ECON 1. Principles of Economics. 5 Units.
This is an introductory course in economics. We will cover both microeconomics (investigating decisions by individuals and firms) and macroeconomics (examining the economy as a whole). The primary goal is to develop and then build on your understanding of the analytical tools and approaches used by economists. This will help you to interpret economic news and economic data at a much deeper level while also forming your own opinions on economic issues. The course will also provide a strong foundation for those of you who want to continue on with intermediate microeconomics and/or intermediate macroeconomics and possibly beyond. In Spring 2018-2019 Econ 1 will use all class time for team-based learning instead of lectures; class attendance will be mandatory, and enrollment will be limited to 120 students.

ECON 10. Microcosm of Silicon Valley and Wall Street. 1 Unit.
Seminar in applied economics with focus on the microcosm of Silicon Valley, how growth companies are originated, managed and financed from start-up to IPO. Round-table discussion format. Applicable to those students with an interest in technology company formation, growth and finance including interaction with Wall Street. Enrollment limited to 10 juniors, seniors and co-term students.

ECON 101. Economic Policy Seminar. 5 Units.
Economic policy analysis, writing, and oral presentation. Topics vary with instructor. Limited enrollment. Prerequisites: Econ 51 and 52, 102B, and two field courses. Some sections require additional prerequisites.

ECON 102A. Introduction to Statistical Methods (Postcalculus) for Social Scientists. 5 Units.
Probabilistic modeling and statistical techniques relevant for economics. Concepts include: probability trees, conditional probability, random variables, discrete and continuous distributions, correlation, central limit theorems, point estimation, hypothesis testing and confidence intervals for both one and two populations. Prerequisite: MATH 20 or equivalent.

ECON 102B. Applied Econometrics. 5 Units.
Hypothesis tests and confidence intervals for population variances, chi-squared goodness-of-fit tests, hypothesis tests for independence, simple linear regression model, testing regression parameters, prediction, multiple regression, omitted variable bias, multicollinearity, F-tests, regression with indicator random variables, simultaneous equation models and instrumental variables. Topics vary slightly depending on the quarter. Prerequisites: Econ 102A or equivalent. Recommended: computer experience (course often uses STATA software to run regressions).

ECON 102C. Advanced Topics in Econometrics. 5 Units.
The program evaluation problem. Identifying and estimating the effects of policies on outcomes of interest (e.g., tax rates on labor supply, etc.). Identifying and estimating the effects of human capital on earnings and other labor market outcomes. Topics: Instrumental variables estimation; limited dependent variable models (probit, logit, Tobit models); Panel data techniques (fixed and random effect models, dynamic panel data models); Duration models; Bootstrap and Estimation by Simulation. Prerequisite: Econ 102B.

ECON 106. World Food Economy. 4 Units.
The economics of food production, consumption, and trade. The micro- and macro-determinants of food supply and demand, including the interrelationship among food, income, population, and public-sector decision making. Emphasis on the role of agriculture in poverty alleviation, economic development, and environmental outcomes. Grades based on mid-term exam and group modeling project and presentation. Enrollment is by application only and will be capped at 25, with priority given to upper level undergraduates in Economics and Earth Systems and graduate students (graduate students enroll in 206). Applications for enrollment are due by December 1, 2018.

Same as: EARTHSYS 106, EARTHSYS 206, ECON 206, ESS 106, ESS 206

ECON 107. Causal Inference and Program Evaluation. 5 Units.
Methods for estimating and doing inference for causal effects. Discussion of randomized experiments, matching methods, the role of the propensity score, instrumental variables, regression discontinuity, and natural experiments. Theoretical aspects of these methods as well as detailed applications drawn from economics, political science, education, and health care. Prerequisite: Econ 102A or equivalent.

ECON 111. Money and Banking. 5 Units.
The primary course goal is for students to master the logic, intuition and operation of a financial system - money, financial markets (money and capital markets, debt and equity markets, derivatives markets), and financial institutions and intermediaries (the Central Bank, depository institutions, credit unions, pension funds, insurance companies, venture capital firms, investment banks, mutual funds, etc.). In other words, how money/capital change hands between agents over time, directly and through institutions. Material will be both quantitative and qualitative, yet always highly analytical with a focus on active learning - there will be an approximately equal emphasis on solving mathematical finance problems (e.g. bond or option pricing) and on policy analysis (e.g. monetary policy and financial regulation.) Students will not be rewarded for memorizing and regurgitating facts, but rather for demonstrating the ability to reason with difficult problems and situations with which they might not previously be familiar. Prerequisite: Econ 50, 52. Strongly recommended but not required: some familiarity with finance and statistics (e.g. Econ 135 or 140, Econ 102A).

ECON 112. Financial Markets and Institutions: Recent Developments. 5 Units.
The course covers innovations, challenges and proposed changes to the financial system. Topics include new mortgage products, foreclosure rules, securitization, credit ratings, credit derivatives, dealer networks, repo financing, implications for prudential regulation & monetary policy. Emphasis is on quantitative studies of these topics. Prerequisites: Econ 52, Econ 102B.

ECON 118. Development Economics. 5 Units.
The microeconomic problems and policy concerns of less developed countries. Topics include: health and education; risk and insurance; microfinance; agriculture; technology; governance. Emphasis is on economic models and empirical evidence. Prerequisites: Econ 50, Econ 102B.

ECON 11N. Understanding the Welfare System. 3 Units.
Discussion of randomized experiments, matching methods, the role of the propensity score, instrumental variables, regression discontinuity, and natural experiments. Theoretical aspects of these methods as well as detailed applications drawn from economics, political science, education, and health care. Methods for estimating and doing inference for causal effects. Discussion of randomized experiments, matching methods, the role of the propensity score, instrumental variables, regression discontinuity, and natural experiments. Theoretical aspects of these methods as well as detailed applications drawn from economics, political science, education, and health care. Prerequisite: Econ 102A or equivalent.
ECON 120. Japan & the World: Innovation, Economic Growth, Globalization, and Int'l Security Challenges. 3-5 Units.
This course introduces students to the economy, politics, and international relations of contemporary Japan. The course puts a particular emphasis on several emerging issues in Japan including innovation and economic dynamism, Japan’s contributions to international peace and cooperation, and Japan's response to international economic and geopolitical challenges. The course will invite several guest instructors, each of whom is an expert on at least one of the issues that Japan faces today, to give lectures in addition to the main instructors. The guest lecturers will also be available outside of the classroom for further discussion during their stays at Stanford.
Same as: EASTASN 153, EASTASN 253, POLISCI 115E
ECON 124. Economic Development and Challenges of East Asia. 3-5 Units.
This course explores East Asia's rapid economic development and the current economic challenges. For the purpose of this course, we will focus on China, Japan, and Korea. The first part of the course examines economic growth in East Asia and the main mechanisms. In this context, we will examine government and industrial policy, international trade, firms and business groups, and human capital. We will discuss the validity of an East Asian model for economic growth. However, rapid economic growth and development in East Asia was followed by economic stagnation and financial crisis. The second part of the course focuses on the current economic challenges confronting these countries, such as, political economy, human capital, inequality, and entrepreneurship and innovation. Readings will come from books, journal articles, reports, news articles, and case studies. Many of the readings will have an empirical component and students will be able to develop their understanding of how empirical evidence is presented in articles. Prerequisites: Econ 102B or equivalent courses that cover regression analysis.
ECON 125. Economic Development, Microfinance, and Social Networks. 5 Units.
An introduction to the study of the financial lives of households in less developed countries, focusing on savings, credit, informal insurance, the expansion of microfinance, and social networks. Prerequisites: Econ 51 or Publpol 51 and Econ 102B.
ECON 126. Economics of Health and Medical Care. 5 Units.
Institutional, theoretical, and empirical analysis of the problems of health and medical care. Topics: demand for medical care and medical insurance; institutions in the health sector; economics of information applied to the market for health insurance and for health care; measurement and valuation of health; competition in health care delivery. Graduate students with research interests should take ECON 249. Prerequisites: Econ 50 and either Econ 102A or Stats 116 or the equivalent. Recommended: Econ 51.
Same as: BIOMEDIN 156, BIOMEDIN 256, HRP 256
ECON 127. Economics of Health Improvement in Developing Countries. 5 Units.
Application of economic paradigms and empirical methods to health improvement in developing countries. Emphasis is on unifying analytic frameworks and evaluation of empirical evidence. How economic views differ from public health, medicine, and epidemiology; analytic paradigms for health and population change; the demand for health; the role of health in international development. Prerequisites: Econ 50 and Econ 102B.
Same as: MED 262
ECON 136. Market Design. 5 Units.
Use of economic theory and analysis to design allocation mechanisms and market institutions. Course focuses on three areas: the design of matching algorithms to solve assignment problems, with applications to school choice, entry-level labor markets, and kidney exchanges; the design of auctions to solve general resource allocation problems, with applications to the sale of natural resources, financial assets, radio spectrum, and advertising; and the design of platforms and exchanges, with applications to internet markets. Emphasis on connecting economic theory to practical applications. Students must write term paper.
ECON 137. Decision Modeling and Information. 5 Units.
Effective decision models consider a decision maker's alternatives, information and preferences. The construction of such models in single-party situations with emphasis on the role of information. The course then evolves to two-party decision situations where one party has more information than the other. Models examined include: bidding exercises and the winner's curse, the Akerlof Model and adverse selection, the Principal-Agent model and risk sharing, moral hazard and contract design. Prerequisite: Econ 102A or equivalent. Recommended: Econ 50, Optimization and simulation in Excel.
ECON 139D. Directed Reading. 1-10 Unit.
May be repeated for credit.
ECON 14. Navigating Financial Crises in the Modern Global Economy. 1 Unit.
What causes financial crises? What are the keys to anticipating, preventing, and managing disruptions in the global financial system? This course prepares students to navigate future episodes as policymakers, finance professionals, and citizens by going inside the practical decisions made in an unfolding crisis, from the U.S. government and IMF to the boardroom and trading floor. Students will learn warning signs of distress; market structures that govern crisis dynamics; strategic interactions among the key actors; and lessons learned for creating a more resilient system. Concepts will be applied to real-world experiences in emerging market crises, the U.S. housing and global financial crisis, and the European sovereign crisis, as well as prospective risks from China's financial system and unwinding of extraordinary central bank stimulus.
Same as: PUBLPOL 14
ECON 140. Introduction to Financial Economics. 5 Units.
Modern portfolio theory and corporate finance. Topics: present value and discounting, interest rates and yield to maturity, various financial instruments including financial futures, mutual funds, the efficient market theory, basic asset pricing theory, the capital asset pricing model, and models for pricing options and other contingent claims. Use of derivatives for hedging. Prerequisites: Econ 51 (Public Policy majors may take PUBLPOL 51 as a substitute for Econ 51), Econ 102A.
ECON 141. Public Finance and Fiscal Policy. 5 Units.
What role should and does government play in the economy? What are the effects of government spending, borrowing, and taxation on efficiency, equity and economic stability and growth? The course covers economic, historical and statistical analyses and current policy debates in the U.S. and around the world. Policy topics: Fiscal crises, budget deficits, the national debt and intergenerational equity; tax systems and tax reform; social security and healthcare programs and reforms; transfers to the poor; public goods and externalities; fiscal federalism; public investment and cost-benefit analysis; and the political economy of government decision-making. Prerequisites: Econ 51 (Public Policy majors may take PUBLPOL 51 as a substitute for Econ 51), Econ 52 (can be taken concurrently).
Same as: PUBLPOL 107
ECON 102B. The Economics of Labor Markets. 5 Units.
This course will cover the economics of labor markets. Topics include: determinants of employment and unemployment; job creation and job destruction. The effects of technological change on the labor market. The effects of a universal basic income. There is a final exam. Prerequisites: ECON 51 (Public Policy majors may take PUBLPOL 51 as a substitute for ECON 51), ECON 102B.

ECON 145. Labor Economics. 5 Units.
Analysis and description of labor markets. Determination of employment, hours of work, and wages. Wage differentials. Earnings inequality. Trade unions and worker co-operatives. Historical and international comparisons. Prerequisites: ECON 51 (Public Policy majors may take PUBLPOL 51 as a substitute for ECON 51), ECON 102B.

ECON 146. Economics of Education. 5 Units.
How a decision to invest in education is affected by factors including ability and family background. Markets for elementary and secondary schooling; topics such as vouchers and charter schools, accountability, expenditure equalization among schools, and the teacher labor market. The market for college education emphasizing how college tuition is determined, and whether students are matched efficiently with colleges. How education affects economic growth, focusing on developing countries. Theory and empirical results. Application of economics from fields such as public economics, labor economics, macroeconomics, and industrial organization. Prerequisites: ECON 50, ECON 102B.

ECON 147. The Economics of Labor Markets. 5 Units.
This course will cover the economics of labor markets. Topics include: determinants of employment and unemployment; job creation and job destruction. The effects of technological change on the labor market. The effects of a universal basic income. There is a final exam. Prerequisites: ECON 51 (Public Policy majors may take PUBLPOL 51 as a substitute for ECON 51), Econ 52, Econ 102B.

ECON 149. The Modern Firm in Theory and Practice. 5 Units.
Examines the empirics on the economics, management and strategy of organizations (e.g. firms). Topics include the organization of firms in US and internationally. Management practices around information systems, target setting and human resources. Focus on management practices in manufacturing, but also analyze retail, hospitals and schools, plus some recent field-experiments in developing countries. Prerequisites: ECON 51 (Public Policy majors may take PUBLPOL 51 as a substitute for ECON 51), ECON 102B.

ECON 14SC. A Random Walk Down Wall Street. 2 Units.
The title of this course is the title of one of the books that will be required summer reading. The course will introduce modern finance theory and cover a wide range of financial instruments: stocks, bonds, options, mutual funds, exchange traded funds, mortgage back securities, etc. Historical returns on different asset classes will be examined. The efficient market hypothesis and the case for and against index funds will be discussed. The course for 2015 will examine the ongoing policies to stimulate the economy, including the quantitative easing policy of the Federal Reserve. There will be coverage of global financial markets. We will try to reconcile the long-run return on stocks, bonds, and money market instruments with the capital asset pricing model. We will try to connect financial markets with the problems of the real economy including the entitlement programs. We will talk with venture capitalists, Federal Reserve officials, hedge fund and mutual fund managers, and those who manage large institutional endowments. Students will be expected to write a short paper and make an oral presentation to the class. A wide range of topics will be acceptable, including market regulation, the introduction of new financial instruments, the functioning of commodity futures markets, and evaluations of the federal government intervention in financial markets. Sophomore College Course: Application required, due noon, April 7, 2015. Apply at http://soco.stanford.edu.

ECON 150. Economic Policy Analysis. 4-5 Units.
The relationship between macroeconomic analysis and public policy making. How economic policy analysis is done and why political leaders regard it as useful but not definitive in making policy decisions. Economic rationales for policy interventions, methods of policy evaluation and the role of benefit-cost analysis, economic models of politics and their application to policy making, and the relationship of income distribution to policy choice. Theoretical foundations of policy making and analysis, and applications to program adoption and implementation. Prerequisites: ECON 50 and ECON 102B. Undergraduate Public Policy students are required to take this class for a letter grade and enroll in this class for five units. Same as: PUBLPOL 104, PUBLPOL 204

ECON 152. The Future of Finance. 2 Units.
(Same as Law 1038) If you are interested in a career in finance or that touches finance (computational science, economics, public policy, legal, regulatory, corporate, other), this course will give you a useful perspective. We will take on hot topics in the current landscape of global financial markets such as how the world has evolved post-financial crisis, how it is being disrupted by FinTech, RegTech, artificial intelligence, crowd financing, blockchain, machine learning & robotics (to name a few), how it is being challenged by IoT, cyber, financial warfare & crypto currency risks (to name a few) and how it is seizing new opportunities in fast-growing areas such as ETFs, new instruments/payment platforms, robo advising, big data & algorithmic trading (to name a few). The course will include guest-lecturer perspectives on how sweeping changes are transforming business models and where the greatest opportunities exist for students entering or touching the world of finance today including existing, new and disruptive players. While derivatives and other quantitative concepts will be handled in a non-technical way, some knowledge of finance and the capital markets is presumed. Elements used in grading: Class Participation, Attendance, Final Paper. Consent Application: To apply for this course, students must complete and email to the instructors the Consent Application Form, which is available on the Public Policy Program’s website at https://publicpolicy.stanford.edu/academics/undergraduate/forms. See Consent Application Form for submission deadline. Same as: ECON 252, PUBLPOL 364, STATS 238
ECON 154. Law and Economics. 4-5 Units.
This course explores the role of law in promoting well-being (happiness). Law, among its other functions, can serve as a mechanism to harmonize private incentives with cooperative gains, to maintain an equitable division of those gains, and to deter "cheating" and dystopia. Law is thus essential to civilization. Economic analysis of law focuses on the welfare-enhancing incentive effects of law and its enforcement and on law's role in reducing the risks of cooperation, achieved by fixing expectations of what courts or the state will do in various futures. Prerequisite: ECON 50.
Same as: PUBLPOL 106, PUBLPOL 206

ECON 155. Environmental Economics and Policy. 5 Units.
Economic sources of environmental problems and alternative policies for dealing with them (technology standards, emissions taxes, and marketable pollution permits). Evaluation of policies addressing local air pollution, global climate change, and the use of renewable resources. Connections between population growth, economic output, environmental quality, sustainable development, and human welfare. Prerequisite: ECON 50. May be taken concurrently with consent of the instructor.

ECON 157. Imperfect Competition. 5 Units.
The interaction between firms and consumers in markets that fall outside the benchmark competitive model. How firms acquire and exploit market power. Game theory and information economics to analyze how firms interact strategically. Topics include monopoly, price discrimination, advertising, oligopoly pricing, product differentiation, collusion and cartel behaviour, and anti-competitive behavior. Sources include theoretical models, real-world examples, and empirical papers. Prerequisite: ECON 50.
Public Policy majors may take PUBLPOL 51 as a substitute for ECON 51.

ECON 159. Economic, Legal, and Political Analysis of Climate-Change Policy. 5 Units.
This course will advance students understanding of economic, legal, and political approaches to avoiding or managing the problem of global climate change. Theoretical contributions as well as empirical analyses will be considered. It will address economic issues, legal constraints, and political challenges associated with various emissions-reduction and adaptation strategies, and it will consider policy efforts at the local, national, and international levels. Specific topics include: interactions among overlapping climate policies, the strengths and weaknesses of alternative policy instruments, trade-offs among alternative policy objectives, and decision making under uncertainty. Prerequisites: Econ 50 or its equivalent.
Same as: EARTHSYS 159, ECON 209, PUBLPOL 159

ECON 160. Game Theory and Economic Applications. 5 Units.
Introduction to game theory and its applications to economics. Topics: strategic and extensive form games, dominant strategies, Nash equilibrium, subgame-perfect equilibrium, and Bayesian equilibrium. The theory is applied to repeated games, voting, auctions, and bargaining with examples from economics and political science. Prerequisites: Working knowledge of calculus and basic probability theory.

ECON 162. Games Developing Nations Play. 3-5 Units.
If, as economists argue, development can make everyone in a society better off, why do leaders fail to pursue policies that promote development? The course uses game theoretic approaches from both economics and political science to address this question. Incentive problems are at the heart of explanations for development failure. Specifically, the course focuses on a series of questions central to the development problem: Why do developing countries have weak and often counterproductive political institutions? Why is violence (civil wars, ethnic conflict, military coups) so prevalent in the developing world, and how does it interact with development? Why do developing economies fail to generate high levels of income and wealth? We study how various kinds of development traps arise, preventing development for most countries. We also explain how some countries have overcome such traps. This approach emphasizes the importance of simultaneous economic and political development as two different facets of the same developmental process. No background in game theory is required.
Same as: POLISCI 247A, POLISCI 347A

ECON 164. The Law and Economics of the World Trading System. 5 Units.
This course focuses on the purpose and design of the World Trade Organization (WTO). The course begins with a discussion of the economics of trade agreements and a brief introduction to the WTO as an institution. The course then considers a series of topics, which may include: the dispute resolution system; the choice between multilateral and regional or bilateral trade agreements; the international regulation of subsidies; the interface between international trade obligations and domestic regulation; safeguard measures; and trade preferences for developing countries in the WTO. Prerequisite: Econ 51.

ECON 165. International Finance. 5 Units.
We will explore models for analyzing a wide variety of issues in open-economy macroeconomics, such as the balance of payments; the determination of exchange rates; the relation between exchange rates and inflation; monetary and fiscal policy under flexible and fixed exchange rate regimes; macroeconomic gains (and pains?) from financial globalization; policy coordination and optimum currency areas; exchange rate crises; debt crises and the possibility of contagion. Our theoretical framework will structure our examination of important historical episodes and contemporary policy debates; the textbook will be supplemented with readings from recent scholarly articles and mainstream news sources. Active class participation is an important part of the course. Prerequisite: Econ 52.

ECON 166. International Trade. 5 Units.
Explaining patterns of trade among nations; characterizing the sources of comparative advantage in production and the prospect of gains from economies of scale. Enumerating and accounting for the net aggregate gains from trade, and identifying winners and losers from globalization. Analyzing the effects of international labor migration, foreign direct investment, outsourcing, and multinational companies. Strategic trade policy, international trade agreements; labor and environmental implications. We will review relevant theoretical frameworks, examine empirical evidence, and discuss historical and contemporary policy debates as covered in the popular press; active class participation is an important part of the course. Prerequisite: Econ 51 (Public Policy majors may take PUBLPOL 51 as a substitute for Econ 51).
ECON 178. Behavioral Economics. 5 Units.
The field of behavioral economics draws on insights from other disciplines, especially psychology, to enrich our understanding of economic behavior. The course will discuss how people may display systematic behavioral patterns that diverge from the predictions of standard economic models, as well as the ways in which economists incorporate those considerations into their theories, and the implications of those theories for market outcomes and public policies. Prerequisites: ECON 50 and ECON 102A. Econ 51 is recommended.

ECON 179. Experimental Economics. 5 Units.
Methods and major subject areas that have been addressed by laboratory experiments. Focus is on a series of experiments that build on one another. Topics include decision making, two player games, auctions, and market institutions. How experiments are used to learn about preferences and behavior, trust, fairness, and learning. Final presentation of group projects. Prerequisites: ECON 51 (Public Policy majors may take PUBLPOL 51 as a substitute for ECON 51), ECON 102A.

ECON 17N. Energy, the Environment, and the Economy. 3 Units.
Examines the intimate relationship between environmental quality and the production and consumption of energy. Assesses the economics efficiency and political economy implications of a number of current topics in energy and environmental economics. Topics include: the economic theory of exhaustible resources, Greenhouse Gas Emissions (GHG) control (cap and trade mechanisms and carbon fees), GHG emissions offsets, the Strategic Petroleum Reserve (SPR), the "smart" transmission grid for electricity, nuclear energy and nuclear waste, the real cost of renewable energy, natural gas and coal-fired electricity production, the global coal and natural gas markets, Corporate Average Fuel Efficiency (CAFE) and Low-Carbon Fuel Standards (LCFS), Energy Efficiency Investments and Demand Response, and Carbon Capture and Sequestration (CCS). For all topics, there will be reading to explain the economics and engineering behind the topic and class discussion to clarify and elaborate on this interaction. Prerequisite: Econ 1 is recommended.

ECON 180. Honors Game Theory. 5 Units.
Rigorous introduction to game theory and applications. Topics include solution concepts for static and dynamic games of complete and incomplete information, signaling games, repeated games, bargaining, and elements of cooperative game theory. Applications mainly from economics, but also political science, biology, and computer science. Prerequisites: Experience with abstract mathematics and willingness to work hard. No background in economics required.

ECON 181. Honors Information and Incentives. 5 Units.
Rigorous introduction to the theory of economic mechanisms under asymmetric information. Covers applications to price discrimination, taxation, regulation, long-term relationships, single-unit and multi-unit auctions. Forms a sequence with ECON 180 and ECON 182, but can be taken independently. Prerequisite: Experience with abstract mathematics and willingness to work hard. No prior knowledge of economics is required, although basic knowledge in game theory is useful.

ECON 182. Honors Market Design. 5 Units.
Rigorous introduction to the theory of matching and resource allocation, and its application to practical market design. Theory covers two-sided matching, "house allocation" problems, random assignment, and their variants. Applied topics include school choice, labor market, house allocation, and organ allocation for transplantation. Final paper required. Forms a sequence with ECON 180 and ECON 181, but can be taken independently. Prerequisites: Experience with abstract mathematics and willingness to work hard. No prior knowledge of economics is required, although basic knowledge in game theory is useful.

ECON 184. Institutional Investment Management: Theory and Practice. 4 Units.
This course provides an introduction to the theory and practice of institutional investment management including asset allocation and manager selection across public and private equity, absolute return, real assets, and fixed income. The course is co-taught by the CIO of Stanford's endowment and takes the perspective of an institution with a long-term investment horizon like Stanford. We introduce and apply a framework for assessing investment strategies and investment firms. Students put theory into practice by meeting with leading investors from various asset classes. Enrollment capped at 20; required application due by December 19; see schedule section below for application instructions. Prerequisites: ECON 50 and Econ 102A, may be taken concurrently.

ECON 198. Junior Honors Seminar. 5 Units.
For students who expect to write an honors thesis in Economics or Public Policy. Weekly sessions go through the process of selecting a research question, finding relevant bibliography, writing a literature review, introduction, and study design, culminating in the write-up of an honors thesis proposal (prospectus) and the oral presentation of each student's research project. Students also select an adviser and outline a program of study for their senior year. Enrollment limited to 17. Same as: PUBLPOL 197

ECON 199D. Honors Thesis Research. 1-10 Unit.
In-depth study of an appropriate question and completion of a thesis of very high quality. Normally written under the direction of a member of the Department of Economics (or some closely related department). See description of honors program. Register for at least 1 unit for at least one quarter after your honors application is approved. Winter registration for one unit under the supervision of the Director of the Honors Program is mandatory for all honors students.

ECON 19Q. Measuring the Performance of Governments in the U.S.. 3 Units.
Spending by federal, state, and local governments accounts for about one-third of U.S. GDP and governments employ more than one-in-seven workers in the U.S. For most U.S. residents, government is represented by a complicated web of federal, state, and local policies. There is an increasingly contentious debate about the proper role of the government and regarding the impact of specific government policies. This debate is rarely grounded in a common set of facts. In this seminar, we will explore how each level of government interacts with U.S. residents through government services, public programs, taxes, and regulations. We will examine financial results for different levels of government while considering the net effects of government intervention on the health and economic well-being of individuals and families. Particular attention will be paid to certain sectors (e.g. education, health care, etc.) and to certain groups (e.g. those in poverty, the elderly, etc.). Along the way we will accumulate a set of metrics to assess the performance of each level of government while highlighting the formidable challenges of such an exercise. Prerequisite: Econ 1.

Same as: PUBLPOL 19Q

ECON 202. Microeconomics I. 2-5 Units.
(Non-Economics graduate students register for 202N.) Open to advanced undergraduates with consent of instructors. Theory of the consumer and the implications of constrained maximization; uses of indirect utility and expenditure functions; theory of the producer, profit maximization, and cost minimization; monotone comparative statics; behavior under uncertainty; partial equilibrium analysis and introduction to models of general equilibrium. Limited enrollment. Prerequisite: thorough understanding of the elements of multivariate calculus and linear algebra.

ECON 202N. Microeconomics I For Non-Economics PhDs. 2-5 Units.
Microeconomics I for non-Economics PhD students. Theory of the consumer and the implications of constrained maximization; uses of indirect utility and expenditure functions; theory of the producer, profit maximization, and cost minimization; behavior under uncertainty; partial equilibrium analysis and introduction to models of general equilibrium. Limited enrollment. Prerequisite: understanding of basic calculus.
ECON 203. Microeconomics II. 2-5 Units.

ECON 203N. Microeconomics II For Non-Economics PhDs. 2-5 Units.
Non-cooperative game theory including normal and extensive forms, solution concepts, games with incomplete information, and repeated games. Externalities, public goods, and asymmetric information. The theory of imperfect competition and other applications. Limited enrollment. Prerequisite: understanding of the elements of multivariate calculus and linear algebra.

ECON 204. Microeconomics III. 2-5 Units.
Social Choice, including Arrow's theorem, the Gibbard-Satterthwaite theorem, and the Vickrey-Clarke-Groves mechanism. The theory of contracts, emphasizing contractual incompleteness and the problem of moral hazard. Incentive regulation. Competition with imperfect information, including signaling and adverse selection. Competitive equilibrium and the core. Limited enrollment. Non-Econ students need permission of instructor to enroll. Prerequisite: ECON 202 and 203.

ECON 206. World Food Economy. 4 Units.
The economics of food production, consumption, and trade. The micro- and macro- determinants of food supply and demand, including the interrelationship among food, income, population, and public-sector decision making. Emphasis on the role of agriculture in poverty alleviation, economic development, and environmental outcomes. Grades based on mid-term exam and group modeling project and presentation. Enrollment is by application only and will be capped at 25, with priority given to upper level undergraduates in Economics and Earth Systems and graduate students (graduate students enroll in 206). Applications for enrollment are due by December 1, 2018. Same as: EARTHSYS 106, EARTHSYS 206, ECON 106, ESS 106, ESS 206

ECON 209. Economic, Legal, and Political Analysis of Climate-Change Policy. 5 Units.
This course will advance students understanding of economic, legal, and political approaches to avoiding or managing the problem of global climate change. Theoretical contributions as well as empirical analyses will be considered. It will address economic issues, legal constraints, and political challenges associated with various emissions-reduction and adaptation strategies, and it will consider policy efforts at the local, national, and international levels. Specific topics include: interactions among overlapping climate policies, the strengths and weaknesses of alternative policy instruments, trade-offs among alternative policy objectives, and decision making under uncertainty. Prerequisites: Econ 50 or its equivalent. Same as: EARTHSYS 159, ECON 159, PUBLPOL 159

ECON 210. Macroeconomics I. 2-5 Units.
Dynamic programming applied to a variety of economic problems. These problems will be formulated in discrete or continuous time, with or without uncertainty, with a finite or infinite horizon. There will be weekly problem sets and a take-home final that will require MATLAB programming. Limited enrollment.

ECON 211. Macroeconomics II. 2-5 Units.
Dynamic stochastic general equilibrium models using dynamic programming methods that are solved with MATLAB. Growth models (neoclassical, human capital, technical change) using optimal control theory. Limited enrollment. Prerequisite: ECON 210.

ECON 212. Macroeconomics III. 2-5 Units.
Real business cycle and new Keynesian models: business cycle fluctuations, inflation dynamics, the effects of monetary and fiscal policy, and optimal policy. Models of heterogeneity: search models of the labor market; precautionary savings and general equilibrium with incomplete markets; constrained efficiency; endogenous market incompleteness and recursive contracts; optimal taxation and redistribution. Limited enrollment. Prerequisites: ECON 203, ECON 210, ECON 211.

ECON 214. Development Economics I. 2-5 Units.
This course uses microeconomic analysis to understand development issues in lower income countries. Topics include institutions and governance: human capital accumulation; productivity; inequality; poverty traps. Prerequisites: 202 or 202N, 270.

ECON 215. Development Economics II. 2-5 Units.
This is a course focusing on development research. It will cover: productivity, market failure, and international trade; farms and firms; markets and contracts; intra-household allocation and bargaining; microfinance; and risk sharing. Prerequisites: 202 or 202N, 270.

ECON 216. Development Economics III. 2-5 Units.
This course focuses on savings, credit, informal insurance, the expansion of microfinance, social networks, social learning and technology adoption, public finance and firm organizations. Prerequisites: 202, 203, 204, 210, 211, 212, 270, 271, 272.

ECON 217. Topics in International Macroeconomics: Theory and Evidence for Latin America. 2-5 Units.
Banking systems, interest rates, regulatory policies, and the productivity of capital in developing countries. Controlling inflation: fiscal and monetary policies for macroeconomic stability. Currency crises, exchange rates, and the liberalization of foreign trade. Further applications to transitional socialist economies in Asia and E. Europe.

ECON 220. Political Economy I. 2-5 Units.
Introduction to empirical and theoretical research in political economy. This course focuses on issues in democracies, while Political Economy II focuses on issues in non-democracies. Topics may include institutional foundations, social choice, electoral competition and candidate positioning, accountability, voter behavior, polarization, media and political communication, redistribution, special interests and lobbying, collective action, immigration, and populism. Prerequisite for Econ PhD students: ECON 202 and 270 or permission of instructors. Prerequisites for Political Science PhD students: POLISCI 450A, POLISCI 450B, and POLISCI 356A. Same as: POLISCI 460A

ECON 221. Political Economy II. 2-5 Units.
Continuation of 220. Preparation for advanced research in political economy. Studies political processes and their implications for economic policies and outcomes. Possible topics this quarter will include conflict and war, corruption, culture, protest movements and rebellion, state capacity and development, autocratic politics, and democratization. Focus is primarily on dynamic game-theoretic models but will also include empirical work. Prerequisite for Political Science PhD students: POLISCI 356A. Same as: POLISCI 460B

ECON 225. Economics of Technology and Innovation. 2-5 Units.
Graduate seminar on current research on the economics of innovation. Topics include the design of optimal patent policies, copyright policies, and the role of human capital (science, immigration, skill-biased technical change). Emphasis on empirical analyses of historical and contemporary data.
ECON 227. European Economic History. 2-5 Units.
European Economic History: covers topics in European Economic History from the Middle Ages to the twentieth century (but does not cover detailed economic history of particular European countries). Topics include competing hypotheses in explaining long term trends in economic growth and cross-country differences in long-term economic growth; the diffusion of knowledge; the formation, function, and persistence of institutions and organizations; the role of institutions and organizations (for example, apprenticeship, servitude, partnerships, cooperatives, social networks, share cropping, and communes) as solutions to contractual problems; the causes and consequences of income inequality; the economics of migration; the changing economic role of the family. The course will highlight the use of economic theory in guiding hypothesis testing, as well as the construction of new datasets and the execution of empirical analysis. Enrollment limited to graduate students.

ECON 228. Institutions and Organizations in Historical Perspective. 2-5 Units.
The course integrates historical analysis and economic theory in evaluating the nature and role of institutions in economic and political outcomes. The motivating question is the factors determining economic and political developments in the long run and the historical focus is on the Middle East, Europe, and China over the last millennium. The course first examines various approaches for the study of institutions, their nature and dynamics and then focuses on detailed discussions of frontier research papers.

ECON 229. Topics in Economic History. 2-5 Units.
Emphasis is on institutions and organizations, such as risk-sharing organizations, and property rights, such as patent laws and their effects on technological change and economic growth. Topics include: competing hypotheses for cross-country differences in long-term growth; the importance of institutions to economic growth; formation, function, and persistence of institutions and organizations; role of patent laws in creating incentives for innovation; informal networks as a mechanism to trade property rights; causes and effects of institutional change; tests of contractual theory in history; and long-term migration and its effect on economic development.

ECON 22N. Causes and Consequences of the Rise in Inequality. 3 Units.
In this class we will discuss the economic and institutional causes of the rise in inequality in the US and other countries over the last 40 years. We will also discuss the consequences of inequality in terms of social justice, economic welfare, aggregate economic performance, intergenerational mobility, and the possible implications of inequality for the recent global financial crisis.

ECON 231. Analytics of Global Economic Externalities under Uncertainty. 3 Units.
Fundamentally important issues for theoretical analysis of macro-dynamical systems with global externalities are the focus of this course's 9 (weekly) meetings: (i) public goods (e.g., information) and public bads (uncontrolled GHG emissions), (ii) sequential decision-making under uncertainty (e.g., multi-period investment programs, and management of evolving technology portfolios), and (iii) time discounting, allowing for rare events and catastrophic risks. Novel approaches to program designs for global climate stabilization, sustainable use of resources and the future adaptation of market mechanisms (e.g., carbon markets, and markets for potable water.

ECON 233. Advanced Macroeconomics I. 2-5 Units.
Topics in the theory and empirics of economic growth. For PhD-level students.

ECON 234. Advanced Macroeconomics II. 2-5 Units.
This is an advanced class on monetary economics. We cover empirical evidence, neoclassical models, recent advances in New Keynesian models, monetary policy with heterogeneous agents and financial frictions, alternative models of price setting and other topics. nStudents enrolled in MGTECON612 take the class for 4 units. Students develop a research proposal and present it to the instructors as the final exam. Prerequisite: Satisfaction of the economics department's core macro requirement or consent of the instructors.

ECON 235. Advanced Macroeconomics III. 2-5 Units.
Current topics to prepare student for research in the field. Recent research in labor-market friction, reallocation, fluctuations, wage and price determination, innovation, and productivity growth. Research methods, presentations skills, and writing in advanced economics.

ECON 236. Financial Economics I. 2-5 Units.
This course will cover research topics at the boundary between macroeconomics and finance. Topics may include the study of macroeconomic models with financial frictions, conventional and unconventional monetary policy, its transmission mechanism and the term structure of interest rates, sovereign debt crises, search frictions and segmentation in housing markets, (over)leveraging by households, heterogeneous expectations, excess volatility, financial bubbles and crises. Prerequisites: 210, 211, 212.

ECON 237. Financial Economics II. 2-5 Units.
This Ph.D. course will cover research topics at the boundary between macroeconomics and finance. Topics will include the study of macroeconomic models with financial frictions, the term structure of interest rates, conventional and unconventional monetary policy, sovereign debt crises, search frictions and segmentation in housing markets, (over)leveraging by households, heterogeneous expectations, excess volatility, financial bubbles and crises. Student presentations and course paper requirement. Designed for second year PhD students in economics or finance.

Same as: MGTECON 617

ECON 239D. Directed Reading. 1-10 Unit.
May be repeated for credit.

ECON 24. SENSA Labs Social Enterprise Seminar. 2 Units.
SENSA labs seminar incubates social entrepreneurship startups through bi-weekly meetings that feature guest speakers. Enrollment by application.

ECON 241. Public Economics I. 2-5 Units.
Design of tax systems, transfers intended to alleviate poverty, the effect of taxes on earnings, fees intended to internalize externalities like pollution, school finance and other forms of fiscal federalism, local public goods such as schools. Students will learn to apply sophisticated applications of frontier applied econometric techniques including synthetic controls, regression discontinuity, advanced instrumental variables methods. Prerequisites: ECON 202-204, ECON 210, ECON 270, ECON 271, or equivalent with consent of instructor.

ECON 242. Public Economics II. 2-5 Units.
This course will explore the rationale for and economic effects of social insurance programs including but not limited to social security, unemployment insurance, disability insurance, and public health insurance. The course will also include four lectures on behavioral public economics. The focus of these lectures will be on developing a framework for conducting welfare analysis in settings with behavioral consumers, and then on applying that framework to issues in public economics, starting with optimal commodity taxation (including sin taxes), followed by policies affecting personal saving, as well as the taxation of earnings (including implications for social insurance). Additional topics covered in the course will include other important areas of government expenditure and regulation such as education, defense procurement, economic stimulus, and environmental regulation. Course will cover both theoretical and empirical evidence and prerequisites are ECON 202-204 and ECON 270-272 or similar with permission of instructor.
ECON 243. Public Economics III. 2-5 Units.
The course covers various topics relating to social insurance. The first half of the course covers the rationale for government interventions into private insurance markets, adverse selection, social insurance design and the intersection between social insurance and intra-family insurance. The second half of the course covers local public policy and urban economics, and includes topics such as spatial equilibrium, placed-based policies and housing policy. Prerequisites: Econ 202, 203, 204, 210, 270, 271, or equivalent with consent of instructor. Recommended: Econ 241 and 242.

ECON 244. Insurance Economics. 2-5 Units.
This course aims at familiarizing students with the frontier empirical, computational, and theoretical tools currently used to address questions in the economics of insurance. Topics include the demand for insurance, the design of risk sharing arrangements, the pricing of insurance contracts, models of competition and equilibrium in insurance markets, adverse selection, moral hazard, the dynamics of insurance and reclassification risk, government interventions in insurance markets, and social insurance design. We will draw on methods from Industrial Organization, Public Economics, Finance, and Contract Theory to address applications in health insurance, annuity markets, financial markets, life insurance, unemployment insurance, and auto insurance. Prerequisites: Micro and Econometrics first year sequences (or equivalent).

ECON 246. Labor Economics I. 2-5 Units.
Topics in current applied microeconomic research including intertemporal labor supply models, public policy, program evaluation, job search, migration, consumption behavior. Student and faculty presentations.

ECON 247. Labor Economics II. 2-5 Units.
Recent topics in applied micro, focusing on papers from top journals (QJE, AER, JPE, Econometrica and RESstud) over the last ten years. Broad overview of current topic and techniques in applied-micro research. Topics include inequality, polarization and skill-biased technical change, discrimination, technology adoption and the spread of information, management practices, field experiments, peer effects and academic spillovers. Combination of student and faculty presentations. Additional sessions on general presentations, paper writing and research skills to prepare for job market. Typically also run a class trip to the NBER West-Coast labor meetings at the San Francisco Fed.

ECON 248. Labor Economics III. 2-5 Units.
Topics in the determination of earnings and job mobility. Classes of models include: search, human capital, Roy, sorting, learning, discrimination and compensating differentials. Basic models as well as contemporary empirical work will be discussed.

ECON 249. Topics in Health Economics I. 2-5 Units.
Course will cover various topics in health economics, from theoretical and empirical perspectives. Topics will include public financing and job search, migration, consumption behavior. Student and faculty presentations.

ECON 24N. Social Choice & Market Design. 3 Units.
The design of mechanisms for group decision making, addressing questions about how apartment mates should choose rooms and share the rent, how a government should select and pay its suppliers, how a town should elect a mayor, or how students and college ought to be matches to one another. The first three weeks include classic papers by two Nobel-prize winning scholars about matching students and about government procurement. We will ask questions such as: What are the provable properties of these mechanisms? Is it possible for individuals or groups to manipulate the mechanisms for their own advantage? The remaining weeks focus on group decisions that are guided by "voting" mechanisms, showing the inherent trade-offs and proving theorems about the incompatibility among some simple, desirable properties of mechanisms. The ideas treated in this class are being used today to design new mechanisms for voting, matching, auctions and other applications, based on an awareness of the formal properties that the mechanisms may have.

ECON 250. Environmental Economics. 2-5 Units.
Theoretical and empirical analysis of sources of and solutions to environmental problems, with application to local pollution challenges and global environmental issues such as climate change. Topics include: analysis of market failure, choice of environmental policy instruments, integrating environmental and distortionary taxes, environmental policy making under uncertainty, valuing environmental amenities, and measuring /promoting sustainable development.

ECON 251. Natural Resource and Energy Economics. 2-5 Units.
Economic theory and empirical analysis of non-renewable and renewable natural resources, with considerable attention to energy provision and use. Topics include: exhaustible resources; renewable resources; and energy industry market structure, pricing, and performance. Prerequisites: 202, 203, 204, 271, and 272, or equivalents with consent of instructor.

ECON 252. The Future of Finance. 2 Units.
(Same as Law 1038) If you are interested in a career in finance or that touches finance (computational science, economics, public policy, legal, regulatory, corporate, other), this course will give you a useful perspective. We will take on hot topics in the current landscape of global financial markets such as how the world has evolved post-financial crisis, how it is being disrupted by FinTech, RegTech, artificial intelligence, crowd financing, blockchain, machine learning & robotics (to name a few), how it is being challenged by IoT, cyber, financial warfare & crypto currency risks (to name a few) and how it is seizing new opportunities in fast-growing areas such as ETFs, new instruments/payment platforms, robo advising, big data & algorithmic trading (to name a few). The course will include guest-lecturer perspectives on how sweeping changes are transforming business models and where the greatest opportunities exist for students entering or touching the world of finance today including existing, new and disruptive players. While derivatives and other quantitative concepts will be handled in a non-technical way, some knowledge of finance and the capital markets is presumed. Elements used in grading: Class Participation, Attendance, Final Paper. Consent Application: To apply for this course, students must complete and email to the instructors the Consent Application Form, which is available on the Public Policy Program's website at https://publicpolicy.stanford.edu/academics/undergraduate/forms. See Consent Application Form for submission deadline.
Same as: ECON 152, PUBLPOL 364, STATS 238
What theory and practice around the world and in Latin America tell us about the design of energy markets; how distributional impacts and enforcement capabilities affect their implementation. Topics include: pricing in wholesale electricity markets, role of long-term contracting, auction design, evidence from spot and contract markets; design of markets for pollution permits, alternative environmental policy instruments, evidence from existing and proposed carbon markets and others, imperfect information, adverse selection in opt-in provisions, effect on innovation, interaction between markets, market power. Advanced undergraduates and masters students are welcome to enroll.

ECON 255. Economics of Communication. 2-5 Units.
This course will cover theoretical and empirical work on the provision of information in markets. Likely topics include: theory of strategic communication; persuasion; media; advertising and brands; financial analysis and disclosure; political communication; text analysis using machine learning and natural language processing methods. Prerequisites: Econ 202 and 210 (or equivalent).

ECON 257. Industrial Organization I. 2-5 Units.
Theoretical and empirical analyses of the determinants of market structure; firm behavior and market efficiency in oligopolies; price discrimination; price dispersion and consumer search; differentiated products; the role of information in markets, including insurance and adverse selection; auctions; collusion and cartel behavior; advertising; entry and market structure; market dynamics; strategic behavior.

ECON 258. Industrial Organization II A. 2-5 Units.
Topics may include theoretical and empirical analysis of bargaining, dynamic models of entry and investment, models of markets with asymmetric information, advertising, brands, and markets for information, and research at the boundaries between IO and neighboring fields such as trade and behavioral economics. Prerequisite: Econ 257.

ECON 259. Industrial Organization II B. 2-5 Units.
Theoretical and empirical analyses of the determinants of market structure; firm behavior and market efficiency in oligopolies; economics of antitrust and regulation, with focus on energy and environmental economics; the role of information asymmetries in markets: adverse selection and moral hazard, with focus on insurance and credit markets.

ECON 25N. Public Policy and Personal Finance. 3 Units.
The seminar will provide an introduction and discussion of the impact of public policy on personal finance. Voters regularly rate the economy as one of the most important factors shaping their political views and most of those opinions are focused on their individual bottom lines. In this course we will discuss the rationale for different public policies and how they affect personal financial situations. We will explore personal finance issues such as taxes, loans, charity, insurance, and pensions. Using the context of (hypothetical) personal finance positions, we will discuss the public policy implications of various proposals and how they affect different groups of people, for example: the implications of differential tax rates for different types of income, the promotion of home ownership in the U.S., and policies to care for our aging population. While economic policy will be the focus of much of the course, we will also examine some of the implications of social policies on personal finance as well. There will be weekly readings and several short policy-related writing assignments.
Same as: PUBLPOL 55N

ECON 260. Industrial Organization III. 2-5 Units.
Course combines individual meetings and student presentations, with an aim of initiating dissertation research in industrial organization. Prerequisites: ECON 257, ECON 258.

ECON 265. International Economics. 2-5 Units.
International macroeconomics and finance, emphasizing current research. The course is organized around the role of different types of frictions (in asset and goods markets) in explaining features of the international macroeconomy. Prerequisites: 202, 203, 204, 210, 211, 212.

ECON 266. International Trade I. 2-5 Units.
The first part of this course covers Ricardian, factor-proportions and monopolistic-competition models of international trade. The second part of the course covers commercial policy, with an emphasis on the economics of trade agreements.

ECON 267. International Trade II. 2-5 Units.
The first part of this course covers the factor-proportions theory of international trade. The second and much larger part of the course covers commercial policy, with an emphasis on the economics of trade agreements.

ECON 268. International Finance and Exchange Rates. 2-5 Units.

ECON 269. International Finance and Exchange Rates II. 2-5 Units.
This is the second half of the international finance sequence. Part I: intertemporal approach to the current account, international real business cycle models, international risk-sharing, gains from financial integration, global imbalances, and exchange rate determination.

ECON 270. Intermediate Econometrics I. 2-5 Units.
Probability random variables, and distributions; large sample theory, theory of estimation and hypothesis testing. Limited enrollment. Prerequisites: math and probability at the level of Chapter 2, Paul G. Hoel, Introduction to Mathematical Statistics, 5th ed.

ECON 271. Intermediate Econometrics II. 2-5 Units.
Analysis of Randomized Experiments, Linear Regression Model, Instrumental Variables, Methods for Causal Effects. Prerequisite: Econ 270 or MGTECON 604 or permission of instructor.

ECON 272. Intermediate Econometrics III. 2-5 Units.
Simultaneous equation models, nonlinear estimation and testing, linear time series analysis, structural modeling. Prerequisites: Econ 271 or permission of instructor.

ECON 273. Advanced Econometrics I. 2-5 Units.

ECON 274. Advanced Econometrics II. 2-5 Units.
(Formerly 273B); Possible topics: nonparametric density estimation and regression analysis; sieve approximation; contiguity; convergence of experiments; cross validation; indirect inference; resampling methods: bootstrap and subsampling; quantile regression; nonstandard asymptotic distribution theory; empirical processes; set identification and inference, large sample efficiency and optimality; multiple hypothesis testing.
ECON 275. Economics-Based Econometrics. 3-5 Units.
This course presents methods for constructing econometric specifications and systems directly based on economic models. One such approach formulates stochastic economic models that give rise to empirically implementable econometric models. The discussion will cover methods for estimating, diagnostic testing, and drawing inferences about the underlying economic primitives, including both parametric and non-parametric identification of economic structures. Applications include models from all fields of empirical microeconomics, Labor, Industrial Organization, Public Finance, and Energy and Environmental Economics. Examples include: consumer demand models integrating corner solutions, intertemporal models of household and firm behavior, and dynamic models of single and multi-agent interactions with complete and incomplete information. The major theme of the course is to present a general framework for economic theory-based empirical research that allows researchers to recover the underlying economic primitives driving observed outcomes of an economic environment. Prerequisites: Econ 202, 203, 204, 270, 271, 272.

ECON 276. Computational Econometrics. 2-5 Units.
Theory and computational methods necessary to implement state-of-the-art econometric methods used in theory-based empirical work. Topics covered include: computation of nonlinear M-estimators subject to equality and inequality constraints, simulation estimators, indirect inference, Markov Chain Monte Carlo methods, resampling (bootstrap and sub-sampling), nonparametric inference, dynamic discrete choice models, continuous and discrete mixture models and estimation and inference for partially identified models.

ECON 277. Behavioral and Experimental Economics III. 2-5 Units.
Economics 277 is a course for graduate students in the Economics department writing dissertations with behavioral or experimental components. Economics 277 is part of a three course sequence (along with Econ 278 & 279), which has two main objectives: 1) examining theories and evidence related to the psychology of economic decision making; 2) introducing methods of experimental economics, and exploring major subject areas (including those not falling within behavioral economics) that have been addressed through laboratory experiments. Focuses on series of experiments that build on one another in an effort to test between competing theoretical frameworks, with the objects of improving the explanatory and predictive performance of standard models, and of providing a foundation for more reliable normative analyses of policy issues. Prerequisites: Econ 204 and 271, or consent of instructor.

ECON 279. Behavioral and Experimental Economics II. 2-5 Units.
This course presents methods for constructing econometric specifications and systems directly based on economic models. One such approach formulates stochastic economic models that give rise to empirically implementable econometric models. The discussion will cover methods for estimating, diagnostic testing, and drawing inferences about the underlying economic primitives, including both parametric and non-parametric identification of economic structures. Applications include models from all fields of empirical microeconomics, Labor, Industrial Organization, Public Finance, and Energy and Environmental Economics. Examples include: consumer demand models integrating corner solutions, intertemporal models of household and firm behavior, and dynamic models of single and multi-agent interactions with complete and incomplete information. The major theme of the course is to present a general framework for economic theory-based empirical research that allows researchers to recover the underlying economic primitives driving observed outcomes of an economic environment. Prerequisites: Econ 202, 203, 204, 270, 271, 272.

ECON 277N. The Economics of Gender. 3 Units.
This seminar draws on empirical and theoretical insights from multiple fields within economics. The objective is to understand the role of gender in economic decision making, and the changing significance, timing and meaning of work, career and family. We will focus on recent work in experimental economics, and empirical work in the developed world. But at times we will widen the perspective to developing countries and consider historical changes as well.

ECON 282. Contracts, Information, and Incentives. 2-5 Units.
Basic theories and recent developments in mechanism design and the theory of contracts. Topics include: hidden characteristics and hidden action models with one and many agents, design of mechanisms and markets with limited communication, long-term relationships under commitment and under renegotiation, property rights and theories of the firm.

ECON 283. Theory and Practice of Auction Market Design. 2-5 Units.
This class will focus on several topics in auction market design and related areas. It is an advanced course, intended as a sequel to the more basic market/mechanism/auction design courses offered at the Economics department and the GSB. Students are expected to be familiar with the material in those courses. We will briefly review some basics of auction theory, but the main goal of the class is to bring students closer to doing independent research and introduce them to recent contributions and currently active research areas. Specific topics may include: multi-item and combinatorial auctions; robust auction design; applied auction design with practical applications; matching and pricing on the Internet; radio spectrum auctions; securities markets; commodities; complex procurements. Grading based on presentation, assignment, and term paper.

ECON 285. Matching and Market Design. 2-5 Units.
This is an introduction to market design, intended mainly for second year PhD students in economics (but also open to other graduates students from around the university and to undergrads who have taken undergrad market design). It will emphasize the combined use of economic theory, experiments and empirical analysis to analyze and engineer market rules and institutions. In this first quarter we will pay particular attention to matching markets, which are those in which price doesn't do all of the work, and which include some kind of application or selection process. In recent years market designers have participated in the design and implementation of a number of marketplaces, and the course will emphasize the relation between theory and practice, for example in the design of labor market clearinghouses for American doctors, and school choice programs in a growing number of American cities (including New York and Boston), and the allocation of organs for transplantation. Various forms of market failure will also be discussed. Assignment: One final paper. The objective of the final paper is to study an existing market or an environment with a potential role for a market, describe the relevant market design questions, and evaluate how the current market design works and/or propose improvements on the current design.
ECON 286. Game Theory and Economic Applications. 2-5 Units.
Aims to provide a solid basis in game-theoretic tools and concepts, both for theorists and for students focusing in other fields. Technical material will include solution concepts and refinements, potential games, supermodular games, repeated games, reputation, and bargaining models. The class will also address some foundational issues, such as epistemic and evolutionary modeling. Prerequisite: 203 or consent of instructor.

ECON 288. Computational Economics. 2-5 Units.
This course studies computational approaches for solving dynamic economic models. First, it provides background in numerical analysis (approximation, integration, optimization, error analysis), and describes local and global numerical methods (perturbation, Smolyak, endogenous grid, stochastic simulation, cluster grid methods). Then, it shows applications from recent economic literature representing challenges to computational methods (new Keynesian models with a zero lower bound, default risk models, Krusell-Smith models, international trade models, overlapping-generations models, nonstationary growth models, dynamic games). Finally, it surveys recent developments in software and hardware (Python, Julia, GPUs, parallel computing, supercomputers), as well as machine learning techniques. No prerequisites. Grading on the basis of problem sets and a final project.

ECON 289. Advanced Topics in Game Theory and Information Economics. 2-5 Units.
Topics course covering a variety of game theory topics with emphasis on market design, such as matching theory and auction theory. Final paper required. Prerequisites: ECON 285 or equivalent. ECON 283 recommended.

ECON 290. Multiplayer Decision Theory. 3 Units.
Students and faculty review and present recent research papers on basic theories and economic applications of decision theory, game theory and mechanism design. Applications include market design and analyses of incentives and strategic behavior in markets, and selected topics such as auctions, bargaining, contracting, and computation.

ECON 291. Social and Economic Networks. 2-5 Units.
Synthesis of research on social and economic networks by sociologists, economists, computer scientists, physicists, and mathematicians, with an emphasis on modeling. Includes methods for describing and measuring networks, empirical observations about network structure, models of random and strategic network formation, as well as analyses of contagion, diffusion, learning, peer influence, games played on networks, and networked markets.

ECON 292. Quantitative Methods for Empirical Research. 2-5 Units.
This is an advanced course on quantitative methods for empirical research. Students are expected to have taken a course in linear models before. In this course I will discuss modern econometric methods for nonlinear models, including maximum likelihood and generalized method of moments. The emphasis will be on how these methods are used in sophisticated empirical work in social sciences. Special topics include discrete choice models and methods for estimating treatment effects.

ECON 293. Machine Learning and Causal Inference. 3 Units.
This course will cover statistical methods based on the machine learning literature that can be used for causal inference. In economics and the social sciences more broadly, empirical analyses typically estimate the effects of counterfactual policies, such as the effect of implementing a government policy, changing a price, showing advertisements, or introducing new products. This course will review when and how machine learning methods can be used for causal inference, and it will also review recent modifications and extensions to standard methods to adapt them to causal inference and provide statistical theory for hypothesis testing. We consider causal inference methods based on randomized experiments as well as observational studies, including methods such as instrumental variables and those based on longitudinal data. We consider the estimation of average treatment effects as well as personalized policies. Lectures will focus on theoretical developments, while classwork will consist primarily of empirical applications of the methods. Prerequisites: graduate level coursework in at least one of statistics, econometrics, or machine learning. Students without prior exposure to causal inference will need to do additional background reading in the early weeks of the course.

ECON 299. Practical Training. 1-10 Unit.
Students obtain employment in a relevant research or industrial activity to enhance their professional experience consistent with their degree programs. At the start of the quarter, students must submit a one page statement showing the relevance of the employment to the degree program along with an offer letter. At the end of the quarter, a three page final report must be supplied documenting work done and relevance to degree program. May be repeated for credit.

ECON 300. Third-Year Seminar. 1-10 Unit.
Restricted to Economics Ph.D. students. Students present current research. May be repeated for credit.

ECON 310. Macroeconomic Workshop. 1-10 Unit.

ECON 315. Development Workshop. 1-10 Unit.

ECON 325. Economic History Workshop. 1-10 Unit.
May be repeated for credit.

ECON 335. Experimental/Behavioral Seminar. 1-10 Unit.
Field seminar in experimental and behavioral economics.

ECON 341. Public Economics and Environmental Economics Seminar. 1-10 Unit.
Issues in measuring and evaluating the economic performance of government tax, expenditure, debt, and regulatory policies; their effects on levels and distribution of income, wealth, and environmental quality; alternative policies and methods of evaluation. Workshop format combines student research, faculty presentations, and guest speakers. Prerequisite: ECON 241 or consent of instructor.

ECON 345. Labor Economics Seminar. 1-10 Unit.

ECON 354. Law and Economics Seminar. 2-6 Units.
This seminar will examine current research by lawyers and economists on a variety of topics in law and economics. Several sessions of the seminar will consist of an invited speaker, usually from another university, who will discuss his or her current research. Representative of these sessions have been discussions of compensation for government regulations and takings, liability rules for controlling accidents, the definition of markets in antitrust analysis, the role of the government as a controlling shareholder, and optimal drug patent length. Cross-listed with LAW 344.

ECON 355. Industrial Organization Workshop. 1-10 Unit.
Current research in the field by visitors, presentations by students, and discussion of recent papers. Students write an original research paper, make a formal presentation, and lead a structured discussion.

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ECON 365. International Trade Workshop. 1-10 Unit.

ECON 370. Econometrics Workshop. 1-10 Unit.

ECON 380. INEQUALITY: Economic and Philosophical Perspectives. 5 Units.
The nature of and problem of inequality is central to both economics and philosophy. Economists study the causes of inequality, design tools to measure it and track it over time, and examine its consequences. Philosophers are centrally concerned with the justification of inequality and the reasons why various types of inequality are or are not objectionable. In this class we bring both of these approaches together. Our class explores the different meanings of and measurements for understanding inequality, our best understandings of how much inequality there is, its causes, its consequences, and whether we ought to reduce it, and if so, how. This is an interdisciplinary graduate seminar. We propose some familiarity with basic ideas in economics and basic ideas in contemporary political philosophy; we will explain and learn about more complex ideas as we proceed. The class will be capped at 20 students.

Same as: ETHICSOC 371R, PHIL 371D, POLISCI 431L

ECON 391. Microeconomic Theory Seminar. 1-10 Unit.

Pre-TGR dissertation research. (Staff).

ECON 50. Economic Analysis I. 5 Units.
Individual consumer and firm behavior under perfect competition. The role of markets and prices in a decentralized economy. Monopoly in partial equilibrium. Economic tools developed from multivariable calculus using partial differentiation and techniques for constrained and unconstrained optimization. Prerequisites: Econ 1 or 1V, and Math 51 or Math 51A or CME 100 or CME 100A.

ECON 51. Economic Analysis II. 5 Units.
Neoclassical analysis of general equilibrium, welfare economics, imperfect competition, externalities and public goods, risk and uncertainty, game theory, adverse selection, and moral hazard. Multivariate calculus is used. Prerequisite: ECON 50.

ECON 52. Economic Analysis III. 5 Units.
Long-run economic growth and short-run economic fluctuations. Focus on the macroeconomic tools of government: fiscal policy (spending and taxes) and monetary policy, and their effects on growth, employment, and inflation. Prerequisites: ECON 50.

ECON 78N. Economic Policies of the Presidential Candidates. 3 Units.
In nearly all polls, American voters rank the economy as one of their most important concerns. In the presidential election, much of the debate for voters will be on questions of economic policy. In this course, we will delve deeply into economic policy issues to understand options for government intervention and possible outcomes. We will combine economic analysis with political science methodology to understand efficient and implementable policy proposals. Specific areas of interest will be taxation, budget, entitlement programs, economic regulation and competition policy, trade, demography, income inequality, and monetary policy. The course will incorporate other timely and salient policy issues as they arise during the course of the campaign. Students will be expected to write a short paper and make an oral presentation to the class. A wide range of topics will be acceptable, including those directly related to campaign issues as well as other long-term economic issues facing the country.

Same as: PUBLPOL 78N

ECON 801. TGR Project. 0 Units.

ECON 802. TGR Dissertation. 0 Units.