ECONOMICS

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M.A., M.Phil., Ph.D.

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FIELDS OF STUDY
Fields include microeconomics, macroeconomics, econometrics, labor, public finance, industrial organization, international trade and finance, financial economics, environmental economics, economic development, economic history, political economy, and behavioral economics.

SPECIAL REQUIREMENTS FOR THE PH.D. DEGREE
Exceptions to the requirements described below may be obtained only by vote of the Economics faculty and will be granted only in recognition of extenuating circumstances.

Prior to Registration for the Second Year

(1.1) Students must have taken for credit and passed at least six economics graduate courses. With the permission of the director of graduate studies (DGS), courses in related fields can be used to fulfill this requirement. (Courses in the International and Development Economics master’s program do not satisfy this requirement.) (1.2) Students who earn a grade of HP- or better in each of the four first-year courses in microeconomics and macroeconomics may proceed directly to the second year. In June and August of each year, the department will give waiver exams in micro and macro, written and graded to the extent possible by a committee of faculty who have taught the first-year courses in the previous year. First-year students who do not earn a grade of HP- or better in each of the first-year micro or macro courses must either take and pass the corresponding exam in June or take the exam in June and then (in the event of failure) take and pass the exam in August in order to continue in the program. A student who obtains an HP- or better in one term of a sequence, but not the other, must take (and retake, if necessary) only the waiver exam corresponding to the term in which they failed to obtain an HP- or better. Students who have not passed all the required examinations prior to the second year of study may register as master’s candidates for the following fall term for the purpose of completing enough courses to be eligible for the Master of Arts degree. Exceptionally well prepared incoming students may petition the DGS and the faculty in the field to take the waiver exam before their first year, with an eye toward placing out of either one or both terms of either of the first-year micro or macro courses. Incoming students taking the waiver exam will be exempt from the corresponding course only if their performance is an exemplary (rather than marginal) pass.

Prior to Registration for the Third Year

(2.1) Students must have met the Graduate School’s requirement of Honors in two courses. (2.2) Students must have taken at least fourteen term courses in economics and have received a grade of at least a P- in each of them. With the permission of the DGS, courses in related fields and independent reading courses can be used to fulfill this requirement. Workshops may not be used to satisfy it. (2.3) Students must have received an average of at least HP in the courses they have taken. The admissibility of courses for this requirement is the same as for the fourteen-course requirement, (2.2). Grades within the Economics department include pluses and minuses. The grade average is computed as follows. A failure counts as a zero, a P- as a 1, a P as a 2, a P+ as a 3, an HP- as a 4, and so on up to a 9 for an H+. The arithmetic average of these numbers must be at least 4.5. (2.4) All students must have submitted a draft of their empirical paper, discussed in (3.3) below. (2.5) All students must make their first attempt at each of two qualifying examinations by June 30 of their second year in the program. The examinations test a student’s general analytic ability in economics and knowledge of two fields chosen by the student. Fields are typically drawn from microeconomics, macroeconomics, econometrics, labor, public finance,
industrial organization, international trade and finance, financial economics, environmental economics, economic development, economic history, political economy, and behavioral economics. Students may request examination in a special field designed in consultation with Economics department faculty. The choice of fields must be approved by the DGS. Students may list two preferred examiners in each field. The DGS’s office strives to satisfy these preferences subject to faculty availability and the number of students making similar requests. The nature and format of the field qualifying exams will be determined by the faculty in the field. If a student fails a field qualifying exam in the spring of the second year, the student must either retake the exam in that field or may take an exam in a different field. In either case, the student must pass this second attempt, whether in the same field or not, in the fall of the third year to remain in the program.

Admission to Candidacy

The Economics department adheres strictly to the Graduate School requirement that students be admitted to candidacy prior to registration for the fourth year of study. Students are recommended to the Graduate School for admission to candidacy by vote of the Department of Economics faculty after having completed requirements (2.1), (2.2), and (2.3) above, the Graduate School’s prospectus requirement, and the following additional requirements. (3.1) Students must have completed two one-term prospectus workshops, one in each term of the third year. All prospectus workshops have the word “prospectus” in their title. If students can find no prospectus workshop corresponding to their interests, they may substitute other workshops to meet this requirement. In order to two workshops to count toward the prospectus requirement, students must make a presentation in each workshop and present original work in one of them. This stipulation applies even if a workshop is not labeled as a prospectus workshop. If students can find no workshop whatsoever in their area of interest, they may substitute an independent study course guided by a faculty member, provided the independent study leads to a dissertation prospects that is accepted. (3.2) Students must receive a grade of HP- or better in ECON 551 (Econometrics II) or ECON 552 (Econometrics III). More advanced courses may be substituted for these with permission of the DGS. (3.3) Students must receive a grade of Satisfactory on an empirical paper, which is evaluated by a faculty adviser or an instructor of ECON 556. In the paper, the student should (a) specify an economic model useful for the investigation of interesting economic problem, (b) select data and econometric methods appropriate to the question, (c) conduct proper statistical analysis, and (d) interpret the results in an intelligent way. The department’s posted description of the empirical paper requirement should answer any questions about it. The paper may be written in the course ECON 556 or independently with the help of a faculty adviser, the standards for a satisfactory paper being the same in both cases. The paper is not expected to be of publishable or nearly publishable quality but should demonstrate facility in the application of econometric methods to an economic question. Note: Jointly authored papers will not be accepted. (3.4) Students must complete with a grade of at least HP- a term of economic history, drawn from a list of courses approved by the DGS and the economic history instructors. (3.5) Students must pass two field qualifying examinations given by committees of faculty members. These exams are discussed in (2.5) above.

Additional Requirements

(1) All students must give a dissertation prospectus to their advisory committee by the second Friday in May of their third year. (2) Students must provide the names of their advisory committee to the DGS’s office by February 1 of the third year. (3) In each academic year after the second, all students must regularly attend at least two workshops. At least one of them must be an “informal” prospectus workshop lunch or reading group, and at least one must be a “formal” research workshop. Each student must present at least once a year in one or other of the workshops that they regularly attend in the third and fourth years. (4) Third-year students who have not yet satisfied the empirical paper requirement must submit an empirical paper by February 1.

The Dissertation

The dissertation should make an original contribution to economics that demonstrates the student’s mastery of relevant resources and methods. Although the dissertation may cover several related topics, it should have a unifying theme. The dissertation may consist of one or more than one essay. The dissertation is guided by a committee of two advisers, at least one of whom must be a member of the Economics department. The second adviser need not be from the Economics department or even from Yale University. Second advisers from outside the Yale Economics department must be approved by the DGS. The two advisers serve as readers. After the student has completed a first draft of the dissertation, the DGS appoints a third reader. The student and the committee may recommend third readers, but the choice remains with the DGS, since the third reader serves as an independent referee.

Collaborative Work in the Dissertation

The Economics department’s objective regarding collaboration is to achieve a reasonable compromise between two goals. While the department wishes to encourage collaborative research among students and between students and faculty, a dissertation should demonstrate the student’s ability to do independent research. The dissertation committee and the DGS must approve the inclusion of collaborative work in the dissertation, and students must acknowledge and describe any collaboration in the preface to the dissertation.

Expiration of Admission to Candidacy

Advancement to candidacy expires ten years after the date it is granted, if no dissertation has been submitted and approved in the intervening period.
Normal Sequence of Studies

What follows in the next three paragraphs are recommendations, not requirements.

During the fall term of the first year, students usually take ECON 500 (General Economic Theory: Microeconomics), ECON 510 (General Economic Theory: Macroeconomics), ECON 550 (Econometrics I). In the following spring, they usually take ECON 501 (General Economic Theory: Microeconomics), ECON 511 (General Economic Theory: Macroeconomics), ECON 551 (Econometrics II). Students who are well prepared in econometrics may take an advanced econometrics course instead of ECON 550 in the fall of the first year after consulting the DGS and an appropriate econometrics faculty member.

Students typically also take a course in economic history in either the fall or spring term, that would satisfy the economic history requirement, (3.4) above, if a grade of at least HP- were obtained. Taking the history course in the spring may be more appropriate for students concerned about making the transition to graduate school in the fall.

During the second year, students normally take ECON 556 and satisfy the empirical paper requirement. Students also take economics courses in specialized fields, such as economic theory, macroeconomics, econometrics, labor, public finance, industrial organization, international trade and finance, financial economics, environmental economics, economic development, economic history, political economy, and behavioral economics. These courses serve as preparation for the field examinations and allow students to identify potential areas of study for dissertation research. As they identify an area, students should locate a faculty adviser to advise them about their studies. Students may also take courses related to economics from other departments.

The third year is normally devoted to finding a dissertation topic and to beginning research on it. In this year, students are expected to make the transition from being a taker of classes to a participant in research. Important elements in achieving this transition are thinking critically about material learned, reading widely, choosing research topics that are feasible and of interest to the student, and gaining contact with faculty. Students should expect to take the initiative in making such contact.

COMBINED PH.D. DEGREES

A combined degree results in the award of one Ph.D. with two departments named. It is not two separate degrees, and the student is not expected to fulfill all the requirements of both departments.

Purpose Combined degrees are intended to provide a sufficiently broad training program for a student wishing to complete an interdisciplinary dissertation.

Who designs a combined degree program Combined degree programs are designed on an ad hoc basis by the student, the DGSs of the two departments, and the appropriate associate dean of the Graduate School.

Timing Most combined degrees are proposed by students during the summer after the first year of study. Students are not given extra time or funding to complete combined degrees. In particular, students must advance to candidacy by the end of their third year of study.

Degree of integration A combined program should synthesize the knowledge and methods of the two departments into a single study. Ideally the dissertation should be equally strong in both fields. For example, a dissertation with the first half focused on economics and the second half focused on political science would not be acceptable.

Administrative requirements An ad hoc combined degree program is established in the following steps.

1. A program is initiated by writing of a pre-prospectus by the student. This document describes how and why the two fields are to be integrated.
2. The student recruits a faculty dissertation adviser from each department and obtains their approval of the pre-prospectus, perhaps modified in response to their advice.
3. The student recruits two other faculty members to serve on the dissertation committee, one from each department.
4. The student discusses the requirements for a combined degree with both departmental DGSs.
5. The student prepares a comprehensive study plan that contains a list of courses and examinations agreed on by both DGSs and approved by both departments. The goals of the course selection are to give some breadth of knowledge of both fields and prepare the student to complete the dissertation. A key to success in combined programs is not to require too many courses and to focus on preparation for dissertation research. Requirements include successful completion of ECON 500, ECON 501, ECON 510, and ECON 511 with grades of at least HP-; please see (1.2) for a complete description of the requirement. Normally the two departments administer qualifying examinations. This procedure may require the production of examinations that both departments evaluate simultaneously. The plan of study should contain the following: (a) a cover sheet for approvals by both dissertation advisers, both DGSs, and the appropriate associate dean of the Graduate School, (b) an introduction where the student explains the rational for proposing the ad hoc combined degree, and (c) a term-by-term timeline listing all classes, teaching, and required examinations.
6. Both departments must accept the dissertation prospectus.
7. The plan of study is a contract, and the student must receive written permission in advance from both DGSs and the appropriate associate dean of the Graduate School for any changes to the plan.
8. Once everyone agrees and the plan of study is approved, the combined program is recorded in Banner.
Funding and teaching The department that first admitted the student is the “primary department.” The student's funding is from the primary department, as is the teaching expectation. Ideally students should obtain teaching experience from both departments.

MASTER’S DEGREES

M.Phil. The M.Phil. degree is awarded to students in the Ph.D. program upon completion of all the requirements for advancement to candidacy for a doctorate in economics except the prospectus and prospectus workshop requirements.

M.A. (en route to the Ph.D.) The M.A. degree is awarded upon completion of at least eight term graduate courses listed or cross-listed by the Department of Economics. At least six of these courses must be Ph.D. courses in the Department of Economics (not courses from the International and Development Economics master's program). The average grade of all the graduate courses taken that are listed or cross-listed by the Department of Economics must be at least a High Pass, and at least two of these grades must be an Honors. Students must complete at least two of the three first-year two-course sequences in microeconomics, macroeconomics, or econometrics. In computing the grade average, the relevant grades are those reported to the registrar and so do not include pluses or minuses. A Fail counts as a zero, a Pass counts as a 1, a High Pass counts as a 2, and an Honors counts as a 3. To say that the average grade must be High Pass means that the arithmetic average of these numbers must be at least 2.

Students in doctoral programs other than Economics may earn an M.A. in Economics under the conditions listed in the previous paragraph. Such students automatically earn an M.A. in their own department when awarded a Ph.D., and Yale allows students to earn only one M.A. degree. Consequently, students must apply to have the M.A. in their own department replaced by the Economics M.A. This application must be made to the DGS of Economics and to the DGS of the student's own department. Prior to this application, the student must have taken the first one-term course in at least one of the three first-year two-course sequences in microeconomics, macroeconomics, or econometrics and obtained a grade of at least High Pass. As part of the application, the student must submit a proposed list of economics courses, and this list must be approved by the two DGSs and by the appropriate dean of the Graduate School. The DGS of Economics must approve any deviation from this list, and this approval should be obtained before taking courses not on the list.

Terminal Master’s Degree Program Students working toward a J.D. in the Law School may earn an M.A. degree in Economics. The degree requirements that apply to these students are the same as those described above for the M.A. degree en route to Ph.D. for students in doctoral programs other than Economics. Students wishing to join this J.D./M.A. joint-degree program must apply for separate admission to the Economics graduate program; applicants should submit scores from the GRE General Test. Students admitted to this program pay three years of tuition to the Law School and one year of tuition to the Graduate School. The Graduate School does not offer fellowship support to J.D./M.A. candidates.

The M.A. in International and Development Economics is described under International and Development Economics.

COURSES

ECON 500a and ECON 501b, General Economic Theory: Microeconomics Staff
Introduction to optimization methods and partial equilibrium. Theories of utility and consumer behavior production and firm behavior. Introduction to uncertainty and the economics of information, and to noncompetitive market structures.

ECON 510a and ECON 511b, General Economic Theory: Macroeconomics Staff
Analysis of short-run determination of aggregate employment, income, prices, and interest rates in closed and open economies. Stabilization policies.

ECON 520a, Advanced Microeconomic Theory I Johannes Horner
A formal introduction to game theory and information economics. Alternative non-cooperative solution concepts are studied and applied to problems in oligopoly, bargaining, auctions, strategic social choice, and repeated games.

ECON 521b, Advanced Microeconomic Theory II Marina Halac and Ryota Iijima
Contracts and the economics of organization. Topics may include dynamic contracts (both explicit and implicit), career concerns, hierarchies, Bayesian mechanism design, renegotiation, and corporate control.

ECON 522a and ECON 523b, Microeconomic Theory Lunch Staff
A forum for advanced students to critically examine recent papers in the literature and present their own work.

ECON 525a, Advanced Macroeconomics I Zhen Huo
Heterogeneous agent economics, investment, scrapping and firing, nonquadratic adjustment costs, financial constraints, financial intermediation, psychology of decision making under risk, optimal risk management, financial markets, consumption behavior, monetary policy, term structure of interest rates.

ECON 526b, Advanced Macroeconomics II Michael Peters
Macroeconomic equilibrium in the presence of uninsurable labor income risk. Implications for savings, asset prices, unemployment.

ECON 531b, Mathematical Economics II Eduardo Davila
This course examines the foundations of money and finance from the perspective of general equilibrium with incomplete markets. The relevant mathematical tools from elementary stochastic processes to differential topology are developed in the course. Topics include asset pricing, variations of the capital asset pricing model, the “Hahn paradox” on the value of flat money, default and bankruptcy,
collateral equilibrium, market crashes, adverse selection and moral hazard with perfect competition, credit card equilibrium, and general equilibrium with asymmetric information.

**ECON 537a and ECON 538b, Microeconomic Theory Workshop**  Staff
Presentations by research scholars and participating students.

**ECON 540a and ECON 541b, Student Workshop in Macroeconomics**  Staff
A course that gives third- and fourth-year students doing research in macroeconomics an opportunity to prepare their prospectuses and to present their dissertation work. Each student is required to make at least two presentations per term. For third-year students and beyond, at least one of the presentations in the first term should be a mock job talk.

**ECON 542a and ECON 543b, Macroeconomics Workshop**  Staff
A forum for presentation and discussion of state-of-the-art research in macroeconomics. Presentations by research scholars and participating students of papers in closed economy and open economy macroeconomics and monetary economics.

**ECON 545a, Microeconomics**  Staff
A survey of the main features of current economic analysis and of the application of the theory to a number of important economic questions, covering microeconomics and demand theory, the theory of the firm, and market structures. For IDE students.

**ECON 546a, Growth and Macroeconomics**  Ana Fieler
This course presents a basic framework to understand macroeconomic behavior and the effects of macroeconomic policies. Topics include consumption and investment, labor market, short-run income determinations, unemployment, inflation, growth, and the effects of monetary and fiscal policies. The emphasis is on the relation between the underlying assumptions of macroeconomic framework and policy implications derived from it.

**ECON 547b, Social Networks and Economic Development**  Kaivan Munshi
The objective of this course is to study the emerging literature on social networks and economic development. Both theoretical and empirical research papers are covered, at a level that is suitable for the advanced undergraduate or graduate student. The course is divided into three sections: (1) Labor Markets and Migration: how community networks support their members in the labor market and how they support their spatial and occupational mobility during the process of development; (2) Commitment: how communities use social ties to solve commitment problems in developing economics, both in theory and in practice; (3) Inter-Group Interactions: community networks do not operate independently, and a nascent literature is starting to investigate the nature of these group interactions. Time permitting, we examine the role played by networks in the diffusion of information at the end of the course. Prerequisites: intermediate microeconomics, introductory econometrics, and data analysis. Students are expected to be familiar with calculus, basic microeconomics, and basic econometrics.

**ECON 548a / PLSC 721a, Political Economy of Development**  Rohini Pande and Gerard Padro
This course analyzes empirically and theoretically the political, institutional, and social underpinnings of economic development. We cover an array of topics ranging from power structures to corruption, state capacity, social capital, conflict, democratization, and democratic backsliding. We focus on recent advances to identify open areas for further research.

**ECON 550a, Econometrics I**  Donald Andrews
Probability: concepts and axiomatic development. Data: tools of descriptive statistics and data reduction. Random variables and probability distributions; univariate distributions (continuous and discrete); multivariate distributions; functions of random variables and transformations; the notion of statistical inference; sampling concepts and distributions; asymptotic theory; point and interval estimation; hypothesis testing.

**ECON 551b, Econometrics II**  Ed Vytlacil
Provides a basic knowledge of econometric theory, and an ability to carry out empirical work in economics. Topics include linear regression and extensions, including regression diagnostics, generalized least squares, statistical inference, dynamic models, instrumental variables and maximum likelihood procedures, simultaneous equations, nonlinear and qualitative-choice models. Examples from cross-section, time series, and panel data applications.

**ECON 552b, Econometrics III**  Donald Andrews
The treatment of the subject is rigorous, attentive to modern developments, and proceeds to research level in several areas. Linear models from core curriculum. Topics include linear estimation theory, multiple and multivariate regressions, Kruskal's theorem and its applications, classical statistical testing by likelihood ratio, Lagrange multiplier and Wald procedures, bootstrap methods, specification tests, Stein-like estimation, instrumental variables, and an introduction to inferential methods in simultaneous stochastic equations.

**ECON 553a, Econometrics IV: Time Series Econometrics**  Staff
A sequel to ECON 552, the course proceeds to research level in time series econometrics. Topics include an introduction to ergodic theory, Wold decomposition, spectral theory, martingales, martingale convergence theory, mixing processes, strong laws, and central limit theory for weak dependent sequences with applications to econometric models and model determination.

**ECON 554b, Econometrics V**  Xiaohong Chen
The first half of this course is about nonlinear parametric models. Specification, estimation, and testing within the Likelihood and Generalized Method of Moments frameworks. First-order asymptotics for both smooth and non-smooth objective functions. Efficiency and robustness. A short account of high-order asymptotics for smooth problems. The second part is on nonparametric and

**ECON 56a, Topics in Empirical Economics and Public Policy**  Philip Haile, Yusuke Narita, and Charles Hodgson

Methods and approaches to empirical economic analysis are reviewed, illustrated, and discussed with reference to specific empirical studies. The emphasis is on learning to use methods and on understanding how specific empirical questions determine the empirical approach to be used. We review a broad range of approaches including program evaluation methods and structural modeling, including estimation approaches, computational issues, and problems with inference. Open only to doctoral students in the Department of Economics. Exceptionally, doctoral students from other departments may take the course for credit if a faculty member, normally from their department, can supervise and grade their term paper.

**ECON 58a, Econometrics**  Michael Boozer

Application of statistical analysis to economic data. Basic probability theory, linear regression, specification and estimation of economic models, time series analysis, and forecasting. The computer is used. For IDE students.

**ECON 59b, Development Econometrics (IDE)**  Michael Boozer

**ECON 64a or b, Research Sem in Econometrics**  Staff

**ECON 565a / CPSC 565a, Algorithms via Continuous Optimization**  Nisheeth Vishnoi

Continuous optimization has played a major role in the recent development of fast algorithms for problems arising in areas such as theoretical computer science, discrete optimization, and machine learning. The approach is to first formulate the problem as a continuous optimization problem, even if the problem may be over a discrete domain; adapt or develop deterministic or randomized continuous-time dynamical systems to solve it; and then design algorithms for the problem via appropriate discretizations. The goal of this course is to design state-of-the-art algorithms for various classical discrete problems through the use of continuous optimization/sampling. The algorithmic applications include shortest paths, bipartite matching, flows, linear programming, sampling, and counting. We present approaches including gradient descent, mirror descent, multiplicative weights update method, accelerated gradient descent, Riemannian descent, Newton’s method, cutting-plane methods, Langevin dynamics, and Hamiltonian dynamics. Prerequisite: CPSC 365 or CPSC 366 or permission of the instructor. S&DS 630 and a solid background in calculus, linear algebra, probability, and algorithms are recommended.

**ECON 567a and ECON 568b, Econometrics Workshop**  Staff

A forum for state-of-the-art research in econometrics. Its primary purpose is to disseminate the results and the technical machinery of ongoing research in theoretical and applied fields.

**ECON 57a and ECON 57b, Prospectus Workshop in Econometrics**  Staff

A course for third- and fourth-year students doing research in econometrics to prepare their prospectus and present dissertation work.

**ECON 58a, General Economic History: Western Europe**  Timothy Guinnane

A survey of some major events and issues in the economic development of Western Europe during the eighteenth and nineteenth centuries, stressing the causes, nature, and consequences of the industrial revolution in Britain and on the Continent, and the implications of the historical record for modern conceptions of economic growth. Prerequisites: simultaneous enrollment in or successful completion of ECON 500 and ECON 510; permission of the instructor.

**ECON 58b, American Economic History**  Jose-Antonio Espin-Sanchez

This course examines both the long-term factors (such as industrialization and the development of markets) and the epochal events (such as the Revolution, Civil War, and Great Depression) that have shaped the development of the American economy. The objectives of this course are to familiarize students with the major topics and debates in American economic history. Prerequisites: concurrent enrollment in or successful completion of ECON 501 and ECON 510.

**ECON 58a and ECON 58b, Economic History Workshop**  Staff

A forum for discussion and criticism of research in progress. Presenters include graduate students, Yale faculty, and visitors. Topics concerned with long-run trends in economic organization are suitable for the seminar. Special emphasis given to the use of statistics and of economic theory in historical research.

**ECON 60a, Industrial Organization I**  Philip Haile and Mitsuru Igami

Begins by locating the study of industrial organization within the broader research traditions of economics and related social sciences. Alternative theories of decision making, of organizational behavior, and of market evolution are sketched and contrasted with standard neoclassical theories. Detailed examination of the determinants and consequences of industrial market structure.

**ECON 60b, Industrial Organization II**  Charles Hodgson

Examination of alternative modes of public control of economic sectors with primary emphasis on antitrust and public utility regulation in the U.S. economy. Public policy issues in sectors of major detailed governmental involvement.

**ECON 606a and ECON 607b, Prospectus Workshop in Industrial Organization**  Staff

For third-year students in microeconomics, intended to guide students in the early stages of theoretical and empirical dissertation research. Emphasis on regular writing assignments and oral presentations.
ECON 608a and ECON 609b, Industrial Organization Seminar  Staff
For advanced graduate students in applied microeconomics, serving as a forum for presentation and discussion of work in progress of students, Yale faculty members, and invited speakers.

ECON 630a and ECON 631b, Labor Economics  Staff
Topics include static and dynamic approaches to demand, human capital and wage determination, wage income inequality, unemployment and minimum wages, matching and job turnover, immigration and international trade, unions, implicit contract theory, and efficiency wage hypothesis.

ECON 638a and ECON 639b, Labor and Population Workshop  Staff
A forum primarily for graduate students to present their research plans and findings. Discussions encompass empirical microeconomic research relating to both high- and low-income countries.

ECON 640a or b, Prospectus Workshop in Labor Economics and Public Finance  Staff
Workshop for students doing research in labor economics and public finance.

ECON 670a / MGMT 740a, Financial Economics I  Stefano Giglio
Current issues in theoretical financial economics are addressed through the study of current papers. Focuses on the development of the problem-solving skills essential for research in this area.

ECON 672b / MGMT 745b, Behavioral Finance  Nicholas Barberis
Much of modern financial economics works with models in which agents are rational, in that they maximize expected utility and use Bayes's law to update their beliefs. Behavioral finance is a large and active field that studies models in which some agents are less than fully rational. Such models have two building blocks: limits to arbitrage, which make it difficult for rational traders to undo the dislocations caused by less rational traders; and psychology, which catalogues the kinds of deviations from full rationality we might expect to see. We discuss these two topics and then consider a number of applications: asset pricing (the aggregate stock market and the cross-section of average returns); individual trading behavior; and corporate finance (security issuance, corporate investment, and mergers).

ECON 675a / MGMT 720a, Models of Operations Research and Management  Vahideh Hosseinikhah Manshadi
The course exposes students to main stochastic modeling methods and solution concepts used to study problems in operations research and management. The first half of the class covers analysis of queuing models such as Markovian queues, networks of queues, and queues with general arrival or service distributions, as well as approximation techniques such as heavy traffic approximation. The second half focuses on control of stochastic processes; it covers finite and infinite-horizon dynamic programming problems, and special classes such as linear quadratic problems, optimal stopping, and multi-armed bandit problems. ½ Course cr

ECON 679a or b, Financial Economics Student Lunch  Eduardo Davila
This workshop is for third-year and other advanced students in financial economics. It is intended to guide students in the early stages of dissertation research. The emphasis is on presentation and discussion of materials presented by students that will eventually lead to dissertation topics. Open to third-year and advanced Ph.D. students only.

ECON 680a, Public Finance I  Orazio Attanasio
Major topics in public finance including externalities, public goods, benefit/cost analysis, fiscal federalism, social insurance, retirement savings, poverty and inequality, taxation, and others. Applications are provided to crime, education, environment and energy, health and health insurance, housing, and other markets and domains. The course covers a variety of applied methods including sufficient statistics, randomized control trials, hedonic models, regression discontinuity, discrete choice, spatial equilibrium, dynamic growth models, differences-in-differences, integrated assessment models, applied general equilibrium, event studies, firm production functions, learning models, general method of moments, and propensity-score reweighting estimators.

ECON 706a and ECON 707b, Prospectus Workshop in International Economics  Staff
This workshop is for third-year and other advanced students in international economic fields. It is intended to guide students in the early stages of dissertation research. The emphasis is on students' presentation and discussion of material that will eventually lead to the prospectus.

ECON 720a, International Trade I  Costas Arkolakis and Ana Fieler
The first part of this course covers the basic theory of international trade, from neoclassical theory where trade is the result of comparative advantage (Ricardo, Heckscher-Ohlin) to the "New Trade Theory" where trade is generated by imperfect competition and increasing returns to scale. Particular emphasis is placed on the implications of the different theories concerning the aggregate gains or losses from trade and the distributional implications of trade liberalization. The second part of the course explores new advances in the field. It covers the Eaton-Kortum (2002) and Melitz (2003) models; extensions of these models with many countries, multiproduct firms, and sectors; methods of quantitative trade analysis to revisit classic questions (gains from trade, distributional effects of trade, trade policy); and new advances in dynamic trade theory.

ECON 721b, International Trade II  Costas Arkolakis and Lorenzo Caliendo
The course covers empirical topics in international trade with particular emphasis on current research areas. Topics include tests of international trade theories; studies of the relationship between international trade, labor markets, and income distribution; recent trade liberalization episodes in developing countries; empirical assessment of various trade policies, such as VERs and Anti-Dumping; productivity (and its relation to international trade liberalization); and exchange rates, market integration, and international trade.
Methodologically, the course draws heavily on empirical models used in the fields of industrial organization and to a lesser degree labor economics; taking these courses is thus recommended though not required.

**ECON 724a, International Finance**  Costas Arkolakis and Ana Fieler
A study of how consumers and firms are affected by the globalization of the world economy. Topics include trade costs, the current account, exchange rate pass-through, international macroeconomic co-movement, multinational production, and gains from globalization. Prerequisite: intermediate macroeconomics or equivalent.

**ECON 728a and ECON 729b, Workshop: International Trade**  Staff

**ECON 730a, Economic Development I**  Mark Rosenzweig and Mushfiq Mobarak
Development theory at both aggregate and sectoral levels; analysis of growth, employment, poverty, and distribution of income in both closed and open developing economy contexts.

**ECON 731b, Economic Development II**  Nicholas Ryan and Kaivan Munshi
Analysis of development experiences since World War II. Planning and policy making across countries and time. Models of development, growth, foreign trade, and investment. Trade, capital, and technology flows and increasing interdependence. The political economy of policy making and policy reform.

**ECON 732b, Advanced Economic Development**  Michael Boozer
Examines the models of classical and modern economists to explain the transition of developing economies into modern economic growth, as well as their relevance to income distribution, poverty alleviation, and human development.

**ECON 737a, Economics of Natural Resources**  Robert Mendelsohn
Linking of abstract economic concepts to concrete policy and management decisions. Application of theoretical tools of economics to global warming, pollution control, fisheries, forestry, recreation, and mining.

**ECON 750a or b, Trade and Development Workshop**  Staff
A forum for graduate students and faculty with an interest in the economic problems of developing countries. Faculty, students, and a limited number of outside speakers discuss research in progress.

**ECON 756a or b, Prospectus Workshop in Development**  Staff
Workshop for students doing research in development to present and discuss work.

**ECON 791a / PLSC 534a, Theories of Distributive Justice: Formal Models of Political Theory**  John Roemer
We survey the main theories of distributive justice proposed by political philosophers since John Rawls, including A. Sen, R. Dworkin, G.A. Cohen, and R. Arneson. We use economic models to study these theories, and we critique them from the economic and philosophical viewpoints. We then read Thomas Piketty’s book *Capital in the Twenty-First Century*. If time permits, we introduce a microeconomic theory modeling how people cooperate in economic settings, to be contrasted with Nash equilibrium, a model of how people compete. Prerequisite: microeconomics, at least at the intermediate level, or permission of the instructor.

**ECON 794b, International Trade Policy**  Giovanni Maggi
Theoretical and empirical research in international trade policy. The course focuses on welfare analysis of trade policies under perfect completion and under oligopoly; the political economy of trade policy; and the economics and political economy of international trade agreements. Prerequisites: ECON 500 and 501.

**ECON 899a or b, Individual Reading and Research**  Staff
By arrangement with faculty.