no fee	Nov 2
Drop no fee	Nov 9
Last day to WD	Dec 3

my. HARVARD

GSAS Academic Calendar 2012-21

16 credits for full-time student status

Contact
617-432-0605
dms_courses@hms.harvard.edu

BMIF 313QC Computing Skills for Biomedical Sciences
Nils Gehlenborg, Ted Feldman

BMIF 315QC Computational Statistics for Biomedical Sciences
Nils Gehlenborg

CELLBIO 306QC Teaching 100: The Theory & Science of Teaching
Johanna L. Gutlerner, Bradley Coleman

HBTM 302QC Imaging and Microscopy Methods in Biology & Medicine
Lev Perelman

IMMUN 307QC Cancer Immunology
Kai Wucherpfennig, Catherine Wu, Stephanie Dougan, Philip Kranzusch

MED-SCI 300QC Conduct of Science
Kristin White

MED-SCI 302QC. Conduct of Science Refresher
Kristin White

MED-SCI 316QC PhD Pathfinder
Joseph Arboleda

NEUROBIO 306QC Quantitative Methods for Biologists (offered August 2019)
Michael Springer, Richard T. Born

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

NEUROBIO 315QC Human Neuroanatomy & Neuropathology
Matthew Frosch, Jean Augustinack

SHBT 301QC Speech & Hearing Laboratory Visits
Bertrand Delgutte

Biomedical Informatics

BMIF 313QC. Computing Skills for Biomedical Sciences
Nils Gehlenborg, Ted Feldman

Section 1, Tu/Th, 8:00 AM - 8:30 AM, Section 2, Tu/Th, 2:00 PM - 2:30 PM

This course will prepare students for advanced graduate level classes that require practical programming and data analysis skills. The main focus of this course is to familiarize students with the R programming language. Additionally, students will learn about the command line on Linux-based systems, high performance computing environments, and fundamental data analysis approaches. The skills taught in this course will enable students to design and implement programs for producible data analysis, manage file-based datasets, and apply basic statistical, algorithmic, and visual approaches for data interpretation, and execute analyses on a computer cluster.

Course Notes BMIF 313QC is graded SAT/UNSAT. If a letter grade is preferred, students can cross-register on my.harvard for BMI 713.

Meeting Dates Sept 3 - Oct 17, 2020
Course Head Nils Gehlenborg, nils@hms.harvard.edu

BMIF 315QC. Computational Statistics for Biomedical Sciences
Nils Gehlenborg

Section 1, Tu/Th, 8:00 AM - 8:30 AM, Section 2, Tu/Th, 2:00 PM - 2:30 PM

This course will provide a practical introduction to statistical analysis of biological and biomedical data. Basic techniques will be covered, including descriptive statistics, elements of probability, hypothesis testing, nonparametric methods, correlation analysis, and linear regression. Emphasis will be on how to choose appropriate statistical tests, how to assess statistical significance, and how to avoid common mistakes in analysis of large datasets.

Course Notes This course is geared toward graduate students in the biological sciences, but others are welcome as auditors if space permits. Cross listed with HMS as BMI715.
Recommended Prep No previous knowledge in statistics is required, but some proficiency in R will be assumed.

Meeting Dates Oct 22 - Dec 12, 2020
Course Head Nils Gehlenborg, nils@hms.harvard.edu

Cell Biology

CELLBIO 306QC. Teaching 100: The Theory & Science of Teaching
Bradley Coleman

Th 8:00am - 9:30am

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.

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

Class Note Each week class will meet from 8:00-9:30AM for a synchronous Zoom session. This will be complemented with substantial required asynchronous learning. These two components will combine to meet the course objectives are equally important to students' learning.

Class begins September 14th with a series of asynchronous introductory activities. The first synchronous class meeting is September 24th and these run through November 19th. There is no class on October 15th.

Recommended Prep Make It Stick, by Brown, Roediger and McDaniel is required pre-reading and should be completed before the first day of class. A required asynchronous 'module 0' will be released on Canvas September 14th.
Course Head Bradley Coleman, bradley_coleman@hms.harvard.edu

Human Biology & Translational Medicine

HBTM 302QC. Imaging and Microscopy Methods in Biology & Medicine
Lev Perelman

T, 3:00pm - 5:00pm

Introduce modern imaging modalities used in biology and medicine with emphasis on modalities frequently employed in cellular and molecular biology. Overview of basic principles of light and electron microscopy and modern advanced light microscopy techniques such as confocal, light sheet, STED, multi-photon, super-resolution, and chromatin-sensitive CLASS. Discuss modality-

specific molecular probes and genetic targeting in microscopy which includes optogenetics and CRISPR-based photoactivatable transcription systems.

Meeting Dates Classes will begin on September 29, 2020, and run through December 1, 2020.

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

Immunology

IMMUN 307QC. Cancer Immunology

Kai Wucherpfennig, Catherine Wu, Stephanie Dougan, Philip Kranzusch, Judith Agudo

M, 4:00pm - 6:00pm

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

Meeting Dates Nov 2 – Dec 14, 2020
Course Head Kai Wucherpfennig, kai_wucherpfennig@dfci.harvard.edu

Medical Sciences

MED-SCI 300QC. Conduct of Science
Kristin White

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 course consists of three lectures for the entire class and five highly interactive sessions with a small group of fellow students moderated by a faculty member. Some of the issues that will be discussed in this course include appropriate methods of collecting laboratory data, interactions with members of the laboratory and the mentor and issues dealing with research misconduct.

Notes All current G2 students must register for this course on their Fall Semester study cards. Specific enrollment instructions will be sent to current G2s and other eligible students in the upcoming weeks. Please contact dms_courses@hms.harvard.edu, for enrollment inquiries.

Restricted to GSAS graduate students on the Longwood campus.

Meeting Dates

Lecture One: *Research Integrity: It's a Matter of Public Trust*, Gretchen Brodnicki, J.D., HMS Dean for Faculty and Research Integrity
Date/Time: Tuesday, September 29, 2020, at 3:00-4:30 p.m. EDT

Lecture Two: *Conflict Resolution Skills for the Researcher,* Melissa Brodrick, Ombudsperson, Harvard Medical School
Date/Time: Tuesday, October 20, 2020, at 3:00-4:30 p.m. EDT

Lecture Three: *Implicit Bias,* Kathy Takayama, Ph.D. former Executive Director, Teaching and Learning Transformation Center at the University of Maryland-College Park
Date/Time: Tuesday, November 17, 2020, at 3:00-4:30 p.m. EDT
Course Director Kristin White
Course Administrator dms_courses@hms.harvard.edu

MED-SCI 302QC. Conduct of Science Refresher
Kristin White

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 course consists of three lectures for the entire class and five highly interactive sessions with a small group of fellow students moderated by a faculty member. Some of the issues that will be discussed in this course include appropriate methods of collecting laboratory data, interactions with members of the laboratory and the mentor and issues dealing with research misconduct. All current G6 students must register for this course on their Fall Semester study cards. **G6 students are required to attend at least two out of the three didactic sessions. Specific enrollment instructions will be sent to current G6s and other eligible students in the upcoming weeks.** Please contact dms_courses@hms.harvard.edu for enrollment inquiries. Restricted to GSAS graduate students on the Longwood campus.

Notes All current G2 students must register for this course on their Fall Semester study cards. Specific enrollment instructions will be sent to current G2s and other eligible students in the upcoming weeks. Please contact dms_courses@hms.harvard.edu, for enrollment inquiries. Restricted to GSAS graduate students on the Longwood campus.

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Date/Time: Tuesday, November 17, 2020, at 3:00-4:30 p.m. EDT

Course Director Kristin White
Course Administrator dms_courses@hms.harvard.edu

MED-SCI 316QC. PhD Pathfinder
Joseph Arboleda, Jane Riccardi

M - F, 5:00pm - 7:00pm (with an additional hour afterwards for networking)

In this course, *PhD Pathfinder*, students will learn about the many career paths available to people with advanced degrees in biomedical research including academia, biotech, patent law, science writing/publishing, consulting/business, education, and science policy/regulation. Students will also learn how to find opportunities on and off campus to take the next step in their career plans.

A PhD education provides students with fundamental knowledge about the principles and practice of the scientific method and promotes development of problem-solving skills in ways that are quite useful for many different professions. Students will have the opportunity to learn from experienced professionals representing each of these paths, to learn about strategies for career development, curriculum enrichment, and networking opportunities that will make them competitive for their career of choice.

The course is open to all PhD students interested in learning about the range of career options available to biomedical PhDs. The course includes talks, didactic sessions, workshops and networking events to promote interactions between students and invited speakers. There will be a special emphasis on helping students with their own skill self-assessment to assist in career and professional development. After each session there will be a small networking reception for both the students and lecturers.

Note Students are required to attend all five sessions for course credit.

Meeting Dates Oct 19-23, 2020
Course Co-Director Joseph Arboleda, joseph_arboleda@meei.harvard.edu
Course Manager Jane Riccardi, jane_riccardi@hms.harvard.edu

Neurobiology

NEUROBIO 306QC. Quantitative Methods for Biologists
August bootcamp
Michael Springer, Richard T. Born

MWF, 12:00pm-5:00pm (one hour break from 2pm-3pm), T/Th, TBD (drop-in/homework) all course times are Eastern Standard

The goal of this virtual camp is to introduce you to programming in the MATLAB 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 MATLAB, 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.

Notes: This course has two components: 1) an asynchronous component during which students will work at their own pace, viewing prerecorded mini-lectures and answering questions through an edX course and 2) a synchronous component that will consist of Zoom meetings with live mini-reviews and coding exercises that will be done in small break-out groups of 3-4 students.

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, with enquiries.

Meeting Dates Aug 10 - Aug 21
Course Instructors Michael Springer, Michael_Springer@hms.harvard.edu and Rick Born, richard_born@hms.harvard.edu

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

Richard T. Born, Brian Healy

W, 5:00pm - 7:00pm

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 MATLAB coding exercises to practice different approaches to analyzing real data sets, with an emphasis on resampling methods.

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 take Neurobiology 306QC as a prerequisite for this course.

Meeting Dates Sept 2 - Oct 21
Course Head Richard Born, richard_born@hms.harvard.edu
Curriculum Fellow Taralyn Tan, taralyn_tan@hms.harvard.edu

NEUROBIO 315QC. Human Neuroanatomy & Neuropathology

Matthew Frosch, Jean Augustinack

MWF, 10:00am – 11:59am

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.

Notes Restricted to Graduate Students only. This course is offered as part of NB200/HT130. Students may not co-register for both courses.

Meeting Dates Sept 28 – Oct 30, 2020
Course Head Matthew Frosch, mfrosch@mgh.harvard.edu, Jean Augustinack, jean@nmr.mgh.harvard.edu
Curriculum Fellow Taralyn Tan, taralyn_tan@hms.harvard.edu

Speech & Hearing Bioscience Technology

SHBT 301QC. Speech & Hearing Laboratory Visits
Bertrand Delgutte

Research on topics in theoretical, experimental, clinical, or translational aspects of Speech and Hearing Sciences arranged on an individual basis with a research supervisor.

Meeting Dates TBA
Course Head Bertrand Delgutte, bertrand_delgutte@meei.harvard.edu