The Blue Book

A Course Guide for the
Secondary Field in
Global Health and Health Policy

2022–2023

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What Can You Expect from Global Health and Health Policy?

Interdisciplinary Approach
Explore interdisciplinary world health challenges from many perspectives; use different disciplinary approaches to learn about health care delivery, health systems, public health and health policy. Courses in the GHHP Secondary Field sit within 27 FAS departments and programs. These courses represent an array of perspectives on global health topics and can inform your course of study both in and out of the classroom.

Experiential Learning
Studying global health and health policy requires integrative experiential learning to connect the knowledge and skills learned in the classroom to real-world complexities. You can take advantage of more than 50 summer internships, both domestic and abroad, and continue your work as part of your research requirement. More information about summer opportunities and funding can be found at https://ghhp.fas.harvard.edu/ExperientialLearning.

Local and Global Perspective
Learn how health is influenced by social, economic, political, cultural, and environmental factors, both locally and globally. Your GHHP Secondary Field could include any of the above topics or move into themes such as: global governance for health; the relevance and morality of socioeconomic inequality in health; consequences of politics and the role of health in foreign policy, national security, and economic development.

Faculty Mentorship
Learn from faculty members teaching global health courses from across the university and receive one-on-one mentorship on independent research. Participate in Harvard Global Health Institute workshops and student roundtables. Work with faculty on research in their field or get valuable advice on projects of your own creation.

Explore the Connections
Learn about the rising global burden of chronic diseases in high-, low-, and middle-resource countries; the emergence of pandemic diseases and their economic and psychological impact; health consequences of travel, urbanization and migration, wars and ethnic conflict; changes in climate and other environmental factors, including water and food security.
This Booklet

The courses listed in this booklet fulfill requirements of the Secondary Field in Global Health and Health Policy (GHHP). The booklet includes FAS courses that are listed in my.harvard.edu as of August 11, 2022. Since the terms and times in which courses are offered can change from time to time, students should consult my.harvard.edu for the most accurate, up-to-date information.

Spreadsheet of Courses

A list of courses that fulfill the various requirements of the Secondary Field in Global Health and Health Policy is available as a sortable spreadsheet on the GHHP website: https://ghhp.fas.harvard.edu/courses-0. Note that the spreadsheet has two tabs at the bottom: the left tab lists courses that appear in the 2022-23 course catalog, while the right tab lists courses that were offered in the past and still count for GHHP credit.

Petitioning Courses for GHHP Credit

Students may petition to have courses not listed in the Blue Book count for GHHP Secondary Field credit. A course will not be approved unless it has substantial global health or health policy content. To petition a course, email your request to deborah_whitney@harvard.edu, attach a syllabus, and explain which category within the GHHP Secondary Field you believe the course satisfies.

Note that the Blue Book lists FAS courses, but courses at other Harvard Schools, such as Harvard Kennedy School or Harvard Chan School of Public Health, may be petitioned for GHHP credit. Be aware that many courses offered at the Chan School are half-semester courses and provide only half the credit of a semester-long course in FAS.

Cross-Registration

Students must cross-register in order to take classes in Harvard schools outside of FAS. Policies and deadlines for cross-registration generally vary from school to school. Note that passing grades received for cross-registered courses will not be used in computing a student’s GPA except when the courses are counted toward concentration requirements. Students wishing to cross-register should consult the discussion of cross-registration in the FAS Handbook for Students at this webpage: https://handbook.fas.harvard.edu/book/cross-registration.

Prerequisites and Instructor Permission

The courses listed in this booklet are suggestions for undergraduates who are interested in learning more about global health and health policy or the application of other disciplines to global health/health policy issues. It is the responsibility of students to ensure that they have the correct prerequisites and the permission of the instructor, when required, before they enroll in a course.

Questions or Comments?

Do you have any comments about this booklet? Do you know of a course that is not listed here and should be? Would you like to receive a copy of this booklet in future years and/or an extra copy of this year’s booklet? Please email deborah_whitney@harvard.edu.
Harvard Secondary Field in Global Health and Health Policy Requirements

In total, five courses (20 credits) are required:

**One Foundational Course:**
- GENED 1063: World Health: Challenges and Opportunities
- GENED 1079: Why is There No Cure for Health?
- Sociology 1046: Life and Death by Design

**One Research Course:**
- One term of the senior thesis tutorial, when the thesis pertains to global health or health policy
- One term of the senior thesis tutorial, when students write an additional thesis chapter on the global health or health policy implications of their hard science, engineering, or computer science thesis
- Global Health and Health Policy 99: Research in Global Health and Health Policy
- Supervised Reading and Research course (GHHP 91 or equivalent course in another department), culminating in a research paper pertaining to global health or health policy

Three Additional Courses, one course in three of the following eight categories:

_CONNECTED:

**Humanities and Social Sciences**
- Economics of Health
- Ethics of Health
- Health and Demography
- Health, Culture, and Society
- History and Practice of Medicine
- Politics of Health

**Sciences**
- Engineering Sciences and Statistics
- Science of Health and Disease

Course options for the eight categories are listed in this Blue Book. Note that the eight categories are divided into two areas, Humanities & Social Sciences, and Sciences. Students are strongly encouraged to take at least one course from both areas.

**Other Information:**
- Only one of the five courses may be non-letter-graded. (Exception: Two courses may be taken non-letter-graded if one is the senior thesis tutorial used to satisfy the research requirement.)
- Only one course may double count for a secondary field and concentration.
- A maximum of two non-FAS courses may count for the GHHP Secondary Field. This includes courses taken at other Harvard schools, including Harvard Summer School, and courses taken in study abroad programs.

Additional guidelines regarding the research requirement are available at [http://ghhp.fas.harvard.edu](http://ghhp.fas.harvard.edu)
FOUNDATIONAL COURSES

GENED 1063: World Health: Challenges and Opportunities
Sue J. Goldie
Spring; MW 10:30-11:45
Class Capacity: 105
Consent Required: Instructor
Extraordinary changes in the world present both risks and opportunities to health—unprecedented interconnections across borders, rapidly shifting global demographics, and changing patterns of diseases and injuries. This course will challenge your assumptions about the world’s populations, as you discover surprising similarities and unexpected differences between and within countries. Approaching the concept of health as a fundamental prerequisite for building strong societies, we will explore its connection to human rights, international relations, and sustainable development. Using case examples of contemporary health challenges, we explore the influence of social, political, and environmental determinants on health, particularly transnational risks associated with globalization. We consider solutions from an array of perspectives, contributions from within and outside the health sector, and interventions at the local, national and global levels. By the end of the course, you will be equipped to thoughtfully analyze important health challenges and appreciate how evidence is contextualized and translated to policy and action.

GENED 1079: Why is There No Cure for Health?
David Cutler
Fall; TTh 12-1:15
Around the world, billions of dollars are spent on health care treatments, public health initiatives, and pharmaceutical research and development. So why are we still not able to prevent preventable diseases, provide affordable healthcare for millions of people, and deliver cures for curable diseases? And what are the best ways to address these issues?
Because these questions are so large, we will focus our discussion around questions like: What steps should be taken to address epidemics? How should the United States reform its health care system? And how should prescription drugs be produced and sold?
We will explore how social scientists address empirical questions, the types of data that are available, how those data are analyzed, and the confidence with which causal statements are made. By the end of the course, you will be able to dissect a large question—such as how to reform American healthcare—into its technological, social, economic, and moral components, and weigh potential solutions according to these guiding vectors.

Reimagining Global Health
Arthur Kleinman, Salmaan Keshavjee, Anne Becker
Fall; TTh 10:30-11:45
If you are sick or hurt, whether you live or die depends not only on biological factors, but social ones: who you are and where you are, what sort of healthcare system is available to help you survive, and what kind of care is available to help you recover, if society believes you deserve it. The global coronavirus pandemic illustrates with dramatic urgency the role social forces play in patterning health inequities and determining individual fates. The vulnerabilities of those most likely to get sick and to die from Covid-19 stem from the ongoing effects of systemic racism on racialized subjects, the devaluation of eldercare and precarity of low-paid work under neoliberal forms of governance, and enduring material effects of colonial-era power structures that render health care systems dangerously weak or inaccessible for many communities. Now, as ever, it is imperative to develop frameworks and methodologies to identify and to intervene effectively in harmful social configurations that cause illness and suffering.
Most medical research narrowly focuses on the biological basis of disease, but this course takes a novel biosocial approach to reveal how governments, institutions, and histories shape health and well-being, how poverty and racism get into someone’s lymph nodes, how cost-saving measures manifest as tuberculosis in someone’s lungs. In doing so, the course challenges conventional assumptions within the field of global health—examining how interventions influence what happens after a catastrophe in unexpected ways, how the persistence of health inequalities over centuries can be explained, how the structures of powerful institutions influence the policies they develop, how the poor deserve not only health care but high quality health care, and how caregiving and global health are urgent moral practices.
Sociology 1046: Life and Death by Design

Jason Beckfield
Fall; TTh 9-10:15

In this course, we will study health differences between social groups. We will begin by examining the extent to which health is unevenly distributed across groups defined by nationality, neighborhood, race, gender, and class - differences highlighted in stark terms by the COVID-19 pandemic. We will then seek to pinpoint the reasons for these disparities with a detailed analysis of the pathways through which these factors are linked to health status. Finally, we will discuss new research on the sociology of population health that shows how health disparities depend on meso- and macro-scale causes like neighborhoods, social policy arrangements, global organizations, and climate change.
RESEARCH COURSES

Global Health and Health Policy 91: Supervised Reading and Research
David Cutler
Fall and Spring
Consent Required: Instructor
Supervised reading leading to a long term paper on a topic or topics not covered by regular courses of instruction.
Course Notes: May not be taken Pass/Fail. To enroll in the course, a written proposal and signature of advisor and chair of GHHP Committee is required. Refer to GHHP website for enrollment requirements and instructions: https://ghhp.fas.harvard.edu/ghhp-91

Global Health and Health Policy 99: Research in Global Health and Health Policy
David Cutler
Spring; W 3-5
Consent Required: Instructor
Global health and health policy are interdisciplinary fields that apply the theories and methods of statistics, sociology, political science, economics, management, decision science, and philosophy to the study of population health and health care. Research from these fields influences policymaking in a variety of settings. For example, the Patient Protection and Affordable Care Act (ACA) drew upon health policy research to develop programs for improving access and quality of care in the United States. Similarly, global health research guides international institutions, such as the World Health Organization, in determining health guidelines for all countries. Global health and health policy research can also inform practices inside hospitals, initiate programs for diseases like HIV, and regulate the food and drug industries. This course introduces the fundamentals of research design and methods in global health and health policy and assists students in developing research projects and crafting policy recommendations that can impact health care systems and public health.
Course Notes: This course fulfills the research requirement of the Secondary Field in Global Health and Health Policy, and enrollment is ordinarily limited to seniors in the GHHP Secondary Field. Underclass GHHP students may petition to take the course if all other Secondary Field requirements have been met. GHHP 99 is primarily taught by graduate students in the PhD in Health Policy program. It may not be taken pass/fail.
ECONOMICS OF HEALTH

Biological Chemistry and Molecular Pharmacology 230: Principles and Practice of Drug Development
Stan Finkelstein; Peter Sorger
Fall; W 3-6
Critical assessment of the major issues and stages of developing a pharmaceutical or biopharmaceutical. Drug discovery, preclinical development, clinical investigation, manufacturing and regulatory issues considered for small and large molecules. Economic considerations of the drug development process.
Notes: Course meets at MIT 4-237 from September 7 – December 14, 2022.

Economics 50: Using Big Data to Solve Economic and Social Problems
Nadarajan Chetty; Gregory Bruich
Spring; MW 1:30-2:45
This course will show how “big data” can be used to understand and address some of the most important social and economic problems of our time. The course will give students an introduction to frontier research and policy applications in economics and social science in a non-technical manner that does not require prior coursework in Economics or Statistics, making it suitable both for students exploring Economics for the first time and more advanced students. Topics include equality of opportunity, education, innovation and entrepreneurship, health care, climate change, and crime. In the context of these topics, the course will also provide an introduction to basic methods in data science, including regression, causal inference, and machine learning. The course will include discussions with leading practitioners who use big data in real-world applications.

Economics 980w: Economic Aspects of Health Policy
Ariel Pakes
Spring; T 12-2:45
The seminar will focus on policy issues in health economics. We will read papers on an assortment of policy options and formulate frameworks for analyzing their likely impacts on outcomes of interest. Examples include the analysis of mergers in hospital and insurance markets, the choice of capitation vs fee for service contracts and its impact on cost and quality of care, policy options for health insurance, and the re-structuring of health service providers. Where possible we will use data and do the analysis quantitatively. Some knowledge of microeconomic and statistical tools, particularly those related to industrial organization, will be helpful (a few of the needed techniques will be taught during the course). This is a Junior Tutorial.

Course Notes: This course requires special action-application or lottery- to enroll. Visit economics.harvard.edu/page/junior-seminar-0 and the course canvas site for more information.
Recommended Prep: Ec 1010a and 1010b (or 1011a and 1011b), one of stats 100, 104 or 110, and Ec 1123 or 1126 (or concurrent enrollment in 1123 or 1126)

Economics 1343: The Economics of Development and Global Health
Matthew Basilico
Spring; TTh 10:30-11:45
Why are some places poorer than others? Why do some places have better health than others? In this class, we will harness the core development and health economics literature to approach some of the most fundamental questions facing humanity today. We will review the historical determinants of our present-day puzzles, including critical relationships between economic development and health. We will consider challenges affecting health and development including political institutions, micro development, environmental change, and psychological wellbeing. Methodologically, the course will review canonical approaches in applied econometrics, and will cover theories in development, macro-growth, and health. It will also consider perspectives on our core questions from neighboring disciplines, including social theory, anthropology and psychology.
Course Notes: A research paper option is available for this class which can be used to fulfill the writing requirement for Economics concentrators.
Recommended Prep: Economics 10a and 10b, familiarity with introductory statistics (e.g. Stat 100, 104 or 110), and calculus are recommended but not required.

GENED 1079: Why is There No Cure for Health?
David Cutler
Fall; TTh 12-1:15
Around the world, billions of dollars are spent on health care treatments, public health initiatives, and pharmaceutical research and development. So why are we still not able to prevent preventable diseases, provide affordable healthcare for millions of people, and deliver cures for curable diseases? And what are the best ways to address these issues?
Because these questions are so large, we will focus our discussion around questions like: What steps should be taken to address epidemics? How should the United States reform its health care system? And how should prescription drugs be produced and sold?
We will explore how social scientists address empirical questions, the types of data that are available, how those data are analyzed, and the confidence with which causal
statements are made. By the end of the course, you will be able to dissect a large question—such as how to reform American healthcare—into its technological, social, economic, and moral components, and weigh potential solutions according to these guiding vectors.
**ENGINEERING SCIENCES AND STATISTICS**

**Applied Mathematics 101: Statistical Inference for Scientists and Engineers**  
Jeffrey Paten  
Fall; TTh 12:45-2  
Class Capacity: 55  
Consent Required: Instructor  
Introductory statistical methods for students in the applied sciences and engineering. Random variables and probability distributions; the concept of random sampling, including random samples, statistics, and sampling distributions; the Central Limit Theorem; parameter estimation; confidence intervals; hypothesis testing; simple linear regression; and multiple linear regression. Introduction to more advanced techniques as time permits.  
Recommendation: Prep: Math 21a or Applied Math 21a or equivalent.

**Biomedical Engineering 110: Physiological Systems Analysis**  
Maurice Smith  
Fall; TTh 9:45-11  
A survey of systems theory with applications from bioengineering and physiology. Analysis: differential equations, linear and nonlinear systems, stability, the complementary nature of time and frequency domain methods, feedback, and biological oscillations. Applications: nerve function, muscle dynamics, cardiovascular regulation. Laboratory: neural models, feedback control systems, properties of muscle, cardiovascular function.  
Recommendation: Prep: Engineering Sciences 53 (or equivalent); Physical Sciences 12b (or equivalent); and Math 21a and Math21b (or equivalents)

**Biomedical Engineering 125: Tissue Engineering**  
David Mooney  
Spring; MW 3:45-5  
Fundamental engineering and biological principles underlying field of tissue engineering, along with examples and strategies to engineer specific tissues for clinical use. Students will prepare a paper in the field of tissue engineering, and participate in a weekly laboratory in which they will learn and use methods to fabricate materials and perform 3-D cell culture.  
Recommendation: Prep: LS1a, Chem17 or 20, or biochemistry and cell biology background.

**Economics 1123: Introduction to Econometrics**  
Davide Pettenuzzo (Fall), Gregory Bruich (Spring)  
Fall; MW 9-10:15  
Spring; TTh 3-4:15  
An introduction to multiple regression techniques with focus on economic applications. Discusses extensions to discrete response, panel data, and time series models, as well as issues such as omitted variables, missing data, sample selection, randomized and quasi-experiments, and instrumental variables. Also develops the ability to apply econometric and statistical methods using computer packages.  
Course Notes: Students may take both Economics 1123 and Statistics 139 for credit. However, Statistics 139 will not count as the econometrics requirement for the economics concentration. Only one course can count towards EC credit; either Economics 1123 or Economics 1126. Both courses can count towards college credit regardless of the order they are taken.  
Recommendation: Prep: Statistics 100 and 104.

**Economics 1126: Quantitative Methods in Economics**  
Ellie Tamer  
Fall; TTh 10:30-11:45  
Topics include conditional expectations and its linear approximation; best linear predictors; omitted variable bias; panel data methods and the role of unobserved heterogeneity; instrumental variables and the role of randomization; various approaches to inference on causal relations.  
Course Notes: Only one course can count towards EC credit; either Economics 1123 or Economics 1126. Both courses can count towards college credit regardless of the order they are taken. Students who fulfill the econometrics requirement with Economics 1126 and who intend to pursue Honors should note that the Honors exam assumes knowledge of the material covered in Economics 1123.  

**Engineering Sciences 53: Quantitative Physiology as a Basis for Bioengineering**  
Linsey Moyer; Jennifer Lewis  
Fall; MWF 11:15-12:30  
This course is designed as an introduction to thinking as a bio/biomedical engineer and is recommended for first years and sophomores but open to all students. Simple mathematical models are used to represent key aspects of organ systems function. Core engineering concepts are explored through mechanical and electrical examples within the human body. The primary focus is on quantitative descriptions of organ systems function and control in terms of physical principles and physiologic mechanisms. It includes a foundation in human organ systems physiology,
including cardiovascular, pulmonary, and renal systems. Emphasis will be given to understanding the ways in which dysfunction in these systems gives rise to common human disease processes.

**Recommended Prep:** Calculus at the high school level

**Course Requirements:** Co-req or pre-req: Applied Physics 50a OR Applied Physics 50b OR Physical Sciences 12a OR Physical Sciences 12b OR Physics 15a OR Physics 15b OR PHYSSCI 2 OR PHYSSCI 3

**Earth & Planetary Sciences 168: Human Environmental Data Science: Agriculture, Conflict, and Health**

*Peter Huybers*

**Fall; TTh 10:30-11:45**

**Class Capacity:** 30

**Consent Required:** Instructor

The purpose of this course is to develop understanding and guide student research of human and environmental systems. In class we will explore agriculture, conflict, and transmissible disease. Study of each topic will involve introduction data, mathematical models, and analysis techniques that build toward addressing a major question at each interface: Have agricultural systems been adapted to climate change? Has drought caused conflict? And does the environment influence the spread of COVID-19? These questions are diverse, but are addressed using common analytical frameworks. Analytical approaches include simple mathematical models of feedback systems, crop development, and population disease dynamics; frequentist statistical techniques including linear, multiple linear, and panel regression models; and Bayesian methods including empirical, full, and hierarchical approaches. You will be provided with sufficient data, example code, and context to come to your own informed conclusions regarding each of these questions. Furthermore, topics covered in class will pro-vide a template for undertaking independent research projects in small teams. Research will either extend on topics presented in class or address other human-environmental questions. Historically, such student projects have sometimes led to senior theses or publication in professional journals.

**Course Notes:** The course is designed for upper-level undergraduates. Enrollment is by instructor permission. This course fulfills the EPS sub-discipline requirement of Atmosphere(s) and Oceans.

**Recommended Prep:** There are no specific prerequisites but a background in environmental, physical or life sciences; experience in coding or statistical analysis; and/or facility with differential equations is useful.

**Jointly Offered with:** Faculty of Arts & Sciences as ESE 168

**Government 50: Data**

*Matthew Blackwell*

**Fall; TTh 12-1:15**

This course, an introduction to quantitative political science, will teach you how to answer questions with data, how to develop questions suited to empirical research, construct hypotheses, conduct descriptive analysis using statistical summaries and data visualizations, how to model relationships, how to assess uncertainty, and how to communicate your findings. Exercises both in and out of class will require students to engage with and apply various social science concepts, and to undertake quantitative analyses of political and policy-relevant data, often with the aid of R programming. Students will complete a final project.

**Molecular and Cellular Biology 111: Mathematics in Biology**

*Elena Rivas*

**Fall; MWF 10:30-11:45**

MCB111 is meant for biologists who want to learn mathematical principles relevant to current biological research, as well as for mathematically oriented students who want to explore applications in biology. The course theme is mathematical modeling of biological processes, with a special emphasis on probabilistic models and inference. More than half of the course covers topics on information theory, Bayesian inference, statistics, probabilistic modeling, and neural networks. The last section of the course covers dynamical systems in biology, including random walks, feedback control, and molecular population dynamics. Each week-long unit is devoted to one specific topic, and is based in one or more scientific papers selected from the recent literature. The best way to learn in this course is through the homework. They are very hands-on, and usually require coding to implement some mathematical concept through a particular biological example. For instance, one unit is devoted to maximum likelihood methods in the context of Quantitative Trait Loci analysis; another unit explores probabilistic models in the context of inferring ancestry and recombination breakpoints from genomic reads in fly populations. More information about the course can be found at mcb111.org.

**Recommended Prep:** Mathematics 19 or higher.

**Psychology 1900: Introduction to Statistics for the Behavioral Sciences**

*Grace Lin (Fall and Spring)*

**Fall; TTh 10:30-11:45**

**Spring; TBA**

Provides a conceptual and practical introduction to statistics used in psychology and other behavioral sciences. Covers basic topics in statistics including: measures of central
tendency and variability; probability and distributions, correlations and regression, hypothesis testing, t-tests, analysis of variance, and chi-square tests. Includes a lab section with instruction in statistical analysis using a computer program.

**Recommended Prep:** The Psychology Department requires completion of Science of Living Systems 20 or Psychology 1 or the equivalent of introductory psychology (e.g. Psych AP=5 or IB=7) before enrolling in this course.

**Sociology 1156: Statistics for Social Sciences**  
*A Alexandra Killewald*  
*Spring; MW 10:30-11:45*  
*Consent: Instructor*

Introduces quantitative analysis in social research, including principles of research design and the use of empirical evidence, particularly from social surveys. Descriptive and inferential statistics, contingency table analysis, and regression analysis. Emphasis on analysis of data and presentation of results in research reports.

**Course Notes:** Required of and limited to Sociology concentrators, ordinarily sophomores. Formerly taught as Sociology 156.

**Statistics 100: Introduction to Statistics and Data Science**  
*Kelly McConville (Fall and Spring)*  
*Fall; MW 10:30-11:45*  
*Spring; TBA*

An application-oriented introduction to statistics and data science where students develop their data acumen and learn exploratory and inferential techniques for analyzing and modeling data. The course covers the entire data analysis process and includes topics such as data collection, data wrangling, exploratory data analysis, visualization, simple/multiple linear regression, sampling distributions, hypothesis testing, confidence intervals, data ethics, statistical communication, and reproducibility. Students develop a reproducible workflow for analyzing data in R and learn several tidyverse R packages. No prior statistics or computing knowledge is expected.

**Course Notes:** Only one of the following courses may be taken for credit: Statistics 100, 101, 102, 104.

**Statistics 102: Introduction to Statistics for Life Sciences**  
*TBA*  
*Spring; TBA*

Introduces the basic concepts of probability, statistics and statistical computing used in medical and biological research. The emphasis is on data analysis and visualization instead of theory. Designed for students who intend to concentrate in a discipline from the life sciences.

**Course Notes:** Only one of the following courses may be taken for credit: Statistics 100, 101, 102, 104.

**Statistics 104: Introduction to Quantitative Methods for Economics**  
*Kevin A. Rader (Fall and Spring)*  
*Fall; TTh 10:30-11:45*  
*Spring; MW 1:30-2:45*

In a world where data is growing larger and more complex, it can be a challenge to turn an abundance of information into the knowledge from which sound decisions can be made. As a discipline, statistics aims to bridge the gap between knowledge and information. This course will motivate statistical methods through data analysis and visualization, in addition to discussing the underlying theory. We will discuss topics such as study design, descriptive statistics, probability, sampling distributions, hypothesis testing, linear regression, and Bayesian inference. A wide variety of applications from the economic and social sciences will be highlighted along with examples from biology, sports, politics, and more. Students with prior exposure to introductory statistics will find some overlap of material but be exposed to new applications and learn more advanced modeling techniques. This course makes use of the statistical programming language R, but no prior knowledge of computer science is required.

**Course Notes:** Only one of the following courses may be taken for credit: Statistics 100, 101, 102, 104.

**Course Requirements:** Anti-Req: may not be taken for credit if STAT 109 or STAT 139 already complete.

**Statistics 110: Introduction to Probability**  
*Joseph Blitzstein*  
*Fall; MW 1:30-2:45*


**Recommended Prep:** Math 1b or equivalent or above.
ETHICS OF HEALTH

Anthropology 1827: Introduction to Social Medicine Methods and Practice
Salmaan Keshavjee, Jason Silverstein, Lindsey Zeve
Fall; T 12-2:45
Social Medicine is a multi-disciplinary field of practice that draws insights and methods from the social sciences to improve care delivery and to address health inequities. As such, practitioners must become familiar with and learn to evaluate a range of qualitative and quantitative methods used in the social and health sciences. Through a series of case studies, students in this course will become familiar with the primary qualitative and quantitative modes of research available to social medicine practitioners and how each defines, measures, and evaluates health challenges. They will also learn to think critically about the ethics and epistemology of these methods, exploring the relationship between the forms of knowledge each produces and the forms of power that shape the social contexts in which health challenges arise and persist. By doing so, students will gain the ability to critically appraise qualitative and quantitative research claims. They will also develop a deep understanding of how the social sciences are used to illuminate and intervene in the harmful social forces that undermine effective care and perpetuate health injustices.

GENED 1064: Brains, Identity, and Moral Agency
Steven Hyman
Spring; TTh 12-1:15
Advances in brain science have the potential to diminish many forms of human suffering and disability that are rooted in disordered brain function. But what are the ethical implications involved in altering the structure and function of human brains? What’s at stake when we have the ability to alter a person’s narrative identity, create brain-computer interfaces, and manipulate social and moral emotion? In this course, you will ask and attempt to answer these questions, and discuss the implications of mechanistic explanations of decision-making and action for widely-held concepts of moral agency and legal culpability. This course will prepare you to be a thoughtful citizen of a world characterized by rapidly emerging understandings of human brain function, and by new technologies intended to repair or influence human brains.

Course Notes: For students who have taken MCB 80, it is contemplated that there will be a section that incorporates more advanced concepts from neurobiology.
Recommended Prep: LPS A or LS 1a, a 4 or 5 on the AP Biology exam, or equivalent experience in biology.

GENED 1115: Human Trafficking, Slavery, and Abolition in the Modern World
Orlando Patterson
Spring; TBA
We often think of slavery as being a dark chapter in our past, but this is a tragic oversimplification. What defines slavery in the modern world, and what are the moral, political, and social implications of its continued existence? As we explore its underpinnings, we discover that all of us may be in some way complicit in its survival. This course surveys the nature, types, and extent of modern servitude such as transnational and domestic prostitution, forced marriage, labor trafficking and forced domestic labor, child soldiering and other forms of enslavement of children, organ trafficking, and other health aspects of trafficking, debt-bondage, and the forced exploitation of other vulnerable groups such as refugees and stateless persons. Throughout the course, but especially in the final part, we examine anti-trafficking and anti-slavery measures and movements and ways in which you can increase awareness or become involved. You will, by the end of our exploration, be able to trace the moral and ethical arguments surrounding human slavery in its various forms, understand the ways in which this problem still affects so many people, and what can and should be done about it.

Global Health and Health Policy 70: Global Response to Disasters and Refugee Crises
Stephanie Kayden, Michael VanRooyen
Spring; F 12:45-2:45
Class Capacity: 30
Consent Required: Instructor
Climate change, urbanization, and conflict mean that global disasters are on the rise. How should the world respond when disasters force people from their homes? How can we better help the world’s refugees? This course examines the past, present, and future of the international humanitarian response system. We will explore how Doctors Without Borders, the United Nations, the Red Cross, and other aid agencies came to be and how global response standards, international humanitarian law, and new technologies are shaping worldwide disaster relief – even during the COVID pandemic.
Through interactive discussions and case studies, students will learn how aid workers interact with governments, militaries, and civil society to provide refugee aid. Students will also have the opportunity to learn about Boston-area response from interactions with a local refugee resettlement agency. At the end of the course, students can opt to participate as a ‘refugee’ in a large, three-day outdoor humanitarian response training exercise with other students and professional aid workers from around the world.

Course Notes: Lotteried course, enrollment limited to 30.
**Government 94gk: The Politics and Ethics of Medical Care**  
*Gabriel Katsh*  
*Fall; Th 3-5:45*  
*Class Capacity: 16*  
*Consent Required: Instructor*  
This course is an introduction to medical ethics and the ways in which political theory can inform our understanding of the moral and political dimensions of medical care. Using case studies as a launching point, we will explore ideas about autonomy, paternalism, beneficence, and distributive justice, and their application to issues such as informed consent, medical privacy, and the right to refuse care. The Fall 2021 iteration of the course will focus in particular on ethical and policy dilemmas that have arisen in the context of the coronavirus pandemic, including questions about the distribution of scarce resources, the health effects of inequality, and balancing the needs of public health with concerns about individual liberty. Readings include classics of moral and political philosophy, writings by contemporary medical ethicists, Supreme Court decisions, and some empirical and historical studies.

**History of Science 2953: Bioethics, Law, and the Life Sciences**  
*Sheila Jasanoff*  
*Spring; T 9:30-11:30*  
*Class Capacity: 30*  
Seeks to identify and explore salient ethical, legal, and policy issues - and possible solutions - associated with developments in biotechnology and the life sciences.  
*Course Notes:* Offered jointly with the Kennedy School as IGA-515. Cannot be taken for credit by students who have already taken IGA-515.

**Sociology 1131: Philanthropy and Nonprofit Organizations**  
*Shai Dromi*  
*Spring; MW 6-7:15*  
*Class Capacity: 25*  
*Consent Required: Instructor*  
When crises strike, nonprofit organizations spring to action, offering their resources, expertise, and innovation to affected communities. Yet COVID-19 brings unprecedented challenges—and unprecedented opportunities—to philanthropic endeavors. Indeed, aside from supporting medical research on COVID-19, nonprofit organizations have been providing medical care, distributing personal protective equipment (PPE), helping address loss of employment and food insecurity, and advocating for global equity in vaccine distribution, among other tasks. This course partners with the Lemann Program on Creativity and Entrepreneurship (LPCE) in order to provide students with a unique opportunity to experience first-hand how philanthropists and nonprofit organizations are helping address the global effects of this global pandemic. On the theoretical side, the course will examine the workings of philanthropy and of nonprofit organizations, using different sociological perspectives and a series of case studies. Alongside the theoretical content, students will form groups and will develop their own nonprofit ventures to address the social impact of COVID-19. Student ventures will receive startup seed funding and, at the end of the course, will compete over additional seed money. The course will include a series of guest lectures and workshops on entrepreneurship to support student venture development.
HEALTH AND DEMOGRAPHY

GENED 1063: World Health: Challenges and Opportunities
Sue J. Goldie
Spring; MW 10:30-11:45
Class Capacity: 105
Consent Required: Instructor
Extraordinary changes in the world present both risks and opportunities to health—unprecedented interconnections across borders, rapidly shifting global demographics, and changing patterns of diseases and injuries. This course will challenge your assumptions about the world’s populations, as you discover surprising similarities and unexpected differences between and within countries. Approaching the concept of health as a fundamental prerequisite for building strong societies, we will explore its connection to human rights, international relations, and sustainable development. Using case examples of contemporary health challenges, we explore the influence of social, political, and environmental determinants on health, particularly transnational risks associated with globalization. We consider solutions from an array of perspectives, contributions from within and outside the health sector, and interventions at the local, national and global levels. By the end of the course, you will be equipped to thoughtfully analyze important health challenges and appreciate how evidence is contextualized and translated to policy and action.

Global Health and Health Policy 30: Global Oral Health: Healthy Teeth, Healthy Societies
Brittany Seymour
Fall; MF 10:30-11:45
Class Capacity: 34
Consent Required: Instructor
Did you know that one of the strongest indicators of a healthy society is the health of its teeth? Everyone has teeth, but most people in the world don’t have access to affordable dental care. This discussion-based course assesses current global health policies and approaches for addressing pressing health challenges despite resource constraints and severe political neglect. It aims for students to be competent in incorporating the global burden of oral diseases into foundational concepts of global health and world development. These include how oral diseases are associated with globalization, poverty, infectious and non-communicable diseases, maternal and child health, mental health, nutrition, tobacco, alcohol, urban and rural infrastructures, climate change, and the environment. This course demonstrates how complete health and an end to global poverty are not possible without including oral health in the global health and development agenda.

Course Notes: Students who complete GHHP 30 may apply to participate in an experiential learning opportunity in San Vito, Costa Rica over spring break. Since slots are limited, there will be a lottery.

Sociology 1046: Life and Death by Design
Jason Beckfield
Fall; TTh 9-10:15
In this course, we will study health differences between social groups. We will begin by examining the extent to which health is unevenly distributed across groups defined by nationality, neighborhood, race, gender, and class - differences highlighted in stark terms by the COVID-19 pandemic. We will then seek to pinpoint the reasons for these disparities with a detailed analysis of the pathways through which these factors are linked to health status. Finally, we will discuss new research on the sociology of population health that shows how health disparities depend on meso- and macro-scale causes like neighborhoods, social policy arrangements, global organizations, and climate change.
Course Notes: May be used as an introductory course when taken for letter grade, or elective.
HEALTH, CULTURE, AND SOCIETY

Anthropology 1822: Environment, Health and Justice
Annikki Herranen-Tabibi
Fall; W 9:45-11:45
Class Capacity: 25
Consent Required: Instructor
The cascading environmental and health crises of the Anthropocene era cast in continually sharper relief the interrelatedness of human health, well-being, and survival with more-than-human ecologies. This course brings critical works in medical anthropology into conversation with select perspectives from environmental humanities, political ecology, science studies, and global health. It thereby draws together diverse empirical, theoretical, and creative accounts of environmental crises. It prioritizes inquiry into the lived experience of environmental crises’ differential health effects – stratified by, inter alia, race, class, gender, generation, and geography – while foregrounding varied approaches to knowledge, action, and representation. Attuned to the acute public relevance of its subject matter, this course also engages with relevant on-the-ground mobilizations through varied media and through classroom visits.

The course consists of four interconnected modules. The first offers a series of conceptual orientations and provocations to guide the semester’s work. The second centers on ethnographic accounts of environmental contamination and of mobilizations for environmental justice. The third interrogates four thematic areas of health concerns – cancer, reproduction, zoonoses, and mental health – in their ecological contexts. The final module draws the semester’s discussions to a close and gives center-stage to student projects. Concluding the semester, each student will complete a substantial final assignment in the form of a research proposal, analytical essay, or creative project.

Course Notes: Open to undergraduates and graduate and professional students. Undergraduates with fewer than two previous social science courses must receive written permission from instructor to enroll.

Anthropology 1826: Anthropology of Mental Health, Mental Illness and Mental Health Care
Arthur Kleinman
Spring; TBA
Class Capacity: 25
Consent Required: Instructor
Course will review ethnographies of mental health problems and mental health care, including substance abuse, depression/anxiety, psychosis, trauma, and related conditions. Also included are ethnographies of the failed chronic care system, psychiatric practice, and global mental health approaches.

Course Notes: Open to advanced undergraduates with some background in social sciences or humanities (regardless of concentration), and to graduate and professional students. Because of the extent of the readings and the intensity of the analysis, the course will be limited to 25 students.

Anthropology 1900: Counseling as Colonization? Native American Encounters with the Clinical Psy-ences
Joseph Gone
Spring; TBA
Class Capacity: 20
Consent Required: Instructor
American Indian, First Nations, and other Indigenous communities of the USA and Canada contend with disproportionately high rates of “psychiatric” distress. Many of these communities attribute this distress to their long colonial encounters with European settlers. Concurrently, throughout the 20th century, the disciplines and professions associated with mind, brain, and behavior (e.g., psychiatry, psychology, psychoanalysis) consolidated their authority and influence within mainstream society. These “psy-ences” promote their professional practices (e.g., diagnosis, psychotherapy) as plausible remedies for Indigenous social suffering, but many Indigenous communities remain skeptical of—and resistant to—these clinical approaches, primarily for cultural and political reasons. In this seminar, we will consider whether and how the concepts, categories, tools, and techniques of the mental health professions might be appropriately adapted and/or adopted for use with Indigenous communities in an increasingly globalized world. In recognition of the (post)colonial status of these populations, we will attend closely to alterNative cultural and spiritual approaches that have been identified and promoted by Indigenous people themselves as conducive to healing and wellness. This course is designed for upper-level undergraduate students interested in medical anthropology, professional psychology, pre-medicine, Indigenous studies, and related social and health sciences. Students will participate in regular seminar discussions, write routine responses to assigned readings, and submit major independent research papers addressed to the promotion of Indigenous well-being. Student engagement and exchange during class is essential, so routine attendance and participation are expected throughout the semester.

Course Notes: Open to advanced undergraduates with some background in social sciences or humanities (regardless of concentration), and to graduate and professional students. Because of the extent of the readings and the intensity of the analysis, the course will be limited to 25 students.
Freshman Seminar 23k: Insights from Narratives of Illness
Jerome Groopman
Spring; M 12:45-2:45
Class Capacity: 12
Consent Required: Instructor
A physician occupies a unique perch, regularly witnessing life’s great mysteries: the miracle of birth, the perplexing moment of death, and the struggle to find meaning in suffering. It is no wonder that narratives of illness have been of interest to both physician and non-physician writers. This seminar will examine and interrogate both literary and journalistic dimensions of medical writing. The investigation will be chronological, beginning with “classic” narratives by Tolstoy, Chekhov, and Kafka, and then moving on to more contemporary authors such as William Carlos Williams, Richard Selzer, Oliver Sacks, Susan Sontag, and Philip Roth. Controversial and contentious subjects are sought in these writings: the imbalance of power between physician and patient; how different religions frame the genesis and outcome of disease; the role of quackery, avarice, and ego in molding doctors’ behavior; whether character changes for better or worse when people face their mortality; what is normal and what is abnormal behavior based on culture, neuroscience, and individual versus group norms. The presentation of illness in journalism will be studied in selected readings from the New York Times’ and Boston Globe’s Science sections, as well as periodicals like the New Yorker, The New York Review of Books, Harper’s, and the Atlantic Monthly. The members of the seminar will analyze how the media accurately present the science of medicine or play to “pop culture.” The seminar will study not only mainstream medical journalists, but so called alternative medical writers such as Andrew Weil and celebrity health voices like Gwyneth Paltrow. Patients with different diseases will be invited to speak to the members of the seminar about their experiences. Students will try their hands at different forms of medical writing, such as an editorial on physician-assisted suicide that would appear in a newspaper and a short story that describes a personal or family experience with illness and the medical system.
Course Requirements: Course open to Freshman Students Only.

Freshman Seminar 25n: Finding Connections: Perspectives on Psychological Development and Mental Illness
Nancy Rappaport
Fall; W 3-5
Class Capacity: 12
Consent Required: Instructor
The seminar's challenge will be to deepen our understanding of human development and how individuals cope with serious emotional or social difficulties (neglect, bipolar disorder, autism, depression, schizophrenia). We will use multiple perspectives: medical observations and texts that provide practical knowledge (e.g. The New England Journal of Medicine review articles), narrative readings to understand how patients experience the meaning of illness from the inside out (e.g. The Center Cannot Hold), visitors who will discuss their experience with mental illness, and how development-related mental illness is portrayed in the press (e.g. The New Yorker articles). We will start with the mental life of babies and how scientists interpret infants’ nonverbal ways of finding safety and security. This begins the journey of our understanding fundamental needs for tenderness, holding, and making meaning. Understanding how conditions such as autism, depression, and schizophrenia are described in clinical research and literature will help us to appreciate the biological vulnerabilities and relational patterns that may disrupt the human connection. We will examine the resourcefulness required for both fragility and resiliency. Throughout the seminar, the instructor, as a practicing child and adolescent psychiatrist, will bridge the gap between research findings, clinical applications, and everyday insight.
Course Requirements: Course open to Freshman Students Only.

Freshman Seminar 43f: When Bad Things Happen Early in Life: Effects of Early Adversity on Brain and Behavioral Development
Charles Nelson
Fall; M 12-2:45
Class Capacity: 12
Consent Required: Instructor
Decades of research tell us that the foundations of healthy development are built early in life. Genes provide the basic blueprint for brain architecture, but experiences shape the activity of the genome and thus determine how the circuitry is wired. Significant adversity can derail developmental processes and distort brain maturation, leading to limited economic and social mobility. Exposure to significant adversity early in life, particularly during critical periods of brain development, may increase risk for a host of chronic physical health problems, including cardiovascular disease, hypertension, diabetes, and addictive behavior; it can also
lead to a variety of mental health problems, including depression and anxiety and characterological problems. Science clearly indicates that the longer we wait to intervene on behalf of such children, the more difficult it becomes to achieve healthy outcomes. This constraint is particularly true for children who sustain the wear and tear of early exposure to so-called “toxic stress”. In this seminar we will critically examine the range of adverse early experiences that impact children growing up in both low and high resource countries. Key themes include a) the nature of the adversity children are exposed to, b) the timing of the adversity c) the chronicity of the adversity, and d) individual differences (including genetic and environmental factors that may confer protection on children exposed to early adversity). We will pay particular attention to the short- and long-term outcomes on physical, neurological and psychological health.

Course Requirements: Course open to Freshman Students Only

Freshman Seminar 71o: The Heart of Medicine: Patients & Physicians & Experience of Serious Illness in the Age of COVID-19

Susan Block
Spring; TBA
Class Capacity: 12
Consent Required: Instructor

Sickness and death are universal human experiences. Although the COVID-19 pandemic has brought this reality home, in many difficult ways, to all of us over the past 2 years, thinking about our own losses and vulnerability and that of people we love is often uncomfortable. This terrible year has also created many opportunities for us to grow, as individuals and as a society. Building on our collective experiences of the past year, we will explore our own perspectives and experiences with serious illness and death; examine the vulnerabilities in our health system and our society that also contribute to the challenges in dealing with serious illness and death, and seek to process these perspectives and experiences as a way of learning to live a more meaningful life, strengthening relationships, helping us be better caretakers of people we love, and of people whom we serve in a professional role. We will use our experiences and observations during the COVID-19 pandemic as one source of data to inform a larger understanding of how humans deal with loss and vulnerability by examining, from multiple perspectives, the social, cultural, psychological, economic, and spiritual factors that influence the experience of serious illness. The seminar will draw on core readings from the humanities, social sciences, and medicine, including numerous readings related to COVID-19 to deepen understandings of how people experience and live and die with a serious illness.

Opportunities for discussion, reflection, live interviews, case analysis, and experiential exercises will take place in class.

Course Notes: If circumstances permit, additional field learning opportunities (e.g., participation in hospital-based teaching rounds) will also be available outside of class.

Course Requirements: Course open to Freshman Students Only

GENED 1053: The Global Heart Disease Epidemic: Stopping What We Started

Richard Lee
Fall; MW 9-10:15
Class Capacity: 60
Consent Required: Instructor

Heart diseases have killed occasional humans since ancient times, but only in the past century have heart diseases become epidemic throughout the world. In fact, the first description of a heart attack in a human was not until 1912. In the current century, heart diseases will be the leading global cause of death, and the majority of those heart disease deaths will actually occur in the developing world. The epidemic of heart disease has been driven by many social, economic and technological events. Some of these events have been dramatically detrimental to human health, such as the accidental invention of the American cigarette by a slave in North Carolina in the 19th Century—an invention that is projected to kill one billion people between 2000 and 2100. Other events, such as advances in public health and safety, have been beneficial by extending lifespan and preventing early death, but they have also allowed age-related heart diseases to explode. Technological advances have improved our economic productivity but also led to changes in our lifestyles that promote heart diseases. In this course, we will consider the complex relationship of health and society by examining the epidemic in common heart diseases. We will explore how major lifestyle factors such as tobacco, alcohol, exercise and diet affect health, and we will also consider how economics and politics powerfully influence health. We will also discuss the role of government and our obligations to each other, and to future generations.

GENED 1089: The Border: Race, Politics, and Health in Modern Mexico

Gabriela Soto Laveaga
Fall; TTh 10:30-11:45

Why does the Mexico-U.S. border continue to be a space for debate and controversy? This course examines how the creation of the U.S.-Mexico border in 1848 shaped modern Mexican society from the nineteenth century to our present. For many, the border served (and serves) as a protective barrier from poverty, violence, and, especially, disease. By the early twentieth century many Mexican bodies were
perceived as “alien,” “illegal,” and in need of patrolling. Yet these descriptions were also used by Mexican politicians to describe and isolate groups such as Indigenous and Chinese within Mexico. By examining, for example, Mexican public health campaigns, response to epidemics, and how Mexican ideas of race and health played out within Mexico we can better understand the U.S.-Mexico border today.

Arthur Kleinman, Salmaan Keshavjee, Anne Becker
Fall; TTh 10:30-11:45
If you are sick or hurt, whether you live or die depends not only on biological factors, but social ones: who you are and where you are, what sort of healthcare system is available to help you survive, and what kind of care is available to help you recover, if society believes you deserve it. The global coronavirus pandemic illustrates with dramatic urgency the role social forces play in patterning health inequities and determining individual fates. The vulnerabilities of those most likely to get sick and to die from Covid-19 stem from the ongoing effects of systemic racism on racialized subjects, the devaluation of eldercare and precarity of low-paid work under neoliberal forms of governance, and enduring material effects of colonial-era power structures that render health care systems dangerously weak or inaccessible for many communities. Now, as ever, it is imperative to develop frameworks and methodologies to identify and to intervene effectively in harmful social configurations that cause illness and suffering.

Most medical research narrowly focuses on the biological basis of disease, but this course takes a novel biosocial approach to reveal how governments, institutions, and histories shape health and well-being, how poverty and racism get into someone’s lymph nodes, how cost-saving measures manifest as tuberculosis in someone’s lungs. In doing so, the course challenges conventional assumptions within the field of global health—examining how interventions influence what happens after a catastrophe in unexpected ways, how the persistence of health inequalities over centuries can be explained, how the structures of powerful institutions influence the policies they develop, how the poor deserve not only health care but high quality health care, and how caregiving and global health are urgent moral practices.

GENED 1144: Mental Health and Mental Illness Through Literature and the Arts
Karen Thornber
Fall; MW 3-4:15
Mental health experts believe that globally, more than 1 billion people have a mental illness. And yet the biases and misperceptions surrounding mental illness, not to mention the dehumanization and abuse in many communities of individuals with a mental illness, remains acute. This course uses literature and the arts to help students learn more about some of the prevalent biases/misperceptions/myths/stigmas against individuals with mental illness and how these biases can be (or in the past have been) ameliorated. Weekly assignments combine readings of literature/film screenings, etc. with a range of secondary sources. Each unit wraps up with a brief 20-minute quiz on the main concepts of that unit. Writing assignments give students the option of traditional papers or creative assignments. The course will include visits to the Harvard Art Museums and other local resources.

Mind, Brain, and Behavior 980p: The Role of Music in Health and Education
Lisa Wong
Fall; Th 3-5
Class Capacity: 15
Consent Required: Instructor
Music shapes the course of human history at both a micro and macro scale; The "universal language" has the power to connect people who share no other common ground. Its power to bind people together is intuitively understood, but only through recent neuroimaging advances over the past few decades have scientists been able to move past intuition to reveal its impact on the brain. In this course, we will examine the exciting progress of the fields of music, science, and social science, through a variety of lenses, and meet some of the experts in the field. Who are the key investigators and practitioners in today's emerging music/brain landscape? What are the latest discoveries about how music affects the brain? How does how we hear and listen impact our perception of music? Who are some of the key influencers in music and social change? This course invites students to deepen their relationship with music, exploring different aspects of the art form through the lens of neuroscience, education, medicine, music therapy, public health and social justice. By the end of this course, the learner will (1) understand the effect of music on the developing brain; (2) understand the mechanism of hearing music; (3) consider the pathophysiology of disordered movement and hearing and how music can be used therapeutically; and (4) understand how other disciplines can add to their knowledge of the therapeutic uses of music. Given the transdisciplinary nature of the work, students will be introduced to literature from different disciplines and use these resources to explore their own individual interests in music.

Course Notes: Course inquiries to Dr. Wong at lisamwonghu@gmail.com. Preference to juniors in MBB tracks or MBB secondary field. Admission to this course is
via lottery; see https://mbb.harvard.edu/seminars for lottery details.

**Psychology 980ad: Psychopathology and the Family**
*Jill Hooley; Katherine Powers*
*Fall; F 12-2*
*Class Capacity: 16*
*Consent Required: Instructor*

In this course, we will explore how the family impacts psychopathology, including relapse, recovery, and resilience, for a member with a mental disorder. We will examine the relationship between the family and mental health conditions like anxiety, autism, depression, personality disorders, and schizophrenia from a life course and a family systems perspective. We will also examine these relationships by discussing the biopsychosocial features of the family that impact child and adolescent psychopathology. The course will focus on contemporary approaches to family life (e.g., dual-earner families, gender equality, LGBTQ+ families, etc.), and the role these approaches play in family functioning. The course will also examine the impact the current COVID-19 pandemic is having on family systems, as well as the increased need for telehealth services.

*Class Notes: The instructor is John Knutsen, john_knutsen@g.harvard.edu.*

*Recommended Prep: The Psychology Department requires completion of Science of Living Systems 20 or Psychology 1 or the equivalent of introductory psychology (e.g. Psych AP=5 or IB =7 or Psyc S-1) and one of PSY 18 or PSY 1861 before enrolling in this course; or permission of instructor.*

**Psychology 1009: Psychology of Women**
*Nicole Noll*
*Spring; TBA*
*Class Capacity: 16*
*Consent Required: Instructor*

How does being a woman affect our behavior, our evaluations of ourselves, and our interactions with others? This course examines psychological science on women and girls in western industrialized societies, addressing such topics as gender stereotypes, girlhood, women and work, relationships, pregnancy and motherhood, mental health, violence against women, and women in later adulthood. We will consider these topics through an understanding of gender as a social construction, being mindful of the intersections of gender, sexuality, class, and race. Although focused on women’s lives and experiences, this course is highly relevant to people of all genders.

*Recommended Prep: The Psychology Department requires completion of Science of Living Systems 20 or Psychology 1 or the equivalent of introductory psychology (e.g. Psych AP=5 or IB =7 or Psyc S-1) and at least one foundational course from PSY 14, PSY 15, PSY 16, or PSY 18 before enrolling in this course; or permission of instructor.*

**Psychology 1812: Intercultural Perspectives on Trauma**
*Mayron Pereira Piccolo Ribeiro*
*Spring: TBA*
*Class Capacity: 20*
*Consent Required: Instructor*

Traumatic experiences vary in part due to the different adversities and experiences people from diverse cultures throughout the world face. And even though most of our understanding of psychological trauma is built on samples found in Western, Educated, Industrialized, Rich, and Democratic (WEIRD) countries, many researchers generalize these findings to non-WEIRD populations. In this course, we will look at psychological trauma and post-traumatic stress through a multicultural lens, beyond the Western perspective. Can a global model of trauma fit all cultures? If not, how should we properly assess trauma using culturally valid methods? What is the impact of the cultural experience on perceiving an event as traumatic? After answering these questions, we will apply the foundational knowledge acquired during the course to establish a deeper understanding of cross-cultural trauma in veterans, refugees, and women who experience female genital excision.

*Recommended Prep: The Psychology Department requires completion of Science of Living Systems 20 or Psychology 1 or the equivalent of introductory psychology (e.g. Psych AP=5 or IB =7 or Psyc S-1) and one of PSY 18 or PSY 1861 before enrolling in this course; or permission of instructor.*

**Sociology 1109: Consumption, Health, and the Environment**
*Monique Ouimette*
*Fall; Tu 9:45-11:45*
*Class Capacity: 12*
*Consent Required: Instructor*

There are many health and environmental impacts associated with consumption activities, yet such impacts often remain hidden or obscured in the course of everyday life. In this applied course, students will examine health and environmental issues associated with consumption activities. Over the course of the semester, students will learn concepts from environmental health, environmental sociology, the sociology of consumption, and public policy. Each student will engage in an original preliminary research project on a contemporary issue related to consumption and environmental health. Students will develop an understanding of the power dynamics and inequalities associated with identifying, defining, managing, and
mitigating the health and environmental impacts of consumption activities. Skills, perspectives, and analytic frameworks learned in this course will be useful for students in their roles as individual consumers, citizens, and professionals.

**Sociology 1110: Public Health and Environmental Injustice**  
*Monique Ouimette*  
*Spring; TTh 9-10:15*

This course focuses on health in the United States and across the world through a lens of environmental injustice. There is strong evidence that exposure to environmental pollution contributes to the onset and severity of illness in humans, yet many medical and public health approaches to health and illness ignore environmental factors. The lack of focus on environmental contributors to illness helps to reinforce existing disparities associated with living in contaminated communities.

Through readings, lectures, class discussions, and written assignments, students in this class will explore the connections between environmental exposures and human health outcomes. Students will learn about the environmental factors that contribute to the onset of common non-communicable diseases, including asthma, cancer, and diabetes, as well as exacerbate the severity of infectious diseases such as COVID-19. Students will explore cultural, economic, regulatory, medical, and scientific factors that contribute to current health disparities in relation to environmental injustice. Students will also examine efforts to incorporate environmental justice considerations into health care and public policy reforms.

**Spanish 61ph: Spanish for Public Health**  
*Adriana Gutierrez*  
*Spring; 001: TTh 12-1:15, 002: TTh 1:30-2:45; 003 TTh 12-1:15*

An advanced language and culture class that examines literature, documentary, films, journalistic articles and other media portraying the cultural, political, sociological and financial impact of Public Health issues in Latin America. Students' linguistic competency is developed through discussion of the issues of public health. Grammar reviews, and weekly writing assignments. Students will also choose a specific project for a Public Health issue in Latin America and research its possible outcome and cultural, social, political, economic consequences.

**Course Notes:** Not open to auditors. May not be taken Pass/Fail but may be taken Sat/Unsat by GSAS students.  
**Recommended Prep:** Prerequisite: A score between 751 and 780 on the SAT II test or Harvard Placement test, a Spanish 50-level course, or permission of course head. Students are allowed to take a maximum of two courses at the 60-level in Spanish, not including Spanish 60.
HISTORY AND PRACTICE OF MEDICINE

Freshman Seminar 24g: A Brief History of Surgery
Frederick Millham
Fall; Th 6-8
Class Capacity: 12
Consent Required: Instructor
The history of surgery begins with the Hippocratic physicians whose principles were based, at least partly, on observation and measurement. However, surgical thinking for first three quarters of the “modern era” was dominated by Galen of Pergamum who, “fooled by his monkeys,” established a school thought as false as it was tightly held. The exposure of Galen’s errors by Vesalius in 1543 and Harvey in 1628 began a Medical Enlightenment. It would take until the 19th century for the next era of discovery to begin. During this time, the pace and significance of medical discovery increase, yet adoption of good ideas, like antisepsis, seems to take much too long, while bad ideas find adherents in spite of poor or no supporting evidence. Throughout this period, the ghost of Galen continues to haunt hospitals and battlefields. It will not be until the 1930’s that Galenism is banished from the wards. Our study will track this history and conclude with a consideration of the management of combat casualties from the time of the first “modern” surgeon, Ambrose Pare, to that of contemporary forward surgical teams in Afghanistan and Iraq. The seminar will consist of weekly discussion, informed by assigned reading and independent inquiry. We will visit the site of the first use of ether anesthesia, and duplicate William Harvey’s experiments in the anatomy lab. From time to time we will be joined by other doctors with expertise in specific areas such as infectious disease, combat surgery and anatomy. Course Requirements: Course open to Freshman Students Only

GENED 1175: Vaccines: History, Science, Policy
Allan Brandt; Ingrid Katz; Galit Alter
Fall; MW 9-10:15
Vaccination is among the oldest and most effective of medical interventions, yet paradoxically, it is also one of the most controversial. In its modern form, it has been used for centuries to prevent some of the most virulent infectious scourges of our time. Today, immunization is one of the most successful and effective interventions available to medicine and public health, reducing morbidity and mortality across the world. In this interdisciplinary course, you will examine the history of vaccination using a number of specific episodes in which it was utilized to prevent illness, disability and death, as well as the social and political controversies that vaccines have generated. You will also be introduced to the modern science of immunology and virology, examining the research that has resulted in the development of effective vaccines. Additionally, you will explore current scientific theories and techniques for developing new vaccines and enhancing their durability. Finally, this course will investigate the complex ethical and policy issues that vaccines continue to generate. What is the nature of compulsory measures for vaccination, vaccine hesitancy and skepticism, and anti-vaccination movements? What are the moral and ethical principles for ensuring equitable access to vaccines in local communities, nations, and globally? The course will encourage a broad interdisciplinary exploration of vaccines to inform our current understanding of the Covid-19 pandemic, while also examining critical issues in science, life-saving technologies, questions of individualism and the good of the community, as well as fundamental issues of global health equity.

GENED 1179: Psychotherapy and the Modern Self
Elizabeth Lunbeck
Spring; TTh 10:30-11:45
What does psychotherapy offer our distressed selves that friends, family, self-help, and psychopharmaceutical remedies do not? The demand for therapy is currently at an all-time high, bolstering its century-long dominance as the preferred antidote to human unhappiness and misery, even as it is under sustained attack from critics characterizing it as self-indulgent as well as from platforms that would replace human therapists with chatbots and analysts with algorithms. This course explores the conflicts and controversies that characterize today’s psychotherapeutic landscape, addressing questions concerning its present condition and future prospects. We will look at the development, methods, aims, efficacy, and limitations of a range of psychotherapeutic modalities—among them psychoanalytic, psychodynamic, cognitive, behavioral, manualized, evidence-based, and AI-informed treatments as well as family, sex, and group therapies—and explore how each took shape, who it is intended to treat, and how clinicians evaluate its effectiveness. We will examine therapy’s long-overdue, on-going reckoning with racial issues, gendered identities, and access to treatment. We will explore the various modern selves envisioned by psychotherapy, from the highly relational to the independently sovereign. You will leave the course prepared to recognize and evaluate claims regarding therapy’s rationale and impact in a range of sites, from the clinician’s office to the modern workplace to the media, as well as to assess the ways in which happiness, contentment, and satisfaction in life are subject—or not—to therapeutic intervention. Does psychotherapy work, and, if so, how? Do
we suffer less and enjoy greater self-knowledge one hundred years after the invention of the talking cures?

Global Health and Health Policy 50: The Quality of Health Care in America
Anupam Jena
Spring; TTh 3-4:15
Class Capacity: 42
Consent Required: Instructor
Offers information and experiences regarding the most important issues and challenges in health care quality. Overview of the dimensions of quality of care, including outcomes, overuse, underuse, variation in practice patterns, errors and threats to patient safety, service flaws, and forms of waste. Each session focuses on one specific issue, exploring patterns of performance, data sources, costs, causes, and remedies. Explores desirable properties of health care systems that perform at high levels in many dimensions of quality.
Course Notes: Lotteried course, enrollment limited to 42.

History and Science 1420: A History of Medicine Through Patient Voices
Michelle LaBonte
Fall; T 12:45-2:45
Class Capacity: 15
Consent Required: Instructor
This course draws from patient accounts as a starting point to examine the history of medicine from the early twentieth century to today. The patient perspective provides not only a glimpse into the experience of illness, but also highlights key themes important to medical practice and patient care. Topics covered include the diagnostic process, decision making about therapeutic interventions, biases and differential health outcomes related to gender, race, and class, medical institutions, and access to care. This is a course on the history of medicine in the US, which we explore in conversation with other medical traditions and geographic regions.

History and Science 1430: Diagnostic Technologies in Medicine: From the Stethoscope to Artificial Intelligence
Michelle LaBonte
Fall; Th 9:45-11:45
This course will explore the role of technology in the diagnosis of disease from the nineteenth century to today. Each class session will begin with a specific technology as a starting point to examine how social, cultural, political, economic, geographic, and scientific factors have intersected to determine who receives a diagnostic label and the impact of disease diagnosis on patients and society. We will explore such questions as: How have diagnostic technologies been prioritized in relation to physician’s own senses and the patient narrative? How have assumptions about race and gender influenced the design, use, and interpretation of diagnostic technologies?

History of Science 1435: A History of Biotechnology
Michelle LaBonte
Spring; TTh 1:30-2:45
This course examines the history of biotechnology, with a focus on the twentieth and twenty first centuries. Topics covered will include early conceptions of biotechnology prior to the advent of recombinant DNA, the development and use of recombinant DNA techniques, medical therapeutics, genetic testing, reproductive technologies, and genetically modified foods. We will explore such questions as: How have biotechnologies reconfigured conceptions of life? How have social, cultural, and political considerations shaped the development and use of biotechnologies? How have potential risks and benefits associated with biotechnologies been conceptualized and addressed? How have biotechnologies shaped society?

History of Science 1471: War and Medicine
Joelle Abi-Rached
Fall; Th 12:45-2:45
Class Capacity: 20
Consent Required: Instructor
War is a constant in human history but its impact and meaning have changed over time. This course explores how modern warfare has shaped the development of medicine from the nineteenth century to the present. Among the topics covered are new mental ailments (Shell-Shock, PTSD), the rise of medical humanitarianism (Red Cross, Médecins Sans Frontières), and the refugee crises. What has been the impact of war on medicine and the medical profession? Why are war-related psychiatric disorders deemed controversial? Should physicians treat the wounds of enemy soldiers and civilians as impartially as they treat those of their own side? And, why should we care?

History of Science 1472: Mental Health Crisis: From War to Neurosis to COVID-19
Joelle Abi-Rached
Spring; TTh 1:30-2:45
The course explores the history of mental health through the ways in which our minds grapple with war, terror, shock, violence, and natural and manmade disasters. The course starts in the nineteenth century, a period that saw the birth of the concept of “traumatic memory,” and ends in our own century, that saw the emergence of new forms of mental distress caused by migration and refugee crises as well as the ongoing Covid-19 pandemic. Drawing on interdisciplinary readings, we will analyze the extent to
which ways of thinking about and acting on broken minds are being reshaped by “crises.”

**Psychology 980jo: Understanding Autism**

*Jill Hooley, Katherine Powers*

*Spring: TBA*

*Class Capacity: 16*

*Consent Required: Instructor*

Roughly 1 in 44 children has been identified with autism spectrum disorder (ASD), yet we still do not know what causes it, or how best to treat it. This course provides students with a broad, interdisciplinary exploration of ASD from infancy through adulthood. We explore three major themes: 1) the psychological and neurological drivers of ASD, including deficits in social cognition, executive function and perception; 2) the epidemiology and clinical practice of ASD, including diagnosis and treatment modalities, and individual and sex/gender differences; and 3) the personal and societal impact of ASD, including discussion of quality of life, neurodiversity, policy and advocacy. We will also explore the impact of the current COVID-19 pandemic for individuals with ASD and their families.

*Course Notes:* The instructor is John Knutsen, john_knutsen@g.harvard.edu.

*Recommended Prep:* The Psychology Department requires completion of Science of Living Systems 20 or Psychology 1 or the equivalent of introductory psychology (e.g. Psych AP=5 or IB =7 or Psyc S-1) and at least one foundational course from PSY 14, PSY 15, PSY 16, or PSY 18 before enrolling in this course; or permission of instructor.
POLITICS OF HEALTH

Freshman Seminar 27i: Global Health: Comparative Analysis of Healthcare Delivery Systems
Sanjay Saini
Fall; M 12-2:45
Class Capacity: 12
Consent Required: Instructor
This interactive seminar will allow students to obtain greater understanding of challenges faced by US healthcare system through critical comparative analysis of healthcare systems of selected countries from the developed, emerging and developing world. Weekly sessions will comprise of student-led discussion that revolves around an important healthcare issue. Domain expert guest speakers will be included allowing students to network with thought leaders. Student will explore in-depth a topic of their choice and prepare a manuscript potentially for publication in a peer-reviewed journal.
Course Requirements: Course open to Freshman Students Only

History of Science 1460: From Colonial to Global Health
Joelle Abi-Rached
Fall; T 3-5
Class Capacity: 30
Consent Required: Instructor
“Global health” has become a new mantra of our time. Its deeper roots, though, lie in the history of colonialism. How does this fact matter? To find out, this course will focus on relations among colonialism, health care, and globalization in Africa, the Middle East, India, and Southeast Asia. Through a set of interdisciplinary and transnational readings, we will explore issues related to race, religion, modernity, subjectivity, and imperial ambitions, and we will do so through the lens of public health, epidemics, psychiatry, medical institutions, and disease history.

History and Science 1465: Health, Disease, and War in the Modern Middle East
Joelle Abi-Rached
Spring; F 12-2
Class Capacity 15
Consent Required: Instructor
The seminar explores the advent of modern science and medicine in the Middle East and North Africa. The course starts in the nineteenth century, a period of modernization and intellectual renewal, and ends in our own century. We will examine the rise of expertise and the bureaucratization of the state, the emergence of a new elite trained in “Western medicine,” the tensions between religious and secular authorities, the relation between technology and epidemics, the discovery of germs and its impact on public health, the birth of new ways of governing bodies and minds, and the implications of colonialism, imperialism, state-led modernization, and war on medicine and society.
SCIENCE OF HEALTH AND DISEASE

Freshman Seminar 25x: How the Brain Becomes the Mind: A Bottoms-Up and Top-Down Perspective
Thomas Byrne
Fall; T 6-8
Class Capacity 12
Consent Required: Instructor
Is the human mind an “emergent” property of the brain? How might that occur? We study how structure and properties of the brain and mind are shaped by biology, chemistry, experience and disease. Experiences during “critical periods” modify brain anatomy/function resulting in learning a foreign language before or after puberty is revealed by a native or foreign accent. Mirror neurons play a role in motor skills, emotion, and empathy: Examples include “contagious” happiness or sadness and theory of mind; their dysfunction may cause autism. Beyond these “bottoms up” explanations, we will also consider a “top down” approach, in which the intention or purpose of a behavior or idea can “pull” our behavior or state of mind, what Aristotle termed “Final Cause.” The human brain/mind is a pattern-seeking organ that uses logical patterns to predict the future. From infancy we make sense of the world by using the logic which is embedded as “core knowledge.” We then use these patterns to look into the future, to anticipate where a given pattern will lead; we may choose to be “pulled” to that goal; thus, the goal often determines behavior and worldview. We read Victor Frankl’s Man’s Search for Meaning which explores human thought, behavior and purpose. This seminar straddles the realms of science, which asks “how?”, and the humanities, which traditionally asks “why?” and strives to reconcile these two approaches to understanding the world and our place in it. Recommended Prep: The course is intended for those who have scored 5 on AP Biology, Chemistry, Physics or Calculus. Course Requirements: Course open to Freshman Students Only

Freshman Seminar 26w: The Biology and Science of Cancer and Its Treatments: From Empiric to Scientific to Humanistic
George Demetri
Spring; T 9:45-11:45
Class Capacity 12
Consent Required: Instructor
“Cancer” represents hundreds of different diseases with a wide variety of causative mechanisms, as well as enormous social impact. This seminar aims to provide an introduction to the biology of cancer and what makes a normal cell become a cancerous one, delving into acquired and inherited genetic abnormalities and effects of environmental factors, such as nutrition, radiation, and tobacco. Current approaches to cancer will be discussed from prevention and early detection to treatment and survivorship. Treatment modalities continue to evolve—no longer just surgery, chemotherapy and radiotherapy, but development of targeted therapies such as monoclonal antibodies, signal transduction inhibitors, vaccines, and angiogenesis inhibitors, which are rationally aimed at biological mechanisms uniquely important to the cancer cells themselves with the goal of reducing side effects of therapy and improving outcomes. Although cancer incidence continues to increase, mortality is decreasing, resulting in many more cancer survivors and a need to care for the secondary effects of the treatment and the societal impact of this disease. We will discuss the field of Integrative Oncology, an evolving discipline that treats the patient as a whole and combines the best of eastern and western medicine. As successful cancer management becomes more targeted with the newer therapies, there needs to be an integrative approach which focuses on clinical outcomes for patients, personalized approaches to individual cancers, yet which takes into account the financial impact of new therapies at a global level and allows development of wise public policy decisions. Recommended Prep: None. Prior AP-Biology may be helpful but not required.
**Course Requirements:** Course open to Freshman Students Only

**GENED 1027: Human Evolution and Human Health**
*Daniel Lieberman*
*Spring; MW 1:30-2:45*
How and why did humans evolve to be the way we are, and what are the implications of our evolved anatomy and physiology for human health in a post-industrial world? Why do we get sick, and how can we use principles of evolution to improve health and wellbeing? To address these questions, this course reviews the major transitions that occurred in human evolution, from the divergence of the ape and human lineages to the origins of modern humans. Also considered are the many effects of recent cultural and technological shifts such as agriculture and industrialization on human health.

**GENED 1038: Sleep**
*Charles Czeisler, Frank Scheer*
*Fall; T 3-5*
Class Capacity 490
Consent Required: Instructor
What is sleep? Why do we sleep? Why don't we sleep? How much sleep do you need? What are circadian rhythms? How do technology and culture impact sleep? This course will explore the role of sleep and circadian timing in maintaining health, improving performance and enhancing safety. We will evaluate the causes and consequences of the epidemic of sleep disorders and deficiency in our society, with particular attention to impacts on brain (learning and memory, mood and cognition) and body (appetite and metabolism, hormones and heart) functions. Personal and public policy approaches to issues such as drowsy students, drowsy drivers and drowsy doctors will be addressed.

**GENED 1084: The First Nine Months**
*David Haig*
*Spring; MW 9-10:15*
What makes a human? A baby develops from a single cell during the nine months of gestation, but the process that begins so simply has complications that stretch beyond the womb into questions of human identity and individuality. This course will explore the process of embryonic and fetal development, highlighting complicated questions such as the medical dilemma of maternal-fetal conflict, which occurs when doctors must evaluate the competing health needs of both fetus and mother. You will study disorders of pregnancy such as gestational diabetes and preeclampsia, as well as types of nonstandard fetal development, like monozygotic twins or microchimerism, that result in human diversity. The course will also consider the kinds of families made possible by ovum donation, sperm donation, surrogate pregnancies, and the like, as well as the questions of bioethics raised by such assistive reproductive technologies.

**GENED 1162: Science of Stress**
*Katie McLaughlin*
*Spring; TTh 10:30-11:45*
Class Capacity 125
Consent Required: Instructor
Stress is a universal human experience. What is stress and why do we experience it? How does stress influence our emotions and the way we think and behave? What are common causes of stress in our modern world? What are the consequences of stress for our health and well-being? Why are some people more vulnerable to developing stress-related illnesses than others? And perhaps most importantly -- what are the most effective strategies for coping with stress?
This course will address these questions with a particular focus on translating advances in the science of stress to help students learn how to manage stress more effectively in their lives. Students who take this course will: Develop knowledge of the stress response, including the neurobiological systems that govern our responses to stress and how they can influence our emotions, cognition, and behavior; Learn to identify causes of stress in the environment and the types of experiences that are likely to trigger a stress response; Develop an understanding of the long-term effects of stress on our health and well-being and how stressful experiences might contribute to disparities in health; Learn skills for adapting to stress—by actively testing a series of evidence-based stress management skills, students will develop a toolkit of strategies for responding to stress effectively in their own lives; Become informed consumers of the scientific literature on stress.

**Human Evolutionary Biology 1328: Clinical Comparative Medicine: Evolutionary Perspectives on Mental and Physical Health**
*Barbara Natterson-Horowitz*
*Fall; T 6-8*
Heart attacks, breast cancer, anxiety and eating disorders occur across the animal kingdom. Taught by a physician, the course explores the species-spanning and evolutionary origins of medical, surgical, and psychiatric illnesses. A ‘mini-medical school’ format will be used to introduce students to ten forms of human pathology emphasizing the typical mechanistic explanations of disease causation offered by physicians followed by in depth evolutionary analyses. Both physical and mental illnesses will be explored across the animal kingdom with a special focus on how emerging awareness of psychopathology in animals can
alter the perception (stigma) and treatment of mental illness in human beings.

**Life Sciences 2: Evolutionary Human Physiology and Anatomy**

*Daniel Lieberman, George Lauder, Andrew Biewener, Joanne Clark Matott*

*Fall; MWF 12-1:15*

*Class Capacity: 192*

Why is the human body the way that it is? This course explores human anatomy and physiology from an integrated framework, combining functional, comparative, and evolutionary perspectives on how organisms work. Major topics, which follow a life-course framework, include embryogenesis, metabolism and energetics, growth and development, movement and locomotion, food and digestion, stress and disease, and reproduction. Also considered is the relevance of human biology to contemporary issues in human health and biology.

*Course Notes:* This course includes a weekly 3-hour lab. This course may not be taken Pass/Fail.

*Recommended Prep:* LIFESCI 1A or permission of the instructor.

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**Mind, Brain, and Behavior 980h: What Disease Teaches about Cognition**

*William Milberg*

*Spring; T 3:45-5:45*

*Class Capacity: 14*

*Consent Required: Instructor*

This course seeks to reconcile the complicated and messy problems of patients with brain disease with the concise analysis of precisely defined cognitive functions in normal subjects. Students will learn to overlap cognitive functions on to the brain in disease - at the gross dissection and imaging levels - and to understand some of the complex interactions of individual cognitive operations in disease using the examples of famous landmark cases in the literature (e.g. Broca’s Monsieur Leborgne, Phineas Gage, HM and others). The course will include a dissection of a human brain, an examination of how the actual brain maps onto two dimensional neuroimages, and discussions of how the classic lesion based maps of cortical function are related to contemporary maps based on functional neuroimaging.

*Course Notes:* Course inquires to Dr. Milberg at william_milberg@hms.harvard.edu. Preference to juniors in MBB tracks or MBB secondary field. Admission to this course is via lottery; see https://mbb.harvard.edu/seminars for lottery details.

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**Mind, Brain, and Behavior 980m: Functional Neuroimaging of Psychiatric Disorders: Insights into the Human Brain-Mind**

*David Silbersweig*

*Spring; Th 3-5*

*Class Capacity: 15*

*Consent Required: Instructor*

Functional brain imaging has revolutionized the study of systems-level behavioral neuroscience and psychiatric disorders, through the ability to localize and characterize distributed brain activity directly associated with perception, cognition, emotion and behavior in disorders where there are not gross brain lesions. This seminar will introduce students to translational neuroimaging methods at the interface of neuroscience, psychology and medicine. It will cover recent and ongoing advances in our understanding of fronto-limbic-subcortical brain circuitry across the range of psychiatric disorders (e.g. mood disorders, anxiety disorders, psychotic disorders, personality disorders, addictions). It will discuss new, emerging biological (as opposed to descriptive) taxonomies and conceptualizations of mental illness and its treatment. It will explore the implications of such knowledge for issues such as consciousness, meaning, free will, emotion, resilience, and religiosity. It will incorporate clinical observations, scientific data and readings, and examine future directions in brain-mind medicine.

*Course Notes:* Course inquires to Dr. Silbersweig at dsilbersweig@partners.org. Preference to juniors in MBB tracks or MBB secondary field. Admission to this course is via lottery; see https://mbb.harvard.edu/seminars for lottery details.

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**Molecular and Cellular Biology 64: Cell Biology in the World**

*Jessica Liu; Sam Kunes*

*Spring; TTh 1:30-2:45*

The goal of this course is to highlight the connection between science, society, and the individual. We believe the narrative form is a powerful way to interweave these elements and enhance student learning. We also value student agency: learning through activities that are meaningful and relevant to learners.

This course teaches fundamental concepts in cell biology using individual life histories drawn from different parts of the world. Together, these life histories focus on key aspects of human development, growth, aging and disease while providing a nuanced view of the interplay between the life sciences, geography, and culture.
Molecular and Cellular Biology 169: Molecular and Cellular Immunology
Shiv Pillai
Fall; TTh 10:30-11:45
The immune system is the frontier at which molecular biology, cell biology, and genetics intersect with the pathogenesis of disease. This year the entire course will be taught through the lens of COVID19, examining the underlying scientific bases of pathogenesis, protection, treatment and prevention. The course examines in depth the cellular and molecular mechanisms involved in the development and function of the immune system and also analyzes the immunological basis of human diseases in general. Apart from COVID19, we will discuss AIDS, autoimmunity, allergic disorders, primary immunodeficiency syndromes, transplantation, and cancer. Recommended Prep: Genetics and cell biology strongly recommended.
Course Requirements: Prerequisite: LPS A OR LS 1a.

Organismic and Evolutionary Biology 50: Genetics and Genomics
Daniel Hart, Robin Hopkins
Fall; TTh 10:30-11:45
Consent Required: Instructor
Fundamental concepts in genetics and genomics forming a critical foundation for biology approached from two perspectives: (1) as a body of knowledge pertaining to genetic transmission, function, mutation, and evolution in eukaryotes and prokaryotes; and (2) as an experimental approach providing a toolkit for the study of biological processes such as development and behavior. Topics include structure, function, transmission, linkage, mutation, and manipulation of genes; genetic approaches in experimental studies of biological processes; and analysis of genomes in individuals and populations. Related ethical issues also discussed include genetically modified organisms, gene therapy, genetic testing, personalized medicine, and genetic privacy.

Psychology 18: Psychopathology
Rebecca Shingleton
Fall; TTh 9-10:15
Introduction to the study of psychological dysfunction. Focuses on abnormal behavior as it relates to the definition, etiology, and treatment of major symptom domains. This course will emphasize critical evaluation of the causes and mechanisms of mental illness, with special attention paid to how these disorders present clinically.
Course Notes: Formerly named “Abnormal Psychology.” This course counts toward foundational requirements for Psychology and should be taken before courses at the 1000 level or higher.

Recommended Prep: The Psychology Department requires completion of Science of Living Systems 20 or Psychology 1 or the equivalent of introductory psychology (e.g. Psych AP=5 or IB=7 or Psyc S-1) before enrolling in this course; or permission of instructor.

Psychology 980ac: Mood Disorders
Hooley, Powers
Fall, W 12-2
Class Capacity 16
Consent Required: Instructor
Most of us feel sad or down from time to time, yet some of us experience clinical depression that can last months or years. Why are some people more vulnerable to developing depression than others? This course will draw on classic and cutting-edge empirical research to examine the etiology, symptom presentation, course, and treatment of mood disorders including depression, bipolar and related disorders.
Course Notes: Students who have taken PSY 1855/PSY 980JK Mood Disorders cannot enroll in this course.
Class Notes: The instructor of this course is Stephanie Roberts, drstephanieroberts@gmail.com.
Recommended Prep: The Psychology Department requires completion of Science of Living Systems 20 or Psychology 1 or the equivalent of introductory psychology (e.g. Psych AP=5 or IB =7 or Psyc S-1) and one of PSY 18 or PSY 1861 before enrolling in this course; or permission of instructor.

Psychology 980t: Eating Disorders
Rebecca Shingleton
Spring, TBA
The goal of this course is to provide a comprehensive overview of DSM-5 feeding and eating disorders (EDs) with a primary focus on anorexia nervosa, bulimia nervosa, and binge eating disorder. We will explore the etiology (i.e., biological and environmental factors), symptom presentation, and empirically supported treatments across these EDs. Additional topics will include cultural considerations, gender and EDs, medical complications, impact of media/social media, and novel directions and treatments for these disorders.
Recommended Prep: The Psychology Department requires completion of Science of Living Systems 20 or Psychology 1 or the equivalent of introductory psychology (e.g. Psych AP=5 or IB =7 or Psyc S-1) and one of PSY 18, PSY 1861 or Psyc S-1240 before enrolling in this course; or permission of instructor.
Psychology 1005: Health: A Positive Psychology Perspective
Ellen Langer
Fall; TTh 9-10:15
Why does it seem that some people are so resilient and content? This course looks at psychological and physical health from the perspective of Positive Psychology. The major focus will be on mindfulness theory and its relationship to stress/coping; illness/wellness; decision-making; and placebos. The medical model, the biosocial model, and a unified mind-body model will be compared to examine their role in becoming mindful and thus healthier, happier and less stressed.

Recommended Prep: The Psychology Department requires completion of Science of Living Systems 20 or Psychology 1 or the equivalent of introductory psychology (e.g. Psych AP=5 or IB =7 or Psyc S-1) and at least one foundational course from PSY 14, PSY 15, PSY 16, or PSY 18 before enrolling in this course; or permission of instructor.

Course Requirements: SLS20 or PSY1 or Psychology AP=5 or Psychology IB=7 or Psyc S-1 AND PSY14 or PSY15 or PSY16 or PSY18.

Psychology 1201: Your Brain on Drugs: Psychopharmacology
Scott Lukas
Fall; TTh 1:30-2:45
An introduction to how drugs affect mood, sensation, consciousness, and other psychological and behavioral functions in both healthy and disease states. Introduces concepts in neuroscience and pharmacology to understand how drugs are used to treat drug abuse, psychiatric disorders and why individuals use recreational drugs. Covers all CNS drugs, including antidepressants, antipsychotics, alcohol, and both licit and illicit drugs of abuse. Debates controversial topics such as research with psychiatric populations, diagnosing ADHD, teenage suicide, marijuana legalization, and needle exchange programs.

Recommended Prep: The Psychology Department requires completion of Science of Living Systems 20 or Psychology 1 or the equivalent of introductory psychology (e.g. Psych AP=5 or IB =7 or Psyc S-1) and at least one foundational course from PSY 14, PSY 18, MCB/NEURO 80, MCB 81 or Psyc S-1240 before enrolling in this course; or permission of instructor.

Psychology 1816: Broken Brains: Mechanisms and Markers of Mental Illness
Mayron Pereira Piccolo Ribeiro
Fall; M 12-2
Class Capacity: 16
Consent Required: Instructor
This course will integrate clinical psychology and cognitive neuroscience to explore the biological underpinnings of mental illness. We will adopt a systems-level approach, examining the relationship between function and dysfunction of specific brain circuits and networks and mental health disorders. For example, addiction, disordered eating, depression, and psychosis have all been linked to the brain’s reward system. What does this common neural foundation indicate and how has this discovery advanced treatment options? Throughout the course, we will draw on findings from traditional and cutting-edge methodologies that have produced critical insights and key breakthroughs. We will also discuss how large-scale neuroimaging studies, like the Human Connectome Project, can be used to trace disordered behaviors such as criminality, depression, and hallucinations to specific brain networks. As we explore these topics, we will discuss how these research findings inform mental health treatment and potentially complement discussions around important societal issues such as racial bias and criminal responsibility.

Recommended Prep: The Psychology Department requires completion of Science of Living Systems 20 or Psychology 1 or the equivalent of introductory psychology (e.g. Psych AP=5 or IB =7 or Psyc S-1) and one of PSY 18 or PSY 1861 before enrolling in this course; or permission of instructor.

Stem Cell and Regenerative Biology 167: Stem Cell Therapeutics: Exploring the Science and the Patient Experience
Leonard Zon
Spring; W 9-11:30
Consent Required: Instructor
Stem cells are the basis for tissue maintenance and repair, thus, are essential elements of normal organ and tissue physiology. Stem cells are also targets for disease processes and through transplantation are important therapeutic agents. This course will allow advanced undergraduates to explore how stem cells and tissue regeneration impact human disease pathogenesis and how stem cells might be exploited to advance new therapies for disease.

Recommended Prep: Life and Physical Sciences A or Life Sciences 1a; Life Sciences 1b; SCRB 10.
Stem Cell and Regenerative Biology 190: Understanding Aging: Degeneration, Regeneration, and the Scientific Search for the Fountain of Youth  
Amy Wagers  
Fall; MW 12-1:15  
This lecture and discussion course will explore the fundamental molecular and cellular mechanisms that govern organismal aging and contemporary strategies to delay or reverse this process.  
Recommended Prep: Life and Physical Sciences A or Life Sciences 1a; Life Sciences 1b; SCRB 10.

Stem Cell and Regenerative Biology 195: The Translational Science of Stem Cells  
Lee Rubin  
Fall; TTh 12-1:15  
Information about the biology of stem cells and their uses in understanding and treating diseases -- particularly those that cannot be studied adequately in non-human model systems -- has increased enormously in the last decade. In this seminar/lecture course, students will learn about transplanting functional human cells (such as pancreatic beta cells or dopaminergic neurons) derived from pluripotent cells to treat disease. They will also discover how to use these cells to model diseases, such as neurodegenerative and cardiovascular diseases, with the goal of identifying more effective, possibly patient-specific, therapeutics. Students will hear about small molecules (conventional medicines), whose therapeutic actions can be attributed to the regulation of tissue-specific stem cells that reside in key adult tissues including the bone marrow and brain, but, interestingly, not including the heart or pancreas. Finally, they will be exposed to relatively new work that demonstrates the possibility of creating new cells from old by using genetic methods to swap cell identities. A typical type of question that we will debate is: When should Parkinson’s disease patients be treated with a drug to slow the death of neurons, with transplanted neurons made from pluripotent cells or with a viral vector that produces new neurons from existing glial cells in the brain? This course will highlight the theoretical, as well as the practical, aspects of drug development. How are therapies progressed from conception to patient (bench to bedside)? How can academic investigators commercialize research? Importantly, while this is a science course, not a health economics course, we intend to discuss ways of reducing drug costs. At the same time, we will introduce the new trend of treating rare (even N=1) genetic diseases and how this is or isn’t accommodated within our existing healthcare framework. We believe that students with different backgrounds (biology, chemistry, engineering, business) and at different levels (undergraduate, graduate) can benefit from taking the course and will help enrich the discussions by providing different perspectives on topics that we’ll cover. However, basic knowledge of cell and molecular biology will be needed to understand the course fully. The class will be live, not remote, except for a small number of lecturers who are located outside of Boston.  
Course Notes: Permission of the instructor is required to enroll for students who have not taken the courses below. Ability to work in a less structured environment will be essential, as will the ability to work with other students.  
Recommended Prep: Life Sciences 1a or Life and Physical Sciences A, Life Sciences 1b, and preferably SCRB 10.

Stem Cell and Regenerative Biology 197: Frontiers in Therapeutics  
Mark Fishman, Douglas Melton  
Fall; MWF 3-4:15  
How realistic are promises to “eliminate” diseases and to “personalize” medicine? This course looks at biological principles underlying therapeutics, in a range of different diseases and disorders. Throughout the course students will encounter a diversity of current medical challenges, get insight into the underlying pathophysiology of individual diseases and discuss the currently available medical approaches. Students will learn to think about therapeutics as a scientific field by criticizing current approaches and suggesting potential next steps in each therapeutic field.  
Course Notes: Prerequisites are Life and Physical Sciences A or Life Sciences 1a; Life Sciences 1b; MCB 60, SCRB 50, or permission of the instructor.
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<td>Molecular and Cellular Biology 64: Cell Biology in the World</td>
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<td>Psychology 980jo: Understanding Autism</td>
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