The Blue Book

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

2023–2024

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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.

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.

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.

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.

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.

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 4, 2023 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. Note that the spreadsheet has two tabs at the bottom: the left tab lists courses that appear in the 2023-24 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 ryan_kim@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 ryan_kim@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?
- GENED 1093: Who Lives, Who Dies, Who Cares? Reimagining Global 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

Additional guidelines regarding the research requirement are available at http://ghhp.fas.harvard.edu

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

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.

Course Listings by GHHP Category

FOUNDATIONAL COURSES

GENED 1063: World Health: Challenges and Opportunities

Sue J. Goldie
Spring; MW 10:30-11:45
How do we analyze the health of global populations in a time of unprecedented crisis, and create new policies that address the social, political, economic, and environmental dimensions of health in an increasingly interdependent world? Extraordinary changes in the world present both risks and opportunities to health—global interconnections, shifting demographics, and changing patterns of disease. This course will challenge your assumptions about the world's populations as you discover surprising similarities and unexpected differences between and within countries. By first positioning the concept of health as a prerequisite for strong societies, we explore its connection to human rights, sustainable development, and climate change. Drawing on examples from infectious diseases, maternal and child health, chronic diseases, and injuries, we pay equal attention to the influence of the social, political, and environmental "conditions for health." We consider solutions from within and outside the health sector and interventions at the local, national, and global levels. Throughout the course, you'll be asked to link classroom concepts to contemporary events, applying your analytical skills to design "problem-inspired" products that respond to and motivate action on global health challenges you care about.

GENED 1079: Why is There No Cure for Health?

David Cutler
Fall; TTh 12-1:15
Given all our technological advances, why are we still not able to prevent preventable diseases, provide affordable healthcare for millions of people, and deliver cures for curable diseases? 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.

GENED 1093: Who Lives, Who Dies, Who Cares? Reimagining Global Health

Arthur Kleinman, Salmaan Keshavjee, Anne Becker
Fall; TTh 10:30-11:45
How can health care systems be restructured to provide high quality care even to the poorest and most vulnerable people on our planet? 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, what kind of care is available to help you recover, and whether society believes you deserve it. Recent pandemics have illustrated 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 die from a variety of diseases are often linked to large-scale social forces that render health care systems dangerously weak or inaccessible for many communities. These social forces are often intersectional, and include, but are not limited to, the ongoing effects of systemic racism on racialized subjects, sex and gender discrimination, the devaluation of eldercare, the distribution of health care under neoliberal forms of governance, and extractive social relationships linked to colonial-era and post-colonial power structures. Because these forces define how health and care delivery problems are framed and addressed, now, as ever, it is imperative to develop frameworks and methodologies to identify and understand harmful social configurations that cause illness and suffering, and to intervene effectively. This

course goes beyond a narrow focus on the biological basis of disease. Instead, drawing from various social science disciplines, including Anthropology and History of Science, this course takes a novel biosocial approach to reveal how governments, institutions, and histories shape health and well-being. In doing so, this course challenges the conventional assumptions within the field of global health, broadening the understanding of how health inequalities persist over centuries, how the structures of powerful institutions influence the policies they develop, how caregiving and global health are urgent moral practices, and what can be achieved when the needs of patients are put first.

Sociology 1046: Life and Death by Design

Jason Beckfield
Spring; MW 3-4:15
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.

RESEARCH COURSES

Global Health and Health Policy 91: Supervised Reading and Research

David Cutler
Fall and Spring
Consent: 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: 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 6 – December 13, 2023.

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 12:45-2:45
Class Capacity: 18
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-seminars 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).

GENED 1079: Why is There No Cure for Health?

David Cutler
Fall; TTh 12-1:15
Given all our technological advances, why are we still not able to prevent preventable diseases, provide affordable healthcare for millions of people, and deliver cures for curable diseases? 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.

First Year Seminar 40K: America's $4 Trillion Challenge: Boosting Health Care Productivity and Broadening Access

Alan Garber
Spring; TBA
Class Capacity: 15
“Why does health care cost so much, and why aren't Americans healthier?” Policymakers, employers, and

the public share deep frustration at high health expenditures, which are blamed for rising federal deficits, the declining competitiveness of US businesses, and the risk of financial ruin for anyone unfortunate enough to suffer a costly illness or injury. Unless health expenditures can be controlled, universal access to care will remain an unattainable goal. Since it began in 2020, the COVID-19 pandemic has raised additional questions about the cost and effectiveness of both medical care and the public health system in the U.S.In this seminar, we will explore the causes and consequences of the high costs of health care and a range of approaches to increasing the productivity of public health and medical care. We will examine these issues in part through the lens of health reform, emphasizing the Affordable Care Act ("Obamacare") as well reactions to the Act, such as proposals for its modification or repeal. Students will be exposed to techniques for measuring the effectiveness and value of health care and will become familiar with economic and clinical studies. Course requirements include a mid-term outline and final paper on either micro or macro solutions for improving health care productivity in the US.

Recommended Prep: Background in microeconomics at the level of first-semester Economics 10 is required. Knowledge of AP-level statistics is desirable. The seminar is relevant to anyone with an interest in applied economics, public policy, health care, or public health.

ENGINEERING SCIENCES AND STATISTICS

Applied Mathematics 10: Computing with Python for Scientists and Engineers

Efthimios Kaxiras, Logan McCarty, Georgios Neofotistos
Fall; TTh 9:45-11
This course is a systematic introduction to computing (with python and jupyter notebooks) for science and engineering applications. Applications are drawn from a broad range of disciplines, including physical, financial, and biological-epidemiological problems. The course consists of two parts: 1. Basics: essential elements of computing, including types of variables, lists, arrays, iteration and control flow (for, while loops, if statement), definition of functions, recursion, file handling and simple plots, plotting and visualization tools in higher dimensions. 2. Applications: development of computational skills for problem solving, including numerical and machine learning methods, and their use in deterministic and stochastic approaches; examples include numerical differentiation and integration, fitting of curves and error analysis, solution of simple differential equations, random numbers and stochastic sampling, and advanced methods like neural networks and simulated annealing for optimization in complex systems. Course work consists of attending lectures and labs, weekly homework assignments, a mid-term project and a final project; while work is developed collaboratively, coding assignments are submitted individually.
Course Notes: This course satisfies the QRD requirement. Lectures meet concurrently with Physics 20, although sections, homework and project assignments are different between the two courses.
Recommended Prep: Mathematics 1b is a prerequisite, although it can be taken concurrently (particularly for sophomores). Some limited concepts from Mathematics 21a are used, but they can be learned during the course. The course provides an introduction to programming with a mathematical focus, using Python, and starts from the level of a complete beginner.

Applied Mathematics 101: Statistical Inference for Scientists and Engineers

Robert D. Howe
Spring; TTh 11:15-12:30
Class Capacity: 55
Consent: 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.
Recommended 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.
Recommended 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.
Recommended 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.
Recommended Prep: Statistics 100 and 104.

Economics 1126: Quantitative Methods in Economics

Phillip Heiler
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.
Recommended Prep: Math 18, 21a, Applied Math 21a.

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.
Course Notes: Open to first-year students. Course includes a 3-hour lab section once per week.
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 PHYSCI 2 OR PHYSCI 3

Environmental Science and Engineering 6: Introduction to Environmental Science and Engineering

Steven Wofsy, Bryan Yoon
Spring; TTh 10:30-11:45
Recommended Prep: The course presumes basic knowledge in chemistry, physics, and mathematics at the high school level. Students will acquire additional skills and knowledge in these areas, as applied to environmental problems, as well as learning basic data analysis and coding skills.

Government 50: Data Science for the Social Sciences

Matthew Blackwell
Fall; TTh 12-1:15
Data is a fundamental part of studying the social, political, and economic world. How can we measure racial discrimination in job hiring? What is the best way to predict election outcomes? What factors drive the onset of civil wars? Is it possible to determine what members of Congress are more or less liberal given their voting record? These are just a few of the numerous questions that social scientists in academia and industry are tackling with quantitative data. In this course, you will learn the fundamentals of data science as applied to the social sciences: visualization, wangling, causal inference, prediction, and inference. All the while you will learn how to communicate your findings to a broad audience and how to use the professional tools of the trade such as R, tidyverse, and GitHub. Each student will complete a final project to showcase their acquired skills. No previous experience with statistics or statistical computing required.

Government 1737: Evaluating the Impacts of Public Policies: How to Design and Implement Randomized Controlled Trials

Michael Hiscox
Spring; TTh 1:30-2:45
In a randomized controlled trial, a policy intervention or program participation is allocated among study subjects by random assignment, then differences in subsequent outcomes (e.g., health, academic performance, income) are compared across the groups. Such trials have become a favored method for empirical research across the social sciences in recent years and the methodology has also altered the way governments approach development, health, welfare, and education policies. The aim of the course is to provide students with training in how to design and implement randomized controlled trials to evaluate policies and programs. We will discuss working with government and non-government partners, ethics, sampling, the use of online and digital platforms, and the analysis and interpretation of results.

Molecular and Cellular Biology 111: Mathematics in Biology

Elena Rivas
Fall; MWF 9-10:15
Consent: Instructor
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 and Spring; TTh 10:30-11:45
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.

Sociology 1156: Statistics for Social Sciences

Jeffrey Swindle
Fall; MW 10:30-11:45
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: Formerly taught as Sociology 156; not intended for graduate student.

Statistics 100: Introduction to Statistics and Data Science

Kelly McConville (Fall and Spring)
Fall; MW 10:30-11:45
Spring; TBA
Class Capacity: 225
Consent: Instructor
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

James Xenakis (Fall) and TBA (Spring)
Fall; TTh 10:30-11:45
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.
Course Requirements: Anti-Req: may not be taken for credit if STAT 111, STAT 139, STAT 211, or STAT 244 already complete.

Statistics 104: Introduction to Quantitative Methods for Economics

Kevin A. Rader
Fall; 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 111, STAT 139, STAT 211, or STAT 244 already complete.

Statistics 109A/COMPSCI 109A: Data Science 1: Introduction to Data Science

Pavlos Protopapas, Kevin A. Rader
Fall; MWF 9:45-11
Data Science 1 is the first half of a one-year introduction to data science. The course will focus on the analysis of messy, real life data to perform predictions using statistical and machine learning methods. Material covered will integrate the five key facets of an investigation using data: (1) data collection - data wrangling, cleaning, and sampling to get a suitable data set; (2) data management - accessing data quickly and reliably; (3) exploratory data analysis – generating hypotheses and building intuition; (4) prediction or statistical learning; and (5) communication – summarizing results through visualization, stories, and interpretable summaries. Part one of a two part series. The curriculum for this course builds throughout the academic year. Students are strongly encouraged to enroll in both the fall and spring course within the same academic year.
Course Notes: Only one of the following can be taken for credit: Stat 109a, Stat 121a, CS 109a, AC 209a.
Recommended Prep: Programming knowledge at the level of CS 50 or above, and statistics knowledge at the level of Stat 100 or above (Stat 110 recommended).
Course Requirements: Not to be taken in addition to Computer Science 109 or Computer Science 109A, or Applied Computation 209, or Applied Computation 209A.

Statistics 110: Introduction to Probability

Joseph Blitzstein
Fall; TTh 1:30-2:45
A comprehensive introduction to probability. Basics: sample spaces and events, conditional probability, and Bayes' Theorem. Univariate distributions: density functions, expectation and variance, Normal, t, Binomial, Negative Binomial, Poisson, Beta, and Gamma distributions. Multivariate distributions: joint and conditional distributions, independence, transformations, and Multivariate Normal. Limit laws: law of large numbers, central limit theorem. Markov chains: transition probabilities, stationary distributions, convergence.
Recommended Prep: Math 1b or equivalent or above.

ETHICS OF HEALTH

First Year Seminar 23H: Medicine in Nazi Germany and the Holocaust—Anatomy as Example for Changes in Medical Science

Sabine Hildebrandt
Fall; W 3-5
This seminar introduces students to the history of Nazi Germany and the Holocaust as an extreme example of antisemitism and racism, and of crimes against humanity and genocide. These included medical crimes, which, thus far, are the most thoroughly documented examples of ethical transgressions of health care professionals. They include forced sterilizations, the "euthanasia" systematic murder program, and forced brutal medical experiments on the living and the dead. However, under conditions of oppression by the same political system, some health care professionals chose to retain the healing powers of medicine. Anatomy in Nazi Germany is a model for ethical transgressions in the medical sciences that reveals the complex relationships between scientists and the Nazi regime. Changes of the traditional anatomical body procurement manifested in the use of many bodies of Nazi victims in teaching and scientific investigations. Research gradually moved from routine studies to murder, from the anatomy lab to the Nazi prison system and then to the concentration camps. Ultimately, anatomists were complicit with the government through their role in the complete destruction of the perceived "enemies" of the Nazi regime. This history of medicine can thus serve as a model for the recognition of patterns and common roots with other histories of discrimination, oppression, and atrocities. Also, there are continuities and legacies from this history that reach into the present and have relevance for today's education and practice in the health professions.
Note: Course open to First-Year Students only.

GENED 1115: Human Trafficking, Slavery, and Abolition in the Modern World

Orlando Patterson
Spring; TTh 1:30-2:45
Why do slavery, human trafficking and other forms of servitude thrive today globally, including in the USA, and what can we do about it? 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.

GENED 1116: Medical Ethics and History

David Shumway Jones
Fall; TTh 10:30-11:45
Consent: Instructor
Class Capacity: 195
Students will encounter the ethical dilemmas of medicine and public health throughout their lives, whether with their own health, or with the health of their families and friends. This course will equip them with the tools of moral philosophy so that they can recognize, critique, and craft arguments grounded in appeals to utilitarianism, deontology, rights, or justice. But the course will focus on historical analysis of the debates so that students understand how social, economic, and political contexts have influenced moral reasoning. By clarifying their own thinking in the classroom, students will be better equipped to engage in the debates and contribute to the ongoing efforts by medicine to relieve human suffering.
Class Notes: This course has an enrollment cap and is a part of the coordinated, ranked-choice Gen Ed lottery. To participate in the lottery, you must request permission to enroll and rank your choices through my.harvard by 11:59p.m. EST Tuesday, August 29, 2023. The Gen Ed lottery will run Wednesday, August 30; if you are successful in the lottery, your course petition in your Crimson Cart will turn to a green check that allows you to enroll. For timely updates and detailed instructions about entering the Gen Ed lottery, please see https://gened.fas.harvard.edu/fall-2023.

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: 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 Health Care

Gabriel Katsh
Fall; W 3-5:45
Class Capacity: 16
Consent: Instructor
This course looks at contemporary debates about health care, with a focus on the ways in which political theory can inform our understanding of its moral and political dimensions. 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 2022 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 freedom. 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
Consent: Instructor
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.
Course Requirements: Anti-req: Cannot be taken for credit by students who have already taken IGA-515.

Sociology 1163: Pursuing Truth and Justice through Action for Health Equity

Flavia Perea
Fall; T 12-2:45
This course will explore the principles and methodologies of liberatory inquiry in the context of research and action to advance health equity. We will examine community-based, participatory, action, and decolonizing approaches to inquiry, and engage with various perspectives on the process, practice, and applications of engaged inquiry to advance health justice. We will discuss epistemology and research paradigms; explore a variety of approaches and methodologies, including Participatory Action Research (PAR), Community Based Participatory Research (CBPR), and indigenous research frameworks; and consider the ethics of engaging with historically and systemically oppressed people and communities. Engaging with voices, perspectives, sources, and materials from beyond the academy will be central to our work to understand how inequity gets under the skin, operates on the body, and how racism, oppression, and systemic injustice are structured and perpetuate injustice in health. Emphasizing health as multidimensional, contextual, and socially determined, we will focus on strategies to advance health justice in urban settings with particular attention to root-cause strategies. We will explore how to apply course concepts to build power for health through community development, capacity building, and community mobilization. Ultimately, we will critically examine how inquiry and action to advance health justice that emphasizes equity, collaboration, participatory

processes, and reciprocity can be a strategy for responding to oppression, colonization, and systems of domination through the pursuit of truth and justice.

Stem Cell and Regenerative Biology 120: Biotech Ethics

Sergio Imparato
Spring; MW 1:30-2:45
This course explores moral issues related to business practices in the fields of healthcare, medicine, genetics, and biotechnology. The class is divided into four parts. The first part of the course draws on foundational concepts of ethics and applies them to biotech entrepreneurship. In the second and third part, we delve into a series of case studies and analyze common moral quandaries faced by well-known biomedical companies. In the fourth part, students develop ad-hoc ethical frameworks that apply to real-life business ideas.
Course Notes: Previous experience in biology and economics is helpful but not necessary.

HEALTH AND DEMOGRAPHY

Environmental Science and Public Policy 173: Water Resources in Developing Countries

Ken Thomas
Spring; MWF 12-1:15
Class Capacity: 10
Consent: Instructor
This course will examine major issues of water resources (i.e. water sources, supply, quality, treatment, use, distribution and storage, policy) in the developing world at various geographic locations and scales. Specific water resources issues will be highlighted through in-depth case studies from Africa, Asia, and Small Island Developing States. Analysis of the hydrological, technological, legal, and geopolitical factors that affect the availability of water for human consumption and agriculture will be explored in all cases. To understand fundamentals in the developing world context, the course will compare how water resources are managed in the developed and developing world. Fundamentals cut across water-related policies, water flows, water sources, water supply, water and wastewater treatment, water distribution, and water storage. The course will emphasize – both quantitatively and qualitatively – the real-world challenges and systemic issues of the developing world that make water resources planning and management complicated.

First Year Seminar 22H: My Genes and Cancer

Giovanni Parmigiani
Fall; Th 3-5
The effect of a person's genetic background on whether they will develop cancer, and when, is at the center of scientific and societal dilemmas which will be explored in this seminar. The seminar will include a brief didactic phase, followed by student-led learning activities and by final debates, moderated by students. Learning will cover genetic inheritance of cancer; cancer evolutionary theories; conceptual and technical notions of probability and risk; and their use in personalized medicine. Debates will emerge from the student's interest. Examples may include: should we test all children at birth? Should we research methods for editing genetic susceptibility to cancer out of embryos? Should race be part of the construction of personalized cancer risk? NASA is both an employer and a health care provider for astronauts: space missions increase astronauts' risk of cancer; should Nasa test astronauts for inherited susceptibility to cancer, and how should they use the information? *Recommended Prep:* There are no strict prerequisites, though some familiarity with the basic concepts of probability and genetics will be very helpful.

GENED 1063: World Health: Challenges and Opportunities

Sue J. Goldie
Spring; MW 10:30-11:45
How do we analyze the health of global populations in a time of unprecedented crisis, and create new policies that address the social, political, economic, and environmental dimensions of health in an increasingly interdependent world? Extraordinary changes in the world present both risks and opportunities to health—global interconnections, shifting demographics, and changing patterns of disease. This course will challenge your assumptions about the world's populations as you discover surprising similarities and unexpected differences between and within countries. By first positioning the concept of health as a prerequisite for strong societies, we explore its connection to human rights, sustainable development, and climate change. Drawing on examples from infectious diseases, maternal and child health, chronic diseases, and injuries, we pay equal attention to the influence of the social, political, and environmental "conditions for health." We consider solutions from within and outside the health sector and interventions at the local, national, and global levels. Throughout the course, you'll be asked to link classroom concepts to contemporary events, applying your analytical skills to design "problem-inspired" products that respond to and motivate action on global health challenges you care about.

Human Evolutionary Biology 1407: The Environment: Health, Human Impacts, and Evolution

Noreen Tuross
Spring; TBA
Class Capacity: 8
Consent: Instructor
We will explore selected examples of human impacts on the environment and the health consequences of an altered environment. In addition, the evidence for environmental interactions with human evolution, the reproductive consequences of environmental modifications and Holocene modifications of landscapes by humans will be discussed. The course is

a seminar that requires a commitment to active participation in weekly classes.
Class Notes: We explore the intersections and impacts of humans on the environment and the reverse. The focus will be on the major transitions in history and evolution that were turning points in the health and demography of humans. The ubiquity of domesticated foods, the heat tolerance of humans, and past and present air pollution are some of the topics covered. This is a reading-intensive seminar with substantial written work required.

Sociology 1046: Life and Death by Design

Jason Beckfield
Spring; MW 3-4:15
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, SOCIETY

African and African-American Studies 197: Poverty, Race, and Health

David Williams
Fall; T 12:45-2:45
This course critically examines the health status of the poor, and of African Americans and other socially disadvantaged racial and ethnic groups in the US. Attention will be focused on the patterned ways in which the health of these groups is embedded in the social, cultural, political, and economic contexts, and arrangements of US society. Topics covered include the meaning and measurement of race, the ways in which racism affects health, the historic uses of minorities in medical research, how acculturation and migration affects health, and an examination of the specific health problems that disproportionately affect nondominant racial groups.
Course Requirements: Course open to Undergraduate Students only.

Anthropology 1900: Counseling as Colonization? Native American Encounters with the Clinical Psy-ences

Joseph Gone
Spring; M 12-2:45
Class Capacity: 20
Consent: 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.

First Year Seminar 23K: Insights from Narratives of Illness

Jerome Groopman
Spring; TBA
Class Capacity: 12
Consent: 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 First-Year Students Only.

First Year Seminar 25N: Finding Connections: Perspectives on Psychological Development and Mental Illness

Nancy Rappaport
Fall; T 3-5
Class Capacity: 12
Consent: 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 First-Year Students Only

First Year Seminar 52N: Misinformation, Disinformation, and BS in Science Communication

Daniel Hartl
Spring; W 12:45-2:45
Class Capacity: 12
Consent: Instructor
It's a jungle out there. The world is awash in hucksters, tricksters, frauds, scammers, grifters, and thieves. And there's no shortage of easy marks, suckers, dupes, and fools. Classic cons like the pigeon drop and three-card monte aimed to heist a bundle from a few. The internet and cable TV have changed the game. Now the goal is to nick a bit from a crowd. You're one of the suckers, so are your friends, so am I, so is everybody. We don't notice we're being scammed because what is being stolen is not our money. What's being stolen is our attention and our time. We're all suckers for clickbait. What's wrong with clickbait is that it leads you down a rabbit hole of misinformation, disinformation, and conspiracy theories that have created and sustained widespread skepticism and mistrust of science and scientists resulting in covid-19 conspiracy theories, vaccine hesitancy, bogus drug treatments, climate change denial, anti-evolution, and so forth. Even the most educated and savvy consumer of information is easily misled in today's complex information ecosystem. This seminar is clickbait vaccine to boost your critical thinking. It is designed to help you identify and refute misinformation, disinformation, and BS rampant on the internet. It will help you recognize sensationalism when science is communicated in the press. It will familiarize you with the main logical fallacies that students and scientists themselves are prone to. As a framework for discussion, we use Bergstrom and West's book "Calling Bullshit" along with supplemental readings.

First Year Seminar 71O: The Heart of Medicine: Patients & Physicians & Experience of Serious Illness in the Age of COVID-19

Susan Block
Spring; T 3-5
Class Capacity: 12
Consent: 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 First-Year Students Only

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

Richard Lee
Fall; MW 9-10:15
Class Capacity: 90
Consent: 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.
Course Notes: You may not take GENED 1053 if you have previously taken SCRB 175.
Class Notes: This course has an enrollment cap and is a part of the coordinated, ranked-choice Gen Ed lottery. To participate in the lottery, you must request permission to enroll and rank your choices through my.harvard by 11:59 p.m. EST Tuesday, August 29, 2023. The Gen Ed lottery will run Wednesday, August 30; if you are successful in the lottery, your course petition in your Crimson Cart will turn to a green check that allows you to enroll. For timely updates and detailed instructions about entering the Gen Ed lottery, please see https://gened.fas.harvard.edu/fall-2023

GENED 1078: Disease, Illness, and Health through Literature

Karen Thornber
Fall; TTh 10:30-11:45
Class Capacity: 75
Consent: Instructor
As healthcare costs soar and considerable suffering from disease and illness continues despite regular advances in medicine, what should we advocate for in our communities, our societies, our nations, and beyond to ease the burden of disease and illness on health professionals, family caregivers, and care recipients alike? Inevitably, at some point in our lives, most of us will develop a health condition that requires medical treatment and care. We also, regardless of our career, are likely to be called on to provide care for individuals (loved ones and/or patients) whose health conditions make it impossible for them to care for themselves. Moreover, as COVID-19 has made glaringly apparent, economic, racial, social, and other inequities mean many members of society are especially vulnerable to serious health conditions. How can we be effective partners in care, both in our personal lives and, for

those in the health professions, in our professional lives? How can we best prepare ourselves to be effective care partners, whether we are the givers of care, the receivers of care, or both? What should our short-term and long-term goals be as individuals, communities, and societies, and how can we best implement these goals? As healthcare costs soar and considerable suffering from disease and illness continues despite regular advances in medicine, what should we advocate for in our communities, our societies, our nations, and beyond to ameliorate if not eradicate racism, sexism, classism, ableism, ageism, ethnocentrism/jingoism, heterosexism, and similar and frequently intersecting forms of oppression, easing the burden of disease and illness on caregivers and care recipients alike? This course provides the ideal space for you to examine, contemplate, discuss, and debate these and similar fundamental questions, which all of us increasingly must face. Class discussions, readings, and written assignments will provide you with the tools to become more effective advocates for and providers of compassionate, empathic care, both now and in the future. Engaging with a diverse range of fiction, drama, creative non-fiction, life writing, and memoirs from five continents by physicians, patients (including physician-patients), activists, and other concerned individuals, the course challenges many fundamental preconceptions regarding disease, illness, health, and care. This course helps us interrogate what it means to promote healing and wellbeing in our personal and professional lives particularly in the current COVID era.

Class Notes: This course has an enrollment cap and is a part of the coordinated, ranked-choice Gen Ed lottery. To participate in the lottery, you must request permission to enroll and rank your choices through my.harvard by 11:59 p.m. EST Tuesday, August 29, 2023. The Gen Ed lottery will run Wednesday, August 30; if you are successful in the lottery, your course petition in your Crimson Cart will turn to a green check that allows you to enroll. For timely updates and detailed instructions about entering the Gen Ed lottery, please see https://gened.fas.harvard.edu/fall-2023.

GENED 1093: Who Lives, Who Dies, Who Cares? Reimagining Global Health

Arthur Kleinman, Salmaan Keshavjee, Anne Becker
Fall; TTh 10:30-11:45

How can health care systems be restructured to provide high quality care even to the poorest and most vulnerable people on our planet? 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, what kind of care is available to help you recover, and whether society believes you deserve it. Recent pandemics have illustrated 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 die from a variety of diseases are often linked to large-scale social forces that render health care systems dangerously weak or inaccessible for many communities. These social forces are often intersectional, and include, but are not limited to, the ongoing effects of systemic racism on racialized subjects, sex and gender discrimination, the devaluation of eldercare, the distribution of health care under neoliberal forms of governance, and extractive social relationships linked to colonial-era and post-colonial power structures. Because these forces define how health and care delivery problems are framed and addressed, now, as ever, it is imperative to develop frameworks and methodologies to identify and understand harmful social configurations that cause illness and suffering, and to intervene effectively. This course goes beyond a narrow focus on the biological basis of disease. Instead, drawing from various social science disciplines, including Anthropology and History of Science, this course takes a novel biosocial approach to reveal how governments, institutions, and histories shape health and well-being. In doing so, this course challenges the conventional assumptions within the field of global health, broadening the understanding of how health inequalities persist over centuries, how the structures of powerful institutions influence the policies they develop, how caregiving and global health are urgent moral practices, and what can be achieved when the needs of patients are put first.

History of Science 1445: Medicine and Health in America

Eram Alam
Spring; TTh 9-10:15

This course surveys major historical developments in medicine and health in the United States during the modern period. We will analyze medicine and health within social, cultural, and political contexts to better understand the relationship between medicine and power. Topics will include: citizenship, nationalism, and imperialism; race, gender, and the body; capitalism and the medical marketplace; professionalization,

expertise, and authority; crises and epidemics; technology and therapeutics; and questions of care.

Mind, Brain, and Behavior 980P: The Role of Music in Health and Education

Lisa Wong
Fall; Th 3-5
Class Capacity: 15
Consent: 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 br 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: Enrollment is via lottery. Preference to juniors in MBB tracks and MBB secondary field. Consult https://mbb.harvard.edu/seminars for lottery deadline, instructions, and link. Course inquiries to lmwong@fas.harvard.edu.

Psychology 980AD: Psychopathology and the Family

Jill Hooley; Katherine Powers
Fall; F 12-2
Class Capacity: 16
Consent: 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.
Course Requirements: SLS20 or PSY1 or Psychology AP=5 or Psychology IB=7 or Psyc S-1 AND PSY18 or PSY1861

Psychology 1009: Psychology of Women

Nicole Noll
Spring; TTh 12:45-2:45
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.
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 1812: Intercultural Perspectives on Trauma

Mayron Pereira Piccolo Ribeiro
Spring; W 12:45-2:45
Class Capacity: 20
Consent: 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.
Course Requirements: SLS20 or PSY1 or Psychology AP=5 or Psychology IB=7 or Psyc S-1 AND PSY18 or PSY1861

Psychology 1813: Technology and Mental Health

Shifali Singh
Fall; Th 3-5
How does screen time relate to changes in emotional states? Can using social media cause depression and disordered eating? How do influencers' online posts affect self-esteem? In what ways can technology improve equity and access in mental health care? We will explore these questions and more in this brand-new course, which will delve into the nuanced ways technology has positively and negatively impacted mental health and wellbeing. For your final project, you will have the opportunity to develop your very own technology-based intervention. Be prepared to think critically about how you and your peers engage with technology!
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 1845: Stigma, Discrimination, and Health

Mark Hatzenbuehler
Fall; MW 3-4:15
What is stigma? How do stigmatized identities and conditions differ from each other? Why do we stigmatize? What are the consequences of stigma for cognitions and emotions, for social relationships, and for health? Through what mechanisms—individual, interpersonal, and structural—does stigma operate to produce adverse health outcomes? How do stigmatized individuals cope with and resist stigma? How can we reduce stigma and its negative effects? In this course we will consider stigma as a fundamental cause of health inequalities across a broad range of phenomena, including (but not limited to) mental illness, sexual and gender diversity, weight, disability, aging, poverty, and immigration status. Students can expect to examine stigma as a predicament that affects nearly all individuals at some point in the life course, and to develop expertise in an individual stigma that is relevant to their personal, academic, and professional interests through a series of focused course assignments.
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.s
Course Requirements: Pre-requisite: SLS20 or PSY1 or Psychology AP=5 or Psychology IB=7 or Psyc S-1

Sociology 1110: Public Health and Environmental Injustice

Monique Ouimette
Spring; TTh 9-10:15
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. 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. Students will examine cultural, economic, regulatory, medical, and scientific factors that contribute to health disparities and environmental injustice. Students will also explore efforts to incorporate environmental justice considerations into health care and public policy reforms.

Spanish 61PH: Spanish for Public Health

Adriana Gutierrez
Spring; 001,003: TThu 12-1:15; 002,004 TThu 1:30-2:45
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

African and African-American Studies 189X: Medicine, Science, and Empire

Jean Comaroff
Spring; Th 3-5
This class examines the changing place of medicine in the long history of modernity. Focusing on key moments the birth of the clinic, the colonial encounter, the consolidation of medicine as profession, the age of genomics and biocapital, and the empire of global health it explores the distinctive role of medical knowledge and practice in the making of modernist persons, identities, economies, and political vocabularies. Readings are drawn from anthropology and the wider social sciences, with cases from Africa, Asia, Europe, and North America. The course is a mix of lecture and discussion.

Anthropology 2797: Theory and Practice of Social Medicine

Mercedes Becerra, Lindsey Zeve, Salmaan Keshavjee, David Shumway Jones
Fall; M 12-2:45
Social medicine is a field of study and practice that uses insights from the social sciences to improve medical theory and the delivery of health care in communities and global health. This course will explore the historical foundations of social medicine in the 19th and 20th centuries in Europe, Latin America, Asia, Africa, and North America. It will then examine case studies of social medicine in the contemporary world that confront the challenges of post-colonialism, neoliberalism, racism, and care-giving.
Course Notes: Advanced undergraduates welcome.
Class Notes: This class will meet in Apthrop House (10 Linden St, Cambridge).

Classical Studies 165: Medicine in the Greco-Roman World

Mark Schiefsky
Fall; T 12:45-2:45
Theories and practices of health and healing in the ancient Greco-Roman world, with emphasis on the relationship of medicine to philosophy. Key themes include medicine as a systematic discipline or art, dissection and the knowledge of human anatomy, gynecology and the female body, and the relationship between bodily and mental conditions. All readings will be in English and include both ancient texts (e.g. the Hippocratic writers, Galen, Plato, Aristotle) and modern secondary sources. The course welcomes students in any field of study, including the sciences, and encourages the drawing of connections between ancient medicine and modern medical practice. Some knowledge of philosophy and/or the ancient world is helpful but not required.

East Asian Studies 170: Medicine and the Self in China and in the West

Shigehisa Kuriyama
Spring; MW 10:30-11:45
Comparative historical exploration of the striking differences and unexpected similarities between traditional conceptions of the body in East Asian and European medicine; the evolution of beliefs within medical traditions; the relationship between traditional medicine and contemporary experience.
Course Notes: This course fulfills the East Asian Studies concentration “Historical Survey” requirement.

English 102M: Introduction to Old English: Charms, Herbals. Folk Medicine, Miracle Cures

Daniel Donoghue
Fall; TTh 10:30-11:45
This course combines language study with the investigation of a critical theme. The narratives set for translation provide a thematic coherence as we dig into the language of Old English, which is the vernacular used in England from the sixth century until about 1100. Although some of its features remain recognizable today, Old English needs to be learned as a foreign language with its own spelling, pronunciation, syntax, and so on. The term begins with an emphasis on grammar, which will be covered in graduated steps until midterm, after which the readings and translation will take up more of our class time.
The unifying theme of the readings will be remedies to preserve the health of the human body. Old English literature offers an abundance of medical texts, including herbal remedies and magical incantations. Some come from ancient Greek and Latin sources, while others are local folk recipes. Some are fantastical, some are known to be effective, and others clearly rely on the placebo effect. The readings will move from simple prose to intricate poetry. An end-of-term project will assign each student a short Old English magical charm—think of it as a human utterance charged with power to control nature. With the help of personal coaching, each student will produce a literal and a creative translation.

English 149SB: Literature, Science, and the Body in 18th-Century Britain

Carlisle Yingst
Fall; MW 12-1:15
What is the relation between the humanities and the sciences? What separates these broad fields of knowledge, and how do ideas move between them? This course will consider these and related questions by turning back to a moment when the boundaries between disciplines were not so clear, and by focusing on a smaller, but especially rich, site for considering their interactions: medicine and writing about the body in eighteenth century Britain. In exploring this time and place—characterized by increasing public access to scientific knowledge, major innovations in literary culture, and continuous interactions between them—the course will take as its starting point the waning of humoral theory and the emergence of the British novel, continue through the Enlightenment foundations of modern medicine, and conclude with a book often read as issuing a humanistic challenge to science: Mary Shelley's Frankenstein. We'll read work by physicians, novelists, and poets, as well as by writers who brought literature and medicine together, including Tobias Smollett (whose surgical training shaped his novels' descriptions of the body), Erasmus Darwin (whose poetry about the natural world was deeply intertwined with his medical studies) and William Earle (whose work as a physician informed his fictional depiction of Jamaican religion and science). Along the way, we'll consider, among other things, plague narratives; accounts of illness and disability; colonialism and indigenous medicines; the popular circulation of race-science and -medicine; and anatomical and literary representations of gender, sex, and sexuality. Other readings may include Cavendish, Defoe, Haywood, Sancho, Sterne, Austen, and the contemporary novelist Jordy Rosenberg, as well as shorter selections from medical and literary periodicals; personal letters and diaries narrating illness; and physician's notes, medical satires, writings on popular medicine, and other related material.

First Year Seminar 24G: A Brief History of Surgery

Frederick Millham
Fall; Th 6-8
Class Capacity: 12
Consent: Instructor
Was Surgery practiced in the Stone Age? Twenty six hundred years ago at the dawn of recorded history, Egyptian surgeons operated on patients by the shores of the Nile. What diagnoses were they making? What treatments did they offer? How did they understand human anatomy and physiology? A millennium later, the Hippocratic physicians emerged on the Aegean Island of Cos. These physicians left us carefully stated surgical principles based, at least partly, on observation and measurement. Why did they record their wisdom in the form of aphorisms? At around the same time, Shushruta, in what is now India, appears to have offered surprisingly modern surgical care to his patients. Who was he? In the second century CE Galen of Pergamum bursts on to the scene, intending to restore Hippocratic orthodoxy. Why was surgical thinking for nearly two millennia dominated by this his, often erroneous, teaching? The Islamic Golden Age, an explosion of scientific and medical discovery, is a key to our understanding of all that follows in surgical history. Why is this period overlooked today? How did the exposure of Galen's anatomical imprecision by Vesalius in 1543 and his absurd physiology by Harvey in 1628 begin a Medical Enlightenment? Why did it take until the 19th century for surgeons solve the riddles of anesthesia and antisepsis? What were the roles of surgeons in the Eugenics movement and the Holocaust? Is the advice of the Hippocratic physicians that "To understand surgery one must go to war" true in the 21st Century? Our study will examine these questions and many more. We will visit the site of the first use of ether anesthesia and explore the human body in the anatomy lab at Harvard Medical School. We will admire rare first additions of the great works of surgical history at the Countway Medical Library. From time to time we will be joined by doctors with expertise in specific areas such as anesthesiology, combat surgery, and anatomy.
Course Requirements: Course open to First-Year Students Only

First Year Seminar 26K: Transformative Ideas in Brain Science: War, Technology, and Disease Pioneered Discovery

Jeffrey Macklis
Fall; Th 3-5:45
Class Capacity: 12
Consent: Instructor
This seminar will offer an integrated historical-neurobiological-neurological introduction to foundational and transformative ideas in the ~3,700 year history of brain science, neuroscience, and "lay" neurology—all accessible to freshmen with interests from neuroscience and (molecular, developmental, organismic, evolutionary, or regenerative) biology to

history and philosophy of science to neuroeconomics and medicine. No background will be assumed. Rather, a series of historical vignettes and sources will be tied to modern understanding of core elements of the nervous system, its organization, function, and modes of investigation and manipulation. Selected historical contexts, often involving war, disease, serendipity, and technology advancement, will be highlighted as advancing knowledge in surprising ways. An inter-disciplinary approach will benefit from each student bringing insights from their own reading of primary source and history of science texts, to be added to in-session discussion, with moderation and direction from me (JDM). We will visit a number of the Harvard Collections and museums, including the Museum of Comparative Zoology, Harvard Herbaria, Houghton Rare Books Library, History of Science Collections, the HMS Warren Anatomical Museum collection (Phineas Gage's skull and railroad tamping rod, among much more), the Harvard collection of historical scientific instruments (advances in microscopy, electrical measurement, e.g.), and the state-of-the-art Center for Brain Science human functional brain imaging facility, with each visit providing context for the week.
Recommended Prep: No background will be assumed.
Course Requirements: Course open to First-Year Students only.

First Year Seminar 72R: Mindfulness: A Path to Success, Happiness, and Health

Ellen Langer
Spring; T 9:45-11:45
Although unaware of it, most people are mindless much of the time. No matter what we are doing, we are doing it mindfully or mindlessly. Mindfulness is easy, fun, and energy begetting and it doesn't require meditation. We will read and discuss the what, the why and the how of being mindful and will learn a new way of approaching our lives. Some 40 years ago, researchers were concerned with how people were thinking. At that time, we discovered that much of the time, many of us are not thinking at all. Thus began the study of mindlessness and mindfulness, characterized simply as the process of actively noticing new things. When you do that, it puts you in the present. It makes you more sensitive to context and perspective. It's the essence of engagement. We come to understand that thinking is not stressful; what's stressful is all the mindless negative evaluations we make, that we won't be able to solve problems, that the world is unstable, etc. We believe that if only we could keep things the same, we'd be able to control them. But since everything is always changing, that doesn't work. Instead, we study increasing mindfulness to increase our well-being, success, and health. This seminar uses the lens of socio-cognitive mindfulness (without meditation) to explore rationality, stress, risk-taking, helplessness, decision making, interpersonal relationships, health, and education. Students will learn how to become more mindful and, as a result, less stressed, healthier, happier, and more comfortable making decisions.

First Year Seminar 73C: Race Science: A History

Alejandro de la Fuente
Fall; W 9:45-11:45
"Race," most social scientists and well-informed people agree, is a social construction with no basis in biology. It is an invention, a political instrument of power and subordination, deployed to naturalize social hierarchies. Yet "race" and racially based understandings of human difference continue to shape how we identify, classify, and group individuals. Scientific studies in various fields, from medicine to psychometric assessments of intelligence, continue to gather racial information for research purposes. Claiming strict adherence to data and the truth, some of these studies conclude that because of evolutionary and environmental influences, human groups are in fact different and that those differences are grounded in biology. In order to engage this body of knowledge critically, it is indispensable to examine the central claims of this "science," how such claims have evolved over time, and their policy implications. To start, should scientists even study "possible links between race, gender, and intelligence," as a top scientific journal, Nature, asked in 2009? Our seminar studies the development of "race science" from the 18th century to the present. Using a variety of primary and secondary sources, we examine the research questions pursued by these scientists, their possible merits, and policy implications. We will devote special attention to the emergence of eugenics, the science of "racial improvement," in Europe and the United States, and its tragic development in Nazi Germany. The final segment of the seminar looks at scientific racism after World War II and to the possible connections between race and recent genomic research.

GENED 1179: Psychotherapy and the Modern Self

Elizabeth Lunbeck
Spring; TTh 10:30-11:45
How can we understand the appeal of psychotherapy, widely recognized as the preferred antidote to human

unhappiness and misery, and what does it offer that friends, family, self-help, and psychopharmacological 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
Fall; TTh 3-4:15
Class Capacity: 42
Consent: 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 15U: The Means of Reproduction: Health, Bodies, Technologies

Tara Suri
Spring; W 3-5
Class Capacity: 15
Consent: Instructor
How does our understanding of the past change when we center the politics of reproduction? This seminar invites students to approach 20th/21st century global history through the history of reproductive technology. Each week, we will follow specific technologies – including IUDs, pills, vacuum aspirators, and sperm banks – across different geographies. We will situate the development and use of these technologies in relation to racialized histories of colonialism, feminist movements, Cold War conflicts, postcolonial state-making, and contemporary right-wing nationalisms. We will ask: how have ideas about reproductive technologies mobilized and remade conceptions of race, gender, sexuality, class, caste, and ability? The course title is inspired by a text on the syllabus, Michelle Murphy's Seizing the Means of Reproduction: Entanglements of Feminism, Health, and Technoscience (2012).

History 97Q: "What is History of Public Health?"

George Aumoithe
Spring; T 12-2:45
Class Capacity: 15
Consent: Instructor
Whether through contraception, masking, prophylaxis, sanitation, disaster response, food recall, mandatory vaccination, viral testing, and more, we live the history of public health every day. What are, however, the historical roots of a government mandate that ranges from persuasion to coercion? What happens when state police power compels behavioral changes with consequences for individual autonomy and economic life? How do governments navigate the quandary of limiting individual freedom to protect collective health? How much power do they truly wield, over whom, and with what effect? What are public health's limits in the face of popular opposition? To answer these questions, this seminar will explore signal cases and approaches in the history of public health focused on the permeable

boundaries of disease surveillance and biopower from pre-modern to modern times.
Course Notes: Required of all History concentrators in the spring term of their sophomore year and open to all secondary field students. This course may not be audited or taken Pass/Faily. It enrolls prior to shopping period through the History concentration. Please contact the ADUS in History if you wish to enroll without being a concentrator in History.

History of Science 1458: Sick and Tired of Being Sick and Tired: A History of Health Disparities in America

Evelynn Hammonds
Fall; M 12:45-2:45
Class Capacity: 15
Consent: Instructor
Since the arrival of Africans from Africa to America, their health and health care has been a critical issue for the nation. From the era of slavery to the present, African Americans have been disproportionately burdened by disease and ill health. Health disparities are the "inequalities that occur in the provision of healthcare and access to healthcare across different racial, ethnic and socioeconomic groups." This course examines this issue over the long time frame from the 17th century to the present. Currently, compared to the white population, African Americans are at an overall greater risk for many serious and life threatening diseases. This course will examine how these disparities emerged over time. It will explore the strategies and practices that African Americans and other ethnic groups employed to improve their health care. It will also examine the ways that cities, states and the federal government supported or ignored the health of African Americans and other marginalized communities. We will give special attention to the impact of the COVID-19 pandemic on these communities.

Psychology 980JO: Understanding Autism

Jill Hooley; Katherine Powers
Spring; F 12-2
Class Capacity: 16
Consent: 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.
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.

South Asian Studies 104: The Body in Indian Medicine

Martha Selby
Fall; T 3-5:45
Class Capacity: 20
Consent: Instructor
What does it mean to inhabit a body in India? This is the primary question that we will attempt to answer during the course of the semester in this seminar. The readings and discussion over the course of the term will parallel the development of the human being from conception, infancy and childhood, adulthood, and sexuality, and will end with aging and death. We will take an interdisciplinary approach and will examine textual materials from an extensive range of sources and time periods. Sources will include selections in translation from medical literature from India's Ayurvedic traditions as well as readings from religious narratives that deal directly with issues of embodiment and provide powerful metaphors for it. We will also be drawing largely on sociological and anthropological studies of the different forms that embodiment takes, from metaphysical issues on what it means to be "alive" or "dead" and the human body's connection to land and landscape to careful explorations of the body's outer surfaces in terms of ritual, ascetic, and strictly sartorial concerns with adornment and fashion. We will also explore the fascinating interfaces between bodybuilding and nation building in India.

POLITICS OF HEALTH

First Year Seminar 27I: Global Health: Comparative Analysis of Healthcare Delivery Systems

Sanjay Saini
Fall; M 12-2:45
Class Capacity: 15
Consent: 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 First Year Students Only

GENED 1092: American Society and Public Policy

Theda Skocpol, Mary Waters
Fall; MW 12-1:15
How do patterns of American economic, political, and social inequality shape our policy responses to working families, immigration, and poverty? In a period of contentious politics, Americans are debating fundamental issues about economic wellbeing, social justice, and the state of our democracy. How can the nation expand opportunity and security for workers and families following years of rising socioeconomic inequalities and shifts in the relationship of families to work? What is the relationship between rising economic inequality and rising political partisanship? How has ongoing partisan polarization and the design of our political institutions affected U.S. responses to social issues? How do we regulate immigration and citizenship and cope with surges in refugees and asylum seekers? Controversies in these areas are bitter and persistent, and this course will introduce students to the ways the United States has dealt with each set of challenges.

History 1957: Healthcare and the Welfare State

George Aumoithe
Fall; W 12:45-2:45
Class Capacity: 15
Consent: Instructor
This conference course examines state-based guarantees to healthcare through an initial comparative analysis of different welfare states, largely focused on the United States' experience. It asks why the United States has not guaranteed a right to healthcare, unlike most other advanced, industrialized, and wealthy countries. Within the United States' federated system, the place of healthcare varies widely amidst other demands for social insurance, which includes unemployment benefits, parental leave, childcare, and pensions. From comparative to national perspective, this course engages American political economy's public-private mix; anti-immigration sentiments and segregation's limits on national health insurance; the Civil Rights Movement's healthcare reforms; the persistent reproduction of health inequality despite de jure desegregation; resistance to and breakthroughs for Medicaid expansion in the contemporary era; and prospects for future reform.

History of Science 1441: On Health and Migration

Eram Alam
Fall; W 12-2:45
Class Capacity: 20
Consent: Instructor
During the twentieth century, unprecedented human mobility has raised significant questions regarding migration and health. Whether coerced or voluntary, these migratory flows reverberate through individuals, communities, populations, environments, and the body politic in unexpected ways. This course will focus on the relationship between health and migration and ask the following questions: How are moving bodies named and managed? What are the political, economic, juridical, and medical implications of movement? How is risk defined and constructed in relation to migration? Readings will include case studies from around the world, supplemented with theoretical and literary texts.

Social Studies 98WD: The Politics of Health and Medicine in the United States

Matthew Reichert
Fall; W 9:45-11:45
Class Capacity: 10
Consent: Instructor

How does politics shape health in America? In this multidisciplinary class, students explore the historical origins of institutions like Medicare and Medicaid, the FDA, the CDC and the NIH. We seek to explain the politics of why American healthcare policy differs so dramatically from its peers, with narrowly targeted public programs and a dominant private insurance sector. Students learn how epidemiologists and clinicians today think about social determinants of health, especially racial disparities in care and outcomes. We conduct deep dives into topics like the Affordable Care Act, Covid-19, and the medical ecosystem here in Boston. Finally, students also observe how public health researchers make use of social science methods, from the clinical trial to the ethnographic case study. This is a junior tutorial.
Course Notes: This course will be lotteried and is open to non-concentrators if space permits.

SCIENCE OF HEALTH AND DISEASE

First Year Seminar 25X: How the Brain Becomes the Mind: A Bottoms-Up and Top-Down Perspective

Thomas Byrne
Spring; T 6-8
Class Capacity: 12
Consent: 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 First Year Students Only

First Year Seminar 51M: Skin, Our Largest, Hottest, and Coolest Organ: From Cancer to Cosmetics

David Fisher
Fall; W 6-8:45
Class Capacity 12
Consent: Instructor
Skin provides a protective barrier that is vital to survival of all multicellular organisms. Its physical properties have been exploited for centuries, from clothing to footballs, and yet skin is a vibrant and dynamic organ that responds to environmental signals in myriad ways. Skin protects humans from toxic exposures but can also be an intrinsic source of dangerous diseases. While its defects only rarely kill humans, its imperfections can cause misery and discomfort, ranging from subtle annoyances to depression and loss of self-esteem. It is a source of immense pleasure or excruciating pain. This seminar will provide a series of exposures at an introductory level, to distinct topics in skin biology. They will exemplify the diverse and vibrant nature of cutaneous networks and signals, through the lens of commonly recognized topics such as tanning, hair, sweat, cancer, cosmetics, cancer, and infections.
Recommended Prep: None. Prior AP-Biology may be helpful but not required.
Course Requirements: Course open to First Year Students Only

First Year Seminar 73C: Race Science: A History

Alejandro de la Fuente
Fall; W 9:45-11:45
“Race,” most social scientists and well-informed people agree, is a social construction with no basis in biology. It is an invention, a political instrument of power and subordination, deployed to naturalize social hierarchies. Yet “race” and racially based understandings of human difference continue to shape how we identify, classify, and group individuals. Scientific studies in various fields, from medicine to psychometric assessments of intelligence, continue to gather racial information for research purposes. Claiming strict adherence to data and the truth, some of these studies conclude that because of evolutionary and environmental influences, human groups are in fact different and that those differences are grounded in biology.
In order to engage this body of knowledge critically, it is indispensable to examine the central claims of this “science,” how such claims have evolved over time, and their policy implications. To start, should scientists even study “possible links between race, gender, and intelligence,” as a top scientific journal, Nature, asked in 2009?
Our seminar studies the development of “race science” from the 18th century to the present. Using a variety of primary and secondary sources, we examine the research questions pursued by these scientists, their possible merits, and policy implications. We will devote special attention to the emergence of eugenics,

the science of "racial improvement," in Europe and the United States, and its tragic development in Nazi Germany. The final segment of the seminar looks at scientific racism after World War II and to the possible connections between race and recent genomic research.

GENED 1027: Human Evolution and Human Health

Daniel Lieberman, Bridget Alex
Spring; TTh 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 today? How can we use principles of evolution to promote health and prevent disease? To address these questions, this course reviews the major transitions that occurred in human evolution, from the divergence of the ape and human lineages some 8 million years ago to the origins of Homo sapiens about 300,000 years ago. We also consider the many health effects of the recent cultural and technological transitions from hunting and gathering to farming and then to industrialization.

GENED 1038: Sleep

Charles Czeisler, Frank Scheer
Spring; T 3-5
How does sleep affect your health, your safety, and our society? 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
Fall; TTh 9-10:15
What is a human individual deserving of rights? 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 1129: Infectious Disease and Social Injustice

Donald Goldmann
Fall; MW 1:30-2:45
Class Capacity: 75
Consent: Instructor
Could we have been better prepared to mitigate the inequitable impact of COVID-19 in the US and globally had we learned the social injustice lessons from previous pandemics and epidemics of the diseases we will study? Amazing scientific and public health advances have transformed our understanding, prevention, and treatment of infectious diseases—discoveries so profound that they were unimaginable even a generation ago. Yet the global burden of infections remains prodigious, disproportionately affecting low-income countries and vulnerable populations in the United States and other developed economies. The COVID-19 pandemic has laid bare these stark inequities. This course prepares students to understand and mitigate the impact of current and future infectious diseases and pandemics through the study of major infections, including COVID-19, cholera, malaria, tuberculosis, syphilis, smallpox, polio, yellow fever, and plague. We provide sufficient clinical, biological, and epidemiological background for students to understand why these infections have had such dramatic effects and how they can be controlled. Rather than merely reciting grim statistics and body counts, we illustrate their impact through the lenses of history, literature, film, and drama. We celebrate how these infections have stimulated revolutionary scientific advances, but also explore the darker side of the story. Advances in prevention and treatment have left large segments of the global population behind. Under the veneer of stunning progress lie the realities of stigmatization, bias, exclusion, shameful human experimentation, and social injustice. The COVID-19 pandemic vividly illustrates these historical lessons.

Class Notes: This course has an enrollment cap and is a part of the coordinated, ranked-choice Gen Ed lottery. To participate in the lottery, you must request permission to enroll and rank your choices through my.harvard by 11:59 p.m. EST Tuesday, August 29, 2023. The Gen Ed lottery will run Wednesday, August 30; if you are successful in the lottery, your course petition in your Crimson Cart will turn to a green check that allows you to enroll. For timely updates and detailed instructions about entering the Gen Ed lottery, please see https://gened.fas.harvard.edu/fall-2023.

Human Evolutionary Biology 1328: Clinical Comparative Medicine: Evolutionary Perspectives on Mental and Physical Health

Barbara Natterson-Horowitz
Spring; TBA
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.

Human Evolutionary Biology 1410: Gut Microbiome and Human Health

Rachel Carmody
Fall; W 12:45-2:45
Class Capacity: 20
Consent: Instructor
Microorganisms residing in the human gastrointestinal tract are as numerous as our own cells and together encode at least 150 times as many unique genes. In this research seminar, we explore gut microbial contributions to human physiology in states of health and disease. We consider how the human gut is colonized, the factors shaping the structure and function of the gut microbiome, and the pivotal roles of the gut microbiome in digestion, energy regulation, immunity, development, drug metabolism, and behavior. We evaluate fast-growing evidence for the gut microbial modulation of metabolic syndrome, cardiovascular disease, cancer, and neurodevelopmental and neurodegenerative disorders, and discuss prospective microbiome-targeted approaches for the prevention and treatment of human disease. The weekly three-hour lab will introduce students to experimental, bench and computational techniques used to investigate the gut microbiome, enabling students to collaborate on a novel research project that dovetails with topics discussed in seminar.
Course Notes: This course fulfills the research seminar requirement for Human Evolutionary Biology. Preference will be given to Human Evolutionary Biology concentrators fulfilling a research seminar requirement and Human Evolutionary Biology graduate students.
Class Notes: Th is course will meet in Peabody 52H.
Recommended Prep: Life Sciences 2 or permission of instructor.

Life Sciences 2: Evolutionary Human Physiology and Anatomy

Daniel Lieberman, George Lauder, Andrew Biewener, Joanne Clark Matott
Fall; MWF 12-1:15
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.

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

William Milberg
Spring; T 3:45-5:45
Class Capacity 14
Consent: 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.
Class Notes: Enrollment via lottery. Preference to juniors in MBB tracks or in MBB secondary field. Consult https://mbb.harvard.edu/seminars for lottery deadline, instructions, and link. Course inquiries to william_milberg@hms.harvard.edu.

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: 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.
Class Notes: Enrollment is via lottery. Preference to juniors in MBB tracks or in MBB secondary field. Consult https://mbb.harvard.edu/seminars for lottery deadline, instructions, and link. Course inquiries to dsilbersweig@bwh.harvard.edu.

Mind, Brain, and Behavior 980T: Sleep and Mental Health

Edward Pace-Schott
Spring; M 3:45-5:45
Class Capacity: 15
Consent: Instructor
The scientific study of sleep is an area of research that is both highly diverse and among the most interdisciplinary and unifying of topics in psychology and neuroscience. In the past several decades, exciting new discoveries on the neurobiology of sleep have been facilitated by technologies such as functional neuroimaging and molecular genetics. Nonetheless, sleep remains mysterious and controversial and, remarkably, there still is no generally agreed upon function for this behavioral state that occupies one third of our lives! Sleep science exemplifies the translational approach in biomedical science whereby human and animal research together continually advance the field of sleep medicine. In this seminar, lectures during the first half of each class will provide overviews of the physiology and behavioral neuroscience of sleep. The second half of each class will be devoted to student-led discussions of assigned study questions as well as free discussions. In a short term paper, students will research in depth a topic of their choice that they find particularly interesting related to sleep neuroscience or mental health. Students will also briefly present what they have learned about their topic during the final class meetings. Some topics students might choose are described in the following paragraph. In addition, students will keep a nightly sleep and/or dream diary for 2-3weeks at some point during the semester in order to learn more about sleep from their own experiences. They will then describe what they have observed in a short essay. In the past, students have found this exercise to be especially interesting. Lastly, there will be a short open-book, unlimited-time final exam on material from the lectures. Topics for term papers might include the characteristic abnormalities of sleep in mood, anxiety, psychotic, addictive or neurodevelopmental disorders. Scientific findings increasingly point to the importance of sleep for mental health and optimum performance, as well as to sleep disruption as both a result and a contributing cause of mental illnesses. Thus, one might focus on the contribution of primary sleep disorders to psychiatric and neurological illness, such as the circadian rhythm disorders in bipolar illness or insomnia as a risk factor for mood and anxiety disorders. Still other topics might focus on the contribution of normal sleep to emotional

regulation, memory consolidation, and cognitive performance. For those with more cellular neuroscience interests, topics might focus on linkages between sleep and immunity or the role of sleep in disposal of abnormal proteins as it relates to neurodegenerative diseases.
Class Notes: Enrollment is via lottery. Preference to juniors in MBB tracks or in MBB secondary field. Consult https://mbb.harvard.edu/seminars for lottery deadline, instructions, and link. Course inquiries to epace-schott@mgh.harvard.edu.

Molecular and Cellular Biology 60: Cellular Biology and Molecular Medicine

Dominc Mao, Vladimir Denic, Emma Nagy
Fall; MW 10:30-11:45
MCB 60 provides an introduction to the principles of molecular and cellular biology and their connections to biomedicine. The course explores how medical syndromes provide insights into biological processes and how biological mechanisms underlie human disease and physiology. Topics range from DNA repair, protein folding and vesicle transport to metabolism, cell migration, and cancer. Content for lecture topics comprising of reading and viewing material will be released weekly followed by mandatory, interactive live sessions with the instructors. Weekly sections will combine a laboratory that focuses on experimental design and data analysis, primary literature reading, and review of lecture materials.
Recommended Prep: LS1B recommended
Course Requirements: Prerequisite – LS1A, LPSA, or LS50

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 Hartl, Robin Hopkins
Fall; TTh 10:30-11:45
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
Spring; MW 10:30-11:45
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.
Course Requirements: SLS20 or PSY1 or Psychology AP=5 or Psychology IB=7 or Psyc S-1

Psychology 980AC: Mood Disorders

Jill Hooley, Katherine Powers
Fall, Th 9:45-11:45
Class Capacity 16
Consent: 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.
Course Requirements: SLS20 or PSY1 or Psychology AP=5 or Psychology IB=7 or Psyc S-1 AND PSY18 or PSY1861

Psychology 980T: Eating Disorders

Rebecca Shingleton
Fall; T 9:45-11:45
Class Capacity: 16
Consent: Instructor
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 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 10:30-11:45
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 12:45-2:45
Class Capacity: 16
Consent: 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.
Course Requirements: SLS20 or PSY1 or Psychology AP=5 or Psychology IB=7 or Psyc S-1 AND PSY18 or PSY1861

Stem Cell and Regenerative Biology 145: From Cells to Tissues, in Sickness and in Health

Ya-chieh Hsu
Fall; TTh 10:30-11:45
Every cell is a part of a larger "community", working together to enable tissue function. This course will explore the principles of building complex tissues from cells. How do cells know what tissues to make and when to make them? How do cells communicate with one another? What diseases can arise when these principles go awry? How can we build tissues in the lab? In addition to lectures, students will engage deeply in primary literature.
Recommended Prep: One year of life sciences introductory sequence – either [LIFESCI 1A / LPS A and LIFESCI 1B] or LIFESCI 50; SCRB 10, SCRB 50 or MCB 60, or permission of the 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: 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 185: Understanding Mental Illness from the Perspective of Brain Development

Paola Arlotta, Steven Hyman
Spring; TTh 12-1:15
What is mental illness? How well can distinguish illness from normal variation in cognition and behavior? Why do most cases begin by age twenty? This course will explore mechanisms underlying neuropsychiatric disorders through the lens of autism spectrum disorder, which begins in early childhood, and schizophrenia, which begins during adolescence. In exploring vulnerability and pathogenesis, the course will weave together material that spans human genetics and environmental exposures, human brain development and neural circuit formation, and remodeling of brain circuits by experience. Given the complexity of the brain and its disorders and the limited access of scientists to living human brains the course will also explore and evaluation our sources of knowledge, our model systems such as human brain organoid models, and our technologies such as brain-computer interfaces. The course will highlight experimental approaches poised to elucidate disease mechanisms and deliver much needed therapeutics for some of the most devastating pathologies of our time.

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 consider new and emerging strategies to delay or reverse this process.
Recommended Prep: Life and Physical Sciences A or Life Sciences 1A; Life Sciences 1B, SCRB 10, MCB 60

Stem Cell and Regenerative Biology 195: The Translational Science of Stem Cells: Present and Future

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 treatments, including 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.
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, Julie Park
Fall; MW 3-4:15
New medical therapies promise to change not only quality of life and life expectancy, but even what it means to be human. And yet huge gaps remain between fundamental sciences and translation to the clinic. We will explore traditional and cutting-edge themes in therapeutics and their applicability to medical needs. Discussions range from understanding the mechanism of action of today's drugs to the possibilities for changing the very nature of our brains and genomes, along with the ethical dilemmas these opportunities bring with them. By engaging in active discussions with leading scientists and biotechnologists, students will garner insight into how advances in fundamental science can be translated into new therapeutics, along with the limitations faced.
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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