

ECONOMICS

Courses offered by the Department of Economics (<http://economics.stanford.edu/>) are listed under the subject code ECON on the (<http://explorecourses.stanford.edu/CourseSearch/search/?view=catalog&catalog=&page=0&q=ECON&filter-catalognumber-ECON=on>) Stanford Bulletin's (<http://explorecourses.stanford.edu/CourseSearch/search/?view=catalog&catalog=&page=0&q=ECON&filter-catalognumber-ECON=on>) ExploreCourses web site (<http://explorecourses.stanford.edu/CourseSearch/search/?view=catalog&catalog=&page=0&q=ECON&filter-catalognumber-ECON=on>).

The department's purpose is to acquaint students with the economic aspects of modern society, to familiarize them with techniques for the analysis of contemporary economic problems, and to develop in them an ability to exercise judgment in evaluating public policy. There is training for the general student as well as for those who plan careers as economists in civil service, private enterprise, teaching, or research.

The department's curriculum is an integral part of Stanford's programs in International Relations, Public Policy, and Urban Studies.

The faculty interests and research cover a wide spectrum of topics in most fields of economics, including behavioral economics, comparative institutional analysis, econometrics, economic development, economic history, experimental economics, industrial organization, international trade, labor, macro- and microeconomic theory, mathematical economics, environmental economics, and public finance.

Mission of the Undergraduate Program in Economics

The mission of the undergraduate program in Economics is to acquaint students with the economic aspects of modern society, to familiarize them with techniques for the analysis of contemporary economic problems, and to develop in them an ability to exercise judgment in evaluating public policy. The program introduces students to macro- and microeconomic theory, teaches them to think and write clearly about economic problems and policy issues and to apply the basic tools of economic analysis. The undergraduate major provides an excellent background for those who plan careers in government and private enterprise as well as those pursuing graduate degrees in professional schools or in the field of economics.

Learning Outcomes (Undergraduate)

The department expects undergraduate majors in the program to be able to demonstrate the following learning outcomes. These learning outcomes are used in evaluating students and the department's undergraduate program. Students are expected to demonstrate:

1. understanding of core knowledge within Economics.
2. ability to analyze a problem and draw correct inferences using qualitative and/or quantitative analysis.
3. ability to write clearly and persuasively and communicate ideas clearly.
4. ability to evaluate theory and critique research within the discipline.

Graduate Programs in Economics

The primary objective of the graduate program is to educate students as research economists. In the process, students also acquire the background and skills necessary for careers as university teachers and as practitioners of economics. The curriculum includes a comprehensive

treatment of modern theory and empirical techniques. Currently, 20 to 25 students are admitted each year.

Graduate programs in economics are designed to ensure that students receive a thorough grounding in the methodology of theoretical and empirical economics, while at the same time providing specialized training in a wide variety of subfields and a broad understanding of associated institutional structures. Toward these ends, the program is arranged so that the student has little choice in the curriculum at the outset but considerable latitude later on.

Students admitted to graduate standing in the department are expected to have a strong background in college-level economics, mathematics, and statistics. Preparation ordinarily consists of a college major in economics, a year-long calculus sequence that includes multivariate analysis, a course in linear algebra, and a rigorous course in probability and statistics.

Learning Outcomes (Graduate)

The purpose of the master's program is to further develop knowledge and skills in Economics and to prepare students for a professional career or doctoral studies. This is achieved through completion of courses, in the primary field as well as related areas, and experience with independent work and specialization.

The Ph.D. is conferred upon candidates who have demonstrated substantial scholarship and the ability to conduct independent research and analysis in Economics. Through completion of advanced course work and rigorous skills training, the doctoral program prepares students to make original contributions to the knowledge of Economics and to interpret and present the results of such research.

Fellowships and Assistantships

The department awards a number of fellowships for graduate study. All students whose records justify continuation in the program may be assured support for the second through fifth years in the form of employment as a teaching or research assistant. All first year and a few second or third year students are typically awarded full fellowships, including a stipend and tuition. Second year students who are not on fellowship receive support in their entire second year (and surrounding summers) through a second year RAship. Third and fourth year students typically arrange for RA support directly with a faculty adviser or request TA support through the department. These half-time (20 hours per week) appointments provide a living wage and tuition allowance. Entering students are not eligible for research or teaching assistantships. Students in their final job market year are encouraged to apply for SIEPR dissertation research fellowships.

Bachelor of Arts in Economics

The Department of Economics offers a Bachelor of Arts in Economics. Eligible students may also pursue a Bachelor of Arts with Honors (p. 3). The department also offers a minor in Economics (p. 3).

Suggested Preparation for the Major

The total number of units required for the major is 80. Students are encouraged to complete the core courses 1-6 below, as early as possible. Ideally, students should complete the core during the sophomore year, before taking upper division courses. Courses may not be taken before the prerequisites are completed. The required number of field courses is five. There is great flexibility in the choice of electives, including some upper-division math, statistics, and computer science.

How to Declare the Major

- Complete the online Econ Major Declaration form and submit it to the Director of Undergraduate Studies (DUS): Declare the Econ Major (<https://docs.google.com/forms/d/e/1FAIpQLSd->

TR9JjglwzJh3hE5v4rZQXSad7SIYIGn255GwvK3ZLrp_3w/viewform/?usp=sf_link)

- When the declaration form is submitted, the DUS reviews the forms and emails the student and the assigned advisor.
- The student then makes an appointment to meet with the advisor to go over the declaration form.
- At the conclusion of the meeting the student requests that the advisor notify the Undergraduate Student Services Officer that the plan is approved.
- The student declares in Axxess (<https://axess.sahr.stanford.edu/>).
- The student makes an appointment to meet with the Student Services Officer, to finalize the major declaration and she approves the declaration in Axxess.
- The student must declare by the end of the quarter prior to the quarter of graduation. Students may not declare during Summer Quarter, the last week of Autumn or Winter Quarter or last two weeks of Spring Quarter.

Degree Requirements

The total number of units required for the major is 80. At least 55 of those units must be taken at Stanford in California. All courses counting toward the economics major must be taken for a letter grade and a GPA in the major of 2.0 (C) or better must be achieved.

Students scoring a 5 on both the advanced placement microeconomics and advanced placement macroeconomics exam may petition the Director of Undergraduate Studies to have the ECON 1 Principles of Economics course requirement waived. Students do not receive units credit for placing out of ECON 1 Principles of Economics.

To use transfer credit in partial satisfaction of the requirements, the student must obtain written consent from the department's Director of Undergraduate Study, who establishes the amount of credit to be granted toward the department requirements (see the Information Book for Undergraduate Economics Majors). Students must have completed all Stanford prerequisites for approved transfer credit courses in order to use those courses towards the Economics major. See the department's Transfer Credit web site for additional information.

Course prerequisites are enforced. Students taking courses to satisfy prerequisites in another department or institution must petition for Stanford course substitution or transfer credit approval in order to satisfy course prerequisites.

The time limit for satisfactory completion of a course is one year from the date an incomplete is given, although instructors may set a shorter time limit. Students are responsible for seeing that all grades of 'incomplete' are cleared within the time limit.

Course Requirements

	Units
Core Courses	30
ECON 1	Principles of Economics 5
ECON 50	Economic Analysis I (Prerequisites: ECON 1 and MATH 51 (or CME 100 or CME 100A)) 5
ECON 51	Economic Analysis II (Prerequisite: ECON 50) 5
ECON 52	Economic Analysis III (Prerequisite: ECON 50) 5
ECON 102A	Introduction to Statistical Methods (Postcalculus) for Social Scientists (Prerequisite: MATH 20 or equivalent) ¹ 5
ECON 102B	Applied Econometrics (Prerequisite: ECON 102A) ² 5
Field Courses	25

Must be taken at Stanford in California.

Select five of the following:

ECON 102C	Advanced Topics in Econometrics	5
ECON 102D	Econometric Methods for Public Policy Analysis and Business Decision-Making	5
ECON 111	Money and Banking	5
ECON 112	Financial Markets and Institutions: Recent Developments	5
ECON 118	Development Economics	5
ECON 125	Economic Development, Microfinance, and Social Networks	5
ECON 126	Economics of Health and Medical Care	5
ECON 135	Foundations of Finance ³	3
or ECON 140	Introduction to Financial Economics	5
ECON 136	Market Design	5
ECON 137	Decision Modeling and Information	5
ECON 141	Public Finance and Fiscal Policy	5
ECON 145	Labor Economics	5
ECON 146	Economics of Education	5
ECON 147	The Economics of Labor Markets	5
ECON 149	The Modern Firm in Theory and Practice	5
ECON 155	Environmental Economics and Policy	5
ECON 157	Imperfect Competition	5
ECON 158	Regulatory Economics	5
ECON 160	Game Theory and Economic Applications ⁴	5
or ECON 180	Honors Game Theory	5
ECON 165	International Finance	5
ECON 166	International Trade	5
ECON 178	Behavioral Economics	5
ECON 179	Experimental Economics	5
ECON 198	Junior Honors Seminar	5
ECON 199D	Honors Thesis Research	1-10

Writing in the Major (WIM) Course

5

Must be taken at Stanford in California. This course should be taken only after completing ECON 51 Economic Analysis II and ECON 52 Economic Analysis III, ECON 102B Applied Econometrics, and at least two field courses.

ECON 101	Economic Policy Seminar	5
Electives ⁵		20

20 units in addition to the field courses taken; choose from any ECON courses offered for a letter grade.

Total Units **80**

¹ It is recommended that students satisfy this basic statistics requirement early in their program.

² Material in ECON 102B Applied Econometrics is used in a number of field courses. Students are advised to take ECON 102B Applied Econometrics early in their program.

³ Students may not count units from both courses towards their major as the courses are too similar in content.

⁴ Students may not count units from both courses towards their field course requirements as the courses cover similar subject matter.

⁵ Up to 10 units of this requirement may be fulfilled by upper-division math, statistics, or computer science (<https://economics.stanford.edu/undergraduate/major/>) with the approval of the Director of Undergraduate Studies.

A maximum of 10 units of transfer credit or of ECON 139D Directed Reading, may be taken under this section. Suitable transfer credit must be approved in writing by the Director of Undergraduate Studies. Advanced undergraduate majors with strong quantitative preparation may enroll in graduate (200-level) courses with permission of the Director of Undergraduate Studies and the course instructor. Some courses offered by Overseas Studies may be counted towards this requirement. The department does not give credit for internships.

Flexible Tracks

Flexible Tracks listings of economics courses are provided to emphasize the diverse interests of Economics majors. Flexible Tracks do not add major requirements. Flexible Tracks may be examined in the department's Information Book for Economics Majors (<http://economics.stanford.edu/undergraduate/>). These flexible tracks are not declared in Axess and are not printed on the transcript or diploma. Flexible Tracks are provided for the following areas of emphasis (field courses are in bold):

- Behavioral & Experimental (ECON 13N, 46, **136 (or 182), 137, 160 (or 180), 178, 179**)
- Finance (ECON 43, 44, **111, 112, 140, 141, 143, 165, 184**)
- International & Development (ECON 15N, 46, 106, **118, 124, 125, 127, 130, 131, 162, 164, 165, 166**)
- Policy (ESF 1, ECON 11N, 15N, 17N, 19Q, 22N, 23N, 46, 47, **111, 118, 126, 130, 141, 144, 145, 146, 147, 150, 154, 155, 159**)
- Research (ECON **102C, 102D, 136 (or 182), 137, 160 (or 180), 198, 199D, 202, 210**)
- Strategy (ECON 19Q, **136 (or 182), 137, 149, 157, 158, 160 (or 180)**)

Honors Program

The honors program offers an opportunity for independent research, creativity, and achievement. It is designed to encourage a more intensive study of economics than is required for the normal major, with course and research work of exceptional quality. Honors students submit their theses in writing and present them during the Honors Research Symposium during Spring Quarter. The honors program requires:

1. Completing all requirements for the major; plus five additional units, bringing the total to 85 units.
2. Achieving a grade point average (GPA) of at least 3.5 for the required courses of the Economics major (excluding ECON 139D Directed Reading and ECON 199D Honors Thesis Research). See details in the Information Book for Economics Majors.
3. Complete ECON 102B Applied Econometrics and at least two Econ upper division courses most relevant for the proposed topic of the honors thesis by the end of the junior year. (These can be included in the basic 80 units.)
4. Candidates must write an honors thesis in their senior year for at least one unit and up to nine units of credit in their thesis advisor's section of ECON 199D Honors Thesis Research. Additionally, winter registration for one unit of Honors Thesis Research, under the Director of the Honors Program section number is mandatory for all honors students. The thesis must be of very high quality and written under the direction of a member of the department or its affiliated faculty. Units of ECON 199D Honors Thesis Research do not count toward the course work requirements for the basic economics major, or in the computation of the GPA requirement for honors.

Juniors interested in the honors program should contact the honors program director for more information. Prospective candidates for the honors program should submit an application to the director no later than the third Wednesday of Autumn Quarter for Spring Quarter degree conferral. Also required, in the same quarter, is a three-page thesis proposal that must be approved by the thesis advisor.

return to top of page (p. 1)

Minor in Economics

The minor in Economics has two main goals: to acquaint students with the rudiments of micro- and macroeconomic theory that are required of all majors; and to allow students to build competence in the application of this theory to two fields of economics of their choosing, and the opportunity to specialize further in any one of these fields by taking one additional advanced course in the Department of Economics.

Students must complete their declaration of the minor no later than the last day of the preceding quarter before their degree conferral.

Degree Requirements

At least 20 out of the 35 units for the minor must be taken at Stanford. Students must have completed all Stanford prerequisites for approved transfer credit courses in order to use those courses towards the Economics minor.

No courses receiving Department of Economics credit under the preceding requirements may be taken credit/no credit. The combined total of all units for the minor must equate to the grade point average (GPA) of 2.0 (C) or better.

Course Requirements

		Units
Core Courses		20
ECON 1	Principles of Economics	5
ECON 50	Economic Analysis I (Prerequisites: ECON 1 and MATH 51 or CME 100 or CME 100A)	5
ECON 51	Economic Analysis II (Prerequisite: ECON 50)	5
ECON 52	Economic Analysis III (Prerequisite: ECON 50)	5
Field Courses		10
Must be taken at Stanford in California		
ECON 102A	Introduction to Statistical Methods (Postcalculus) for Social Scientists	5
ECON 102B	Applied Econometrics	5
ECON 102C	Advanced Topics in Econometrics	5
ECON 102D	Econometric Methods for Public Policy Analysis and Business Decision-Making	5
ECON 111	Money and Banking	5
ECON 112	Financial Markets and Institutions: Recent Developments	5
ECON 118	Development Economics	5
ECON 125	Economic Development, Microfinance, and Social Networks	5
ECON 126	Economics of Health and Medical Care	5
ECON 135	Foundations of Finance ¹	3
or ECON 140	Introduction to Financial Economics	
ECON 136	Market Design ²	5
or ECON 182		
ECON 137	Decision Modeling and Information ²	5
or ECON 181		

ECON 141	Public Finance and Fiscal Policy	5
ECON 145	Labor Economics	5
ECON 146	Economics of Education	5
ECON 147	The Economics of Labor Markets	5
ECON 149	The Modern Firm in Theory and Practice	5
ECON 155	Environmental Economics and Policy	5
ECON 157	Imperfect Competition	5
ECON 158	Regulatory Economics	5
ECON 160	Game Theory and Economic Applications ²	5
or ECON 180	Honors Game Theory	
ECON 164		5
ECON 165	International Finance	5
ECON 166	International Trade	5
ECON 178	Behavioral Economics	5
ECON 179	Experimental Economics	5
ECON 198	Junior Honors Seminar	5
ECON 202	Microeconomics I ³	2-5
ECON 210	Macroeconomics I ³	2-5
Electives		5
Select from: Any ECON courses offered for letter grades		
Total Units		35

¹ Students may not count units from both courses towards their minor as the courses are too similar in content.

² Students may not count units from both courses towards their minor as the courses cover similar subject matter.

³ Students may enroll with permission of the Director of Undergraduate Studies and the course instructor.

Master of Arts in Economics

University requirements for the master's degree are described in the "Graduate Degrees (<http://exploreddegrees.stanford.edu/graduatedegrees/>)" section of this bulletin.

The Economics department does not offer a terminal M.A. degree. An M.A. degree may only be pursued in combination with a doctoral degree from Economics or another department at the University. Students must be currently enrolled in a Ph.D. program at Stanford before adding the Economics M.A. degree. Economics students may, but need not, elect to add this degree in addition to their current Ph.D. degree after they have been enrolled at Stanford for at least one quarter.

Adding the M.A. Degree

While a formal application to the M.A. program is not required, current Ph.D. students (including those in the Economics Ph.D. program) must:

1. Submit a Graduate Authorization Petition (<https://registrar.stanford.edu/students/graduate-degree-progress/graduate-program-authorization-petition/>) via Axxess in order to add the M.A. as an additional degree. Students must have completed the Stanford requirements for a B.A. in Economics or approximately equivalent training. Since students are required to take some of the same courses as Ph.D. candidates, similar preparation in mathematics and statistics generally is expected before the petition to add the M.A. will be approved.
2. Complete the Master's Program Proposal form (<https://stanford.app.box.com/v/progpropma/>) and submit it to the Economics Student Services Manager.
3. Apply to graduate (in Axxess, before the quarterly deadline) in the quarter you wish to confer the degree. The degree is not conferred automatically.

Degree Requirements

A master's program must satisfy these criteria:

1. Completing, at Stanford, at least 45 units of credit beyond those required for the bachelor's degree, of which at least 40 units must be in the Department of Economics. Students must complete ECON 202 Microeconomics I or ECON 202N Microeconomics I For Non-Economics PhDs students and at least three other 200-level lecture courses. They must receive a grade of 'B-' or better in ECON 202 Microeconomics I or ECON 202N Microeconomics I For Non-Economics PhDs students. Undergraduate courses must be numbered 105 or higher (with the exception of the ECON 102A Introduction to Statistical Methods (Postcalculus) for Social Scientists, ECON 102B Applied Econometrics, ECON 102C Advanced Topics in Econometrics sequence listed below). No seminar courses numbered 300 or above can be counted.
2. Demonstrating competence in empirical methodology by receiving a grade of 'B-' or better in both ECON 270 Intermediate Econometrics I and ECON 271 Intermediate Econometrics II, or by receiving a grade of 'B-' or above in each of ECON 102A Introduction to Statistical Methods (Postcalculus) for Social Scientists, ECON 102B Applied Econometrics, and ECON 102C Advanced Topics in Econometrics.
3. Submitting two term papers (or a thesis of sufficient quality). At least one of these papers must be deemed to represent graduate-level work. Normally, this means that it is written in connection with a 200-level course. A maximum of 5 units of credit can be earned for a directed reading/thesis (ECON 239D, ECON 400, or comparable thesis course in home department) toward the 45-unit degree requirement. In lieu of this paper requirement, students may elect to take two additional 200+ level Economics courses.
4. A grade point average (GPA) of 3.0 must be maintained for all master's level work. All lecture courses must be taken for a letter grade.

Doctor of Philosophy in Economics

University requirements for the Ph.D. are described in the "Graduate Degrees (<http://exploreddegrees.stanford.edu/graduatedegrees/>)" section of this bulletin.

Students admitted to graduate standing in the department are expected to have a strong background in college-level economics, mathematics, and statistics. Preparation ordinarily consists of a college major in economics, a year-long calculus sequence that includes multivariate analysis, a course in linear algebra, and a rigorous course in probability and statistics. When deemed appropriate, a student may be required to complete the necessary background preparation at Stanford. All students take a common core curriculum at the outset and later branch out into the desired fields of specialization.

Well-prepared students should anticipate spending, with some overlap, approximately two years in course work and another two years in seminars, independent study, and dissertation research. A minimum of 135 completed units is required for the degree. The goal is to complete the program in five years, although some types of research programs may require at least six years to complete. The department has a strong commitment to guiding students through the program expeditiously.

Questions and petitions concerning the program and the admissions process should be addressed to the Director of Graduate Study, who has responsibility for administering the graduate program.

Requirements for the Ph.D.

Specific requirements are best discussed in two stages, the first consisting of requirements for admission to candidacy and the second involving further requirements for earning the degree.

Admission to Candidacy for Ph.D.

A student may apply for admission to candidacy when the following minimal requirements are met:

Graduate Core

1. Successful completion of core sequences in microeconomics, macroeconomics, and econometrics:

	Units	
A. Microeconomics		
ECON 202	Microeconomics I	2-5
ECON 203	Microeconomics II	2-5
ECON 204	Microeconomics III	3-5
B. Macroeconomics		
ECON 210	Macroeconomics I	2-5
ECON 211	Macroeconomics II	2-5
ECON 212	Macroeconomics III	3-5
C. Econometrics		
ECON 270	Intermediate Econometrics I	2-5
ECON 271	Intermediate Econometrics II	2-5
ECON 272	Intermediate Econometrics III	3-5

To pass a sequence, an overall grade of 'B' is required for the sequence, and individual course grades must be 'B-' or better. Petitions to substitute courses or waive out of any core course must be submitted to the Director of Graduate Study at least two weeks before the start of the term.

2. Completing the requirements in two additional advanced fields of specialization from the list below or, if approved in advance by the Director of Graduate Study, in one such field together with a substantial amount of work toward a second field taught in a related department (e.g. GSB Finance). Students may request permission from the Director of Graduate Study to create a field not listed as an advanced field below, such as International Finance or Law & Economics. Requirements for completing a field can usually be satisfied by completing two courses and a paper, although students in some fields may be advised to add a third course, which can then be counted toward the distribution requirement discussed later. A minimum grade average of B is required to pass a field sequence. Individual course grades cannot be less than a B- in order to count for field course credit. Specific requirements for completing each field can be found on the Economics department website (<http://economics.stanford.edu/>).
3. Completing a candidacy paper, normally written in conjunction with one of the advanced specialty fields selected above. Submission of this paper or another research paper is required by the first day of Autumn Quarter of the third year. Satisfactory presentation of this paper is required in the Autumn quarter third year seminar. It is expected that the student meet, and indeed exceed, the above standards by the end of the first quarter in the third year of residency. When this is not possible for any reason, the Director of Graduate Study should be consulted as early as possible during the third year.

Once it is deemed that the above standards have been met, the student should complete the Application for Candidacy for Degree of Doctor of Philosophy. After a student fulfills the department prerequisites for applying for candidacy and submits their candidacy application form, the faculty votes to determine whether the student has the potential to successfully complete the requirements of the degree program. If approved, candidacy remains valid for five years (although it can be terminated earlier by the department if progress is deficient); it can be renewed or extended beyond this period only under unusual circumstances. Failure to advance to candidacy results in dismissal from the program.

Further Requirements for the Ph.D. Degree

1. *Third Year Seminar*: presentation of an expanded research paper in Spring Quarter of the third year.
2. *Distribution Requirement*: Students must complete four other graduate-level courses meeting the following requirements:
 - a. at least one course from the area of economic history, unless history is one of the two fields of specialization.
 - b. courses in at least two fields other than the two fields of specialization. Distribution courses cannot be crosslisted in those fields.
 - c. with advance approval of the Director of Graduate Study, some of these distribution courses may be drawn from related fields taught in other departments. However, including courses taken to meet either the specialization or distribution requirements, no more than two courses in total may be taken outside the Economics department.
 - d. all courses used to fulfill distribution requirements must be passed with a grade of B or better.
3. *Teaching Experience*: Each student must serve as a teaching assistant for at least one quarter. It is strongly recommended that this requirement be satisfied before the fourth year of residence.
4. *Seminar Participation*: Each student is expected to participate in at least two all-year research seminars by the end of the fourth year of residence. Normally, participation in a seminar requires one or more oral presentations and the submission of a research paper (which, however, need not be completely separate from dissertation research). Detailed information on fulfilling the seminar requirements can be found on the Economics department website (<http://economics.stanford.edu/>).
5. *Ph.D. Dissertation*: The process involves selecting a topic, choosing an appropriate adviser, submitting a prospectus (signed by the adviser) outlining the proposed research, selecting a three-member reading committee (usually all from the Department of Economics, although exceptions can be made under certain circumstances), passing the University oral examination at which these three faculty (and two other members of the Academic Council) ask questions about the completed research, and submitting a final draft of the work signed by all members of the reading committee. The student is advised to initiate this process as early as possible.

Graduate Fields

A. Behavioral and Experimental Economics

To receive credit for this field, students must take the following three courses. Research papers and presentations are requirements of these courses.

		Units
ECON 278	Behavioral and Experimental Economics I	2-5
ECON 279	Behavioral and Experimental Economics II	3-5
ECON 280	Behavioral and Experimental Economics III	3-5

B. Econometric Methods For Causal Inference

To receive credit for the Econometric Methods field, students must complete the two courses from the list below.

		Units
ECON 292	Quantitative Methods for Empirical Research	3-5
ECON 293	Machine Learning and Causal Inference	3
STATS 361	Causal Inference	3

C. Econometrics

A student may satisfy the requirements for the econometrics field by completing the requirements of one of two subfields:

C-A: Theoretical Econometrics:

To receive credit in the theoretical econometrics subfield, students must complete two courses from:

		Units
ECON 273	Advanced Econometrics I	3-5
ECON 274	Advanced Econometrics II	3-5

C-B: Applied Econometrics:

To receive credit in the applied econometrics subfield, students must complete ECON 273 and either ECON 275 or ECON 276 or ECON 292 (also known as GSB MGTECON 640). Students must also complete a course (or set of courses) that is empirically oriented. The last requirements must be approved by the Director of Graduate Study in consultation with the instructor of 275, 276 or 292.

		Units
ECON 273	Advanced Econometrics I	3-5
ECON 275	Economics-Based Econometrics	3-5
ECON 276	(not offered this year)	2-5
ECON 292	Quantitative Methods for Empirical Research	3-5

D. Economic Development

To receive credit for this field, students must complete two courses from the following list. Students are required to develop and present a series of research ideas throughout each course. Regular attendance at the Development Economics workshop and the Development student workshop is required.

		Units
ECON 214	Development Economics I	2-5
ECON 215	Development Economics II	2-5
ECON 216	Development Economics III	3-5

E. Economic History/Institutions

Students must complete two courses from the following list and develop a research proposal in each course. Presentation of a research proposal is required at the end of the second year. Regular attendance (at least four quarters) at the economic history workshop is required.

		Units
ECON 226	U.S. Economic History	2-5
ECON 227		2-5
ECON 228		2-5
ECON 229	Topics in Economic History	3-5

F. Environmental, Resource and Energy Economics

To receive credit for this field, students must complete:

		Units
ECON 250	Environmental Economics	2-5
ECON 251	Natural Resource and Energy Economics	2-5

G. Finance

To receive credit for the field, students must complete two courses from list below. A 20-minute research project proposal is required.

		Units
ECON 236	Financial Economics I	3-5
ECON 237	Financial Economics II	2-5
FINANCE 622	Dynamic Asset Pricing Theory	4

FINANCE 624	Corporate Finance Theory	4
FINANCE 625	Empirical Asset Pricing	3

H. Industrial Organization

To receive credit for the field, students must complete:

		Units
ECON 257	Industrial Organization 1	2-5
ECON 258	Industrial Organization IIA ¹	3-5

¹ ECON 251 can substitute for ECON 258 only, as long as the student is not also using ECON 251 to fulfill requirements for the Environmental field.

² Students who select Industrial Organization as a primary focus are expected to also take ECON 260.

I. International Trade and Finance

To receive credit for this field, students must complete two courses from the list below, but are encouraged to take all three courses. Those interested in an **International Trade** concentration should take, at a minimum, 266 and 268; those interested in an **International Finance** concentration should take, at a minimum, 268 and 269. Students are expected to develop and present a research proposal in each course.

		Units
ECON 266	International Trade I	3-5
ECON 268	International Finance and Exchange Rates	3-5
ECON 269	International Finance and Exchange Rates II	3-5

Students must pass all courses with a grade of B or better. With instructor approval, students can substitute another macroeconomics class for 268 or 269.

J. Labor Economics

To receive credit for this field, students must complete two courses from:

		Units
ECON 246	Labor Economics I	2-5
ECON 247	Labor Economics II	2-5
ECON 248	Labor Economics III	3-5

Each course requires completion of a term paper. Each course must be passed with a grade of B or better.

K. Macroeconomics

Requirements for this field are completion of two courses from the list below. Presentation of a research proposal in each course is required. ECON 236 and 237 may not be double-counted towards both the macroeconomics and the finance field.

		Units
ECON 233	Advanced Macroeconomics I	2-5
ECON 234	Advanced Macroeconomics II	2-5
ECON 235	(not offered this year)	2-5
ECON 236	Financial Economics I	3-5
ECON 237	Financial Economics II	2-5

L. Market Design

To receive credit for this field, students must take two from the following and give a research presentation:

		Units
ECON 283	Theory and Practice of Auction Market Design	2-5

ECON 284	Simplicity and Complexity in Economic Theory	3-5
ECON 285	Matching and Market Design	2-5
ECON 287	Mechanism and Market Design	3
ECON 289	Advanced Topics in Game Theory and Information Economics	2-5

M. Microeconomic Theory

To receive credit for this field, students must complete two courses from the following and give a research presentation:

		Units
ECON 282	Contracts, Information, and Incentives	3-5
ECON 286	Game Theory and Economic Applications	3-5
ECON 291	Social and Economic Networks	3-5

N. Political Economy

To receive credit for this field, students must pass the two courses below with grades of B or better. Students may petition to substitute Econ 221 for a comparable course in the political science department.

ECON 220	Political Economy I	3-5
ECON 221	Political Economy II	2-5

O. Public Economics

To receive credit for the field, students must complete the two courses from the list below and develop an original research project. Regular attendance at the Public Economics workshop is required for students in their third year or above to receive credit for the field.

		Units
ECON 241	Public Economics I	2-5
ECON 242	Public Economics II	3-5
ECON 243	Public Economics III	2-5

Ph.D. Minor in Economics

To be recommended for the Ph.D. degree with Economics as a minor subject, a student must qualify in three fields of economics, at least one of which must be in the core economics sequence (Microeconomics, Macroeconomics, Econometrics). The standard of achievement in these fields is the same for minor as for major candidates, including minimum grade requirements, paper submissions and research presentations where appropriate. All courses used for the Ph.D. minor must be taken for a letter grade.

Joint Degree Programs in Economics with the School of Law

J.D./M.A. and J.D./Ph.D.

The Department of Economics and the School of Law offer a joint program leading to either a J.D. degree combined with an M.A. degree in Economics, or to a J.D. degree combined with a Ph.D. in Economics.

The J.D./M.A. and J.D./Ph.D. degree programs are designed for students who wish to prepare themselves for careers in areas relating to both law and economics. Students interested in either joint degree program must apply and gain entrance separately to the School of Law and the Department of Economics and, as an additional step, must secure permission from both academic units to pursue degrees in those units as part of a joint degree program. Interest in either joint degree program should be noted on the student's admission applications and may be considered by the admission committee of each program. Alternatively, an enrolled student in either the Law School or the Economics department may apply for admission to the other program

and for joint degree status in both academic units after commencing study in either program.

Joint degree students may elect to begin their course of study in either the School of Law or the Department of Economics. Faculty advisers from each academic unit participate in the planning and supervising of the student's joint program. Students must be enrolled full time in the Law School for the first year of law school, and, at some point during the joint program, may be required to devote one or more quarters largely or exclusively to studies in the Economics program regardless of whether enrollment at that time is in the Law School or in the Department of Economics. At all other times, enrollment may be in the graduate school or the Law School, and students may choose courses from either program regardless of where enrolled. Students must satisfy the requirements for both the J.D. and the M.A. or Ph.D. degrees as specified in this bulletin or by the School of Law.

The Law School approves courses from the Economics Department that may count toward the J.D. degree, and the Economics department approves courses from the Law School that may count toward the M.A. or Ph.D. degree in Economics. In either case, approval may consist of a list applicable to all joint degree students or may be tailored to each individual student's program. The list may differ depending on whether the student is pursuing an M.A. or a Ph.D. in Economics.

In the case of a J.D./M.A. program, no more than 45 quarter hours of approved courses may be counted toward both degrees. In the case of a J.D./Ph.D. program, no more than 54 quarter hours of approved courses may be counted toward both degrees. In either case, no more than 36 quarter hours of courses that originate outside the Law School may count toward the Law degree. To the extent that courses under this joint degree program originate outside the Law School but count toward the Law degree, the Law School credits permitted under Section 17(1) of the Law School Regulations shall be reduced on a unit-per-unit basis, but not below zero. The maximum number of Law School credits that may be counted toward the M.A. or the Ph.D. in Economics is the greater of: (a) 5 quarter hours in the case of the M.A. and 10 quarter hours in the case of the Ph.D.; or (b) the maximum number of hours from courses outside of the department that M.A. or Ph.D. candidates in Economics are permitted to count toward the applicable degree under general departmental guidelines or in the case of a particular student's individual program.

Tuition and financial aid arrangements are normally made through the school in which the student is then enrolled.

For more information, see the Law School's Degrees and Joint Degrees (<http://www.law.stanford.edu/program/degrees/>) web site.

Joint Degree Program in Ph.D. in Economics and Master of Public Policy

The Ph.D./M.P.P. joint degree is designed for students who wish to prepare themselves for careers in areas relating to both policy and economics. Students interested in this degree first apply to the Economics Department, indicating an interest in the joint program. There is one admissions application and one fee. If the decision is made by the department to admit the applicant, the file is then forwarded to the M.P.P. program. An admission decision, based on the information in the Ph.D. application, is made promptly, and the department informs the student of the decision.

Students may also apply to the M.P.P. after having commenced study in the Economics Department at Stanford, by first receiving the consent of the Director of Graduate Studies in Economics and then applying to the Public Policy program.

Students must have a faculty adviser from the Economics Department to assist with the planning and supervising of the joint program. The adviser

is usually chosen from among the department's Public Policy-affiliated faculty.

Tuition and financial aid arrangements are made through the Economics Department.

Requirements for the M.P.P./Ph.D. in Economics

Core M.P.P. curriculum of 45 units

		Units
PUBLPOL 301B	Economic Policy Analysis for Policymakers	4-5
PUBLPOL 302A	Introduction to American Law	3-5
PUBLPOL 302B	Economic Analysis of Law	3
PUBLPOL 304A		3-4
PUBLPOL 305B	Public Policy and Social Psychology: Implications and Applications	4
PUBLPOL 306	Writing and Rhetoric for Policy Audiences	4
PUBLPOL 307		4-5
PUBLPOL 309	Practicum	1-10
PUBLPOL 311	Public Policy Colloquium	1
LAW 7508	Problem Solving and Decision Making for Public Policy and Social Change	4
Total Units		31-45

Other Programs

Other programs leading to dual degrees may be arranged. For example, the Ph.D. in Economics combines with one or two years of study in the School of Law, leading to the nonprofessional Master of Legal Studies (M.L.S.) degree. A dual degree program does not permit counting any courses toward both the Economics and the Law degrees. For more information, see the Law School's Degrees and Joint Degrees (<http://www.law.stanford.edu/program/degrees/>) web site.

COVID-19 Policies

On July 30, the Academic Senate adopted grading policies effective for all undergraduate and graduate programs, excepting the professional Graduate School of Business, School of Law, and the School of Medicine M.D. Program. For a complete list of those and other academic policies relating to the pandemic, see the "COVID-19 and Academic Continuity (<http://exploreddegrees.stanford.edu/covid-19-policy-changes/#tempdeplatetabtext>)" section of this bulletin.

The Senate decided that all undergraduate and graduate courses offered for a letter grade must also offer students the option of taking the course for a "credit" or "no credit" grade and recommended that deans, departments, and programs consider adopting local policies to count courses taken for a "credit" or "satisfactory" grade toward the fulfillment of degree-program requirements and/or alter program requirements as appropriate.

Undergraduate Degree Requirements

Grading

In academic year 2020-21, the Department of Economics will count courses taken with a grade of 'CR' (credit) towards the satisfaction of its undergraduate degree requirements so long as (i) the number of units taken CR does not exceed 15 and (ii) the CR courses are not ECON 50, ECON 51, ECON 52, ECON 102B, or ECON 199D (Honors Research). In academic year 2020-21, the five aforementioned courses must be taken for a letter grade if they are to count towards the satisfaction of the degree requirements. Apart from the five aforementioned courses, even courses that normally require a letter grade will count towards the degree requirements if they are taken CR.

Graduate Degree Requirements

Grading

The Department of Economics counts all first year (core) courses taken in academic year 2020-21 with a grade of 'CR' (credit) or 'S' (satisfactory) towards satisfaction of graduate degree requirements that otherwise require a letter grade provided that the instructor affirms that the work was done at a 'B-' or better level for each individual course and a 'B' average or better across each field sequence.

For second year+ (field & distribution) courses, a grade of 'CR' (credit) or 'S' (satisfactory) will count towards satisfaction of graduate degree requirements that otherwise require a letter grade provided that the instructor affirms that the work was done at a 'B' or better level.

Graduate Advising Expectations

For a statement of University policy on graduate advising, see the "Graduate Advising (<http://exploreddegrees.stanford.edu/graduatedegrees/#advisingandcredentialstext>)" section of this bulletin.

The Department of Economics is committed to providing academic advising in support of graduate student scholarly and professional development. When most effective, this advising relationship entails collaborative and sustained engagement by both the adviser and the advisee. As a best practice, advising expectations should be periodically discussed and reviewed to ensure mutual understanding. Both the adviser and the advisee are expected to maintain professionalism and integrity.

Faculty advisers guide students in key areas such as selecting courses, designing and conducting research, developing of teaching pedagogy, navigating policies and degree requirements, and exploring academic opportunities and professional pathways.

Graduate students are active contributors to the advising relationship, proactively seeking academic and professional guidance and taking responsibility for informing themselves of policies and degree requirements for their graduate program. Outlined below are a list of specific responsibilities of the various advising relationships, year by year.

First Year

First-year students are assigned to an adviser in groups of four or five students, so that there are only a handful of first-year advisers. First-year advisers should meet with students early in Autumn Quarter and offer to help with any questions as the year progresses. Including the DGS, Ph.D. administrator, student mentors, study groups, core course instructors, and the first-year seminar series, students have a variety of information sources. The adviser is simply another person to whom the students can turn to for basic and broad advice about the program.

If a first year adviser sees a student struggling academically or personally, please ensure that they are connected to the help that they need, and if unsure of how to help please consult with the DGS.

Second-Year RAship

The second-year RA-ship is an opportunity for students to gain experience with research. The RA-ship is subsidized by the department and averages 15 hours/week (rather than the 20 for standard RAships in later years) for the entire second year (and surrounding summers). Students are advised to ensure that it is as educational as possible. Some students have fellowships and thus do not need RA support, but should still seek advisers and should be given the same attention to ensure that their research is progressing.

Second-Year Paper

The second-year paper is due at the beginning of Autumn Quarter of the third year, and students have to agree with a faculty member to oversee that paper by the end of the Spring Quarter of the second year.

An adviser on a second-year paper should make sure that the student is progressing on the paper during the Summer by setting a timeline and meeting with them at key points. It is essential that this be finished on time so that students can move on to new projects or to further develop it during the third year. Students are encouraged to talk to multiple faculty, but the person who signs their paper should take responsibility. The student also has a responsibility to be seeking advice and communicating regularly with their adviser, both about progress and unexpected setbacks, both of which are inevitable in research. Note that second-year papers can be co-authored with other students and/or faculty.

Third-Year Advising

The third-year seminar helps shepherd students through the transition to dissertation research; however, it is not a substitute for an adviser but rather a complement. Students should clear their slides for their third-year presentations with their advisers before the presentations.

The adviser and student are both responsible for ensuring that they meet regularly and have set a clear a timeline and goals for their research.

At the end of the third year, students meet with the DGS and present a form signed by someone agreeing to advise their dissertation research, and they should have plans for a dissertation and a committee. If a faculty member is advising a student during the third year and does not plan to continue that relationship, the faculty member is responsible for letting the student know early enough so that s/he can find a new adviser going forward. Occasionally, students who are getting substantial advice from more than one person may wish to designate co-primary advisers. This involves a serious commitment in terms of time and attention from all of the primary advisers, and should involve more than window-dressing.

Fourth Year and Beyond

Advisers and students should be meeting regularly and have a clear plan and timeline for completion of a dissertation research and going on the market. The adviser's role includes providing guidance concerning designing, implementing, conducting, writing, presenting, submitting (where, how, etc.), and revising their research. The adviser should meet regularly with the student and inform the DGS if a student is languishing or falling behind in their research.

Advisers should be very clear with students about how their research is progressing and what they need to do to improve. Students are responsible for being broadly engaged, keeping their adviser regularly informed of their progress, and seeking advice from several faculty, attending and participating in conferences, regularly attending seminars, talking with other students, and more generally being regularly involved in research-related activities.

Faculty who are on a student's dissertation committee must discuss the student's job market prospects with him or her well in advance of the job market. It is essential to calibrate students' expectations appropriately. If the student aspires to jobs for which a committee member feels s/he cannot write supportive letters, that faculty must make that fact absolutely clear to the student well in advance. The faculty member must also confer with other committee members to determine whether they are in agreement concerning the student's progress, job market plans, and likely prospects. A dissertation committee member whose assessment of a student is out of line with the rest of the committee has an obligation to make their views known to the committee well before the student enters to job market, and should be willing to withdraw from the committee if it is in the student's best interest. Committee members should therefore

compare their assessments, at the latest, by the start of the Autumn Quarter during which the student enters the job market.

Students need to become self-sufficient; most of these aspects of conducting and disseminating research are not learned via courses or readings, but by doing coupled with timely advice. It is the most important, and rewarding, part of the Ph.D. program.

An extensive and detailed guide to the adviser/advisee relationship and responsibilities appears on the department's website (<https://economics.stanford.edu/>).

Emeriti: (Professors) Takeshi Amemiya, Timothy F. Bresnahan, Paul A. David, Walter Falcon, Victor R. Fuchs, John G. Gurley, Peter J. Hammond, Donald Harris, Anne O. Krueger, Mordecai Kurz, Lawrence J. Lau, Roger G. Noll, John H. Pencavel, Thomas Sargent, John B. Shoven, David A. Starrett, Joseph E. Stiglitz, Gavin Wright

Chair: B. Douglas Bernheim

Vice Chair: Monika Piazzesi

Director of Graduate Studies: Luigi Pistaferri

Director of Undergraduate Studies: Frank Wolak

Professors: Ran Abramitzky, Kyle Bagwell, B. Douglas Bernheim, Nicholas Bloom, Michael Boskin, Mark Duggan, Pascaline Dupas, Liran Einav, Matthew Gentzkow, Lawrence Goulder, Avner Greif, Robert E. Hall, Han Hong, Caroline Hoxby, Guido Imbens, Matthew Jackson, Patrick Kehoe, Pete Klenow, Jonathan Levin, Thomas E. MaCurdy, Neale Mahoney, Paul R. Milgrom, Muriel Niederle, Monika Piazzesi, Luigi Pistaferri, Joseph Romano, Alvin Roth, K. Martin Schneider, Ilya Segal, John B. Taylor, Alessandra Voena, Heidi L. Williams, Frank Wolak

Associate Professors: Gabriel Carroll, Arun Chandrasekhar

Assistant Professors: Adrien Auclert, Luigi Bocola, Ignacio Cuesta, Daniel Fetter, Bradley Larsen, Melanie Morten, Petra Persson, Isaac Sorokin

Lecturers: Marcelo Clerici-Arias, Gopi Shah Goda, Alexander Gould, Ward Hanson, Gregory La Blanc, Chris Makler, Scott McKeon, Mark Tendall, Ramin Toloui

Postdocs: Ravi Jagadeesan, Øvind Schøyen, Colin Sullivan

Courtesy Professors: Anat Admati, Susan Athey, Jay Bhattacharya, Jeremy Bulow, Steve Callander, Darrell Duffie, Marcel Fafchamps, James D. Fearon, Stephen H. Haber, Charles Kolstad, David M. Kreps, Edward Lazear, Rosamond L. Naylor, Peter C. Reiss, Gregory Rosston, Kenneth Singleton, Andrzej Skrzypacz

Courtesy Associate Professors: Jacob Goldin, Saumitra Jha, Grant Miller, Rebecca Diamond

Visiting Assistant Professors: Assaf Romm

Overseas Studies Courses in Economics

The Bing Overseas Studies Program (<http://bosp.stanford.edu>) (BOSP) manages Stanford international and domestic study away programs for Stanford undergraduates. Students should consult their department or program's student services office for applicability of Overseas Studies courses to a major or minor program.

The BOSP course search site (<https://undergrad.stanford.edu/programs/bosp/explore/search-courses/>) displays courses, locations, and quarters relevant to specific majors.

For course descriptions and additional offerings, see the listings in the Stanford Bulletin's ExploreCourses (<http://explorecourses.stanford.edu>) or Bing Overseas Studies (<http://bossp.stanford.edu>).

Due to COVID-19, all BOSP programs have been suspended for Autumn Quarter 2020-21. All courses and quarters of operation are subject to change.

		Units
OSPBER 82	Globalization and Germany	4-5
OSPFLOR 26	Economics of the EU	5
OSPMADRD 54	Contemporary Spanish Economy and the European Union	4
OSPPARIS 91	The Future of Globalization: Economics, Politics and the Environment	5
OSPSANTG 119X	The Chilean Economy: History, International Relations, and Development Strategies	5

Courses

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.

ECON 1V. Principles of Economics. 5 Units.

The course covers all of economics at a basic level. It stresses the key idea that economics is about making purposeful choice with limited resources and about people interacting with other people as they make these choices. Most of those interactions occur in markets, and the course is mainly about markets, including labor markets and capital markets. We show why free competitive markets can improve people's lives and how they have removed millions from people from poverty, with many more, we hope, to come; we show how monopolies and environmental spillovers cause market failures; we show how to remedy these failures through government policy; and we explain why government failure can also be a problem. The overall goal is to use economics to understand the big issues of the day including economic growth, inequality, crises, and unemployment. The goal of this course is to learn how to use economic analysis to reach reasoned conclusions about the big issues of the day from the workings and benefits of a market economy to the causes of economic growth, financial crises, and unemployment.

ECON 4. Democracy Matters. 1 Unit.

Should the U.S. close its border to immigrants? What are the ramifications of income inequality? How has COVID-19 changed life as we know it? Why are Americans so politically polarized? How can we address racial injustice? As the 2020 election approaches, faculty members from across Stanford will explore and examine some of the biggest challenges facing society today. Each week will be dedicated to a different topic, ranging from health care and the economy to racial injustice and challenges to democracy. Faculty with expertise in philosophy, economics, law, political science, psychology, medicine, history, and more will come together for lively conversations about the issues not only shaping this election season but also the nation and world at large. There will also be a Q&A following the initial discussion. Attendance and supplemental course readings are the only requirements for the course.

Same as: PHIL 30, POLISCI 42, PUBLPOL 4

ECON 5. Frontiers in Economic Research and Policy. 1 Unit.

Interested in exploring how economics is used in professional, policy, and research settings? This course will feature weekly presentations from Stanford faculty and scholars and economists in government, non-profit, and business to demonstrate how economic analysis can be applied to a wide range of practical and policy problems. May be repeated for credit. Pre-requisites: none.

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. Application found at <https://economics.stanford.edu/academics/undergraduate-program/forms>.

ECON 11N. Understanding the Welfare System. 3 Units.

Welfare-reform legislation passed by the federal government in the mid-1990s heralded a dramatic step in the movement that has been termed the devolution revolution, which is again being discussed in the context of healthcare reform. The centerpiece of devolution is the transfer of more responsibilities for antipoverty programs to the states. We will explore the effects of these reforms and the role that devolution plays in the ongoing debates over the designs of programs that make up America's social safety net. In addition to discussing conventional welfare programs (e.g., Medicaid, food stamps, TANF, SSI) and other governmental policies assisting low-income families (EITC, minimum wages), we will examine the trends in governmental spending on anti-poverty programs and how our nation defines poverty and eligibility for income support. We will apply economics principles throughout to understand the effectiveness of America's antipoverty programs and their consequences on the behavior and circumstances of families. Prerequisites: A basic understanding/knowledge of introductory economics is recommended.

ECON 12. Economics of Artificial Intelligence. 1 Unit.

How will artificial intelligence and machine learning reshape the economy? This course examines the prospective impact of AI on jobs, wages, inequality, industrial power, and global competition. We begin by examining the effects of previous technological revolutions (from the Industrial Revolution to the digital age) on living standards, relative power of labor and capital, and organization of economic activity. We then review the tools and methods economists use to analyze the potential consequences of AI and machine learning. We conclude by assessing priorities for government policy, including opportunities for harnessing AI to create a more prosperous and equitable society.

ECON 14. Navigating Financial Crises: From Emerging Markets to COVID-19. 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, the European sovereign crisis, and as well the extraordinary fiscal and central bank responses to the COVID-19 crisis.

Same as: PUBLPOL 14

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 19Q. Government by the Numbers. 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 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 23N. Capitalism, Socialism and Democracy. 3 Units.

We will explore the evolution and current performance of capitalist and socialist economies, their interaction with democracy, and the contemporary debate about the appropriate roles of individual vs. collective rights and responsibilities.

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 27N. 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 43. Introduction to Financial Decision-Making. 5 Units.

The purpose of the class is for you to obtain greater comfort making the major financial decisions your life journey will require. Illustrative examples, case studies, historical and statistical evidence, and some simple analytical tools will be presented. We hope to help students avoid damaging mistakes in the decisions that will determine their financial flexibility and safeguard them against life's uncertainties. Students will learn how to keep more options open and to live with fewer constraints by making sound financial decisions. Topics include making a financial plan and budget, managing money, saving, investing in stocks and other assets, purchasing insurance, taxes and inflation, inheritance, financial markets and financial advisors.

ECON 44. The Modern Financial System. 3 Units.

The purpose of the class is to introduce you to the modern financial system. What are the major financial instruments – bonds, bank loans and also equity - and how are their prices determined. What are the key financial institutions that lend, provide liquidity and make markets. What role does the government play through regulation, monetary policy and special intervention in crisis time. We'll devote particular attention to the payments system: how do households and firms make payments, how do financial institutions organize these payments, and how could this business change with potential entry of new digital currencies, provided by central banks or the private sector. Prerequisites: Econ 1 is recommended.

ECON 46. Networks and Human Behavior. 5 Units.

Two threads are interwoven: why social and economic networks have special features, and how those features shape power, opinions, opportunities, and behaviors. Some of the topics included are: the different ways in which a person's position in a network determines their influence; which systematic errors people make when forming opinions based on what they learn from others; how financial contagions work and why are they different from the spread of a flu; the role of splits in our social networks in inequality, immobility, and polarization; and how network patterns of trade and globalization have changed international conflict and wars. The course requires analyzing network data, which will be provided. No prerequisite but Econ 102A or equivalent is recommended.

ECON 47. Media Markets and Social Good. 5 Units.

This class will apply tools from economics and related social sciences to study the functioning of media markets and their impact on society. The guiding question will be: when and how do media best serve the social good? Topics will include the economics of two-sided markets, media bias, polarization, social media, fake news, advertising, propaganda, effects of media on children, media and crime, and the role of media in corruption, protests and censorship. The course will give students a non-technical introduction to social science empirical methods, including regression analysis, causal inference, experimental and quasi-experimental methods, and machine learning.

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 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 102D. Econometric Methods for Public Policy Analysis and Business Decision-Making. 5 Units.

This course focuses on the use of econometric methods in public policy analysis and business decision-making. Building on methods taught in Economics 102A and 102B, additional descriptive, predictive and causal econometric modeling methods will be introduced along with the assumptions required for the validity of each methodology. Methods for designing randomized controlled trials (RCT) and analyzing the resulting data will be discussed. The methods for recovering economically meaningful magnitudes such as price elasticities of demand and other behavioral responses from observational data will be discussed. Both classical econometric methods and modern techniques in machine learning will be employed. The class will be taught using the R programming language. Students will perform both in-class and out-of-class assignments working with actual datasets to address policy-relevant decisions and simulation exercises designed to deepen their knowledge of these methods. Prerequisites: Econ102A, Econ102B.

ECON 106. World Food Economy. 5 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). Application found at <https://economics.stanford.edu/academics/undergraduate-program/forms>.

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

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 124. Economic Development and Challenges of East Asia. 3-5 Units.

(Formerly IPS 224) 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. 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: INTPOL 301B, Polisci150A(355A), Econ 102B or equivalent courses that cover regression analysis.

Same as: INTLPOL 224

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, social learning, public finance/redistribution, 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 131. The Chinese Economy. 4 Units.

This is a survey course of the Chinese economy with emphasis on understanding the process of economic reform, transition and development during the past 40 years. It will help students learn the different historical stages of institutional changes, develop an informed perspective on economic and political rationale and the effectiveness of the economic policies that have shaped China's economic emergence, and think critically about the process of economic and social changes. Prerequisite: Econ 1.

ECON 135. Foundations of Finance. 3 Units.

For graduate students and advanced undergraduates. This course teaches the foundations of finance. Topics include internal rate of return and net present value, Black-Scholes option pricing, portfolio diversification and the Capital Asset Pricing Model, relationships between risk and return, market efficiency, and the valuation of derivative securities. Much of the analysis will build on the Arrow-DeBreu state preference model. Next, adverse selection and moral hazard in contracting and the design of auctions will be discussed. Towards the end of the course applied topics such as bank capital regulation, sovereign debt, pension funds, university endowments, and the evaluation of private equity performance and fees will be discussed, depending on time. Prerequisites: MATH 51, ECON 50, ECON 102A, or equivalents; ability to use spreadsheets, and basic probability and statistics concepts including random variables, expected value, variance, covariance, and simple estimation and regression.

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 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 50, 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 143. Finance, Corporations, and Society. 4 Units.

Both "free market capitalism" and democracy are in crisis around the world. This interdisciplinary course will help you understand the issues by exploring the interactions between the financial system, corporations, governments, and broader society. Topics include basic financial decisions of individuals and corporations, consumer finance (including mortgages, student loans, insurance and savings), financial markets and firms, corporations and their governance, the role of disclosures and regulations, political economy and government institutions, and the role of the media. We will discuss current events and policy debates regularly throughout the course. The approach will be rigorous and analytical but not overly mathematical. Visitors with relevant experience will enrich the discussion.

Same as: INTLPOL 227, POLISCI 127A, PUBLPOL 143

ECON 144. Family and Society. 5 Units.

The family into which a child is born plays a powerful role in determining lifetime opportunities. This course will apply tools from economics and related social sciences to study how the functioning of families is shaped by laws, social insurance, social norms, and technology. Topics will include intergenerational transmission of wealth and health, the importance of the early family environment, partnership formation, cohabitation and marriage, teen pregnancy and contraception, assisted reproduction, Tiger Moms and Helicopter Parenting, and the employment effects of parenthood. In the context of these topics, the course will cover social science empirical methods, including regression analysis, causal inference, and quasi-experimental methods. Throughout the course, we will think critically about the role of the government and how the design of public policy targeting families affect our ability to solve some of the most important social and economic problems of our time. Prerequisites: Econ 50.

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 148. Investors and the Social Responsibility of Business. 3 Units.

Much of the world's economic activity is undertaken by corporations, the largest being more powerful than most nations. Given daunting societal challenges like climate change, inequality, and racial injustice, what objectives should corporations have? In this course, we discuss the ongoing debate about the social responsibility of corporations. We consider shareholder activism, divestments made by university endowments and other ways investors might influence corporations. We look at the ESG (environment, social, governance) movement and the potential for "impact investing" to solve problems. Throughout we focus on whether the incentives of key decision makers are aligned with desirable objectives. We will bring to class CEOs and leading investors in public and private equity, to ensure we provide a balance of theory and practice.

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 150. Economic Policy Analysis. 4-5 Units.

The relationship between microeconomic 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 151. Tackling Big Questions Using Social Data Science. 5 Units.

Big data can help us provide answers to fundamental social questions, from poverty and social mobility, to climate change, migration, and the spread of disease. But making sense of data requires more than just statistical techniques: it calls for models of how humans behave and interact with each other. Social data science combines the analysis of big data with social science theory. We will take a project-oriented, many models-many methods approach. This course will introduce students to a variety of models and methods used across the social sciences, including tools such as game theoretical models, network models, models of diffusion and contagion, agent based models, model simulations, machine learning and causal inference. Students will apply these tools to tackle important topics in guided projects. Prerequisite is Econ 102A or equivalent.

Same as: POLISCI 151

ECON 152. The Future of Finance. 2 Units.

This 2-credit course will examine vast changes driven by innovation both from within traditional finance and from new ecosystems in fintech among others. Breath-taking advances in financial theory, big data, machine learning, artificial intelligence, computational capability, IoT, payment systems (e.g. blockchain, crypto currencies), new products (e.g. robo advising, digital lending, crowd funding, smart contracts), new trading processes (e.g. algorithmic trading, AI-driven sales & trading), and new markets (e.g. ETFs, zero-cost products), among others are changing not only how financial and non-financial firms conduct business but also how investors and supervisors view the players and the markets. We will discuss critical strategy, policy and legal issues, some resolved and others yet to be (e.g. failed business models, cyber challenges, financial warfare, fake news, bias problems, legal standing for cryptos). The course will feature perspectives from guest speakers including top finance executives and Silicon Valley entrepreneurs on up-to-the-minute challenges and opportunities in finance. We will discuss slowing global growth against the backdrop of ongoing intervention and wildcards in the capital markets of the U.S., Europe, Hong Kong, Singapore, China, India, Japan, the Middle East and Latin America. We will look forward at strategic opportunities and power players appearing and being dethroned in the markets to discuss who is likely to thrive and not survive in the new global financial landscape. Prerequisites: If you are an undergraduate wishing to take this course, apply by completing the course application and provide a brief bio here: <https://forms.gle/9BGYr8brdYwPS8Cu8>.

Same as: ECON 252, PUBLPOL 364

ECON 154. Law and Economics. 4-5 Units.

In this course, we explore the role of law in promoting social well-being (happiness). Law, among its other benefits, can serve as a mechanism to harmonize private incentives with cooperative gains, to maintain an equitable division of those gains, and to deter social defection and dystopia. Law is thus an implementation of the social contract and essential to civilization. Economic analysis of law focuses on the welfare-enhancing incentive effects of law (and of law enforcement). More generally, we study the law's role in reducing the risks of cooperation, achieved by fixing expectations of what courts or the state will do in possible 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 51 (Public Policy majors may take PUBLPOL 51 as a substitute for ECON 51).

ECON 158. Regulatory Economics. 5 Units.

Economics 158 examines public policies for dealing with problems arising in markets in which competitive forces are weak. The focus is on monopolies, oligopolies, cartels, and other environments where market mechanisms are unlikely to produce outcomes that benefit consumers more than the alternatives involving costly government intervention. The two main areas examined are competition policy and economic regulation. Competition policy refers to laws that define certain market behavior as illegal because it is harmful to competition or fails to provide consumer benefits that justify its costs to consumers. Economic regulation refers to policies in which government controls prices and/or decides the terms and conditions under which firms can participate in a market. A growing area of study and policy design is the introduction of market mechanisms into formerly regulated industries such as: telecommunications, electricity, airlines, railroads, postal delivery services and environmental regulation. Cross-listed with Law 1056. Prerequisites: Econ 51 or equivalent.

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 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; monetary and fiscal policy under flexible and fixed exchange rate regimes; exchange rate crises; sovereign 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 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 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 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. To apply please send a statement of interest and an unofficial transcript to econ184@smc.stanford.edu by December 20, 2019. Prerequisites: Econ 50 and Econ 102A, may be taken concurrently.

ECON 198. Junior Honors Seminar. 5 Units.

For juniors (advanced sophomores will be considered) 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 interact with potential advisors, and outline a program of study for their senior year. To apply, complete the application at <https://economics.stanford.edu/undergraduate/forms>. 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 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 students. 2-5 Units.

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; discussion of how assumptions and models stand up to recent developments in empirical and in particular behavioral economics. Prerequisite: understanding of basic calculus and some familiarity with writing basic proofs.

ECON 203. Microeconomics II. 3-5 Units.

(Non-Economics graduate students register for 203N.) Non-cooperative game theory including normal and extensive forms, solution concepts, games with incomplete information, and repeated games. Externalities and public goods. The theory of imperfect competition: static Bertrand and Cournot competition, dynamic oligopoly, entry decisions, entry deterrence, strategic behavior to alter market conditions. Limited enrollment. Prerequisite: ECON 202.

ECON 204. Microeconomics III. 3-5 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. 5 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). Application found at <https://economics.stanford.edu/academics/undergraduate-program/forms>.

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. 3-5 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. 3-5 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. 3-5 Units.

This course uses microeconomic theory and empirical analyses to understand barriers to human and economic development in lower income countries, as well as how public policies are formulated and their effectiveness at alleviating poverty. Topics include institutions and governance; human capital accumulation; productivity; inequality; poverty traps. Prerequisites: 202 or 202N, 270.

ECON 215. Development Economics II. 3-5 Units.

This is a course focusing on macro development research. It will cover dynamic models of growth and development, with a focus on migration; technological change; the functioning of financial markets; barriers to agricultural productivity; informal financial systems (savings, credit, and insurance); and public finance in less developed countries. Prerequisites: 202 or 202N, 270.

ECON 216. Development Economics III. 3-5 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. Prerequisite: 202, 203, 204, 210, 211, 212, 270, 271, 272.

ECON 220. Political Economy I. 3-5 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. 3-5 Units.

Continuation of ECON 220 / POLISCI 460A. Preparation for advanced research in political economy. This quarter will focus on topics related to culture, institutions, political and economic development, historical evolution, nondemocratic politics, conflict and cooperation. We will cover both empirical and theoretical work. Prerequisite for Political Science PhD students: POLISCI 356A.

Same as: POLISCI 460B

ECON 226. U.S. Economic History. 2-5 Units.

The role of economic history as a distinctive approach to the study of economics, using illustrations from U.S. history. Topics include: historical and institutional foundations of the U.S. rise to world economic preeminence; economic causes and consequences of slavery; the American national system of technology; the Great Depression of the 1930s and the policy response; inequality and intergenerational mobility; the growth of social insurance. Intended for graduate students.

ECON 229. Topics in Economic History. 3-5 Units.

Topics in Economic History: covers topics in Economic History such as the industrial revolution, the demographic transition, the great divergence, the importance of institutions, the diffusion of knowledge, the causes and consequences of income inequality, and immigration over the last two centuries. The course will highlight the roles of economic history in modern economics, the use of economic theory in guiding hypothesis testing, and the construction of new datasets and the execution of empirical analysis. The course is open to PhD students only.

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. 3-5 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. Students enrolled in MGTECON 612 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 236. Financial Economics I. 3-5 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. 3-5 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 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, policy evaluation with behavioral decision makers. 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. 3-5 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 ζ 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. 3-5 Units.

The first part of the course concerns inequality and the design of social insurance. We also explore questions in the intersection of public and family economics such as the unit of taxation, and the interaction 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, place-based policies and housing policy. Prerequisites: Econ 202, 203, 204, 210, 270, 271, or equivalent with consent of instructor. Recommended: Econ 241, 270, 271, or equivalent with consent of instructor. Recommended: Econ 241 and 242.

ECON 244. Market Failures and Public Policy. 3-5 Units.

Market failures are the classic justification for government intervention in private markets. This course will focus on a small number of economically important markets where market failures are thought to be important: credit, health care, innovation, and insurance. For each of these markets, we will discuss theory and evidence on the existence and magnitude of market failures, and theory and evidence on the efficiency of public policy interventions designed to address those market failures. Prerequisites: ECON 202-204, ECON 270, ECON 271, or equivalent with consent of instructor.

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. 3-5 Units.

Recent topics in applied micro, focusing on papers from top journals (QJE, AER, JPE, Econometrica and REStud) 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. 3-5 Units.

This course focuses on household decision making, the economics of discrimination, and the economics of migration. We will examine unitary, cooperative and non-cooperative models of the household, the collective model, dynamic extensions of the collective model with frictions. We will then discuss empirical applications of these models to labor supply, retirement behavior, human capital accumulation, division of labor within the family and migration decisions.

ECON 249. Topics in Health Economics I. 3-5 Units.

Course will cover various topics in health economics, from theoretical and empirical perspectives. Topics will include public financing and public policy in health care and health insurance; demand and supply of health insurance and healthcare; physicians' incentives; patient decision-making; competition policy in healthcare markets, intellectual property in the context of pharmaceutical drugs and medical technology; other aspects of interaction between public and private sectors in healthcare and health insurance markets. Key emphasis on recent work and empirical methods and modelling. Prerequisites: Micro and Econometrics first year sequences (or equivalent). Curricular prerequisites (if applicable): First year graduate Microeconomics and Econometrics sequences (or equivalent).

Same as: HRP 249, MED 249

ECON 250. Environmental Economics. 3-5 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.

This 2-credit course will examine vast changes driven by innovation both from within traditional finance and from new ecosystems in fintech among others. Breathtaking advances in financial theory, big data, machine learning, artificial intelligence, computational capability, IoT, payment systems (e.g. blockchain, crypto currencies), new products (e.g. robo advising, digital lending, crowd funding, smart contracts), new trading processes (e.g. algorithmic trading, AI-driven sales & trading), and new markets (e.g. ETFs, zero-cost products), among others are changing not only how financial and non-financial firms conduct business but also how investors and supervisors view the players and the markets. We will discuss critical strategy, policy and legal issues, some resolved and others yet to be (e.g. failed business models, cyber challenges, financial warfare, fake news, bias problems, legal standing for cryptos). The course will feature perspectives from guest speakers including top finance executives and Silicon Valley entrepreneurs on up-to-the-minute challenges and opportunities in finance. We will discuss slowing global growth against the backdrop of ongoing intervention and wildcards in the capital markets of the U.S., Europe, Hong Kong, Singapore, China, India, Japan, the Middle East and Latin America. We will look forward at strategic opportunities and power players appearing and being dethroned in the markets to discuss who is likely to thrive and not survive in the new global financial landscape. Prerequisites: If you are an undergraduate wishing to take this course, apply by completing the course application and provide a brief bio here: <https://forms.gle/9BGYr8brdYwPS8Cu8>.

Same as: ECON 152, PUBLPOL 364

ECON 254. Economics of Digitization. 3-5 Units.

Examines the transformation of the economy enabled by digital technologies, including AI, networks, and the digitization of information, goods and services. Topics include the economics of information, two-sided networks and platforms, power laws, intangible assets, organizational complementarities, incomplete contracts, labor economics, growth theory, and design of empirical studies. Extensive reading and discussion of research literature with relevant guest speakers. Students will complete a final research paper and presentation. Primarily for doctoral students.

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 IIA. 3-5 Units.

Topics may include theoretical and empirical analysis of bargaining, dynamic models of entry and investment, models of household borrowing, 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, behavioral economics, and household finance. Prerequisite: Econ 257.

ECON 260. Industrial Organization III. 3-5 Units.

Course combines individual meetings and student presentations, with an aim of initiating dissertation research in industrial organization. Prerequisites: ECON 257, ECON 258. Enrollment by non-Econ PhD students requires instructors' consent.

ECON 266. International Trade I. 3-5 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. Students are expected to develop and present a research proposal. Prerequisites: Econ 202 or permission of instructor.

ECON 267. International Trade II. 2-5 Units.

The course will cover quantitative and empirical work in trade, trade policy, and related subjects.

ECON 268. International Finance and Exchange Rates. 3-5 Units.

Benchmark open economy models. Solution methods for macroeconomic models. Analysis and evaluation of quantitative macroeconomic models. Main applications: Sovereign debt and default; Financial crises and sudden stops; Hedging, interest parity relationships, and the determination of exchange rates; Liability dollarization.

ECON 269. International Finance and Exchange Rates II. 3-5 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. Part 2: open-economy monetary models and currency unions. Part 3: international finance policy, capital controls and foreign exchange interventions. Part 4: sovereign debt. Prerequisites: Econ 210, 211, 212 and 268.

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. 3-5 Units.

Analysis of Randomized Experiments, Linear Regression Model, Instrumental Variables, Methods for Causal Effects. Prerequisite: Econ 270 or MGTECON 603 or permission of instructor.

ECON 272. Intermediate Econometrics III. 3-5 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. 3-5 Units.

Possible topics: parametric asymptotic theory. M and Z estimators. General large sample results for maximum likelihood; nonlinear least squares; and nonlinear instrumental variables estimators including the generalized method of moments estimator under general conditions. Model selection test. Consistent model selection criteria. Nonnested hypothesis testing. Markov chain Monte Carlo methods. Nonparametric and semiparametric methods. Quantile Regression methods.

ECON 274. Advanced Econometrics II. 3-5 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; randomization and permutation tests; inference for dependent data.

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: Industrial Organization, Labor, 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. These include auction markets, oligopolies, regulator-firm interactions, and nonlinear pricing. 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 278. Behavioral and Experimental Economics I. 2-5 Units.

This is the first part of a three course sequence (along with Econ 279 & 280-formerly 277) on behavioral and experimental economics. The sequence has two main objectives: 1) examines theories and evidence related to the psychology of economic decision making, 2) Introduces methods of experimental economics, and explores 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: 204 and 271, or consent of instructor.

ECON 279. Behavioral and Experimental Economics II. 3-5 Units.

This is part of a three course sequence (along with Econ 278 & 280-formerly 277) on behavioral and experimental economics. The sequence has two main objectives: 1) examines theories and evidence related to the psychology of economic decision making, 2) Introduces methods of experimental economics, and explores 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: 204 and 271, or consent of instructor.

ECON 280. Behavioral and Experimental Economics III. 3-5 Units.

Economics 280 (formerly ECON 277) is a course primarily directed at graduate students in the Economics department writing dissertations with behavioral or experimental components. Economics 280 is the third part of a three course sequence (along with Econ 278 & 279). The first two quarters, which are taught primarily in lecture format, have 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 objectives of improving the explanatory and predictive performance of standard models, and of providing a foundation for more reliable normative analyses of policy issues. This third quarter is a practicum, focused on students who have taken (at least one of) the first two quarters and who are now preparing an experimental or behavioral study of their own. Prerequisites: Non-Econ Phd students must complete 204 and 271, or have consent of instructor.

ECON 282. Contracts, Information, and Incentives. 3-5 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 284. Simplicity and Complexity in Economic Theory. 3-5 Units.

Technology has enabled the emergence of economic systems of formerly inconceivable complexity. Nevertheless, some technology-related economic problems are so complex that either supercomputers cannot solve them in a reasonable time, or they are too complex for humans to comprehend. Thus, modern economic designs must still be simple enough for humans to understand, and must address computationally complex problems in an efficient fashion. This topics course explores simplicity and complexity in economics, primarily via theoretical models. We will focus on recent advances. Key topics include (but are not limited to) resource allocation in complex environments, communication complexity and information aggregation in markets, robust mechanisms, dynamic matching theory, influence maximization in networks, and the design of simple (user-friendly) mechanisms. Some applications include paired kidney exchange, auctions for electricity and for radio spectrum, ride-sharing platforms, and the diffusion of information. Prerequisites: Econ 203 or equivalent. Same as: CS 360

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 graduate 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. We will also cover some of the basics of auction theory, with a particular emphasis on its connections to matching. 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, school choice programs in a growing number of American cities (including New York and Boston), the allocation of organs for transplantation, online advertising auctions, and the market for transportation. 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. 3-5 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 287. Mechanism and Market Design. 3 Units.

Primarily for doctoral students. Focus on quantitative models dealing with sustainability and related to operations management. Prerequisite: consent of instructor. May be repeated for credit. Same as: MS&E 365

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. Multiperson 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. 3-5 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. 3-5 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. Prerequisite: Prior coursework in basic observational study methods for causal inference, including instrumental variables, fixed effects modeling, regression discontinuity designs, etc. Students should be comfortable reading and engaging with empirical research in economics and related fields.

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. Submit this documentation to the Econ professor, who has agreed to the student enrolling in their Econ 299 section. 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. 3-10 Units.

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. 2-3 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. Contact the instructor listed for the class to request permission to enroll. Cross-listed with the Law School (Law 7506 and Law 7507).

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.

ECON 365. International Trade Workshop. 1-10 Unit.**ECON 370. Econometrics Workshop. 1-10 Unit.****ECON 391. Microeconomic Theory Seminar. 1-10 Unit.****ECON 400. Ph.D. Dissertation. 1-15 Unit.**

Pre-TGR dissertation research.(Staff).

ECON 801. TGR Project. 0 Units.**ECON 802. TGR Dissertation. 0 Units.**