

The Blue Book

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

2016–2017

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Contents

What Can You Expect from Global Health
and Health Policy? **3**

This Booklet **4**

Secondary Field Requirements **5**

Course Listings by GHHP Category

Foundational Courses **6**

Economics of Health **7**

Engineering Sciences and Statistics **9**

Ethics of Health **13**

Health and Demography **17**

Health, Culture, and Society **19**

History and Practice of Medicine **25**

Politics of Health **29**

Science of Disease **31**

Index of Courses

Courses Offered in 2016-2017 **39**

Bracketed Courses 2016-2017 **41**

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 three schools and 27 FAS departments, representing the array of perspectives on global health topics, informing 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-income 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.

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 courses that are listed in the 2016-17 online course catalogs from several Harvard Schools. Since the terms and times in which courses are offered can change from time to time, students should consult the online catalogs available from the different Harvard Schools for the most accurate, up-to-date information. Note that courses that were offered previously and count for GHHP credit are not listed in this document, but a listing of them can be found on our website at <http://ghhp.fas.harvard.edu/courses-0>.

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 the request to ghhp@fas.harvard.edu, attach a syllabus, and indicate which requirement within the GHHP Secondary Field you believe the course satisfies. Note that the only HSPH courses listed in the Blue Book are those that have been petitioned previously. It is likely that the majority of courses offered at HSPH, once petitioned and reviewed, would count for GHHP; however, many courses offered at HSPH 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. Students wishing to cross-register should consult the discussion of cross-registration in the *FAS Handbook for Students* or follow directions on this website: <https://courses.harvard.edu/crossregistration.html>

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 contact us at ghhp@fas.harvard.edu.

Harvard Secondary Field in Global Health and Health Policy Requirements

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

One Foundational Course:

- Empirical and Mathematical Reasoning 20: The Business and Politics of Health
- Societies of the World 24: Global Health Challenges: Complexities of Evidence-Based Policy
- Societies of the World 25: Case Studies in Global Health: Biosocial Perspectives
- United States in the World 11: U.S. Health Care Policy

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 the student writes an additional thesis chapter on the global health or health policy implications of his/her 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:

Health Policy

- Economics of Health
- Ethics of Health
- Health and Demography
- Health, Culture, and Society
- History and Practice of Medicine
- Politics of Health

Science of Disease

- Engineering Sciences and Statistics
- Science of Disease

Course options for the eight categories are listed in this Blue Book. Note that the eight categories are divided into two areas, Health Policy and Science of Disease. 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 required research component.)
- 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

[GEN ED: Empirical and Mathematical Reasoning 20: The Business and Politics of Health]

David Cutler

Likely to be offered in 2017

Health and medical care pervade every aspect of our lives. This course uses quantitative methods (graphical analysis, algebra, data analysis) to examine issues related to health, disease, and systems for delivering health care. Topics to be covered include differences in health between rich and poor countries, differences in types of medical care and who receives it, and the political context for reforming health care policy. Techniques for analysis will be developed and demonstrated in class and section. The course uses examples from a variety of international settings, but focuses mainly on health and health care in the US.

Course Notes: This course counts for Ec concentration credit. Economics concentrators wishing to obtain writing credit for this course will need to write a term paper that uses Economics 10 concepts. This course, when taken for a letter grade, meets the General Education requirement for Empirical and Mathematical Reasoning or United States in the World, but not both.

GEN ED: Societies of the World 24: Global Health Challenges: Complexities of Evidence-Based Policy

Sue J. Goldie

Spring; T 2-5

Class Capacity: 300

Consent Required: Instructor

This course introduces the global health challenges posed by failure to adequately reduce infections, malnutrition, and maternal-child health problems in the most vulnerable populations, escalating rates of non-communicable diseases/injuries, and emerging health risks that cross national boundaries. We will assess social responses to these challenges at the community, national, and global levels. Through an understanding of population health measures, we will examine patterns of disease/mortality between and within countries, capture important time trends, and identify determinants of health inequalities. While emphasizing

science driven policy, comparative case examples will illuminate influential systemic factors, health system performance, and the economic/social/ political climate. *Course Notes:* This course, when taken for a letter grade, meets the General Education requirement for either Societies of the World or Empirical and Mathematical Reasoning, but not both.

[GEN ED: Societies of the World 25: Case Studies in Global Health: Biosocial Perspectives]

Arthur Kleinman, Anne Becker, Paul Farmer, Salmaan Keshavjee

Likely to be offered in 2017 Fall

Examines, through lectures and case-based discussions, a collection of global health problems rooted in rapidly changing social structures that transcend national and other administrative boundaries. Students will explore case studies (addressing AIDS, tuberculosis, mental illness, and other topics) and a diverse literature (including epidemiology, anthropology, history, and clinical medicine), focusing on how a broad biosocial analysis might improve the delivery of services designed to lessen the burden of disease, especially among those living in poverty.

Course Notes: Course counts as Social Anthropology.

GEN ED: United States in the World 11: U.S. Health Care Policy

Amitabh Chandra

Fall; MW 11-12

Class Capacity: 180 ; Consent Required: Instructor

This course provides an overview of the U.S. health care system in historical and international perspective, and engages students in critically analyzing health policy issues. The course is focused around three complex and interdependent policy challenges that every health system must address: *ensuring access to health care, paying for new innovations, and improving quality.* Using primarily an economic lens, students will grapple with the complexity of the issues, learn to analyze policy arguments, evaluate evidence, identify tradeoffs, and recognize the limits of economic analysis—critical skills for engaging constructively as informed citizens in a wide range of policy debates.

Course Notes: Students who have taken General Education 186 or Extra-Departmental Courses 186 may not take this course for credit.

Class Notes: If student interest exceeds the course limit, a random lottery will be conducted. To enter the lottery, you must add the course to the Study Card and explicitly request enrollment permission when prompted. Instructor permission will be granted to only those admitted by the lottery; all students will be notified of their results. See the course website for more details.

ECONOMICS OF HEALTH

[GEN ED: Empirical and Mathematical Reasoning 20: The Business and Politics of Health]

David Cutler

Likely to be offered in 2017

Health and medical care pervade every aspect of our lives. This course uses quantitative methods (graphical analysis, algebra, data analysis) to examine issues related to health, disease, and systems for delivering health care. Topics to be covered include differences in health between rich and poor countries, differences in types of medical care and who receives it, and the political context for reforming health care policy. Techniques for analysis will be developed and demonstrated in class and section. The course uses examples from a variety of international settings, but focuses mainly on health and health care in the US.

Course Notes: This course counts for Ec concentration credit. Economics concentrators wishing to obtain writing credit for this course will need to write a term paper that uses Economics 10 concepts. This course, when taken for a letter grade, meets the General Education requirement for Empirical and Mathematical Reasoning or United States in the World, but not both.

BCMP 230 / [SCRB 230]: Principles and Practice of Drug Development

Stan Finkelstein, [Lee Rubin]

Consent Required: Instructor

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.

Course Notes: Classes held at MIT. SCRB 230 is also offered as BCMP 230. Students may not take both for credit. Although SCRB 230 is not offered fall term 2016, students are encouraged to enroll in BCMP 230.

Economics 980w: Policy Options in Health and Environmental Economics

Ariel Pakes

Spring; T 2-4

Enrollment: Lottery

Consent Required: Instructor

The seminar will focus on policy issues in two areas; health economics, and environmental economics. We will read papers on an assortment of policy options and formulate frameworks for analyzing their likely impacts on outcomes of interest. Examples from health care include the analysis

of mergers in hospital markets and the choice of capitation vs fee for service contracts. Examples from environmental economics include the choice between tradeable pollution permits and pollution taxes. 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 assumed.

Course Notes: This course requires special action-application or lottery- to enroll. Visit economics.harvard.edu/page/junior-seminar-0 and the course canvas site for more information.

Recommended Prep: Ec 1010a and 1010b (or 1011a and 1011b), one of stats 100, 104 or 110, and Ec 1123 or 1126 (or concurrent enrollment in 1123 or 1126).

Economics 1389: Economics of Global Health

TBA

Spring; MW 2:30-4

This course examines health issues in developing countries from the standpoint of applied microeconomic research. Specific topics include: identifying the effect of health on growth and development and identifying the causal relationships between income, poverty, and health. We will also discuss health care delivery and human resource issues, the challenges of healthcare financing and health insurance, and the tension between equity and efficiency in the allocation of health resources.

Course Notes: Offered jointly with the Kennedy School as SUP-518.

Recommended Prep: Economics 1010a1, 1010a2 (or 1011a), and 1123 (or 1126).

Economics 1460: Economics of Health Care Policy

Joseph P. Newhouse

Fall; MW 8:40-10

Policy issues related to the following: the demand for medical care services, especially as a function of insurance; the demand for insurance and issues of selection; reimbursement policies of Medicare and other payers toward health plans, hospitals, and physicians; effects of health maintenance organizations and managed care; and malpractice and tort reform. Focus on federal policy, although state and local perspectives will receive some attention.

Course Notes: Students may not take both Economics 1460 and Quantitative Reasoning 24: Health Economics and Policy for credit. Offered jointly with the Kennedy School as SUP-572.

Class Notes: This course meets at Harvard Kennedy School in Room L 130.

Recommended Prep: Economics 1010a or 1011a. A statistics course is highly desirable.

Economics 2395: Health, Inequality and Development

Amartya Sen, Sudhir Anand

Fall; T 3:30-5:20 Th 1:30-3:20

Class Capacity: 18

The course will be focused on an examination of the constitutive role of health in human development, and its instrumental role in economic development. It will include discussion of the conceptual issues and measurement problems in health studies, and also in assessing inequalities in health and healthcare. The correspondence and dissonance in the links between income inequality and health inequality will be investigated, and the challenge of instituting universal health care in poor countries will be examined.

Course Notes: Offered jointly with the Harvard School of Public Health (as GHP 558).

ENGINEERING SCIENCES AND STATISTICS

Applied Mathematics 101: Statistical Inference for Scientists and Engineers

Robert D. Howe

Fall; TTh 1-2:30

Consent Required: Instructor

Introductory statistical methods for students in the applied sciences and engineering. Random variables and probability distributions; the concept of random sampling, including random samples, statistics, and sampling distributions; the Central Limit Theorem and its role in statistical inference; parameter estimation, including point estimation and maximum likelihood methods; confidence intervals; hypothesis testing; simple linear regression; and multiple linear regression. Introduction to more advanced techniques as time permits.

Course Notes: This course, when taken for a letter grade, meets the General Education requirement for Empirical and Mathematical Reasoning.

Recommended Prep: Math 21a or Applied Math 21a or equivalent.

Biomedical Engineering 110: Physiological Systems Analysis

Kevin K. Parker

Fall; MW 11:30-1

Consent Required: Instructor

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: Applied Mathematics 21b or Mathematics 21b or equivalent. Physiology at the level of Engineering Sciences 53 suggested.

Biomedical Engineering 125: Tissue Engineering

David Mooney

Spring; TTh 1-2:30

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: Biochemistry or cell biology background.

[Biomedical Engineering 130: Neural Control of Movement]

Instructor TBA

Approaches from robotics, control theory, and neuroscience for understanding biological motor systems. Analytical and computational modeling of muscles, reflex arcs, and neural systems that contribute to motor control in the brain. Focus on understanding how the central nervous system plans and controls voluntary movement of the eyes and limbs.

Learning and memory; effects of variability and noise on optimal motor planning and control in biological systems.

Course Notes: Offered in alternate years.

Recommended Prep: Mathematics 21b or Applied Mathematics 21b or equivalent, probability and statistics, Physics 11a or equivalent.

Economics 1123: Introduction to Econometrics

James H. Stock (fall term), Roland Fryer (spring term)

Fall; TTh 11:30-1

Spring; MW 2:30-4

Consent Required Fall Term: Instructor

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 either Economics 1123 or Statistics 139 for credit. Statistics 139 will not count as an econometrics requirement. Also, Economics 1123 may not be taken for credit if taken after Engineering Sciences 6:, but credit will be given for both courses if Economics 1123 is taken first. This course, when taken for a letter grade, meets the General Education requirement for Empirical and Mathematical Reasoning.

Recommended Prep: Statistics 100 and 104.

Economics 1126: Quantitative Methods in Economics

Maximilian Kasy

Fall; TTh 11:30-1

Consent Required: Instructor

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: Economics 1123 may not be taken for credit if taken after Economics 1126, but credit will be given for both courses if Economics 1123 is taken first. 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.

[Economics 1160: Data Science and Behavioral Economics: Application to Systems Medicine]

Instructor TBA

Large data sets, combined with advances in “data science,” have generated new insights into complex empirical phenomena. We explore how these developments can be transformative for clinical medicine, and for human health and well-being. Since human judgment is at the core of medicine, we draw on insights from behavioral science to explore human decision making and understanding of medicine. We develop the implications of these concepts for health policy and for clinical topics such as cause of death, complications and aging.

Engineering Sciences 6: Introduction to Environmental Science and Engineering

Elsie Sunderland, Patrick Ulrich

Spring; TTh 11:30-1

This course will provide an introduction to environmental science and engineering through case studies of some of the most pressing environmental issues. Course modules will include climate and air quality; food production and environmental impact; availability and quality of water; species biodiversity and ecosystem services; and ecological economics, risk management and environmental policy. Case studies will provide an introduction to the fundamental principles underlying disciplines in environmental research including chemistry, hydrology, soil science, ecology, statistics, and economics. Engineering solutions to societal problems will be discussed in the context of energy availability, air and water pollution control, design of effective monitoring strategies for ecological populations, and metrics used to evaluate the effectiveness of environmental policies.

Course Notes: This course, when taken for a letter grade, meets the General Education requirement for Science of the Physical Universe.

Recommended Prep: The course presumes basic knowledge in chemistry, physics, and mathematics at the high school level.

Engineering Sciences 53: Quantitative Physiology as a Basis for Bioengineering

Maurice Smith, Lindsey Moyer

Fall; MWF 12-1

Consent Required: Instructor

A foundation in human organ systems physiology, including cardiac, respiratory, renal, gastrointestinal, and neural systems. Quantitative description of organ systems function and control in terms of physical principles and physiologic mechanisms. Simple mathematical models representing key aspects of organ systems function. 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 freshmen.

[Engineering Sciences 103: Spatial Analysis of Environmental and Social Systems]

Instructor TBA

Introduces the fundamental statistical and mapping tools needed for analysis of environmental systems. Topics will be linked by environmental and social themes and will include GIS concepts; data models; spatial statistics; density mapping; buffer zone analysis; surface estimation; map algebra; suitability modeling. Students will acquire technical skills in both mapping and spatial analysis. Software packages used will include ArcGIS. There will be guest lectures by researchers and practitioners who use GIS for spatial analysis.

Recommended Prep: Applied Mathematics 21 or equivalent.

Engineering Sciences 165: Water Engineering

Chad Vecitis

Fall; TTh 11:30-1

Consent Required: Instructor

Introduces the fundamentals of water biology, chemistry, physics and transport processes needed to understand water quality and water purification technologies. Practical instruction in basic water analyses concluding with a final water treatment project in place of exam.

Course Notes: Offered jointly with the Design School as SCI-06273.

Recommended Prep: Physical Sciences 1 or Physical Sciences 11 or equivalent and Engineering Sciences 6 or equivalent or with permission of instructor.

Government 50: Introduction to Political Science Research Methods

Muhammet Bas, Xiang Zhou

Spring; TTh 11-12

This class will introduce students to techniques used for research in the study of politics. Students will learn to think systematically about research design and causality, how data and theory fit together, and how to measure the quantities

we care about. Students will learn a ‘toolbox’ of methods—including statistical software—that enable them to execute their research plans. This class is highly recommended for those planning to write a senior thesis.

Course Notes: This course, when taken for a letter grade, meets the General Education requirement for Empirical and Mathematical Reasoning. This course must be taken for letter grade.

MCB 111: Mathematics in Biology

Elena Rivas

Spring; MW 10-11:30

Develops the mathematics needed for quantitative understanding of biological phenomena including data analysis, simple models, and framing quantitative questions. Topics include probability, transforms and linear algebra, and dynamical systems, each motivated by current biological research.

Recommended Prep: Mathematics 19 or higher.

Psychology 1900: Introduction to Statistics for the Behavioral Sciences

Patrick Mair (fall term), Max Krasnow (spring term)

Fall; TTh 10-11

Spring; MW 10-11

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.

Course Notes: Open to freshmen with permission of instructor. This course, when taken for a letter grade, meets the General Education requirement for Empirical and Mathematical Reasoning.

Class Notes: There will be an additional lab section to be arranged.

Sociology 156: Quantitative Methods in Sociology

Alexandra Killewald

Spring; MW 10-11

Consent Required: Instructor

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

Course Notes: Required of and limited to Sociology concentrators, ordinarily sophomores. This course, when

taken for a letter grade, meets the General Education requirement in Empirical and Mathematical Reasoning.

Statistics 100: Introduction to Quantitative Methods for the Social Sciences and Humanities

Kerrie Nelson

Fall; MW 1-2:30

Consent Required: Instructor

Introduction to key ideas underlying statistical and quantitative reasoning. Topics covered: methods for organizing, summarizing and displaying data; elements of sample surveys, experimental design and observational studies; methods of parameter estimation and hypothesis testing in one- and two-sample problems; regression with one or more predictors; correlation; and analysis of variance. Explores applications in a wide range of fields, including the social and political sciences, medical research, and business and economics.

Course Notes: Only one of the following courses may be taken for credit: Statistics 100, 101, 102, 104. This course, when taken for a letter grade, meets the General Education requirement for Empirical and Mathematical Reasoning.

Statistics 102: Introduction to Statistics for Life Sciences

David P. Harrington

Spring; MWF 11-12

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. This course, when taken for a letter grade, meets the General Education requirement for Empirical and Mathematical Reasoning.

Class Notes: Weekly sections to be arranged.

Statistics 104: Introduction to Quantitative Methods for Economics

Michael Parzen

Fall; MWF 11-12

Spring; MWF 11-12

Consent Required: Instructor

A rigorous introduction to statistics for students intending to study economics. Examples drawn from finance, decision analysis and economic decision-making. In addition to descriptive statistics, probability, inference and regression modeling, also covers portfolio optimization, decision analysis, and time series analysis. 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.

Course Notes: Only one of the following courses may be taken for credit: Statistics 100, 101, 102, 104. This course, when taken for a letter grade, meets the General Education requirement for Empirical and Mathematical Reasoning.

Statistics 107: Introduction to Business and Financial Statistics

Michael Parzen

Fall; MW 9:30-11

Consent Required: Instructor

Introduces the technical skills required for data-driven analysis of business and financial data. Emphasis on applying statistical methods to summarize and make inferences from complex data and to develop quantitative models to assist business decision making. Topics include: how to collect and summarize financial data, understanding the concept of risk, portfolio construction and analysis, testing trading systems, and simulation techniques.

Course Notes: The software packages Excel and R will be used to obtain quantitative solutions to financial problems.

Recommended Prep: Statistics 100, 101, 104 or equivalent.

Statistics 110: Introduction to Probability

Joseph Blitzstein

Fall; TTh 2:30-4

Consent Required: Instructor

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: Mathematics 18 or above (may be taken concurrently).

ETHICS OF HEALTH

Freshman Seminar 23h: Anatomy and Ethical Transgressions in National Socialism

Sabine Hildebrandt

Fall; Th 3-5

Class Capacity: 12

Consent Required: Instructor

This course introduces students to the history and ethics of anatomy, and their relevance for current questions in medicine concerning the human body in life and death. The story of anatomy in National Socialist (NS or Nazi) Germany is an example of ethical transgressions in the anatomical sciences and reveals the complex relationship between anatomists and the Nazi regime. The historic causes of this development will be explored by examining the roots of the biologicistic NS ideology in the connections between anatomy, physical anthropology, the global eugenics movement and German racial hygiene. Many anatomists became members of the NS party, while others were persecuted for so-called “racial” and political reasons. An examination of the history of anatomical body procurement from ancient Greece to the 21st century demonstrates the changes of the traditional sources of bodies for anatomical dissection under NS rule, resulting in the use of many bodies of NS victims for anatomical purposes. Anatomical research changed with the exploitation of the rising number of bodies of executed men and women. Case studies of the work of individual anatomists reveal a gradual shift in the paradigm of anatomy. A few anatomists left the traditional paradigm- i.e. the gain of anatomical knowledge through work with the dead- in favor of a new paradigm- i.e. work with the “future dead”- in human experiments on prisoners who were subsequently murdered. Ultimately, anatomists became complicit with the government through their role in the complete destruction of the perceived “enemies” of the NS regime.

Course Notes: Course open to Freshman Students Only

Freshman Seminar 23l: Medicine, Law, and Ethics: An Introduction

Shahram Khoshbin

Spring; MTh 7-9

Class Capacity: 12

Consent Required: Instructor

The seminar explores medical, legal, and ethical aspects of medical care, with particular attention to medical decision-making at the beginning and end of life, participants in research on human subjects, human reproductive technologies, mental illness, and experimentation on

animals. Historical background of present-day medical practices and relevant law to be discussed.

Recommended Prep: All students are welcome, but this seminar is particularly geared to pre-medical and pre-law students. Students are advised that this course is intended to be introductory.

Course Requirements: Course open to Freshman Students Only

Freshman Seminar 25w: Responsibility, the Brain, and Behavior

Ronald Schouten

Fall; T 7-9

Class Capacity: 11

Consent Required: Instructor

Explores philosophical and legal bases of the concept of individual responsibility as applied in the criminal justice system. Examines how forensic mental health professionals assess an individual's mental state at time of an alleged criminal act, the legal standards applied, and the social and political forces that help shape the legal decision. Considers the insanity defense; examines modern concepts of the biological basis of behavioral disorders and their relationship to existing standards of criminal responsibility.

Course Notes: The seminar may include an optional trip outside of class time to Bridgewater State Hospital, Massachusetts's maximum security forensic hospital. Transportation will be provided free of charge.

Recommended Prep: There are no prerequisites, but an interest in law, psychology, or related fields would be advantageous.

Course Requirements: Course open to Freshman Students Only

Freshman Seminar 70f: Bioethics through Film: An Exploration of the Law and Ethics of Medicine

I. Cohen

Spring; T 2-4:15

Class Capacity: 12

Consent Required: Instructor

Should animals have the rights of persons? What about very sophisticated robots? Is it ethical to run clinical trials in the developing world for drugs that will be unaffordable there? How far should we go in genetic screening and attempts to eradicate certain disabilities in our children? Is it wrong to buy and sell organs? Should the state be allowed to use neuroscience in the courtroom to convict or exculpate? In this freshman seminar we will examine these and other contemporary issues in bioethics using film and television paired with readings from law, philosophy, medicine, and shot story. Possible films/topics include (but are not limited to): A.I. (speciesism and the boundaries of legal and ethical personhood); The Constant Gardener (research ethics and

running experimental drug trials in sub-Saharan Africa); Gattaca (genetic privacy and enhancement); Dirty Pretty Things (commodification and markets for organs); Minority Report (free will and criminal responsibility); Never Let Me Go (the ethics of creating children with disabilities), the Surrogate (sex and disability); Eternal Sunshine of the Spotless Mind (pharmacological interventions and the medicalization of happiness). This Freshman Seminar is a good fit for students interested in these topics and ready and willing to engage in discussions of hard questions and argue their positions. Some of the teaching will be Socratic (i.e., students will be called on to express their views to the class).

Course Requirements: Course open to Freshman Students Only

GEN ED: Ethical Reasoning 33: Medical Ethics and History

David Shumway Jones
Fall; TTh 11-12

Disease and medicine have generated ethical dilemmas that have challenged patients and doctors for centuries, from abortion and euthanasia to informed consent and compulsory treatment. Although moral philosophy can clarify the relevant issues, resolution often depends on the details of the specific clinical and social contexts. Taking a historical approach to medical ethics, this class explores how the moral discourse in health care has changed over time in order to understand how social factors influence the persuasiveness of moral arguments. The focus will be on medical practice in the United States in the twentieth century.

[GEN ED: Societies of the World 44: Human Trafficking, Slavery, and Abolition in the Modern World]

Orlando Patterson

This course surveys the nature, types and extent of modern servitude, distinguishing broadly between those resulting from international trafficking such as trans-national prostitution, human smuggling into bonded labor, child soldiering and organ trafficking, and more intra-national forms such as debt-bondage and the domestic exploitation of women and other vulnerable groups. Examines the conceptual and theoretical issues raised in attempts to distinguish among these types of differential power relations; the empirical difficulties of estimating the magnitude of what are inherently secretive processes; and the ideological controversies surrounding the subject. Explores ethical, socio-political and practical issues raised by these trends.

Global Health and Health Policy 70: Global Response to Disasters and Refugee Crises

Stephanie Kayden, Michael VanRooyen
Spring; Th 1-3

Class Capacity: 25

Consent Required: Instructor

Climate change, urbanization, and conflict mean that global disasters are on the rise. How should the world respond when disasters force people from their homes? How can we better help the world's refugees? This course examines the past, present, and future of the international humanitarian response system. We will explore how Doctors Without Borders, the United Nations, the Red Cross, and other aid agencies came to be and how global response standards, international humanitarian law, and new technologies are shaping worldwide disaster relief.

Through interactive discussions and case studies, students will learn how aid workers interact with governments, militaries, and civil society to provide refugee aid. At the end of the course, students can choose to live the refugee experience during a large-scale, weekend outdoor simulated humanitarian response training program together with other students and professional aid workers from around the world.

Government 94gk: The Politics and Ethics of Medical Care

Gabriel Katsh
Spring; Th 3-5

Class Capacity: 16

Consent Required: Instructor

This course is an introduction to medical ethics and the ways in which political theory can inform our understanding of the moral and political dimensions of medical care. Using case studies as a launching point, we will explore ideas about autonomy, paternalism, beneficence, and distributive justice, and their application to issues such as informed consent, euthanasia, the right to refuse care, the distribution of scarce resources, and conflicts between patient rights and the public good.

Class Notes: Undergraduate seminar. Enrollment by lottery. Please see Gov Dept [undergraduate website](#) for details.

Government 1093 / SCRB 60: Ethics, Biotechnology, and the Future of Human Nature

Douglas Melton, Michael Sandel
Fall; T 2-4

Explores the moral, political, and scientific implications of new developments in biotechnology. Does science give us the power to alter human nature? If so, how should we exercise this power? The course examines the science and ethics of stem cell research, human cloning, sex selection,

genetic engineering, eugenics, genetic discrimination, and human-animal hybrids.

Course Notes: Priority given to undergraduate students. May not be taken concurrently with SCRB 60. May not be taken for credit if SCRB 60 has already been taken. The course is open to both science and non-science concentrators. Ethical Reasoning 22 (Justice) is recommended as a background. This course, when taken for a letter grade, meets the General Education requirement for Ethical Reasoning.

History of Science 136: History of Biotechnology

Sophia Roosth

Fall; TTh 10-11

What becomes of life when researchers can materially manipulate and technically transform living things? In this course, we will historically investigate biotechnology in the twentieth and twenty-first centuries, paying attention to how efforts to engineer life are grounded in social, cultural, and political contexts. Topics include reproductive technologies, genetic engineering and cloning, genetically modified foods, genomics, stem cells, intellectual property, and biosafety and biosecurity. The course is organized around five crosscutting domains in which we will explore the ethical, legal, and social impacts of biotechnology: (1) food, (2) property and law, (3) sex and reproduction, (4) disease and drugs, and (5) genomic identities. We will read and discuss historical accounts of biotechnology, primary scientific publications, and legal cases. We will learn to evaluate the social constitution and impact of biotechnology on daily life, as well as how to place contemporary issues and debates in biotechnology in historical context.

[History of Science 253: Bioethics, Law, and the Life Sciences]

Sheila Jasanoff

Consent Required: Instructor

Likely to be offered in 2018 Spring

Seeks to identify and explore salient ethical, legal, and policy issues—and possible solutions—associated with developments in biotechnology and the life sciences.

Course Notes: Offered jointly with the Kennedy School as IGA-515. Cannot be taken for credit by students who have already taken IGA-515.

Religion 111: Cultures of Health and Healing: Religion, Medicine, and Global Health

Mara Block

Fall; W 1-3

Class Capacity: 12

Consent Required: Instructor

What does it mean to “be healthy” and “to heal” in different contexts? What sorts of medical, ritual, or religious

expertise authorizes different sorts of healers and forms of healing? What conceptions of human bodies and their capabilities are assumed? These questions probe entanglements of religion and medicine in everyday life. This course focuses on ways in which these issues might inform, challenge, and enrich thinking about global health. We will examine moral and religious histories of the global health movement alongside pressing contemporary questions such as, how do disease epidemics shape religious practice? How does religious belief shape the reception of biomedical technologies? We will consider examples from a range of contexts and traditions. Topics include colonialism, medical missionaries, social gospel and public health, human rights, bioethics, and liberation theology. Throughout the course, we will discuss the relevance of socio-economics, race, gender, and sexuality.

[SCRB 187: Brains, Identity, and Moral Agency]

Steven E. Hyman

Consent Required: Instructor

Human beings experience a sense of self that provides a stable foundation from which to understand personal experience, consciously formulate goals, and initiate actions. The view that people act in accordance with freely formed intentions underlies important concepts of moral agency and culpability, yet evidence from neuroscience questions this assumption. This course will examine competing views of human agency grounded in concrete scientific examples to encourage reflection on the implications for identity and moral agency.

Course Notes: For students who have taken MCB 80, it is contemplated that there will be a section that incorporates more advanced concepts from neurobiology. This course, when taken for a letter grade, meets the General Education requirement for Ethical Reasoning.

Recommended Prep: LPS A or LS 1a (or equivalent—permission of instructor required).

XREG: HSPH GHP 214: Health, Human Rights, and the International System

Stephen P. Marks

Spring 2; T 3:30-6:20

Class Capacity: 28

This course is designed to provide an overview of the way international institutions deal with health and human rights issues. Focus will be on the responses of the United Nations system, including the World Health Organization (WHO), regional organizations, and non-state actors to some of the pressing issues of health from a human rights perspective. Issues to be explored include: mother-to-child transmission of HIV and ARV drug pricing in Africa; traditional practices, such as female genital cutting (FGC); forced sterilization and rights of indigenous people in Latin

America; accountability for mass violations of human rights; health of child workers; and international tobacco control. Among the international institutions to be examined are the WHO, UNAIDS, the World Trade Organization (WTO), UNESCO, the Council of Europe, the Organization of American States, the World Bank, and the International Criminal Court (ICC). The principal teaching method is simulation of actual cases, in which students prepare and present positions of various protagonists, based on research into those positions. The ultimate aim of the course is to prepare students to work for and interact professionally with international institutions to advance the health and human rights objectives, whether through governmental, intergovernmental or nongovernmental processes.

XREG: HSPH GHP 265: Ethics of Global Health Research

Richard Cash, Daniel Wikler

Spring 2; MW 3:30-5:20

Class Capacity: 30

This course is designed to expose students to the key ethical issues that may be encountered in the course of conducting global health research. Using case presentations and discussion-based class sessions, students will have the opportunity to begin developing their own tools for dealing with these important issues in an applied context.

Note: This course provides 2.5 credits. In order to receive credit equivalent to a course in FAS, a student must take two 2.5-credit HSPH courses.

XREG: HSPH GHP 288: Issues in Health and Human Rights

Stephen P. Marks

Fall 2: T 3:30-6:20

Class Capacity: 37

The aim of this course is to introduce students to the application of the human rights framework to a wide range of critical areas of public health. Through lectures, cases and guest speakers, students will become familiar with the human rights perspective as applied to selected public health policies, programs and interventions. The course clarifies how human rights approaches complement and differ from those of bioethics and public health ethics. Among the issues to be considered from a human rights perspective are the bioethics, torture prevention and treatment, infectious diseases, violence prevention and responses, genetic manipulation, access to affordable drugs, community-based health management and financing, child labor, aging, and tobacco control. Course requirements are active participation in class discussion (25%), presentation of a paper (10%) and quality of the term paper (65%).

Note: This course provides 2.5 credits. In order to receive credit equivalent to a course in FAS, a student must take two 2.5-credit HSPH courses.

XREG: HSPH ID 250: Ethical Basis of the Practice of Public Health

Nir Eyal, Ole Norheim (fall term), Dan Wikler (spring term)

Fall 1; MW 8:30-10:20

Spring 1; MW 10:30-12:20

Class Capacity: 77 (fall) 70 (spring)

This course serves as an introduction to ethical issues in the practice of public health. Students will identify a number of key ethical issues and dilemmas arising in efforts to improve and protect population health and will become familiar with the principal arguments and evidence supporting contesting views. The class aims to enhance the students' capacity for using ethical reasoning in resolving the ethical issues that will arise throughout their careers.

Unlike courses in medical ethics, which mainly examine ethical dilemmas facing individual clinicians, the population-level focus of this course directs our attention to questions of ethics and justice that must be addressed at the societal level. These include: What social response is required of a just society to the needs of its members for protecting and restoring health? Is population health "something other than the aggregate of the health concerns of the individuals who make up a society at a given time? And what are the ethical implications of the answers? When are inequalities in health inequitable, and what priority should be assigned to reducing disparities in health when pursuing this goal might compromise the effort to maximize population health? Which ethical choices, if any, are unavoidable in developing the methodologies for measurement of health and of the global burden of disease? Which ethical choices if any are unavoidable in developing and using methods for priority-setting such as cost-effectiveness analysis and cost-benefit analysis? Are the ethical commitments of the profession of public health consistent with some methods and not others? Should the institution of universal health coverage be guided by ethical precepts and if so, what are these values and how should they guide policy? Can and should public health's dedication to improving population health conflict with the priorities of some individuals whose choices to not reflect such high priority for health? Should these individual preferences always be respected? How should responsibility for poor health be assigned, and what are the ethical implications of this assignment for poor health due to health problems due to smoking, obesity, and other unhealthy behavior? To the extent that the socio-economic health gradient reflects differences in how well people take care of themselves are these disparities in health individual failings rather than social injustices?

Note: This course provides 2.5 credits. In order to receive credit equivalent to a course in FAS, a student must take two 2.5-credit HSPH courses.

HEALTH AND DEMOGRAPHY

Freshman Seminar 22h: My Genes and Cancer

Giovanni Parmigiani

Fall; T 3-5

Class Capacity: 12

Consent Required: Instructor

The role of a person's genetic background in determining whether he or she will develop cancer, and when, is at the center of public discussions and active scientific investigations. Already, one's genetic background is used in making life-altering health decision aimed at preventing the occurrence of cancer, as was recently the case with actor Angelina Jolie. This seminar will explore the extent to which current scientific knowledge can inform this type of decisions. The goal is to gain enough understanding of the scientific background to critically evaluate the discourse of a genetic counseling session. The course will proceed at first by laying essential foundations of genetic inheritance in humans; cancer evolutionary theories; statistical risk; and decision-making in health care. Subsequently student will read articles from the scientific and popular press, and listen to podcasts. In class we will discuss the readings. There are no strict prerequisites, though some familiarity with the basic concepts of probability and genetics will be very helpful. There is a good deal of reading and listening, which everyone is expected to do ahead of class. Students can expect readings in genetics and statistics that will stretch them, though it will not always be necessary to understand all the technical details of every paper. Students can also expect to read opinion pieces with which they (as well as I) may disagree. Students will be required to write two 5-page double spaced essays (midterm and final) and to lead a class discussion on the topic of one of their two papers. A typical paper is the critique of a scientific or popular press article, chosen from a list of suggested options or identified independently by the student, with my approval, during the first seven weeks of classes. Attendance is essential, not only for the students' education, but for the benefit their contributions provide to the others.

Course Requirements: Open to freshman only

Freshman Seminar 24n: Child Health in America

Judith Palfrey

Fall; M 4-6

Class Capacity: 12

Consent Required: Instructor

How can American health care be improved for children? How a nation cares for its children's health is often considered a measure of its commitment to the general citizenry and to its future. The members of the seminar will review together the history of children's health and health

care in the United States, exploring the impact of geography, environment, nutrition, clean water, as well as of the scientific discoveries of the late 19th century and the early 20th century and the emergence of the high technology care of the middle and late 20th century. Then they will pose the question, "Does America provide children and youth the best possible health care available in the 21st century?" To approach this question, students will analyze the current causes of illness, disability and death among U.S. children and youth and compare United States epidemiology with that of other developed and developing nations. Students will also explore how child health delivery is financed.

Course Requirements: Open to freshman only

GEN ED: Societies of the World 24: Global Health Challenges: Complexities of Evidence-Based Policy

Sue J. Goldie

Spring; T 2-5

Consent Required: Instructor

Class Capacity: 300

This course introduces the global health challenges posed by failure to adequately reduce infections, malnutrition, and maternal-child health problems in the most vulnerable populations, escalating rates of non-communicable diseases/injuries, and emerging health risks that cross national boundaries. We will assess social responses to these challenges at the community, national, and global levels. Through an understanding of population health measures, we will examine patterns of disease/mortality between and within countries, capture important time trends, and identify determinants of health inequalities. While emphasizing science driven policy, comparative case examples will illuminate influential systemic factors, health system performance, and the economic/social/political climate. *Course Notes:* This course, when taken for a letter grade, meets the General Education requirement for either Societies of the World or Empirical and Mathematical Reasoning, but not both.

Environmental Science and Public Policy 90d: Planetary Health: Understanding the Human Health Impacts of Accelerating Environmental Change

Samuel Myers, Christopher Golden

Spring; W 3-5:30

Class Capacity: 30

Consent Required: Instructor

Rapid human population growth and even more rapid growth in consumption are driving a transformation of most of Earth's natural systems including its climate system, its oceans, land cover, biogeochemical cycles, biodiversity, and coastal and fresh water systems. These systems underpin global food production, our exposure to infectious disease

and natural hazards, even the habitability of the places where we live. We will explore the global human health impacts of this transformation of natural systems.

**[Environmental Science and Public Policy 90]:
Environmental Crises, Climate Change, and Population Flight]**

Jennifer Leaning, James J. McCarthy

Consent Required: Instructor

War, disaster, drought, or famine force people to flee their land. Climate change is contributing to many of these factors. The humanitarian consequences of population flight, including loss of place and livelihood, are filled with complexity, relating to the extent and permanence of environmental destruction wrought by these crises, people's attachment to their homes and ecosystems, the circumstances of departure, the destinations of refuge, and the possibilities for return. These issues will be examined through case studies and review of literature on forced migration and calamity.

Sociology 146: Death by Design: Health Inequalities in Global Perspective

Jason Beckfield

Spring; TBA

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. 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.

HEALTH, CULTURE, AND SOCIETY

Freshman Seminar 22d: Time for Sleep: Impact of Sleep Deficiency and Circadian Disruption in Our 24/7 Culture

Charles Czeisler

Fall; W 3-5:30

Class Capacity: 12

Consent Required: Instructor

America is a sleep-starved nation. The Institute of Medicine estimates that between 50 and 70 million Americans are suffering from chronic sleep deficiency or sleep disorders, increasing their risk of weight gain, heart ailments, mood disorders, errors and catastrophic road accidents that kill more than 7,000 and maim more than 50,000 Americans annually. Children of all ages are sleeping about two hours less per night than they did in prior generations, rendering them hyperactive and irritable and compromising their ability to sustain attention and learn in school. This hyperactivity leads many sleep-deprived children to be misdiagnosed with ADHD and treated for years with amphetamines and other stimulants that further disrupt sleep. Yet, prevailing cultural attitudes lead us all to undervalue sleep and lionize all-nighters, such that most patients with sleep disorders remain undiagnosed and untreated. This seminar will explore the function of sleep, the physiologic factors that regulate sleep and circadian rhythms, the impact of exposure to artificial light on sleep and circadian rhythms, historical and cultural differences in sleep habits, and the consequences of sleep deficiency, circadian disruption and sleep disorders on both the brain and the body. Public policy issues, such as school start times, limits on resident physician work hours, drowsy driving laws, and proposed regulations to screen transportation workers for sleep disorders will be debated. Students will be encouraged to track their own sleep patterns throughout the semester, identify the personal, structural and cultural barriers to maintaining healthy sleep while in college, and propose strategies to improve sleep health at Harvard College, the local community and the nation.

Course Requirements: Course open to Freshman Students Only

Freshman Seminar 23k: Insights from Narratives of Illness

Jerome Groopman

Spring, W 1-3

Class Capacity 12

Consent Required: Instructor

A physician occupies a unique perch, regularly witnessing life's great mysteries: the miracle of birth, the perplexing moment of death, and the struggle to find meaning in

suffering. It is no wonder that narratives of illness have been of interest to both physician and non-physician writers. This seminar will examine and interrogate both literary and journalistic dimensions of medical writing. The investigation will be chronological, beginning with "classic" narratives by Tolstoy, Chekhov, and Kafka, and then moving on to more contemporary authors such as William Carlos Williams, Richard Selzer, Oliver Sacks, Susan Sontag, and Philip Roth. Controversial and contentious subjects are sought in these writings: the imbalance of power between physician and patient; how different religions frame the genesis and outcome of disease; the role of quackery, avarice, and ego in molding doctors' behavior; whether character changes for better or worse when people face their mortality; what is normal and what is abnormal behavior based on culture, neuroscience, and individual versus group norms. The presentation of illness in journalism will be studied in selected readings from the New York Times' and Boston Globe's Science sections, as well as periodicals like the New Yorker, The New York Review of Books, Harper's, and The Atlantic. 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 also. Patients with different diseases will be invited to speak to the members of the seminar about their experiences. Students will try their hands at different forms of medical writing, such as an editorial on physician-assisted suicide that would appear in a newspaper and a short story that describes a personal or family experience with illness and the medical system.

Course Requirements: Course open to Freshman Students Only

Freshman Seminar 25n: Finding Connections: Perspectives on Psychological Development and Mental Illness

Nancy Rappaport

Fall; W 3-5

Class Capacity: 12

Consent Required: Instructor

The seminar's challenge will be to deepen our understanding of human development and how individuals cope with serious emotional or social difficulties (neglect, bipolar disorder, autism, depression, schizophrenia). We will use multiple perspectives: medical observations and texts that provide practical knowledge (e.g. The New England Journal of Medicine review articles), narrative readings to understand how patients experience the meaning of illness from the inside out (e.g. The Center Cannot Hold), visitors who will discuss their experience with mental illness, and how development-related mental illness is portrayed in

press (e.g. *The New Yorker* articles). We will start with the mental life of babies and how scientists interpret infants' nonverbal ways of finding safety and security. This begins the journey of our understanding fundamental needs for tenderness, holding, and making meaning. Understanding how conditions such as autism, depression, and schizophrenia are described in clinical research and literature will help us to appreciate the biological vulnerabilities and relational patterns that may disrupt the human connection. We will examine the resourcefulness required for both fragility and resiliency. Throughout the seminar, the instructor, as a practicing child and adolescent psychiatrist, will bridge the gap between research findings, clinical applications, and everyday insight.

Course Requirements: Course open to Freshman Students Only

Freshman Seminar 26v: Blood: From Gory to Glory

David Scadden

Fall; M 1-3

Class Capacity: 10

Consent Required: Instructor

Blood has long symbolized life and death, hope and horror, health and disease. Ritual places it rightly as representative of life itself. What it actually is as a substance depends on perspective. The course examines how blood, like many things we think we know, is different depending on context. Therefore, we examine how the ancients, literary and visual artists, the early experimentalists and current day explorers bring us different ways of understanding blood. We discuss how blood is a magical substance, a commercial commodity and a paradigm for scientific understanding of stem cells and regeneration. We read *Dracula*, debate the values inherent in a free market of body components like blood, conduct the experiments that proved blood has stem cells and meet patients undergoing therapy for blood gone bad.

Course Requirements: Course open to Freshman Students Only

Freshman Seminar 43f: When Bad Things Happen Early in Life: the Effects of Early Adversity on Brain and Behavioral Develop

Charles Nelson

Spring; M 1-3

Class Capacity: 15

Consent Required: Instructor

Decades of research tell us that the foundations of healthy development are built early in life. Genes provide the basic blueprint for brain architecture, but experiences shape the activity of the genome and thus determine how the circuitry is wired. Significant adversity can derail developmental processes and distort brain maturation, leading to limited economic and social mobility. Exposure to significant

adversity early in life, particularly during critical periods of brain development, may increase risk for a host of chronic physical health problems, including cardiovascular disease, hypertension, diabetes, and addictive behavior; it can also lead to a variety of mental health problems, including depression and anxiety and characterological problems. Science clearly indicates that the longer we wait to intervene on behalf of such children, the more difficult it becomes to achieve healthy outcomes. This constraint is particularly true for children who sustain the wear and tear of early exposure to so-called "toxic stress". In this seminar we will critically examine the range of adverse early experiences that impact children growing up in both low and high resource countries. Key themes include a) the nature of the adversity children are exposed to, b) the timing of the adversity c) the chronicity of the adversity, and d) individual differences (including genetic and environmental factors that may confer protection on children exposed to early adversity). We will pay particular attention to the short- and long-term outcomes on physical, neurological and psychological health.

Freshman Seminar 48e: Health and Mental Health in Everyday Life

Mary Ruggie

Spring; M 2-4

Class Capacity: 12

Consent Required: Instructor

Why do students feel ill before an exam? Why do women seem to suffer more than men from depression and eating disorders, whereas men use and abuse substances more than women? Why do some race/ethnic groups have better or worse health and mental health outcomes than others? These are some of the questions this course addresses. Using interdisciplinary perspectives we will investigate how such social and personal characteristics as gender, race/ethnicity, family background, and self-esteem impact health and mental health behaviors and outcomes. We will also examine how specific configurations of circumstances and contexts contribute to health and mental health problems. For instance, college students, regardless of gender, race/ethnicity, etc., are increasingly experiencing stress and turning to amphetamines at higher rates than young adults who are not in college. One goal in these classes will be to explore causes and consequences. Another will be to understand the role of individuals themselves, their personal and social support networks, and health care professionals in developing and guiding positive strategies for coping and healing. Throughout, we traverse the boundary between health and illness in order to understand the complex web of factors that create and jeopardize well-being. Students will present analyses of the readings in class and write short papers based on class readings and discussions, as well as

additional research. Students will also give two brief presentations: a team project and a representation of health and/or mental health in the arts.

Course Requirements: Course open to Freshman Students Only.

[GEN ED: Aesthetic and Interpretive Understanding 50: Literature and Medicine]

Karen Thornber

Examines the relationship between literature and medicine through creative texts that question understandings, shatter binaries, and reconceptualize notions of normality/disability, health/disease, and life/death. Pays particular attention to the work of physician-writers and narratives by patients.

[GEN ED: Culture and Belief 58: Case Studies in the Medical Humanities: Interdisciplinary Perspectives on the Experience of Illness]

David Shumway Jones

Disease and healing pose pragmatic and moral challenges for individuals and societies. Artists and writers have struggled to make sense of these tragic and transcendent experiences through fiction, poetry, art, and music. Scholars can explore these archives of the illness experience to understand not just disease and medicine but also what it means to be human. This interdisciplinary course examines how the medical humanities can change how we think about suffering, resilience, and care-giving, an endeavor relevant to anyone who expects to encounter these problems in life (i.e., everyone). In 2015 the course will focus on epidemics; case studies may include plague, tuberculosis, cancer, AIDS, SARS, and Ebola. Future offerings might address chronic disease, mental illness, death and dying, or caregiving.

[GEN ED: Societies of the World 25: Case Studies in Global Health: Biosocial Perspectives]

Arthur Kleinman, Anne Becker, Paul Farmer, Salmaan Keshavjee

Likely to be offered in 2017 Fall

Examines, through lectures and case-based discussions, a collection of global health problems rooted in rapidly changing social structures that transcend national and other administrative boundaries. Students will explore case studies (addressing AIDS, tuberculosis, mental illness, and other topics) and a diverse literature (including epidemiology, anthropology, history, and clinical medicine), focusing on how a broad biosocial analysis might improve the delivery of services designed to lessen the burden of disease, especially among those living in poverty.

Course Notes: Course counts as Social Anthropology.

[African and African American Studies 178: Health, Society, and Subjectivity in the American Context]

Laurence Ralph

Likely to be offered in 2017 Fall

While diseases are often imagined to be scientific, medical conditions, they are also social constructs. In the nineteenth century, for example, the condition of Dysaesthesia Aethiopsis (an ailment that made its sufferers “mischievous”) was considered nearly universal among free blacks. Today, diseases like AIDS and tuberculosis are often associated with personal attributes, while the social forces at work to structure risk for acquiring these illnesses are glossed over. This course examines the ways people reproduce and challenge contemporary visions of society through the lens of social injury, and in the process cultivate subjectivities that are marked by race, gender, class.

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

David Williams

Spring; T 2-4

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.

Anthropology 1825: Medical Expertise

Stephen Scott

Fall; TTh 1-2:30

Whether embodied in individuals or distributed in infrastructures, expertise—as craft, as system, as ideology—is crucial to the constitution and legitimation of medical knowledge and its practice. Drawing on readings in medical anthropology and sociology as well as the growing field of science studies, this course examines the role of expertise in contemporary biomedical cultures. What is medical expertise? How is it made? And what does it make? How do expert practitioners confront lay patients and publics? And how are patients and publics and their own ways of knowing, doing, and being reshaped by expert knowledges and practices? What role do expert infrastructures play in the enactment and authorization of biomedicine? What role do they play in assembling and extending the broader biomedical cultures that link practitioners, patients, and publics? This course explores these questions and more. After introducing classic and contemporary readings in

social theory that problematize medical expertise and its practice, it examines a range of related themes from both a theoretical and ethnographic vantage: the shifting relations between the patient's view, the clinical gaze, and the visibilities of the biomedical laboratory; medical standardization and the coordination of medical ontologies; the power of medical records and other inscriptions both inside and outside biomedical institutions; the creation and legitimation of medical facts; the tense relation between the body as object and the embodied subject in biomedical knowledge and practice; and the broader interactions between medical policy and its publics.

Course Notes: This course is offered via the Social Anthropology track within Anthropology.

[Anthropology 1882: The Woman and the Body]

Susan Greenhalgh

Likely to be offered in 2017 Fall

This course probes the culture and politics of the body in America today, stressing America's role as a center of bodily ideals that now dominate global imaginations. Emphasizing the intersections of gender with race/ethnicity, class, and sexuality, the course examines the diverse notions of beauty, bodily practices, and body politics embraced by American women (and, to a lesser extent, men) of different classes, ethnicities, and sexualities. It deals with critical issues facing our society in the early 21st century—the growing prevalence of eating disorders, the normalization of cosmetic surgery, rising levels of childhood and adult obesity using contemporary theory to tease out their complex sources and effects. Lying at the intersection of the anthropology of the body, medical anthropology, and women's/gender studies, the course outlines an important new arena for critical inquiry.

Global Health and Health Policy 60: Negotiation and Conflict Management: From the Interpersonal to the International

Daniel Shapiro

Fall; M 2-5

Class Capacity: 40

Consent Required: Instructor

How can you best negotiate conflict in your own life? How should policymakers negotiate global conflict? Around the world, conflict imposes profound direct and indirect costs on global health and individual well-being, ranging from death and injury to trauma, the loss of social networks, and destabilization of political systems. Rather than focusing on how to address the aftermath of conflict and violence, this course examines theory and practical methods to prevent destructive conflict. Explores theory, frameworks, and tools developed to negotiate the substantive, emotional, and identity-based dimensions of conflict. Applies the theory to

a diversity of real-life negotiations, ranging from interpersonal disputes between friends to international conflicts in the Middle East and elsewhere.

This highly interactive course aims to improve students' skill in resolving conflicts, and draws on a variety of learning methodologies, including lecture, case simulations, self-reflection exercises, and application of negotiation frameworks to conflicts depicted in movies. Students will have the opportunity to analyze firsthand case narratives of senior-level global leaders who have negotiated serious conflicts; these cases are part of an emerging Global Curriculum on Conflict Management spearheaded by the instructor, the Harvard International Negotiation Program, and the World Economic Forum.

History 87a: Health, Disease, and Ecology in African History

Emmanuel Akyeampong

Fall; W 1-3

Class Capacity: 15

Consent Required: Instructor

Examines the history of disease and health in sub-Saharan Africa from the 19th century to recent times, exploring African and western concepts of health, disease and healing. Illustration through discussion of case studies of individual diseases, including malaria/sickle cell trait, trypanosomiasis, tuberculosis, sexually transmitted diseases, alcoholism, AIDS, and onchocerciasis, and the public health policies affecting them.

Recommended Prep: Senior level undergraduates.

History of Science 142v: Masculinities and Health: History and Politics of Men's Health and Illness

Sean O'Donnell

Spring; W 4-6

Class Capacity: 15

Consent Required: Instructor

This course will introduce recent theories of masculinity and performativity in gender theory with the aim of exploring possible links to medical and public health constructions of the male body and men's health. From 19th century concerns about degeneration and the identification of "effete" male to the military's failed policy of "don't ask, don't tell," we will consider the various ways cultural anxieties about "manliness" have been addressed by medical, psychological, and public health experts. Topical areas will include: risk taking, sports, body image, sexuality, violence, depression, ADHD, sociopathy, suicide, aging and life expectancy.

History of Science 149: The History and Culture of Stigma

Allan Brandt

Spring; T 2-4

Class Capacity: 20

Consent Required: Instructor

This course will investigate the history of a number of stigmatized conditions and diseases including, for example, cancer, mental illness, addiction, obesity, AIDS, and disability. A central goal will be to understand the stigmatization of disease and its effects in diverse historical and cultural contexts. The course will evaluate both the impact of stigmatization on health disparities and outcomes, as well as attempts to de-stigmatize conditions that are subject to discrimination, prejudice, and isolation.

Psychology 980p: Social Factors in the Development of Psychopathology

Sarah Hope Lincoln

Fall; M 7-9

Class Capacity: 16

Consent Required: Instructor

Does bullying lead to school shootings? Can Facebook cause depression? Are “fitspiration” communities dangerous? This course will review the role social factors (social support, social interactions, social functioning, and the broader social context of communities) relate to the development and maintenance of psychopathology on biological and behavioral levels. In the context of disorders such as schizophrenia, depression (including suicide), eating disorders, and post-traumatic stress disorder, this course will look at how social factors might contribute to the development of mental illness, as well as how social factors might be indicators of mental illness, and finally how social factors might mediate the severity of or even prevent the development of mental illness.

Recommended Prep: The Psychology Department requires completion of Science of Living Systems 20 (or equivalent) and PSY 18 or PSY 1861 before enrolling in this course.

Psychology 980u: Psychological Challenges of Adolescence and Early Adulthood

Sarah Kleiman

Fall; T 6:30-8:30

Class Capacity: 16

Consent Required: Instructor

This seminar will examine research on a wide range of developmental, social, and psychological processes that affect the mental health of adolescents and young adults. We will discuss factors that facilitate resilience during adolescence and the transition to adulthood (such as personality traits and economic resources), as well as risk factors (such as parental maltreatment and exposure to

violence). We will also explore questions specific to disorders common during this developmental period, such as whether adolescent mood and anxiety disorders are unidimensional or bidimensional constructs, and how recent social and neurobiological research can enhance our understanding of the unique challenges faced by adolescents and young adults with ADHD. Throughout the course, we will discuss research on emerging trends in media use and Facebook, and the impact of these technologies on depression, anxiety, substance abuse, and cyberbullying.

Class Notes: Course instructor is Sarah Erb. Please contact her with any questions about the course.

Recommended Prep: The Psychology Department requires completion of Science of Living Systems 20 (or equivalent) and PSY 18 or PSY 1861 before enrolling in this course.

[Sociology 98ha: Sociology of Health]

Instructor TBA

Likely to be offered in 2017 Fall

Consent Required: Instructor

Examines how culture, politics, and finance “matters” in health care through an exploration of the diverse community health centers and major medical centers throughout greater Boston. Students will enhance their qualitative research skills through ethnographic observation, mapping, and historical and documentary analysis of the services provided and populations served in various clinical settings.

Course Notes: Spring Junior Tutorials are by assignment only.

Course Requirements: Prerequisite: Sociology 97 AND Sociology Concentrators.

Sociology 98sb: The Social Determinants of Health

Benjamin Sosnaud

Spring; Th 2-4

Class Capacity: 10

Consent Required: Instructor

There is growing awareness of the importance of social factors in shaping health outcomes. In this course, we will explore these social determinants of health through the study of issues like differences in mortality and morbidity between social groups, the influence of social networks on health behaviors, the structure of health insurance provision, the effects of public health expenditures, and the environmental factors that influence health outcomes. Students will develop independent quantitative research projects on a topic of interest and gain experience with the process of research design, data collection, and analysis.

[Sociology 165: Inequalities in Health Care]

Mary Ruggie

Likely to be offered in 2017 Fall

Asks why certain social groups are at greater risk for more severe health problems (e.g., infant mortality, HIV/AIDS, cancer) and yet receive unequal health care in the US.

Examines what best practices foster adequate delivery of healthcare services, mutual respect between patient and provider, and healthy living. Considers the role of government, the private sector, family and community.

Women, Gender, and Sexuality 1125: Gender, Poverty and Health: Social Inequalities and Social Policy

Mary Ruggie

Spring; W 1-3

Class Capacity: 12

Consent Required: Instructor

Among advanced countries, the United States has the highest rates of poverty and the lowest outcomes on such measures of health as infant mortality. Social inequalities based on gender, race and ethnicity exacerbate the negative impact of poverty on ill-health. Moreover, these inequalities persist despite relatively high levels of government expenditures on health and related social programs. This course examines some of the many reasons for entrenched inequalities in poverty and health, including fragmented funding and delivery systems and institutionalized discrimination. In addition, our concern throughout will be on what can be done to alleviate social exclusion and stigma. To that end, we will consider the possible contributions of a variety of social actors and organizations. Our topics include: understanding poverty and its relationship to health; gender, race and ethnic variations in poverty and health; and the role of public policies on infant, child, and maternal health; food insecurity; homelessness; and HIV/AIDS.

Women, Gender, and Sexuality 1239: Plagues and Politics: The Impact of AIDS on US Culture

Michael Bronski

Spring; M 1-3

Class Capacity: 35

Consent Required: Instructor

This course surveys the history, social impact, and long lasting ramifications the AIDS epidemic in the United States from 1981 to the present. Using the lenses of sexuality, race, class and gender, among others "Plagues and Politics" explores the immediate and recurring affects of HIV/AIDS on issues such as health care, anti-discrimination law, immigration, prevention and education strategies, drug policies, urban planning, criminalization of sex, and social services.

Course Notes: Weekly lecture and a one hour section to be arranged.

[Women, Gender, and Sexuality 1421: Medical Management of the Female Body]

Instructor TBA

Likely to be offered in 2017 Fall

Consent Required: Instructor

This course examines how Western medical knowledge, practices, and institutions define female health and normality and manage diseased and gender-variant female bodies. How, for instance, does medicine conceive of the female body as a medical problem or mystery and how do race, class, and sexuality inflect these conceptions? Topics include: "female maladies," medicalization of childbirth and the pregnant body, medical management of transgender and intersexed bodies, ideals of fitness, cosmetic surgery, disability, and pharmaceutical marketing.

HISTORY AND PRACTICE OF MEDICINE

Freshman Seminar 21h: Modern Civilization and the Rise of Heart Disease

Richard Lee

Fall; M 3-5

Class Capacity: 12

Consent Required: Instructor

Heart diseases have plagued humans since ancient times, but only in the past century has heart disease become epidemic throughout the world. Despite great progress in prevention and therapy, heart diseases will be major causes of death and disability throughout the next century. Modernization of civilization has played a major role in the rise of heart disease. Conversely, advances in heart disease have powerfully changed society and our personal daily behavior. In this seminar, we will examine some of the major intersection events between heart disease and modern society over the past century and consider how this could change the next century in America and throughout the world. The topics include highly visible events such as the deaths of American Presidents from cardiovascular disease, leading to the rise of biomedical research in the US, as well as relatively obscure events like a young physician inserting a urinary drainage tube into his heart—ultimately generating the modern life-saving treatment for heart attacks. We will explore how major lifestyle factors such as tobacco, alcohol, exercise and diet affect health, and how economics and politics often play a role in the complex relationship of health and society. In addition, we will visit a high technology modern cardiology facility and watch some technology in action.

Course Requirements: Course open to Freshman Students Only.

Freshman Seminar 24g: A Brief History of Surgery

Frederick Millham

Fall; Th 7-9

Class Capacity: 15

Consent Required: Instructor

The history of surgery begins with the Hippocratic physicians whose principles were based, at least partly, on observation and measurement. However, surgical thinking for first three quarters of the “modern era” was dominated by Galen of Pergamum who, “fooled by his monkeys,” established a school thought as false as it was tightly held. The exposure of Galen’s errors by Vesalius in 1543 and Harvey in 1628 began a Medical Enlightenment. It would take until the 19th century for the next era of discovery to begin. During this time, the pace and significance of medical discovery increase, yet adoption of good ideas, like antisepsis, seems to take much too long, while bad ideas

find adherents in spite of poor or no supporting evidence. Throughout this period, the ghost of Galen continues to haunt hospitals and battlefields. It will not be until the 1930’s that Galenism is banished from the wards. Our study will track this history and conclude with a consideration of the management of combat casualties from the time of the first “modern” surgeon, Ambrose Pare, to that of contemporary forward surgical teams in Afghanistan and Iraq. The seminar will consist of weekly discussion, informed by assigned reading and independent inquiry. We will visit the site of the first use of ether anesthesia, and duplicate William Harvey’s experiments in the anatomy lab. From time to time we will be joined by other doctors with expertise in specific areas such as infectious disease, combat surgery and anatomy.

Course Requirements: Course open to Freshman Students Only.

Freshman Seminar 41d: Sick and Tired of Being Sick and Tired: Health Disparities and African Americans

Evelynn Hammonds

Spring; Th 3-5

Class Capacity: 12

Consent Required: 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 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.

Course Requirements: Course open to Freshman Students Only.

Freshman Seminar 70i: Contagion: Epidemics and Endemics from Black Death to Ebola

Ahmed Ragab

Fall; W 4-6

Class Capacity: 12

Consent Required: Instructor

For centuries, communicable diseases ravaged different communities causing massive mortality and morbidity. The death toll disrupted social organizations, destroyed families,

and challenged medical thought and State authority. Physicians struggled to make sense of contagion, disease factors and treatment; State authorities were faced with demands to intervene, protect and support the sick, all while its own institutions were ravaged by diseases; social, religious and legal institutions were disrupted, stressed and tested time and again. In this course, we trace how epidemic and endemic diseases influenced medical practice and public and global health, and how they impacted social structures in different periods and regions. We ask about the meaning of contagion, and how physicians understood disease transmission before and after germ theory. We investigate the history of quarantines and isolations, and ask about stigma attached to diseases, and about race, gender and sexuality in the making of stigma. We also look at how colonialism impacted disease transmission and how colonial powers dealt with epidemic and endemic diseases. The course moves from Black Death in the fourteenth century to other plague epidemics in the eighteenth century, where debates on contagion in medicine became most heated. We study tropical diseases and discuss the Cholera epidemics of the nineteenth century to the much feared Tuberculosis. We then discuss vaccination and eradication as we analyze small pox, measles and polio ending with our most recent epidemics: HIV and Ebola. The course introduces students to history of medicine and history of epidemics as well as to discussions of epidemiology, medical practice and medicine in society.

Course Requirements: Course open to Freshman Students Only

[GEN ED: Culture and Belief 11: Medicine and the Body in East Asia and in Europe]

Shigehisa Kuriyama

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 requirement that one of the eight General Education courses also engage substantially with Study of the Past.

GEN ED: Culture and Belief 34: Madness and Medicine: Themes in the History of Psychiatry

Anne Harrington

Fall; MWF 10-11

Psychiatry is one of the most intellectually and socially complex and fraught fields of medicine today, and history offers one powerful strategy for better understanding why. Topics covered in this course include the invention of the mental asylum, early efforts to understand mental disorders

as disorders of the brain or biochemistry, the rise of psychoanalysis, psychiatry and war, the rise of psychopharmacology, the making of the DSM, anti-psychiatry, and more.

Course Notes: This course fulfills the requirement that one of the eight General Education courses also engage substantially with Study of the Past.

[GEN ED: United States in the World 13: Medicine and Society in America]

David Shumway Jones

Surveys major developments in the history of American medicine since 1500. Emphasis on setting the practice of medicine and the experience of health and disease into broad social, cultural, and political contexts. Topics include the social and cultural impact of epidemic disease; the nature of demographic and epidemiological change; the development of medical therapeutics and technologies; the growth of health care institutions; the rise of the medical profession; and debates about the allocation of health care resources. Evaluates the role of medicine in addressing social needs as well as the social and economic determinants of patterns of health and disease.

Course Notes: This course fulfills the requirement that one of the eight General Education courses also engage substantially with Study of the Past.

[African and African American Studies 189x: Medicine, Culture, and Society]

Jean Comaroff

Likely to be offered in 2017 Spring

This course examines the changing place of medicine in the long history of modernity. Focusing on key moments - the birth of the clinic, the colonial frontier (where biomedicine met its therapeutic “others”), the consolidation of medicine as self-governing profession, the age of genomics and biocapital—it explores the distinctive role of medical knowledge in the making of modernist persons, identities, and social worlds. Readings are drawn from across the social sciences, with material from Africa, Europe, and North America. Part lecture, part discussion, the class will be open to upper-level undergraduates and graduates.

[Classical Studies 165: Medicine in the Greco-Roman World]

Mark Schiefsky

Theories and practices of health and healing in the ancient Greco-Roman world, with special emphasis on the relationship of learned medicine to philosophy and other healing traditions.

Course Notes: This course, when taken for a letter grade, meets the General Education requirement for Culture and Belief. This course fulfills the requirement that one of the

eight General Education courses also engage substantially with Study of the Past.

Global Health and Health Policy 50: The Quality of Health Care in America

Ashish Jha, Anupam Jena

Spring; MW 3:30-5

Class Capacity: 40

Consent Required: Instructor

Offers information and experiences regarding 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.

[History 97a: "What Is the History of Medicine?"]

Emmanuel Akyeampong

Consent Required: Instructor

Likely to be offered in 2018 Spring

The emergence of the science of medicine and its professionalization have been integral aspects of human history. The history of medicine allows us to trace the various traditions that have come together to create "modern medicine." In this section, students will examine the human endeavor to be healthy and to cure disease. The practice of medicine draws on changing ideas about the natural world and the body. It also demands interventions in the physical environment so as to maximize public health, and readily incorporates transformative technologies from other sectors of human society. Students will be asked to reflect on the interaction of medicine and culture through questions such as: How did western powers use biomedicine in the context of empire? How do non-western cultures appropriate and indigenize biomedicine?

History of Science 108: Bodies, Sexualities, and Medicine in the Medieval Middle East

Ahmed Ragab

Fall; MW 11-12

This course will examine the ways in which medical, religious, cultural, and political discourses and practices interacted in the medieval and early modern Middle East to create and reflect multiple understandings of human bodies and sexualities. Special attention to debates on health, sexuality, and gender and racial identities.

Course Notes: This course, when taken for a letter grade, meets the General Education requirement for Culture and Belief. This course fulfills the requirement that one of the

eight General Education courses also engage substantially with Study of the Past.

History of Science 143: Confined: Hospitals in the History of Medicine and Religion

Ahmed Ragab

Spring; MW 11-12

While hospitals seem to be the most ubiquitous site for medical practice, they were not always as common, as important or even looked the same. Hospitals were the battleground for defining the relationship between medicine and religion. From their charitable role to their staffing with nurses, hospitals represented and symbolized this relationship and its continuing development. They were also the space where medicine and law interacted and where ethical questions, questions about patient autonomy and about end-of-life care continue to play out. Embedded in their history and even their architecture, gender, sexuality and race were always central to the changing nature of hospitals and to how their role was understood.

This course investigates the history of hospitals from the medieval period till today looking at how they developed from sites of charitable care, to places for the confinement of the socially-marginalized to factories of medical technology. We will look at their role in the making of medical knowledge, in the relationship between medicine and religion, and in the changing doctor-patient relationship. We will also look at how doctors and other medical practitioners think, how hospitals were and are designed and run and how they perceive their roles.

[History of Science 144: Medical Technologies in Historical Perspective]

Evelynn Hammonds

The course examines the ways in which various medical technologies shaped and were shaped by physician and nurse practices and goals as well as ideas about patient care in American medicine from the 19th-century to the present. We will look at how the meanings attached to medical technologies grew out of specific historical, social, political and medical contexts. Medical technologies examined include: imaging machines; clinical, diagnostic and genetic tests; reproductive technologies; and artificial organs.

History of Science 147: The Changing Concept of Race in America: From Jefferson to Genomics

Evelynn Hammonds

Spring; Th 2-4

Class Capacity: 15

Consent Required: Instructor

This course explores changing concepts of race in American science and medicine, and examines the historical meanings and uses of these concepts in U.S. society from the 18th

century to the present. The course asks the following questions: How have diverse scientific and medical disciplines historically defined, measured, and produced knowledge about “race”? How have scientific and medical concepts of race historically interrelated with key political, economic, and social institutions? How do current 21st century genomic concepts of race fit into this larger history of race and science?

[History of Science 178v: History of the Psychotherapies]

Elizabeth Lunbeck

Examines the history of the current psychotherapeutic landscape, looking at the development, methods, aims, efficacy, and limitations of a range of psychotherapeutic modalities from Freud’s time to our own, among them psychoanalytic, psychodynamic, cognitive, behavioral, manualized, and evidence-based treatments; individual, play, family, and group therapies. Explores tensions between therapy as a quest for self-improvement and a means of relieving symptoms, between focusing on cognition and on behavior, and between mind and brain. Looks at providers and patients, at the testimonies of writers and poets, and at office-based, hospital, and computer therapies. The question of the relationship between professional practices and the rise of a popular therapeutic sensibility is central to the course.

Women, Gender and Sexuality 1218: Women in American Medicine

Jenna Tonn

Fall; T 3-5

Class Capacity: 15

Consent Required: Instructor

This course explores the history of women in American medicine from the colonial period to the present. We will consider both the changing place of women within the medical profession and the development of medical knowledge about women’s health and disease. How have women practiced medicine as traditional healers, midwives, nurses, physicians, and caregivers? What is the historical relationship between female medical practitioners and the production of medical knowledge about the female body? We will pay particular attention to structural inequalities within the American medical profession and the important role that practitioners, patients, and feminists have played in challenging gender-based discrimination in medicine as well as sexist assumptions about the female body.

POLITICS OF HEALTH

Freshman Seminar 27i: Global Health: Comparative Analysis of Healthcare Delivery Systems

Sanjay Saini

Fall; M 2-4

Class Capacity: 15

Consent Required: Instructor

This interactive seminar will allow students to obtain greater understanding of global health issues 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 for publication in a peer-reviewed journal.

Course Requirements: Course open to Freshman Students Only.

GEN ED: United States in the World 11: U.S. Health Care Policy

Amitabh Chandra

Spring; MW 11-12

Class Capacity: 180

Consent Required: Instructor

This course provides an overview of the U.S. health care system in historical and international perspective, and engages students in critically analyzing health policy issues. The course is focused around three complex and interdependent policy challenges that every health system must address: *ensuring access to health care, paying for new innovations, and improving quality*. Using primarily an economic lens, students will grapple with the complexity of the issues, learn to analyze policy arguments, evaluate evidence, identify tradeoffs, and recognize the limits of economic analysis—critical skills for engaging constructively as informed citizens in a wide range of policy debates.

Course Notes: Students who have taken General Education 186 or Extra-Departmental Courses 186 may not take this course for credit.

Class Notes: If student interest exceeds the course limit, a random lottery will be conducted. To enter the lottery, you must add the course to the Study Card and explicitly request enrollment permission when prompted. Instructor permission will be granted to only those admitted by the lottery; all students will be notified of their results. See the course website for more details.

GEN ED: United States in the World 31: American Society and Public Policy

Theda Skocpol, Mary Waters

Fall; MW 10-11

In the U.S., compared to other major nations, how have social problems been defined and redefined in recent decades; why do they appear differently to various groups; and how are public policies about problematic social conditions debated, devised, and changed? This course synthesizes various kinds of evidence—demographic, attitudinal, ethnographic, and institutional—to probe the creation and impact of major public policies about social support for families and workers; immigration and citizenship; and access to higher education.

Social Studies 98ok: The Politics of the Environment in Asia

Kevin Caffrey

Spring; TBA

Class Capacity: 10

Consent Required: Instructor

Scholars have noted the connection between environment and specific forms of Asian politics and society. Today China reengineers the flow of its rivers to address social demands for water. South & Southeast Asian polities realize how politics beyond their borders can determine the flow of the region's rivers—and thus the health of their societies. The dangers of poor air quality, polluted land, and contaminated food energize social movements and unrest. Asian development models have resulted in extreme pollution, and with resulting public health problems, governmental attention to the environment has increased. In this research seminar students will explore “politics and environment” in Asia, with some attention being given to the future.

Course Notes: This course will be lotteried.

XREG: HKS SUP-575 / HSPH HPM 247: Political Analysis and Strategy for US Health Policy

Robert Blendon

Spring, MW 4:10-5:50

Class Capacity: 78

Health policymaking in the U.S. has a strong political dimension. This course offers analytical insights into understanding U.S. health policymaking and developing political strategies that influence health policy outcomes. The course provides both the theoretical basis and strategic skills for those in future leadership roles to influence the health policy process. Major topics to be covered include analyzing how health policy is shaped by interest groups, media, public opinion, legislative lobbying, elections, coalition building, policy legacies, institutions, and the politics of information. Student-led case studies focus on

marijuana legalization in Colorado, defunding Planned Parenthood, and gun control legislation, as well as major movements toward comprehensive national health insurance in the U.S. including the Clinton and Obama health plans and the debate over the implementation of the Affordable Care Act. Leaders in political strategy from both the health and political fields will be guest lecturers.

Course Note: Cross-listed with SUP-575; HSPH students must register for HSPH course. HPM 247 will now only be taught on the Harvard Kennedy School of Government campus. It will no longer be offered on alternating years at HSPH. This course is not open to auditors.

Registration Note: Priority goes to DrPH, HPM-SM2, and MPH45-HP students

XREG: HSPH GHP 244: Health Sector Reform: A Worldwide Perspective

Thomas Bossert

Fall 2; TTh 1:30-3:20

Class Capacity: 67

This course is designed to help students understand health systems, and processes to reform them, in middle and low income countries. It presents a purposeful framework for the analysis of why health systems are not able to achieve broad objectives such as health status improvement, financial risk protection and patient satisfaction, as well as greater access to services with better quality and more efficiency. It introduces the concept of control knobs for developing appropriate options to reform the systems in policy areas of financing (including tax and insurance based systems), payments to providers, organizational changes like centralization and use of private sector, regulations and persuasion through social marketing. It also includes attention to ethical choices and to political feasibility of reform options. The course involves case studies, class discussion and lectures and mid-term and final papers that apply the framework concepts of a country chosen by each student.

Note: This course provides 2.5 credits. In order to receive credit equivalent to a course in FAS, a student must take two 2.5-credit HSPH courses.

XREG: HSPH GHP 269: Applied Politics and Economics I: Political Economy of International Health

Jesse Bump

Spring 2; MW 10:30-12:20

Class Capacity: 67

This course presents theoretical perspectives, empirical cases and research issues in policy analysis and political economy in global health. The focus is on analytical and methodological issues. The main purpose is to examine the political economy constraints on national and global health

initiatives, the role of international agencies, the impact of non-governmental organizations, and the role of the state.

All students will be expected to participate actively in class discussions and submit three assignments. Doctoral students in GHP must write a final paper; master's students and non-GHP doctoral students have the option to either write a final paper or complete a take-home final exam. Exams and papers will constitute 80% of the grade and class participation 20%.

Course Notes: Course is restricted to GHP SM2 research students. Seats will be made available to other students if room is available.

Note: This course provides 2.5 credits. In order to receive credit equivalent to a course in FAS, a student must take two 2.5-credit HSPH courses.

SCIENCE OF DISEASE

Freshman Seminar 25p: Neurotoxicology: Biological Effects of Environmental Poisons

S. Counter

Fall; W 2-4

Consent Required: Instructor

Class Capacity: 15

This seminar will explore a wide range of environmental and man-made neurotoxic substances and their effects on human and animal populations. Particular attention will be given to pediatric exposure to neurotoxic agents and associated neurodevelopmental disabilities, as well as neurobehavioral and immunological changes. The seminar will examine the impact on children of lead (Pb) exposure from Pb glazing activities, household paints, and automobile petroleum emissions in the environment. Mercury poisoning through contaminated foods, cosmetics, vaccine preservatives, inorganic mercury in teething powders, elemental mercury from amalgamation, and magico-religious rituals will define another area of study. The basic neurophysiology and neurochemistry of a number of other neurotoxins, including arsenic, tetrodotoxin, saxitoxin, botulinum, curare, cocaine, and “nerve gas” will be reviewed. What dangers do these toxins pose? What can or should be done to prevent exposure?

Course Notes: This course welcomes science and non-science concentrators. Some background in high school biological and physical sciences is useful and preferred.

Course Requirements: Course open to Freshman Students Only.

Freshman Seminar 25x: Human Brain in Health and Disease: A Neurologist’s Perspective

Thomas Byrne

Fall; T 7-9

Class Capacity: 15

Consent Required: Instructor

Is the human mind an “emergent” property of the brain? How might that occur? We study how structure and properties of the brain and mind are shaped by biology, chemistry, experience and disease. For example, experiences during “critical periods” modify brain anatomy/function; learning a foreign language before or after puberty is revealed by a native or foreign accent. Mirror neurons play a role in perception, motor skills and emotion. Examples include “contagious” happiness or sadness, empathy 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 seeking logical patterns; mathematics is “core knowledge” of infants. We then use these patterns to look into the future to anticipate where a given pattern will lead and are thus “pulled” to that goal or not; thus the goal can determine 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.

Course Requirements: The course is intended for those who have scored -5- on AP Biology or Chemistry. Course open to Freshman Students Only.

Freshman Seminar 26w: The Biology and Science of Cancer and Its Treatments: From Empiric to Scientific to Humanistic

George Demetri

Spring; W 2-4

Consent Required: Instructor

Class Capacity: 12

“Cancer” represents hundreds of different diseases with a wide variety of causative mechanisms, as well as enormous social impact. This seminar aims to provide an introduction to the biology of cancer and what makes a normal cell become a cancerous one, delving into acquired and inherited genetic abnormalities and effects of environmental factors, such as nutrition, radiation, and tobacco. Current approaches to cancer will be discussed from prevention and early detection to treatment and survivorship. Treatment modalities continue to evolve—no longer just surgery, chemotherapy and radiotherapy, but development of targeted therapies such as monoclonal antibodies, signal transduction inhibitors, vaccines, and angiogenesis inhibitors, which are rationally aimed at biological mechanisms uniquely important to the cancer cells themselves with the goal of reducing side effects of therapy and improving outcomes. Although cancer incidence continues to increase, mortality is decreasing, resulting in many more cancer survivors and a need to care for the secondary effects of the treatment and the societal impact of this disease. We will discuss the field of Integrative Oncology, an evolving discipline that treats the patient as a whole and combines the best of eastern and western medicine. As successful cancer management becomes more targeted with the newer therapies, there needs to be an integrative approach which focuses on clinical outcomes for patients, personalized approaches to individual cancers, yet which takes into account the financial impact of new

therapies at a global level and allows development of wise public policy decisions.

Course Requirements: Course open to Freshman Students Only.

[GEN ED: Science of Living Systems 11: Molecules of Life]

Jon Clardy, David Liu

Molecules form the basis of heredity, govern how our bodies develop, allow us to respond to changes in our environment, and carry our thoughts. This course explores the roles of molecules through case studies of our bodies' messengers, modern drugs, and the future of medicine. Examples include sexual development, metabolism, diabetes, nerve transmission, psychiatric disease, infectious disease, cancer, aging and stem cells. Students will connect to lecture material in discussion section through hands-on activities and role-playing scenarios.

GEN ED: Science of Living Systems 16: Human Evolution and Human Health

Daniel Lieberman

Spring; TTh 1-2:30

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

Course Notes: This course fulfills the requirement that one of the eight General Education courses also engage substantially with Study of the Past.

GEN ED: Science of Living Systems 17: Human Physiology: From Personal To Public Health

Stephanie Shore, Nancy Long Sieber

Spring; MWF 12-1

Class Capacity: 75

The course introduces students to the functioning of the human body in health and disease. Students will examine critical determinants of their own health (genetics, diet, sleep, exercise, stress, social interactions) and also consider how these and other factors impact the health of diverse communities in both rich and poor countries. Emphasis will be placed on responses of the human organism to infection, injury, and environmental stress, and on topics with high public health impact (obesity, smoking, mental health). Activities include lectures, 3 guided laboratories/

demonstrations, weekly sections to review key concepts, and a directed term project.

GEN ED: Science of Living Systems 19: Nutrition and Global Health

Clifford W. Lo, Christopher Duggan

Spring; M 3-5

This course will introduce students to nutrition and global health problems through exploration of demographic, epidemiological, biological, social, political, and economic determinants of nutritional status. Emphasis will be placed on the role of nutritional status and dietary intake, both as a determinant and as a consequence, of these health problems. Students will be encouraged to think critically about the major challenges to improve nutrition and health at a global level, with a focus on nutrition and infectious diseases, maternal and child health, and chronic diseases. Nutritional assessment, study design, and efficacy of nutrition interventions, will be explored in detail.

GEN ED: Science of Living Systems 26: The Toll of Infection: Understanding Disease in Scientific, Social, and Cultural Contexts

Donald Goldmann

Fall; MW 1-2:30

Class Capacity: 60

Consent Required: Instructor

This course will review the devastating impact of representative infectious diseases on wars, politics, economics, religion, public health, and society as reflected in history, literature, and the arts. We will study how infections spawned revolutionary epidemiologic and scientific advances in detection, treatment, and prevention. We will address the gaps between discovery and implementation, including ethical, social, economic, and health systems barriers to progress. We will confront challenges posed by microbial mutation (e.g., antibiotic resistance, evasion of immunity, and adaptation of animal viruses to humans). By weaving together knowledge from science and the humanities, students will understand the historical and contemporary impact of infections and potential solutions to the challenges they pose.

Class Notes: If student interest exceeds the course limit, a random lottery will be conducted. To enter the lottery, you must add the course to the Study Card and explicitly request enrollment permission when prompted. Instructor permission will be granted to only those admitted by the lottery; all students will be notified of their results. See the course website for more details.

Chemistry 101: Chemical Biology Towards Precision Medicine

Stuart Schreiber

Fall; TTh 10-11:30

Consent Required: Instructor

Chemical Biology Towards Precision Medicine teaches students principles of modern organic synthesis, chemical biology and human biology relevant to the discovery of safe and effective small-molecule therapeutics in the future. The course will explore patient-based “experiments of nature” that illuminate disease, including cancer, diabetes, infectious disease and psychiatric disease, among others. Students will then use their knowledge of chemistry and chemical biology to propose research yielding novel small molecules that affect biological systems by mechanisms suggested by the experiments of nature. Chem 101 aims to prepare students for the next decade where academic research tests hypotheses emerging from human biology in humans using novel small-molecule probes.

Course Notes: Pre-requisite: Chemistry 17/27, Chemistry 20/30, or the equivalent

[Environmental Science and Public Policy 90t: Environmental Health: Your World and Your Life at Risk]

Douglas Dockery, Steve Curwood

Through the seminar course students will be introduced to ongoing environmental health research. They will read published articles and interview faculty. Studies will include birth outcomes and heavy metals; neurological and cognitive development in children exposed to lead; dietary interventions and pesticide exposure; asthma and public housing; air pollution and cardiovascular health; exposures and effects of plasticizers, flame retardants, polychlorinated biphenyls (PCBs), bisphenol A (BPA) and other synthetic organic compounds; cell phone use and brain cancer; respiratory effects of biomass cooking and heat fuels on children and women; heat waves and heat stress mortality; and land-use factors and obesity.

Human Evolutionary Biology 1410: Gut Microbiome and Human Health

Rachel Carmody

Spring; Th 1-4

Class Capacity: 8

Consent Required: Instructor

Microorganisms residing in the human gastrointestinal tract outnumber our own cells and together encode at least 100 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 the pivotal roles of the gut microbiota in digestion, detoxification, energy regulation, and immunity, and discuss emerging evidence for the microbial modulation of risks and/or treatment of

metabolic syndrome, cardiovascular disease, cancer, and behavioral disorders. Students will be introduced to bench and bioinformatics techniques used to investigate gut microbial communities, allowing students to pilot projects that dovetail with topics discussed in seminar.

Course Notes: Preference will be given to Human Evolutionary Biology concentrators fulfilling a research seminar requirement and Human Evolutionary Biology graduate students. This course fulfills the research seminar requirement for Human Evolutionary Biology.

Recommended Prep: Life Sciences 2 or permission of instructor.

Human Evolutionary Biology 1424: Evolutionary Medicine

Lara Durgavich

Spring; Th 1-4

Class Capacity: 12

Consent Required: Instructor

This course applies a Darwinian perspective to explore the ultimate causes of human disease, and uses the tenets of evolutionary theory to explain variability in the health of individuals and populations. In addition, we will examine the role that environmental conditions, economic factors, and sociocultural practices play in shaping modern patterns of human health and disease. Topics will include human-pathogen coevolution, diet and nutrition, reproductive health, mental illness, and senescence.

Course Notes: This is an introductory course that covers the basics of evolutionary theory. Priority given to Human Evolutionary Biology concentrators.

Life Sciences 2: Evolutionary Human Physiology and Anatomy

Andrew Biewener, Daniel Lieberman, George Lauder

Fall; MWF 1-2

Consent Required: Instructor

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 replaces OEB 102. This course, when taken for a letter grade, meets the General Education requirement in Science of Living Systems. This course may not be taken Pass/Fail.

Class Notes: MWF at 1 and three hours of laboratory/discussion weekly.

Life Sciences 120 / MCB 120: Global Health Threats

Richard Losick, Barry Bloom

Spring, TTh 1-2:30

Class Capacity: 50

Consent Required: Instructor

The multidisciplinary application of epidemiology, molecular biology and genetics, pathogenesis, drug discovery, immunology and vaccine development, and economic analysis to understanding and combating major threats to human health in developing countries. Emphasis will be on critical readings and scientific writing. Grades will be based on papers in which students will propose the application of multidisciplinary approaches to global health threats not covered in lecture.

Course Notes: This course cannot be taken if MCB 120 has already been taken. LS 120 cannot be taken concurrently with MCB 120.

Course Requirements: Prerequisite: LS 1a and LS 1b, or LPS A and one additional course from the following: Chemistry 27, Engineering 53, Life Sciences 2, MCB 60, MCB 52, MCB 54, OEB 10, OEB 53, or SCRB 10.

Mind, Brain, and Behavior 980b: Addiction, Choice, and Motivation

Gene Heyman

Fall; T 3-5

Class Capacity: 18

Consent Required: Instructor

Seeks a comprehensive understanding of addiction and why it has been such a contentious topic. Topics include but are not restricted to (1) the characteristics of addiction as revealed in biographies, epidemiological studies, clinical research, laboratory experiments, and "natural experiments;" (2) the current "opioid epidemic," including an exploration of its possible economic correlates; (3) genetic influences on alcohol consumption; (4) drug-induced cognitive changes and their implications for drug use; (5) smoking and delay discounting; and (6) a choice-based analysis of addiction.

Class Notes: Preference to juniors in MBB tracks or MBB secondary field.

[Mind, Brain, and Behavior 980k: Fighting Cancer with the Mind]

Consent Required: Instructor

Using contemporary mind-body practices as context, examines evidence (or lack of evidence) linking psychological practices with cancer survival. We will (1) review theoretical foundations for these links including psychoanalysis, psychoneuroimmunology, and cognitive-behavioral therapy; (2) analyze legitimization of mind-body practices for cancer in popular media; (3) interview mind-body medicine practitioners; and (4) examine published scientific data. Students will choose one mind-body practice

for in-depth study, analyzing its underlying theories, scientific evidence, and appeal to patients.

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

David Silbersweig, Marie-Christine Nizza

Spring; Th 3-5

Class Capacity: 18

Consent Required: Instructor

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

MCB 64: The Cell Biology of Human Life in the World

Robert Lue

Spring; MW 1-2:30

This course teaches fundamental concepts in cell biology in the context of individual life histories drawn from different parts of the world. Each life case focuses on key aspects of human development, growth, aging and disease while providing a nuanced view of the interplay between the life sciences, geography and culture. For example, a comparative discussion of aging in the United States and Japan is used to explore diet, cellular metabolism and its relationship to protein damage and turnover, while the Human Immunodeficiency Virus and AIDS in South Asia is used to explore mucosal immunity and the basis for estimating relative infection risk. Each case delves into the cell biology of major biological events across the life history of the human.

MCB 169: Molecular and Cellular Immunology

Shiv Pillai

Fall; TTh 10-11:30

Consent Required: Instructor

The immune system is frontier at which molecular biology, cell biology, and genetics intersect with the pathogenesis of disease. 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 disease including AIDS and other infectious diseases, autoimmune disorders, allergic disorders, primary immunodeficiency syndromes, transplantation, and cancer.

Class Notes: 90-minute section to be arranged.

Recommended Prep: Genetics and cell biology strongly recommended.

Course Requirements: Prerequisite: LPS A OR LS 1a

MCB 186: Sleep and Circadian Clocks: from Biology to Public Health

Charles Czeisler

Spring; W 2-5

Consent Required: Instructor

The impact of the brain's circadian clock on sleep becomes evident when we travel across time zones or shift our sleep on weekends. How does this clock work? How does light from a tablet or smartphone affect our biology? What is the best time for sleep? What about naps? This course will explore the neurobiology of the brain's circadian clock that regulates the timing and structure of sleep, its interaction with the periodic environment, and the consequences of circadian disruption in our 24/7 society on health, performance and safety.

OEB 50: Genetics and Genomics

Daniel Hartl, Robin Hopkins

Fall; TTh 11:30-1

Consent Required: Instructor

Fundamental concepts in genetics and genomics forming a critical foundation for biology approached from two perspectives: (1) as a body of knowledge pertaining to genetic transmission, function, mutation, and evolution in eukaryotes and prokaryotes; and (2) as an experimental approach providing a toolkit for the study of biological processes such as development and behavior. Topics include structure, function, transmission, linkage, mutation, and manipulation of genes; genetic approaches in experimental studies of biological processes; and analysis of genomes in individuals and populations. Related ethical issues also discussed include genetically modified organisms, gene therapy, genetic testing, personalized medicine, and genetic privacy.

[OEB 123: Biology of Symbiosis]

An examination of the major aspects of microbial endosymbiosis with emphasis on mutualisms, although some parasitic interactions are covered. Topics include origins of the eukaryotic cell, specificity and recognition of partners, distribution and diversity of associations, and coevolution of host and symbiont. The course covers symbiotic interactions among bacteria and archaea with protists, fungi, plants, and animals, including the human microbiome.

Recommended Prep: Life Sciences 1b, OEB 10, and MCB 52 or equivalent, or permission of instructor.

Psychology 18: Abnormal Psychology

Diego Pizzagalli

Spring; TTh 1-2:30

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 recent neuroscientific and genetic research on the neurobiology of psychopathology.

Course Notes: 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 the equivalent of introductory psychology (e.g. Psych AP=5 or IB = 7) before enrolling in this course.

Psychology 980t: Eating Disorders

Spring; TBA

Class Capacity: 16

Consent Required: 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 equivalent) and PSY 18 or PSY 1861 before enrolling in this course.

Psychology 1005: Health Psychology

Ellen Langer

Fall; TTh 10-11:30

Class Capacity: 60

Consent Required: Instructor

This course will examine psychological and physical health from the perspective of Positive Psychology. A major focus will be on mindfulness theory and its relationship to stress/coping; illness/wellness; decision-making; placebos. The medical model, the bio social model, and a unified mind/body model will be compared to examine their relationship to achieving resilience.

Recommended Prep: The Psychology Department requires completion of Science of Living Systems 20 (or equivalent) and at least one foundational course from PSY 14, PSY 15, PSY 16, PSY 18 or Science of Living Systems 15 before enrolling in this course.

Psychology 1201: Your Brain on Drugs: Psychopharmacology

Scott Lukas

Fall; TTh 1-2:30

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 equivalent) and at least one foundational course from PSY 14, PSY 18, or MCB 80 before enrolling in this course.

SCRB 130: Biomedical Entrepreneurship: Turning Ideas into Medicine

Derrick Rossi

Fall; W 9-12

Medicines and other therapeutics have revolutionized the treatment of many diseases. Few of us pause to consider how these products are developed from an initial discovery in the lab to the treatment of patients. This course will consider this journey by incorporating scientific, biotechnology, intellectual property, venture capital, and business perspectives. In addition to lectures, students will work on group projects to chart a strategy toward bringing a novel biomedical idea to the clinic.

Recommended Prep: Life and Physical Sciences A or Life Sciences 1a; Life Sciences 1b; SCRB 10 or MCB 52, or permission of the instructor.

[SCRB 150: Human Genetics: Mining Our Genomes for an Understanding of Human Variation and Disease]

Instructor TBA

Likely to be offered in 2017 Fall

The sequencing of the human genome has revealed the full extent of genetic variation that exists within us as a species. This genetic diversity underlies much of our physical variation as well as our differences in responsiveness to disease stimuli and their treatments. We will explore these and other ramifications of human genetic diversity by applying classical and contemporary genetic tools to the identification of specific genes and pathways that functionally underlie our variable biology.

Recommended Prep: Life and Physical Sciences A or Life Sciences 1a; Life Sciences 1b (or equivalent); SCRB 10 or MCB 52.

SCRB 167: Stem Cells and Regeneration in the Pathobiology and Treatment of Human Disease

George Daley, Leonard Zon

Spring; T 2-4

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.

Class Notes: George Daley and members of the Department
Recommended Prep: Life and Physical Sciences A or Life Sciences 1a; Life Sciences 1b; SCRB 10; MCB 52 or MCB 54.

[SCRB 185: Human Disease]

Instructor TBA

Likely to be offered in 2017 Spring

This course will address both the molecular basis of human disease, and the biological and chemical foundation of therapeutic intervention. The course will include lectures by prominent experts, and analysis of the primary literature.

Course Notes: May not be taken concurrently with MCB 185. May not be taken for credit if MCB 185 or Chemistry 285 has already been taken. Credit cannot also be received for MCB 185.

Recommended Prep: Chemistry 20/30 or 17/27, Life Sciences 52 or their equivalents. SCRB 192: Principles of Drug Discovery and Development

SCRB 192: Principles of Drug Discovery and Development

Gregory Verdine

Fall; MW 2:30-4

Class Capacity: 40

Consent Required: Instructor

This interdisciplinary course will examine the process of drug discovery and development through disease-driven examples. Topics include: the efficacy/toxicity balance, the differences between drugs and inhibitors, and the translation of cellular biochemistry to useful medicine.

Course Notes: May not be taken concurrently with Chemistry 192. May not be taken for credit if Chemistry 192 or MCB 192 have already been taken.

Recommended Prep: Chemistry 20/30 or 17/27, Life Sciences 52 or their equivalents, MCB 52, and one year of organic chemistry. MCB 54 is recommended.

SCRB 195: The Translational Science of Stem Cells

Lee Rubin

Fall; T 2-4

Class Capacity: 30

Consent Required: Instructor

This tutorial will emphasize applications of stem cell biology to treating human disease. Students will help decide on the area of focus for the semester from a range of topics, including cell therapy for diabetes, drugs that mobilize stem cells to repair damaged tissue, and disease modeling.

Together with the instructor, they will explore this area through lectures and extensive analysis of primary literature, with the goal of preparing a scientific review suitable for publication.

Course Notes: Permission of the instructor required to enroll. Ability to work in a less structured environment will be essential.

Recommended Prep: Life Sciences 1a or Life and Physical Sciences A, Life Sciences 1b, SCRB 10, SCRB 20 or equivalent

Index of GHHP Courses

Courses Offered in 2016-2017

African and African American Studies 197: Poverty, Race, and Health	21
Anthropology 1825: Medical Expertise	21
Applied Mathematics 101: Statistical Inference for Scientists and Engineers	9
BCMP 230 / [SCRB 230]: Principles and Practice of Drug Development	7
Biomedical Engineering 110: Physiological Systems Analysis	9
Biomedical Engineering 125: Tissue Engineering	9
Chemistry 101: Chemical Biology Towards Precision Medicine	33
Economics 1123: Introduction to Econometrics	9
Economics 1126: Quantitative Methods in Economics	9
Economics 1389: Economics of Global Health	7
Economics 1460: Economics of Health Care Policy	7
Economics 2395: Health, Inequality and Development	8
Economics 980w: Policy Options in Health and Environmental Economics	7
Engineering Sciences 165: Water Engineering	10
Engineering Sciences 53: Quantitative Physiology as a Basis for Bioengineering	10
Engineering Sciences 6: Introduction to Environmental Science and Engineering	10
Environmental Science and Public Policy 90d: Planetary Health: Understanding the Human Health Impacts of Accelerating Environmental Change	17
Freshman Seminar 21h: Modern Civilization and the Rise of Heart Disease	25
Freshman Seminar 22d: Time for Sleep: Impact of Sleep Deficiency and Circadian Disruption in Our 24/7 Culture	19
Freshman Seminar 22h: My Genes and Cancer	17
Freshman Seminar 23h: Anatomy and Ethical Transgressions in National Socialism	13
Freshman Seminar 23k: Insights from Narratives of Illness	19
Freshman Seminar 23l: Medicine, Law, and Ethics: An Introduction	13
Freshman Seminar 24g: A Brief History of Surgery	25
Freshman Seminar 24n: Child Health in America	17
Freshman Seminar 25n: Finding Connections: Perspectives on Psychological Development and Mental Illness	19
Freshman Seminar 25p: Neurotoxicology: Biological Effects of Environmental Poisons	31
Freshman Seminar 25w: Responsibility, the Brain, and Behavior	13
Freshman Seminar 25x: Human Brain in Health and Disease: A Neurologist's Perspective	31
Freshman Seminar 26v: Blood: From Gory to Glory	20
Freshman Seminar 26w: The Biology and Science of Cancer and Its Treatments: From Empiric to Scientific to Humanistic	31
Freshman Seminar 27i: Global Health: Comparative Analysis of Healthcare Delivery Systems	29
Freshman Seminar 41d: Sick and Tired of Being Sick and Tired: Health Disparities and African Americans	25
Freshman Seminar 43f: When Bad Things Happen Early in Life: the Effects of Early Adversity on Brain and Behavioral Develop	20
Freshman Seminar 48e: Health and Mental Health in Everyday Life	20
Freshman Seminar 70f: Bioethics through Film: An Exploration of the Law and Ethics of Medicine	13
Freshman Seminar 70i: Contagion: Epidemics and Endemics from Black Death to Ebola	25
GEN ED: Culture and Belief 34: Madness and Medicine: Themes in the History of Psychiatry	26

GEN ED: Ethical Reasoning 33: Medical Ethics and History 14
 GEN ED: Science of Living Systems 16: Human Evolution and Human Health 32
 GEN ED: Science of Living Systems 17: Human Physiology: From Personal To Public Health 32
 GEN ED: Science of Living Systems 19: Nutrition and Global Health 32
 GEN ED: Science of Living Systems 26: The Toll of Infection: Understanding Disease in Scientific, Social, and Cultural Contexts 32
 GEN ED: Societies of the World 24: Global Health Challenges: Complexities of Evidence-Based Policy 6, 17
 GEN ED: United States in the World 11: U.S. Health Care Policy 6, 29
 GEN ED: United States in the World 31: American Society and Public Policy 29
 Global Health and Health Policy 50: The Quality of Health Care in America 27
 Global Health and Health Policy 60: Negotiation and Conflict Management: From the Interpersonal to the International 22
 Global Health and Health Policy 70: Global Response to Disasters and Refugee Crises 14
 Government 1093 / SCRB 60: Ethics, Biotechnology, and the Future of Human Nature 14
 Government 50: Introduction to Political Science Research Methods 10
 Government 94gk: The Politics and Ethics of Medical Care 14
 History 87a: Health, Disease, and Ecology in African History 22
 History of Science 108: Bodies, Sexualities, and Medicine in the Medieval Middle East 27
 History of Science 136: History of Biotechnology 15
 History of Science 142v: Masculinities and Health: History and Politics of Men's Health and Illness 22
 History of Science 143: Confined: Hospitals in the History of Medicine and Religion 27
 History of Science 147: The Changing Concept of Race in America: From Jefferson to Genomics 27
 History of Science 149: The History and Culture of Stigma 23
 Human Evolutionary Biology 1410: Gut Microbiome and Human Health 33
 Human Evolutionary Biology 1424: Evolutionary Medicine 33
 Life Sciences 120 / MCB 120: Global Health Threats 34
 Life Sciences 2: Evolutionary Human Physiology and Anatomy 33
 MCB 111: Mathematics in Biology 11
 MCB 169: Molecular and Cellular Immunology 35
 MCB 186: Sleep and Circadian Clocks: from Biology to Public Health 35
 MCB 64: The Cell Biology of Human Life in the World 34
 Mind, Brain, and Behavior 980b: Addiction, Choice, and Motivation 34
 Mind, Brain, and Behavior 980m: Functional Neuroimaging of Psychiatric Disorders: Insights into the Human Brain-Mind 34
 OEB 50: Genetics and Genomics 35
 Psychology 1005: Health Psychology 36
 Psychology 1201: Your Brain on Drugs: Psychopharmacology 36
 Psychology 18: Abnormal Psychology 35
 Psychology 1900: Introduction to Statistics for the Behavioral Sciences 11
 Psychology 980p: Social Factors in the Development of Psychopathology 23
 Psychology 980t: Eating Disorders 35
 Psychology 980u: Psychological Challenges of Adolescence and Early Adulthood 23
 Religion 111: Cultures of Health and Healing: Religion, Medicine, and Global Health 15
 SCRB 130: Biomedical Entrepreneurship: Turning Ideas into Medicine 36
 SCRB 167: Stem Cells and Regeneration in the Pathobiology and Treatment of Human Disease 36
 SCRB 192: Principles of Drug Discovery and Development 37
 SCRB 195: The Translational Science of Stem Cells 37
 Social Studies 980k: The Politics of the Environment in Asia 29
 Sociology 146: Death by Design: Health Inequalities in Global Perspective 18
 Sociology 156: Quantitative Methods in Sociology 11
 Sociology 98sb: The Social Determinants of Health 23

Statistics 100: Introduction to Quantitative Methods for the Social Sciences and Humanities	11
Statistics 102: Introduction to Statistics for Life Sciences	11
Statistics 104: Introduction to Quantitative Methods for Economics	11
Statistics 107: Introduction to Business and Financial Statistics	12
Statistics 110: Introduction to Probability	12
Women, Gender and Sexuality 1218: Women in American Medicine	28
Women, Gender, and Sexuality 1125: Gender, Poverty and Health: Social Inequalities and Social Policy	24
Women, Gender, and Sexuality 1239: Plagues and Politics: The Impact of AIDS on US Culture	24
XREG: HKS SUP-575 / HSPH HPM 247: Political Analysis and Strategy for US Health Policy	29
XREG: HSPH GHP 214: Health, Human Rights, and the International System	15
XREG: HSPH GHP 244: Health Sector Reform: A Worldwide Perspective	30
XREG: HSPH GHP 265: Ethics of Global Health Research	16
XREG: HSPH GHP 269: Applied Politics and Economics I: Political Economy of International Health	30
XREG: HSPH GHP 288: Issues in Health and Human Rights	16
XREG: HSPH ID 250: Ethical Basis of the Practice of Public Health	16

Bracketed Courses in 2016-2017

[African and African American Studies 178: Health, Society, and Subjectivity in the American Context]	21
[African and African American Studies 189x: Medicine, Culture, and Society]	26
[Anthropology 1882: The Woman and the Body]	22
[Biomedical Engineering 130: Neural Control of Movement]	9
[Classical Studies 165: Medicine in the Greco-Roman World]	26
[Economics 1160: Data Science and Behavioral Economics: Application to Systems Medicine]	10
[Engineering Sciences 103: Spatial Analysis of Environmental and Social Systems]	10
[Environmental Science and Public Policy 90j: Environmental Crises, Climate Change, and Population Flight]	18
[Environmental Science and Public Policy 90t: Environmental Health: Your World and Your Life at Risk]	33
[GEN ED: Aesthetic and Interpretive Understanding 50: Literature and Medicine]	21
[GEN ED: Culture and Belief 11: Medicine and the Body in East Asia and in Europe]	26
[GEN ED: Culture and Belief 58: Case Studies in the Medical Humanities: Interdisciplinary Perspectives on the Experience of Illness]	21
[GEN ED: Empirical and Mathematical Reasoning 20: The Business and Politics of Health]	6, 7
[GEN ED: Science of Living Systems 11: Molecules of Life]	32
[GEN ED: Societies of the World 25: Case Studies in Global Health: Biosocial Perspectives]	6, 21
[GEN ED: Societies of the World 44: Human Trafficking, Slavery, and Abolition in the Modern World]	14
[GEN ED: United States in the World 13: Medicine and Society in America]	26
[History 97a: "What Is the History of Medicine?"]	27
[History of Science 144: Medical Technologies in Historical Perspective]	27
[History of Science 178v: History of the Psychotherapies]	28
[History of Science 253: Bioethics, Law, and the Life Sciences]	15
[Mind, Brain, and Behavior 980k: Fighting Cancer with the Mind]	34
[OEB 123: Biology of Symbiosis]	35
[SCRB 150: Human Genetics: Mining Our Genomes for an Understanding of Human Variation and Disease]	36
[SCRB 185: Human Disease]	36
[SCRB 187: Brains, Identity, and Moral Agency]	15
[Sociology 165: Inequalities in Health Care]	24
[Sociology 98ha: Sociology of Health]	23
[Women, Gender, and Sexuality 1421: Medical Management of the Female Body]	24