HARVARD PH.D. PROGRAM IN HEALTH POLICY
ECONOMICS CONCENTRATION
2023–2024

The economics concentration focuses on the economic behavior of individuals, providers, insurers, and international, federal, state, and local governments and actors, as their actions affect health and medical care. In addition to examining the literature on health economics, the training emphasizes microeconomic theory, econometrics, and interactions with other disciplines, including clinical medicine. The concentration prepares students for research and teaching careers as health economists.

Guide for students in the PhD in Health Policy economics concentration:

SUMMARY OF REQUIREMENTS

(1) One year of graduate-level microeconomic theory – This requirement is fulfilled by taking **Economics 2020A** and **2020B**.

(2) Statistics and Econometrics – Economics track students are required to take Econometrics I (**Economics 2110**) offered in the Fall and Econometrics II (**Economics 2115**) offered in the Spring. If a student has significant econometric training, Econometric Methods (**Economics 2140**) can substitute for **Economics 2115**, pending approval of track chair. Please note that the completion of this sequence also fulfills the two-semester statistics distribution requirement required of all Health Policy PhD students.

(3) Field Courses – Students must take four one-semester courses from the following applied fields: public economics (**Economics 2450A, 2450B, MIT 14.471[1], 14.472**), labor economics (**Economics 2810A, 2810B, 2330, MIT 14.661, 14.662**), industrial organization (**Economics 2610, 2611, MIT 14.271, 14.272, 14.273**), development economics (**Economics 2325, 2338, 2360**), behavioral economics (**Economics 2030, 2035, 2040, 2338**), economic history (**Economics 2325, 2330**) or methods (**Economics 2140**, if not used to substitute for Economics 2115 in the statistics and econometrics requirement or **MIT 14.387**). The four courses can come from any of the courses listed above. Other graduate level economics courses – for example, MIT or Harvard courses not listed, such as data science, machine learning, or statistics – may be substituted for these courses with permission of the chair of the committee. Such permission, however, will not be routinely granted, and students asking to substitute should have a strong reason for wishing to substitute. Note that other econometrics courses can be counted toward the field course requirement only if the student has already had courses equivalent to the required econometrics sequence (**Economics 2110** and **Economics 2115**).

[1] MIT courses may be late to appear in my.harvard.edu. You can consult the MIT course catalog directly at student.mit.edu/catalog/index.cgi

(4) Health Economics Reading Courses (**Economics 2465** ***and*** **3017**) – Second-year students must take Health Economics (**Economics 2465**), led by Professor David Cutler, *and* Research in Health Economics (**Economics 3017**).

(5) Economics concentration exam preparation course (**Health Policy 3070**) – Second-year students take this half-credit course in the spring.

(6) Research seminar – The program requires the completion of **Economics 3117**, the Harvard/BU/MIT joint Health Economics Seminar by the second year. In addition, attendance is recommended for third year and higher. This is in addition to the weekly research seminar (**Health Policy 3040**) led by Professors Laura Hatfield and Bapu Jena, which is required of all third-year and higher Health Policy students. Although this is a joint seminar, students must register for this course to receive credit.

(7) Third year students organize a year-long weekly Health Economics Seminar with support from faculty members. This seminar is typically held at the Department of Health Care Policy at Harvard Medical School, and is a venue for students in the concentration to present work in progress and receive feedback from peers and faculty.

FACULTY ASSOCIATED WITH THE ECONOMICS TRACK

- **Leila Agha** – Associate Professor of Health Care Policy, Harvard Medical School
- **Sebastian Bauhoff** – Assistant Professor of Global Health and Economics, Harvard T.H. Chan School of Public Health *(on leave 2023-2024)*
- **David Bloom** – Clarence James Gamble Professor of Economics and Demography, Harvard T.H. Chan School of Public Health
- **David Canning** – Richard Saltonstall Professor of Population Sciences and Professor of Economics and International Health, Harvard T.H. Chan School of Public Health
- **Alex Chan,** Assistant Professor of Business Administration, Harvard Business School
- **Amitabh Chandra** – Ethel Zimmerman Professor of Public Policy, Harvard Kennedy School, and Henry and Allison McCance Professor of Business Administration, Harvard Business School
- **Michael Chernew** – Leonard D. Schaeffer Professor of Health Care Policy, Harvard Medical School
- **Jessica Cohen** – Bruce A. Beal, Robert L. Beal, and Alexander S. Beal Associate Professor of Global Health, Harvard T.H. Chan School of Public Health
- **Vilsa Curto** – Assistant Professor of Health Economics and Policy, Harvard T.H. Chan School of Public Health
- **David Cutler** – Otto Eckstein Professor of Applied Economics, Faculty of Arts and Sciences; Member of Faculty, Harvard Kennedy School; Professor in the Dept of Global Health and Population (Harvard T.H. Chan School of Public Health); Chair, PhD Program in Health Policy
- **Leemore Dafny** – Bruce V. Rauner Professor of Business Administration, Harvard Business School; Member of Faculty, Harvad Kennedy School
- **David Grabowski** – Professor of Health Care Policy, Harvard Medical School
- **Jerry Green** – John Leverett Professor in the University, David A. Wells Professor of Political Economy, Faculty of Arts and Sciences
- **Robert Huckman** – Albert J. Weatherhead III Professor of Business Administration, Harvard Business School
- **Haiden Huskamp** – Henry J. Kaiser Professor of Health Care Policy, Harvard Medical School
- **Anupam Jena** – Ruth L. Newhouse Professor of Health Care Policy, and Professor of Medicine, Harvard Medical School
- **Timothy Layton** – 30th Anniversary Associate Professor of Health Care Policy, Harvard Medical School; Co-Chair, Economics track, PhD Program in Health Policy
- **Nicole Maestas** – Professor of Health Care Policy, Harvard Medical School
- **Luca Maini** – Assistant Professor of Health Care Policy, Harvard Medical School
- **Margaret McConnell** – Associate Professor of Global Health Economics, Harvard T.H. Chan School of Public Health
- **Ellen Meara** – Professor of Health Economics and Policy, Harvard T.H. Chan School of Public Health
- **Joseph Newhouse** – John D. MacArthur Research Professor of Health Policy and Management (Harvard Medical School, Harvard T.H. Chan School of Public Health, Harvard Kennedy School)
- **Ariel Pakes** – Thomas Professor of Economics, Faculty of Arts and Sciences
- **Meredith Rosenthal** – C. Boyden Gray Professor of Health Economics and Policy, Harvard T.H. Chan School of Public Health
- **Mark Shepard** – Associate Professor of Public Policy, Harvard Kennedy School; Co-Chair, Economics track, PhD Program in Health Policy
- **Anna Sinaiko** – Assistant Professor of Health Economics and Policy, Harvard T.H. Chan School of Public Health
- **Benjamin Sommers** – Huntley Quelch Professor of Health Care Economics, Harvard T.H. Chan School of Public Health; Professor of Medicine, Harvard Medical School
- **Zirui Song** – Associate Professor of Health Care Policy and of Medicine, Harvard Medical School
- **Ariel Stern** – Poronui Associate Professor of Business Administration, Harvard Business School

- **Richard Zeckhauser** – Frank Plumpton Ramsey Professor of Political Economy, Harvard Kennedy School

COURSE DESCRIPTIONS

REQUIRED COURSES

ECONOMICS AND ECONOMETRICS

Economics 2020A. Microeconomic Theory I
Armona
Fall, TTh 1:30–2:45
A comprehensive course in economic theory designed for doctoral students in all parts of the university. Topics include consumption, production, behavior toward risk, markets, and general equilibrium theory. Also looks at applications to policy analysis, business decisions, industrial organization, finance, and the legal system.
Note: Offered jointly with the Kennedy School as API–111 and with the Business School as HBS 4010.
Prerequisite: Multivariate calculus and one course in probability theory. Thorough background in microeconomic theory at the intermediate level.

Economics 2020B. Microeconomic Theory II
Avery, Richardson
Spring, MW 9–10:15
A continuation of Economics 2020a. Topics include game theory, economics of information, incentive theory, and welfare economics.
Note: Offered jointly with the Kennedy School as API–112 and with the Business School as 4011.
Prerequisite: Economics 2020a.

Economics 2110. Econometrics I
Bruich
Fall, MW 1:30–2:45
Economics 2110 and 2115 comprise a two-course sequence for first-year graduate students seeking training in econometric methods at a level that prepares them to conduct professional empirical research. Economics 2110 (fall) reviews probability and statistics, then covers the fundamentals of modern econometrics, with a focus on regression methods for causal inference in observational and experimental data.
Note: The two-course sequence is open only to qualified PhD students from HKS, HBS, GSE, and HSPH, but occasionally others may be admitted at the discretion of the instructor (if the instructor is convinced that such individuals can perform well and would not negatively affect the nature and pace of the course). Offered jointly with the Kennedy School as API–114 and with the Business School as HBS 4170.
Prerequisites: Undergraduate courses in probability and statistics, regression analysis, linear algebra, and multivariate calculus.

Economics 2115. Econometric Methods II
Dobbie
Spring, MW 1:30–2:45
Economics 2110 and 2115 comprise a two-course sequence for first-year graduate students seeking training in econometric methods at a level that prepares them to conduct professional empirical research. Economics 2115 (spring) covers topics (different methods) in current empirical research. Faculty members from across the university will teach modules each covering a different method of causal inference, including but not limited to instrumental variables, panel data methods, and regression discontinuity and kink designs. The course will emphasize a mixture of theory and application, with problem sets focused on the replication or extension of recent papers utilizing these methods.
Note: The two-course sequence is open only to qualified PhD students from HKS, HBS, GSE, and HSPH, but occasionally others may be admitted at the discretion of the instructor (if the instructor is convinced that such individuals can perform well and would not negatively affect the nature and pace of the course). Offered jointly with the Kennedy School as API–115 and with the Business School as HBS 4175.
Prerequisite: Economics 2110 or the equivalent.

Economics 2465. Health Economics
Cutler
Spring, TTh 10:30–11:45
This course surveys topics in health economics. It touches on public sector issues, the industrial organization of health care markets, interactions between health and labor markets, and health in developing countries. Theory and empirical

work are presented.
Note: A graduate level microeconomics class at the level of Economics 2010 or 2020 is required for enrollment. Students unsure about the adequacy of their background should contact the instructor.

Economics 3017. Research in Health Economics
Shepard
Fall, Th 8:45–10:15
This is a discussion-based course with the goal of helping PhD students in economics, health care policy, public policy, public health, and related fields read and learn the health economics literature. Each session is taught by a different instructor from around Harvard, who will introduce you to key research in their area of expertise.

Economics 3117. Seminar in Health Economics
Cutler et al.
Spring, TBA
Focuses on theory, econometric models, and public policy of health care. Frontier work in health economics presented and discussed by instructors and outside speakers.
Note: This is the Harvard/MIT/BU Health Economics Seminar. Offered jointly with the Kennedy School as SUP–951.

Health Policy 3070. Graduate Reading Course: Economics
Layton
Spring, TBA
Graduate reading course covering major topics in health economics and policy for health policy research. This course is designed to help students in the Economics track of the Health Policy PhD program prepare for their concentration exam.

FIELD COURSES

Four one–semester courses from the following options are required. Additional courses may be taken as electives. Some field courses may require instructor permission to enroll, so please be sure to check the course syllabus.

Economics 2030. Psychology and Economics
Laibson, Shleifer
[Not Offered in 2023-2024]
Explores economic and psychological models of human behavior. Topics include bounded rationality, intertemporal choice, decision making under uncertainty, inference, choice heuristics, and social preferences. Economic applications include asset pricing, corporate finance, macroeconomics, labor, development, and industrial organization.
Prerequisite: Knowledge of multivariable calculus and econometrics.

Economics 2035. Psychology and Economic Theory
Rabin
Fall, M 3–5:45
This course explores ways that psychological research indicating systematic departures from classical economic assumptions can be translated into formal models that can be incorporated into economics. Topics include ways utility theory can be improved--such as incorporating reference dependence, news utility, social preferences, self image, and other belief-based tastes--and ways we can relax assumptions of perfect rationality--such as incorporating focusing effects, limited attention, biased prediction of future tastes, present-biased preferences, biases in probabilistic judgment, and errors in social inference. The course will emphasize (a) careful interpretation and production of new evidence on relevant departures,(b) formalizing this evidence into models that can, with discipline and rigor, generate sharp predictions using traditional economic approaches, and (c) exploring economic implications of those models presented. Although we will primarily emphasize (b), the course is meant to be useful to students whose interests lie anywhere in this spectrum, under the premise that all such research will be improved by a greater appreciation of the full spectrum.
Note: The course is intended for PhD students in the Business Economics and Economics programs and others who have a solid background in microeconomic theory at the level of introductory PhD courses in these programs. While obviously appropriate to those wishing to specialize in "behavioral economics", the course is also designed for those interested in doing research in particular fields of economics. And while the course centers on theoretical models (learning and evaluation will center around solving formal problem sets), the theory is focused towards its empirical implementability and economic relevance, so that the course is also designed for those interested in theory-influenced empirical research. Offered jointly with HBS as HBSDOC 4155.

Economics 2040. Experimental Economics
Enke
Fall, TTh 3–4:15
This course provides an introduction to experimental methods and their applications in economics. We will focus on (i) the use of lab experiments in establishing causal effects, testing models, and illuminating mechanisms; (ii) field experiments in behavioral economics; and (ii) the measurement of preference parameters and behavioral traits in lab-in-the-field settings. Topics include bounded rationality, wishful thinking, moral values and social image concerns, gender, the measurement of preferences in lab and large-scale survey settings, and the explanatory power of behavioral traits for field behaviors. We will cover methodological topics including the relationship between experiments and theory, simple process-tracing techniques, internet experiments, and surveys. Students will become acquainted with the full process of designing an experiment, and class discussions will place heavy emphasis on the development of early-stage research ideas. The course is intended not just for those with an interest in behavioral and experimental economics per se, but also for those who wish to measure behavioral parameters in non-lab settings in applied work or to conduct field experiments.

Economics 2140. Econometric Methods (may replace Economics 2115, see Summary of Required Courses)
TBA
Spring, TTh 1:30–2:45
This course continues the first year sequence in econometrics and covers a variety of topics and ideas that are important for pursuing and interpreting empirical research in economics. The first half of the course covers core econometric approaches that are important for a wide range of applications, including identification analysis, asymptotic approximations, large sample theory for estimation and hypothesis testing, and the bootstrap. The second part of the course examines a range of complementary topics and new developments, including reasons why canonical econometric methods may be unreliable (such as model misspecification, identification failure, and the incidental parameters problem) and extensions of and alternatives to the traditional econometric paradigm (such as partial identification, Bayesian inference, nonparametrics, and machine learning). Economic applications will be discussed throughout.
Note: Enrollment limited.
Prerequisite: Economics 2120 or equivalent.

MIT 14.387. Applied Econometrics
Angrist
Fall, TTh 10:30–12, Recitation F 9–10:30
Emphasizes econometric theory, methods, and applications using regression, instrumental variables, differences-in-differences, regression discontinuity designs, machine learning and big data sets, and problems related to standard errors and statistical inference. Includes a project with a theoretical, written and data-analytic component. Students taking graduate version complete additional assignments.

Economics 2325. Comparative Historical Economic Development
TBA
[Not Offered in 2023-2024]
The course examines the historical origins of differences in the economic and social development of societies. Participants discuss recent research in the field and present their own work in progress.
Note: This course is targeted to second-year Ph.D. students in economics. It is not open to undergraduate or Masters students. The course fulfills the distribution requirement.

Economics 2330. History and Human Capital
Katz, Goldin
Spring, MW 10:30–11:45
Explores a range of subjects concerning human capital, historically, theoretically, and comparatively. Topics include human capital and economic growth, population and fertility, health and public interventions, education and training, economic inequality, gender and the family, slavery and race, and intergenerational mobility, all within the broad context of economic history. A research paper or significant proposal and a final exam are required.
Note: Satisfies the graduate distribution requirement. Open to undergraduates on a limited basis with permission of instructor.

Economics 2338. Behavioral Development Economics
Rao
[Not Offered in 2023-2024]
This graduate level course will focus on the intersection of two rapidly growing fields in economics - development economics, and behavioral economics. We will study applications of behavioral economics to development questions, and ask whether there is a special behavioral science of poverty and development. Methods covered will include field experiments, lab experiments, tests of theory and combining experiments with structural estimation.

Economics 2360. The Microeconomics of Development
Breza
Fall, TTh 3–4:15
This course covers the microeconomic foundations of development economics. We will focus on market frictions that may hinder growth in developing countries. Topics include labor markets, land markets, and credit markets. We will also discuss the economics of the household and social networks. The course will use both theoretical and empirical tools.

Economics 2450A. Public Economics and Fiscal Policy I
Stantcheva
Fall, MW 1:30–2:45
This course covers optimal labor income taxation and redistribution, behavioral responses to taxes and transfers, inequality, the distribution and taxation of wealth and capital income, social preferences (normative analysis), dynamic taxation and mechanism design. For each topic, we will cover the theoretical models and the empirical evidence.
Prerequisite: Economics 2010a and 2010b or Economics 2020a and 2020b. Good understanding of core empirical methods (event studies, diff-in-diff, regression discontinuity) is encouraged. In addition to the requirements above, you are strongly encouraged to review i) labor supply concepts (Hicksian elasticity, Marshallian elasticity, income effects); ii) "dynamic programming" and "optimal control methods"; iii) constrained optimization and the envelope theorem.

Economics 2450B. Public Economics and Fiscal Policy II
Chetty
Spring, T 3–5:45
The course will focus on a range of topics in public economics including welfare estimation of tax and expenditure policies, including income and commodity taxation, public goods, education, and place-based policies. We will also discuss foundations for government intervention, including market failures such as externalities and asymmetric information. Throughout, the focus will be on using theoretical models to motivate empirical analyses to uncover the desirability of government intervention in the economy and to quantify the welfare impacts of such policies.
Prerequisite: Economics 2010a and 2010b or Economics 2020a and 2020b. Students are strongly encouraged to take Economics 2450a before taking 2450b.

MIT 14.471. Public Economics I
Poterba, Werning
Fall, MW 2:30–4, Recitation: F 12–1
Theory and evidence on government taxation policy. Topics include tax incidence; optimal tax theory; the effect of taxation on labor supply and savings; taxation and corporate behavior; and tax expenditure policy.

MIT 14.472. Public Economics II
Hendren
TBA
Focuses on government expenditures and policies designed to correct market failures and/or redistribute resources. Key topics include theoretical and empirical analysis of insurance market failures, the optimal design of social insurance programs, and the design of redistributive programs.

Economics 2610. Industrial Organization I
Lee
Fall, MW 12–1:15
An introduction to applied work in industrial organization. Static analysis (theory and estimation) of demand systems and cost functions (adverse selection, moral hazard, productivity), and applications of game theoretic concepts of equilibrium. Topics include the determinants of market structure and product availability, merger analysis and antitrust, and contracting and bargaining in vertical markets.

Economics 2611. Industrial Organization II
Pakes
Spring, M 12–2:45
A continuation of the graduate sequence in industrial organization, with an emphasis on the applied analysis of dynamic environments (including single agent optimization problems and the specification, estimation, and computation of dynamic games). Additional topics may include network industries, spatial equilibrium models, transportation markets, and others depending on interest.
Note: Topics require an understanding of materials covered in Economics 2610.

MIT 14.271. Industrial Organization I
Salz, Whinston
Fall, MW 10:30–12, Recitation: F 9–10:30
Covers theoretical and empirical work dealing with the structure, behavior, and performance of firms and markets and core issues in antitrust. Topics include: the organization of the firm, monopoly, price discrimination, oligopoly, and auctions. Theoretical and empirical work are integrated in each area.

MIT 14.272 Industrial Organization II
Rose, Whinston
Spring, TBA
Continuation of 14.271, which focuses on government interventions in monopoly and oligopoly markets, and addresses both competition and regulatory policy. Topics include horizontal merger policy and demand estimation, vertical integration and vertical restraints, and the theory and practice of economic regulation. Applications include the political economy of regulation; the performance of economic regulation; deregulation in sectors, including electric power, transportation, and financial services; and pharmaceutical and environmental regulation in imperfectly competitive product markets.

MIT 14.273 Advanced Topics in Industrial Organization
Agarwal, Salz
Spring, TBA
Empirical analysis of theoretically derived models of market behavior. Varied topics include demand estimation, differentiated products, production functions, analysis of market power, entry and exit, vertical relationships, auctions, matching markets, network externalities, dynamic oligopoly, moral hazard and adverse selection. Discussion will focus on methodological issues, including identification, estimation, counter-factual analysis and simulation techniques.

Economics 2810A. Labor Market Analysis
Katz
Fall, MW 10:30–11:45
Theoretical and empirical research on labor markets. Wage determination covers equalizing differences, human capital, job mobility, and incentive models. Labor supply covers life-cycle models. Labor demand includes minimum wage and union models.

Economics 2810B. Labor Economics and Labor Market Institutions
Pallais
Spring, TTh 12–1:15
Examines the operation of the labor market and evaluation of labor market policies. Topics: labor econometrics, theories of wage determination, changes in the wage structure, unemployment, labor market institutions, and globalization and the labor market.

MIT 14.661. Labor Economics I
Acemoglu, Adams-Prassi
Fall, TTh 2:30–4, Recitation: F 10:30–12
A systematic development of the theory of labor supply, labor demand, and human capital. Topics include wage and employment determination, turnover, search, immigration, unemployment, equalizing differences, and institutions in the labor market. Particular emphasis on the interaction between theoretical and empirical modeling.

MIT 14.662 Labor Economics II
Autor, Roussille
Spring, TBA
Theory and evidence on the determinants of earnings levels, inequality, intergenerational mobility, skill demands, and employment structure. Particular focus on the determinants of worker- and firm-level productivity; and the roles played by supply, demand, institutions, technology and trade in the evolving distribution of income.

ELECTIVE COURSES

ECONOMETRICS AND STATISTICS

Economics 2142. Time Series Analysis
Shephard
Fall, MW 3–4:15
Time series centers around three main goals: describing data (e.g. seasonal adjustment, detrending), predicting future variables given the past data, and drawing causal conclusions about the effect of changing one variable on the future path of another. We will delve into principles and methods for all three of these goals. Due to the complexity of these problems, a three-pronged approach is often needed, combining theory, simulation, and data. Throughout problems from Economics and Finance will be used to illustrate time series methods. Likely topics covered include: martingales, theory of prediction, linear models and projection, control, reinforcement learning, causality (e.g. SVAR, local projection), hidden Markov models, stationarity and non-stationarity, spectral and wavelet methods.

Government 2001. Quantitative Social Science Methods I
Imai
Fall, MW 3–4:15
This class introduces students to quantitative methods and how they are applied to political science research. It has two overarching goals. First, we focus on the theory of statistical inference - using facts you know to learn about facts you don't know - so that you can truly understand a wide range of methods we introduce, feel comfortable using them in your research, digest new ones invented after class ends, implement them, apply them to your data, interpret the results, and explain them to others. Second, students learn how to publish novel substantive contributions in a scholarly journal. A substantial portion of those in this class publish a revised version of their class paper as their first scholarly journal article. Please see http://j.mp/G2001 for details.

HKS API 222. Machine Learning and Big Data Analytics
Saghafian
Spring, TTh 12–1:15
In the last couple of decades, the amount of data available to organizations has significantly increased. Individuals who can use this data together with appropriate analytical techniques can discover new facts and provide new solutions to various existing problems. This course provides an introduction to the theory and applications of some of the most popular machine learning techniques. It is designed for students interested in using machine learning and related analytical techniques to make better decisions in order to solve policy and societal level problems.
We will cover various recent techniques and their applications from both supervised and unsupervised learning. In addition, students will get the chance to work with some data sets using software and apply their knowledge to a variety of examples from a broad array of industries and policy domains. Some of the intended course topics (time permitting) include: *K-Nearest Neighbors, Naive Bayes, Logistic Regression, Linear and Quadratic Discriminant Analysis, Model Selection (Cross Validation, Bootstrapping), Support Vector Machines, Smoothing Splines, Generalized Additive Models, Shrinkage Methods (Lasso, Ridge), Dimension Reduction Methods (Principle Component Regression, Partial Least Squares), Decision Trees, Bagging, Boosting, Random Forest, K-Means Clustering, Hierarchical Clustering, Neural Networks, Deep Learning, and Reinforcement Learning*.
Prerequisite: An understanding of intermediate-level statistics and probability theory (e.g., API–201, API–202, or equivalent courses.

(SPH) BST 210. Applied Regression Analysis
Lake: *Fall, TTh 11:30–1*
Thaweethai: *Spring, TTh 8–9:30*
Topics include model interpretation, model building, and model assessment for linear regression with continuous outcomes, logistic regression with binary outcomes, and proportional hazards regression with survival time

outcomes. Specific topics include regression diagnostics, confounding and effect modification, goodness of fit, data transformations, splines and additive models, ordinal, multinomial, and conditional logistic regression, generalized linear models, overdispersion, Poisson regression for rate outcomes, hazard functions, and missing data. The course will provide students with the skills necessary to perform regression analyses and to critically interpret statistical issues related to regression applications in the public health literature.
Prerequisite: ID201 or BST201 or (BST202 and BST203) or (BST206 and (BST207 or 208)).

(SPH) BST 223. Applied Survival Analysis
Haneuse
Spring, TTh 9:45–11:15
This is a course on survival analysis, or more generally time-to-event analysis, with the primary audience being graduate students pursuing a Masters degree in biostatistics or a PhD in one of the other departments at the Harvard Chan School. Covered in the course will be: an introduction to various types of censoring and truncation that commonly arise; the mathematical representations of time-to-event distributions, such as via the hazard and survivor functions; nonparametric methods such as Kaplan-Meier estimation of the survivor function and log-rank test for hypothesis testing; semi-parametric and parametric regression modeling techniques, such as the Cox model, the accelerated failure time model, the additive hazards model and cure fraction models; survival analysis within the causal inference paradigm; the analysis of competing and semi-competing risks; outcome-dependent sampling schemes, such as nested case-control and case-cohort designs; and, power/sample size calculations for studies with time-to-event endpoints. Throughout, equal emphasis will be given to the theoretical/technical underpinnings of survival analysis and to the use of real world data examples.
Prerequisite: BST210 or BST213 or BST 232 or BST 260 or PHS2000A.

ECONOMICS

Economics 1415. Analytic Frameworks for Policy
Zeckhauser
[Not Offered in 2023-2024]
This course develops abilities in using analytic frameworks in the formulation and assessment of public policies. It considers a variety of analytic techniques, particularly those directed toward uncertainty and interactive decision problems. It emphasizes the application of techniques to policy analysis, not formal derivations. Students encounter case studies, methodological readings, modeling of current events, the computer, a final exam, and challenging problem sets.
Note: Jointly offered with the Kennedy School as API–302.
Prerequisite: Economics 1011a or permission of instructor.

Economics 2022. Health, Well-Being and Justice
Sen, Anand
Fall, M 12–2
The course will be focused on an examination of the role of health in well-being and human capability, and the requirements of justice in the space of health. 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 health inequality, health inequity, and health justice will be examined. The challenge of instituting universal health care in less-developed countries will also be investigated.

Economics 2050. Behavioral Economics, Law, and Public Policy
Sunstein
[Not Offered in 2023-2024]
This seminar will explore a series of issues at the intersection of behavioral economics and public policy. Potential questions will involve climate change; energy efficiency; health care; and basic rights. There will be some discussion of paternalism and the implications of neuroscience as well.
Note: Jointly offered with the Kennedy School as API–305 and the Law School as 2589.

Economics 2052. Game Theory I: Equilibrium Theory
Li
[Not Offered in 2023-2024]
This is a course about game theory and mechanism design. The first half covers key concepts and techniques, and the second half surveys advanced topics near the research frontier.
Prerequisite: Economics 2010a.

Economics 2059. Decision Theory
Strzalecki
Fall, TTh 1:30–2:45
This course prepares students for pure and applied research in axiomatic decision theory. We start with a rigorous treatment of the classical topics that are at the heart of all of economics (utility maximization, expected utility, discounted utility, Bayesian updating, dynamic consistency, option value). We then delve into a number of modern topics inspired by the observed violations of the classical models ("exotic preferences" used in macro-finance, ambiguity aversion, temptation and self-control). The last part of the course explores the recently flourishing literature on stochastic choice (which is related to, but distinct from, discrete choice econometrics).
Prerequisite: Basic microeconomic theory at the level of Mas Colell, Whinston, Green; being comfortable with abstract models.

Economics 2060. Contract Theory
Hart
Spring 1, MW 10:30–11:45
Recent developments in contract theory. Includes hidden action and hidden information models, dynamic agency issues, incomplete contracts, and applications of contract theory to theories of the firm and corporate financial structure.

Economics 2082. Social Choice Theory
Maskin, Sen
[Not Offered in 2023-2024]
A basic course in social choice theory and its analytical foundations. There will be particular emphasis on recent work in voting theory. Attention will also be paid to implementation theory, the theory of justice, and the analysis of liberties and rights.

Economics 2880. Economics of Science
Freeman
Spring, Th 3–5:45
Analyzes economic issues regarding the role of science and RD in the economy and in the deployment and productivity of scientists, engineers, and highly skilled technical workers. Topics include: wage levels/employment prospects; stipend policy, education/recruitment, student unionization/post-doc organization, career choices/trajectories, with reference to women; scientific competition/collaboration, and effects of the Covid19 pandemic on the economics of science.

GRADUATE STUDENTS WORKSHOPS AND SEMINARS

These workshops and seminars have been found to be useful by students enrolled in related field work. Attendance is recommended but courses do not count for credit towards program or concentration requirements.

WORKSHOPS

Economics 3001. Graduate Student Workshop in Behavioral Economics
Fall, W 12–1
Spring, Th 12–1:15
Participants discuss recent research in Theory, Behavioral Economics, and Experimental Economics and present their own work in progress. Open to doctoral students in economics who have passed their oral examinations.

Economics 3005. Graduate Student Workshop in Economic Development
Fall and Spring, T 12–1:15
Participants discuss recent research in economic development and present their own work in progress. Popularly known as the Development Lunch.

Economics 3007. Graduate Student Workshop in Public Economics and Fiscal Policy
Fall and Spring, T 1:30–2:45
Participants discuss recent research in public economics and fiscal policy and present their own work in progress. Open to doctoral students in economics who have passed their oral examinations.

Economics 3009. Graduate Student Workshop in Industrial Organization
Fall and Spring, W 1:30–2:45
Participants present their own research in progress in an informal setting. Open to doctoral students in economics who have passed their general examinations and are in the early stages of their dissertations.

Economics 3012. Graduate Student Workshop in Labor Economics
Fall and Spring, T 1:30–2:45
Participants discuss recent research in labor economics and present their own work in progress.

EARLY STAGE RESEARCH AND DISCUSSION

Economics 2907. Early-Stage Research and Discussions on Public Economics and Fiscal Policy
Stantcheva
Fall, T 5–6

Economics 2909. Early-Stage Research and Discussions on Industrial Organization
Kalouptsidi, Lee, Pakes
Fall and Spring, W 10:30–11:45

Economics 2912. Early-Stage Research and Discussions on Labor Economics
Katz, Pallais, Goldin, Glaeser
Fall and Spring, F 10–11

Economics 2922. Early-Stage Research and Discussions on Urban Economics
Kreindler, Glaeser
Fall, W 10:30–11:45; Spring, M 3–4:30

Economics 2923. Early-Stage Research and Discussions in Cognitive Economics
Shleifer
Fall and Spring, Th 5–6

Economics 2925. Early Stage Research and Discussions on the Economics of Health Equity
Cutler, Alsan
Spring, Th 4–5:15

SEMINARS

Information about Economics Department Seminars is available here: https://economics.harvard.edu/seminars-workshops