DEPARTMENT OF ECONOMICS (GRAD)

Contact Information
Department of Economics
Visit Program Website (http://econ.unc.edu/graduate/)

Donna Gilleskie, Chair

The graduate program in the Department of Economics prepares students for teaching and research careers in the fields of econometrics, financial econometrics, health economics, industrial organization, international finance, international trade, labor economics, microeconomic theory, quantitative macroeconomics. During the first year of the program, students concentrate on the core areas of econometrics, macroeconomics, and microeconomics. Later, each student chooses a field of specialization. The department's objective is to provide students both with broad training in economics and econometrics and in a chosen field of specialization.

A number of students supplement their study in economics at UNC–Chapel Hill with work in finance, statistics, mathematics, biostatistics, urban and regional studies, computer science, and operations research, along with courses at Duke University and North Carolina State University. Strong offerings in these and other related areas enhance the overall graduate training offered to students.

Fellowships and Assistantships
The department offers several fellowships and a number of research and teaching assistantships. All applicants to the Ph.D. program are considered for financial support, and most students enrolled in the Ph.D. program receive a stipend, tuition assistance, and health insurance from the Department of Economics or other sponsors for the first five years of the program. Detailed information regarding the fellowships, assistantships, and instructorships may be obtained on the graduate program Web page (https://econ.unc.edu/graduate/) in the department's Web site (https://econ.unc.edu/).

Master of Science
Master's and doctoral students take the same courses in the first year; therefore, master's students must have competitive backgrounds similar to our doctoral students to do well in the courses.

The master's degree requires the following coursework:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 710</td>
<td>Advanced Microeconomic Theory I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 720</td>
<td>Advanced Macroeconomic Theory I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 700</td>
<td>Basic Quantitative Techniques</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>One course in econometrics:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ECON 770</td>
<td>Introduction to Econometric Theory</td>
</tr>
<tr>
<td></td>
<td>ECON 771</td>
<td>Econometrics</td>
</tr>
<tr>
<td></td>
<td>ECON 870</td>
<td>Advanced Econometrics</td>
</tr>
<tr>
<td>Two courses in a specialized field</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Three electives</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

A research course:

ECON 992 | Master's (Non-Thesis) | 3     |

Total Hours 30

Courses are to be selected in consultation with, and with the approval of, the director of graduate studies and the faculty in the field of specialization. In addition to coursework, a master of science student writes a research paper under the direction of the faculty advisor. The Graduate School Handbook describes the general requirements for the master's examinations and for the papers.

Doctor of Philosophy
A doctoral candidate must complete 15 Ph.D.-level courses and two semesters of the doctoral dissertation course (ECON 994). Unless otherwise specified by the faculty in the specialized field, at least 12 of the 15 courses must be from the Department of Economics. All courses must be approved by the director of graduate studies.

Courses in the Fundamentals of Economics
The following seven courses or their equivalents are required:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON 710</td>
<td>Advanced Microeconomic Theory I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 711</td>
<td>Advanced Macroeconomic Theory II</td>
<td>3</td>
</tr>
<tr>
<td>ECON 720</td>
<td>Advanced Macroeconomic Theory I</td>
<td>3</td>
</tr>
<tr>
<td>ECON 721</td>
<td>Advanced Macroeconomic Theory II</td>
<td>3</td>
</tr>
<tr>
<td>ECON 700</td>
<td>Basic Quantitative Techniques</td>
<td>3</td>
</tr>
<tr>
<td>ECON 770</td>
<td>Introduction to Econometric Theory</td>
<td>3</td>
</tr>
<tr>
<td>ECON 771</td>
<td>Econometrics</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Hours 21

Courses in the Field of Specialization within Economics
Each student selects a specialized field from among the following fields within economics:

- Econometrics
- Financial Econometrics
- Health Economics
- Industrial Organization
- International/Macro
- Labor Economics
- Microeconomic Theory

At least three courses in the field of specialization are required. Students typically take courses in a complimentary field (e.g., finance courses when the focus is financial econometrics; health and labor; micro theory and industrial organization). The choice of courses is agreed upon by the student, the director of graduate studies, and faculty of the field.

Courses in Supporting Fields
The remaining courses are supporting courses chosen by the student in consultation with the director of graduate studies and other faculty members. The supporting courses may be within the field of specialization or in areas that complement the field of specialization.

Doctoral Exams and Dissertation
Students must pass qualifying exams in econometrics, macroeconomics, and microeconomics. Students are also required to produce and pass a field paper (students have the option of taking a field exam, but in recent years all students produce a field paper). The qualifiers are taken
in May and August of the student's first year. Students are allowed to skip one qualifying exam if their course sequence grades are high enough. Students have two opportunities to pass each of the exams they take and may petition the appeals committee for permission to take an exam for the third time.

The Graduate School Handbook describes the requirements for the doctoral oral exam, doctoral dissertation, and final oral defense of the dissertation. The doctoral oral exam includes an evaluation of the thesis prospectus.

The general regulations of The Graduate School apply to students receiving graduate degrees in economics from the University of North Carolina at Chapel Hill.

### Professors

- **Gary A. Biglaiser**, Microeconomic Theory, Industrial Organization
- **Anusha Chari**, International Finance, Open-Economy Macroeconomics
- **Eric Ghysels**, Econometrics, Financial Econometrics
- **Donna B. Gilleskie**, Health Economics, Econometrics, Labor
- **David K. Guilkey**, Econometrics
- **Peter Hansen**, Econometrics, Time Series, Financial Econometrics
- **Steven S. Rosefielde**, Comparative Economic Systems

### Associate Professors

- **Luca Flabbi**, Labor Economics, Applied Econometrics, Structural Estimation
- **Neville R. Francis**, Macroeconomics, Time Series
- **Jane Cooley Fruehwirth**, Social Economics, Economics of Education, Public Economics
- **Lutz A. Hendricks**, Macroeconomics, Human Capital, Economic Growth, Wealth Inequality
- **Brian McManus**, Empirical Industrial Organization, Applied Microeconomics, Public Economics
- **Peter Norman**, Microeconomics, Public Economics
- **William R. Parke**, Econometrics, Macroeconomics
- **Sergio O. Parreiras**, Game Theory, Microeconomics
- **Klara Peter**, Labor, Development, Applied Microeconomics, Public Policy
- **Boone A. Turchi**, Demography
- **Andrew Yates**, Environmental Economics

### Assistant Professors

- **Simon Alder**, Growth and Development, Applied Econometrics
- **Andrii Babii**, Econometrics
- **Qing Gong**, Public Economics, Health Economics
- **Andrés Hincapié**, Labor, Health, Entrepreneurship
- **Ju Hyun Kim**, Econometrics
- **Fei Li**, Applied Microeconomic Theory, Industrial Organization, Labor Economics
- **Luca Maini**, Industrial Organization, Health Economics
- **Stanislav Rabinovich**, Macroeconomics, Labor Economics
- **Can Tian**, Macroeconomics, Searching and Matching Theory
- **Valentin Verdier**, Econometrics
- **Kyle Woodward**, Microeconomic Theory

### Fixed-term Faculty

- **Michael D. Aguilar**, Financial Econometrics, Applied Macroeconomics, Econometric Theory
- **Rita A. Balaban**, Applied Microeconomics, Economic Education
- **Bernard E. Bell**, Entrepreneur in Residence
- **Burton B. Goldstein**, University Entrepreneur in Residence
- **Michelle Sheran-Andrews**, Microeconomics, Labor Economics, Economic Statistics
- **Kalina Staub**, Labor Economics, Gender Economics, Economics Education, Household and Family Economics

### Professors Emeriti

- **John Akin**
- **Dennis R. Appleyard**
- **Arthur Benavie**
- **Stanley W. Black**
- **Ralph Byrns**
- **William A. Darity Jr.**
- **Alfred J. Field Jr.**
- **Richard T. Froyen**
- **A. Ronald Gallant**
- **Dell B. Johannesen**
- **James L. Murphy**
- **Michael K. Salemi**
- **John Stewart**
- **Vincent J. Tarascio**
- **Helen V. Tauchen**
- **Roger Waud**
- **James A. Wilde**
- **Xiaodong Wu**

### ECON Advanced Undergraduate and Graduate-level Courses

**ECON 400. Introduction to Statistics and Econometrics. 3 Credits.**

Comprehensive introduction to statistics, including descriptive statistics and statistical graphics, probability theory, distributions, parameter estimation, hypothesis testing, simple and multiple regression, and use of powerful statistical estimation software. This course includes a substantial introduction to basic econometrics. Honors version available

**Requisites:** Prerequisites, ECON 101, STOR 155, and one of MATH 152, 231, STOR 112, or 113.

**Gen Ed:** QI.

**Grading status:** Letter grade.

**ECON 400H. Introduction to Statistics and Econometrics. 3 Credits.**

Comprehensive introduction to statistics, including descriptive statistics and statistical graphics, probability theory, distributions, parameter estimation, hypothesis testing, simple and multiple regression, and use of powerful statistical estimation software. This course includes a substantial introduction to basic econometrics. Honors version available

**Requisites:** Prerequisites, ECON 101, STOR 155, and one of MATH 152, 231, STOR 112, or 113.

**Gen Ed:** QI.

**Grading status:** Letter grade.
ECON 410. Intermediate Theory: Price and Distribution. 4 Credits.
The determination of prices and the distribution of income in a market system. Students may not receive credit for both ECON 310 and 410. Honors version available
Requisites: Prerequisites, ECON 101, and one of MATH 152, 231, STOR 112, or 113.
Grading status: Letter grade.

ECON 410H. Intermediate Theory: Price and Distribution. 4 Credits.
The determination of prices and the distribution of income in a market system. Students may not receive credit for both ECON 310 and 410.
Requisites: Prerequisites, ECON 101, and one of MATH 152, 231, STOR 112, or 113.
Grading status: Letter grade.

ECON 411. Game Theory. 3 Credits.
Game theory is the study of strategic interactions, where the best choice for the individual depends directly on what other individuals are doing. This course formalizes strategic interactions as mathematical games. Students examine the concept of a strategy, examine what it means to be rational or irrational, and define solution concepts that correspond to different assumptions.
Requisites: Prerequisite, ECON 410 with a grade of C or better, or COMP 550, POLI 287, or POLI 288; permission of the instructor for students lacking the prerequisite.
Grading status: Letter grade.

ECON 415. Market Failures. 3 Credits.
This course is a continuation of ECON 410. While ECON 410 dealt with basic price theory and market successes, this course will mainly cover market failures. In particular, we will first explore the notion of efficiency and equity in a partial and general equilibrium framework. We will then add asymmetric information, behavioral economics, externalities, public goods, and market power to models learned in ECON 101 and ECON 410 to analyze the effects on economic efficiency.
Requisites: Prerequisite, ECON 410 with a grade of C or better.
Grading status: Letter grade.

ECON 416. Behavioral Economics. 3 Credits.
This course covers alternatives to the standard rational choice model featured in ECON 410. The course covers four themes: choice under certainty (e.g. menu and endowment effects), choice under uncertainty (e.g. prospect theory), intertemporal choice (e.g. hyperbolic preferences), and strategic choices by individuals (e.g., social preferences, envy, altruism). The readings focus on the contributions of experimental economics and neuroeconomics.
Requisites: Prerequisite, ECON 410 with a grade of C or better.
Grading status: Letter grade.

ECON 420. Intermediate Theory: Money, Income, and Employment. 3 Credits.
An introduction to contemporary macroeconomic concepts and analysis. Topics include the level, fluctuations, and growth of national income, and monetary and fiscal policies designed to achieve economic goals. Students may not receive credit for both ECON 320 and ECON 420. Honors version available
Requisites: Prerequisite, ECON 410 with a grade of C or better.
Grading status: Letter grade.

ECON 420H. Intermediate Theory: Money, Income, and Employment. 3 Credits.
An introduction to contemporary macroeconomic concepts and analysis. Topics include the level, fluctuations, and growth of national income, and monetary and fiscal policies designed to achieve economic goals. Students may not receive credit for both ECON 320 and ECON 420.
Requisites: Prerequisite, ECON 410 with a grade of C or better.
Grading status: Letter grade.

ECON 423. Financial Markets and Economic Fluctuations. 3 Credits.
An examination of financial institutions and markets, their role in economic conditions, and the use of macroeconomic policies in affecting those conditions. Students may not receive credit for both ECON 320 and ECON 423. Honors version available
Requisites: Prerequisites, ECON 400, 410, and 420; a grade of C or better in ECON 400 and 410 is required.
Grading status: Letter grade.

ECON 423H. Financial Markets and Economic Fluctuations. 3 Credits.
An examination of financial institutions and markets, their role in economic conditions, and the use of macroeconomic policies in affecting those conditions. Students may not receive credit for both ECON 320 and ECON 423.
Requisites: Prerequisites, ECON 400, 410, and 420; a grade of C or better in ECON 400 and 410 is required.
Grading status: Letter grade.

ECON 425. Financial Economics. 3 Credits.
How does a risk averse individual allocate their funds? Students begin by defining and measuring risk, making connection to their microeconomics training. They then develop and use asset pricing models to explore the interplay between risk and return. Finally, students use these tools to develop a mean-variance optimal portfolio allocation. Students are introduced to basic quantitative tools and participate in myriad practical applications.
Requisites: Prerequisites, ECON 400, 410, and 420; a grade of C or better in ECON 400 and 410 is required.
Grading status: Letter grade.

ECON 430. Economic Development of the United States. 3 Credits.
This course parallels ECON 330 but is designed for students with a higher level of theoretical preparation. Students may not receive credit for both ECON 330 and ECON 430.
Requisites: Prerequisites, ECON 400, 410, and 420; a grade of C or better in ECON 400 and 410 is required.
Grading status: Letter grade.

ECON 434. History of Economic Doctrines. 3 Credits.
A survey of the fundamental forms of economic thought from the scholastics through Keynes.
Requisites: Prerequisites, ECON 101, 400, and 410; a grade of C or better in ECON 400 and 410 is required.
Gen Ed: SS.
Grading status: Letter grade.

ECON 440. Analysis of Public Finance. 3 Credits.
Application of economic analysis to the taxing and spending functions of government. Students may not receive credit for both ECON 340 and ECON 440.
Requisites: Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
Grading status: Letter grade.
ECON 445. Industrial Organization. 3 Credits.
The course covers the causes and consequences of firms’ strategic behavior, focusing on situations in which firms have market power. The main analytical tools are microeconomic theory and game theory. Topics covered include: pricing, product design, imperfect competition, collusion and cartels, firm-to-firm supply relationships, mergers, and antitrust policy. Students may not receive credit for both ECON 345 and 445.
Requisites: Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
Grading status: Letter grade.

ECON 450. Health Economics: Problems and Policy. 3 Credits.
Economic analysis applied to problems and public policy in health care.
Requisites: Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required; permission of the instructor for students lacking the prerequisites.
Grading status: Letter grade.

ECON 454. Economics of Population. 3 Credits.
Analysis of economic-demographic interrelations including demographic analysis, population and economic growth and development, economic models of fertility and migration, and population policy.
Requisites: Prerequisites, ECON 400 and 310 or 410; a grade of C or better in ECON 400, and 310 or 410 is required; permission of the instructor for students lacking the prerequisites.
Grading status: Letter grade.

ECON 455. Environmental Economic Theory. 3 Credits.
A rigorous economic analysis of environmental issues, with particular emphasis on the problem of designing appropriate institutions and regulations under private information and the interaction between economic and ecological systems. Topics include emission fees and marketable permits, pollution models, carbon regulation, and ecosystem service markets.
Requisites: Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
Grading status: Letter grade.

ECON 460. International Economics. 3 Credits.
An introduction to international trade, the balance of payments, and related issues of foreign economic policy.
Requisites: Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
Grading status: Letter grade.
Same as: EURO 460, PWAD 460.

ECON 461. European Economic Integration. 3 Credits.
Economic and political aspects of European economic integration, the EC customs union, barriers to integration, convergence vs. divergence of inflation rates and income levels, enlargement of the EC.
Requisites: Prerequisites, ECON 400 and 410; a grade of C or better is required in ECON 400 and 410; permission of the instructor for students lacking the prerequisites.
Gen Ed: SS, GL.
Grading status: Letter grade.

ECON 465. Economic Development. 3 Credits.
An introduction to the economic characteristics and problems of the less developed countries and to the theories and policies applicable to the developing economy.
Requisites: Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required; permission of the instructor for students lacking the prerequisites.
Gen Ed: SS, GL.
Grading status: Letter grade.

ECON 468. Socialism, Planning, and the Contemporary Russian Economy. 3 Credits.
Study of the principles, design, organization, and performance of state-controlled economies relying on planning or regulated markets, with an emphasis on continuity and post-communist transition.
Requisites: Prerequisites, ECON 400, and 310 or 410; a grade of C or better in ECON 400, and 310 or 410 is required.
Grading status: Letter grade.

ECON 469. Asian Economic Systems. 3 Credits.
This course provides an in-depth examination of the behavioral principles and performances of five core Asian economic systems: Japan, China, Taiwan/South Korea, North Korea and Thailand.
Requisites: Prerequisites, ECON 400, and 310 or 410; a grade of C or better in ECON 400, and 310 or 410 is required.
Grading status: Letter grade.
Same as: ASIA 469.

ECON 470. Econometrics. 3 Credits.
Econometrics is the application of statistical methods and economic theory to the problem of identifying, estimating, and testing economic models. This course covers concepts and methods used in empirical economic research. Students will learn how to conduct and how to critique empirical studies in economics. Students may not receive credit for both ECON 470 and 570. Honors version available
Requisites: Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
Gen Ed: QI.
Grading status: Letter grade.

ECON 470H. Econometrics. 3 Credits.
Econometrics is the application of statistical methods and economic theory to the problem of identifying, estimating, and testing economic models. This course covers concepts and methods used in empirical economic research. Students will learn how to conduct and how to critique empirical studies in economics. Students may not receive credit for both ECON 470 and 570.
Requisites: Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
Gen Ed: QI.
Grading status: Letter grade.

ECON 480. Labor Economics. 3 Credits.
An introduction to the field of labor economics with emphasis on how the interactions between firms and workers influence wages, employment, unemployment, and inflation. Students may not receive credit for both ECON 380 and ECON 480.
Requisites: Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
Grading status: Letter grade.

ECON 485. Economics of Sports. 3 Credits.
Applies microeconomic techniques to professional and amateur sports through the examination of real-world issues and problems. Employs statistical analysis to test some of the theoretical predictions of the models in the sports literature.
Requisites: Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
Gen Ed: QI.
Grading status: Letter grade.
ECON 486. Gender and Economics. 3 Credits.
This course uses basic microeconomic theory and recent empirical studies to examine the causes and consequences of gender differences in economic outcomes. Topics covered may include family formation and dissolution, fertility decisions, human capital investment, labor force participation, the gender earnings gap, and occupational choice.
**Requisites:** Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
**Gen Ed:** SS, CI.
**Grading status:** Letter grade.

ECON 490. Special Topics. 1-3 Credits.
Topic varies from semester to semester.
**Requisites:** Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
**Repeat rules:** May be repeated for credit; may be repeated in the same term for different topics; 12 total credits. 4 total completions.
**Grading status:** Letter grade.

ECON 493. Practicum in Quantitative Financial Economics. 1 Credit.
This practicum provides students the opportunity to implement and test the models being developed in ECON 525. Students will work with multiple data sources and programming platforms, and engage in a series of practical experiments using live market information.
**Requisites:** Prerequisites, ECON 400, 410, and 425; a grade of C or better in ECON 400 and 410 is required; corequisite, ECON 525.
**Grading status:** Letter grade.

ECON 495. Research Course. 1-3 Credits.
Topic varies from semester to semester. Permission of the instructor.
**Repeat rules:** May be repeated for credit. 6 total credits. 2 total completions.
**Grading status:** Letter grade.

ECON 496. Independent Study. 1-3 Credits.
Permission of the director of undergraduate studies. Readings and research under the supervision of a member of the department.
**Requisites:** Prerequisite, ECON 410; a grade of C or better in ECON 410 is required.
**Repeat rules:** May be repeated for credit. 12 total credits. 4 total completions.
**Grading status:** Letter grade.

ECON 510. Advanced Microeconomic Theory. 3 Credits.
A treatment of topics in microeconomic theory not normally covered in ECON 410. Honors version available
**Requisites:** Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
**Gen Ed:** EE- Mentored Research.
**Grading status:** Letter grade.

ECON 510H. Advanced Microeconomic Theory. 3 Credits.
A treatment of topics in microeconomic theory not normally covered in ECON 410.
**Requisites:** Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
**Gen Ed:** EE- Mentored Research.
**Grading status:** Letter grade.

ECON 511. Advanced Game Theory in Economics. 3 Credits.
Topics in noncooperative and cooperative game theory are covered, along with a selection of applications to economics in areas such as industrial organization, international trade, public finance, and general equilibrium. Honors version available
**Requisites:** Prerequisites, ECON 400 and 410; a grade of C or better is required; permission of the instructor for students lacking the prerequisites.
**Grading status:** Letter grade.

ECON 511H. Advanced Game Theory in Economics. 3 Credits.
Topics in noncooperative and cooperative game theory are covered, along with a selection of applications to economics in areas such as industrial organization, international trade, public finance, and general equilibrium. Honors version available
**Requisites:** Prerequisites, ECON 400 and 410; a grade of C or better is required; permission of the instructor for students lacking the prerequisites.
**Grading status:** Letter grade.

ECON 520. Advanced Macroeconomic Theory. 3 Credits.
This course will emphasize theoretical and empirical topics such as growth, labor search, Phillips curves, stagflation, and optimal government policy. Honors version available
**Requisites:** Prerequisites, ECON 400, 410, and 420; a grade of C or better in ECON 400 and 410 is required.
**Grading status:** Letter grade.

ECON 520H. Advanced Macroeconomic Theory. 3 Credits.
This course will emphasize theoretical and empirical topics such as growth, labor search, Phillips curves, stagflation, and optimal government policy.
**Requisites:** Prerequisites, ECON 400, 410, and 420; a grade of C or better in ECON 400 and 410 is required.
**Grading status:** Letter grade.

ECON 525. Advanced Financial Economics. 3 Credits.
Building upon the foundation developed in ECON 425, students take part in each of the five steps of the asset allocation process (explore, explain, predict, allocate, and protect) by addressing the following questions. How does the modern financial economist acquire, clean, and transform data? What drives asset returns? Can we forecast returns? How do we form a portfolio in the presence of risk? How do we assess and manage risk?
**Requisites:** Prerequisites, ECON 400, 410, and 425; a grade of C or better in ECON 400 and 410 is required; corequisite, ECON 493.
**Gen Ed:** EE- Mentored Research.
**Grading status:** Letter grade.

ECON 540. Advanced Public Finance. 3 Credits.
Selected topics in taxation, public expenditures, and governmental transfer programs.
**Requisites:** Prerequisites, ECON 400, 410, and 340 or 440; a grade of C or better in ECON 400 and 410 is required.
**Grading status:** Letter grade.

ECON 545. Advanced Industrial Organization and Social Control. 3 Credits.
The theory of market failure and its relationship to antitrust and regulatory policy; exploration of empirical literature of industrial organization; current issues in social control.
**Requisites:** Prerequisites, ECON 400, 410, and 445; a grade of C or better in ECON 400 and 410 is required.
**Gen Ed:** EE- Mentored Research.
**Grading status:** Letter grade.
ECON 550. Health Economics. 3 Credits.
Course will equip students with tools used by economists to navigate health-related markets. Topics include the demand for and production of health, the demand for and supply of medical care, and the demand for and supply of health insurance.
Requisites: Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
Gen Ed: SS, EE- Mentored Research, QI.
Grading status: Letter grade.

ECON 551. Economics of Education. 3 Credits.
This course will apply and build on existing economic theory and econometric skills to study education policy. Topics include education production, teacher quality, and investment in education, with a particular emphasis on recent policies aimed at reducing inequality. Students will learn how to conduct and how to critique empirical studies in economics of education.
Requisites: Prerequisites, ECON 400 and 410; Co-requisite, ECON 470 or 570, or permission of instructor.
Gen Ed: CI, EE- Mentored Research.
Grading status: Letter grade.

ECON 560. Advanced International Economics. 3 Credits.
Analysis and interpretation of selected problems and policy issues. Content varies, but attention is given to such topics as trade barriers, trade patterns, floating exchange rates, and international monetary policy.
Requisites: Prerequisites, ECON 400, 410, and 460; a grade of C or better in ECON 400 and 410 is required.
Gen Ed: SS, EE- Mentored Research, GL.
Grading status: Letter grade.

ECON 570. Applied Econometric Analysis. 3 Credits.
Statistical methods in the construction, estimation, testing, and application of linear economic models; computer programs and interpretation of their output in empirical analysis of common economic theories. Students may not receive credit for both ECON 470 and 570. Honors version available
Requisites: Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
Gen Ed: SS, EE- Mentored Research, QI.
Grading status: Letter grade.

ECON 570H. Applied Econometric Analysis. 3 Credits.
Statistical methods in the construction, estimation, testing, and application of linear economic models; computer programs and interpretation of their output in empirical analysis of common economic theories. Students may not receive credit for both ECON 470 and 570.
Requisites: Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
Gen Ed: SS, EE- Mentored Research, QI.
Grading status: Letter grade.

ECON 571. Advanced Econometrics. 3 Credits.
Econometric models and inference methods for program evaluation. Topics include self-selection models, heterogeneous treatment effect models, differences-in-differences methods, and regression discontinuity designs.
Requisites: Prerequisites, ECON 400, 410, and ECON 470 or 570; a grade of C or better in ECON 400 and 410 is required.
Grading status: Letter grade.

ECON 575. Applied Time Series Analysis and Forecasting. 3 Credits.
Econometric techniques for time series data. Topics include ARMA models, forecasting, nonstationarity, conditional heteroskedasticity, and multiple equation models.
Requisites: Prerequisites, ECON 400, 410, 420, and 470; a grade of C or better in ECON 400 and 410 is required; permission of the instructor for students lacking the prerequisites.
Gen Ed: SS, QI.
Grading status: Letter grade.

ECON 580. Advanced Labor Economics. 3 Credits.
A theoretical and empirical analysis of current social problems involving individuals and their jobs. Included are such topics as poverty, discrimination, and working conditions.
Requisites: Prerequisites, ECON 400, 410, and 480; a grade of C or better in ECON 400 and 410 is required.
Grading status: Letter grade.

ECON 586. Economics of the Family. 3 Credits.
Analysis and interpretation of selected problems and policy issues. Content varies, but attention is given to such topics as poverty, poverty, and family policy.
Requisites: Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required; permission of the instructor for students lacking the prerequisites.
Grading status: Letter grade.

ECON 590. Special Topics. 1-3 Credits.
Topic varies from semester to semester.
Requisites: Prerequisites, ECON 400 and 410; a grade of C or better in ECON 400 and 410 is required.
Repeat rules: May be repeated for credit; may be repeated in the same term for different topics; 12 total credits. 4 total completions.
Grading status: Letter grade.

ECON 595. Research Course. 1-3 Credits.
Topic varies from semester to semester.
Repeat rules: May be repeated for credit. 6 total credits. 2 total completions.
Grading status: Letter grade.

ECON 596. Independent Study. 1-3 Credits.
Permission of the director of undergraduate studies. Readings and research under the supervision of a member of the department.
Requisites: Prerequisite, ECON 410; a grade of C or better in ECON 410 is required.
Repeat rules: May be repeated for credit. 12 total credits. 4 total completions.
Grading status: Letter grade.

ECON 691H. Honors Course. 3 Credits.
Permission of the instructor. Readings in economics and beginning of directed research on an honors thesis. Required of all candidates for graduation with honors in economics.
Gen Ed: EE- Mentored Research.
Grading status: Letter grade.

ECON 692H. Honors Course. 3 Credits.
Permission of the instructor. Completion of an honors thesis under the direction of a member of the faculty. Required of all candidates for graduation with honors in economics.
Requisites: Prerequisite, ECON 691H.
Gen Ed: EE- Mentored Research.
Grading status: Letter grade.
ECON 698. Philosophy, Politics, and Economics: Capstone Course. 3 Credits.
Permission of the department. This capstone course advances PHIL 384, focusing on such theoretical and philosophical issues as the analysis of rights or distributive justice and the institutional implications of moral forms.
Requisites: Prerequisite, PHIL 384.
Grading status: Letter grade
Same as: PHIL 698, POLI 698.

Graduate-level Courses
Graduate standing in economics or permission of the director of graduate studies in economics is required for all courses numbered 700 or higher.

ECON 700. Basic Quantitative Techniques. 3 Credits.
Topics from real analysis, linear algebra, calculus, convex analysis, nonlinear programming, dynamic programming.
Grading status: Letter grade.

ECON 701. Analytical Methods for Mathematical Economics. 3 Credits.
Covers mathematical bases for economic analysis. Proofs, real analysis, functional analysis, convexity, fixed points, and modularity.
Grading status: Letter grade.

ECON 710. Advanced Microeconomic Theory I. 3 Credits.
This course offers a graduate level introduction to decision theory, general equilibrium and game theory.
Requisites: Pre- or corequisites, ECON 410 and 700.
Grading status: Letter grade.

ECON 711. Advanced Microeconomic Theory II. 3 Credits.
This course covers basic game theory and information economics. It covers games in normal and extensive form. Topics include repeated games, Bayesian games, dynamic games of incomplete information, mechanism design, and contracting.
Requisites: Prerequisite, ECON 710.
Grading status: Letter grade.

ECON 720. Advanced Macroeconomic Theory I. 3 Credits.
Requisites: Prerequisite, ECON 700 or permission of instructor.
Grading status: Letter grade.

ECON 721. Advanced Macroeconomic Theory II. 3 Credits.
Growth models, general equilibrium approach to monetary theory; input-output; disequilibrium theory; extensions of Keynesian and classical models.
Requisites: Prerequisite, ECON 720.
Grading status: Letter grade.

ECON 770. Introduction to Econometric Theory. 3 Credits.
Grading status: Letter grade.

ECON 771. Econometrics. 3 Credits.
Standard first year course in econometric theory and methods. Topics include least squares and maximum likelihood, asymptotic theory, classic inference, GMM, seemingly unrelated regression, endogeneity bias, and multi-stage least squares.
Requisites: Prerequisite, ECON 770.
Grading status: Letter grade.

ECON 775. Applied Econometric Analysis. 3 Credits.
This course covers concepts and methods used in economic research with an emphasis on empirical applications. Topics include the basic single equation regression model, multiple equation models, discrete and categorical dependent variables, instrumental variables and longitudinal data. Permission of the instructor required.
Grading status: Letter grade.

ECON 799. Experimental. 1-3 Credits.
Varied.
Repeat rules: May be repeated for credit.
Grading status: Letter grade.

ECON 805. Seminar in Teaching Methods in Economic for TAs. 1-3 Credits.
Covers skills in lecturing, encouraging student participation and active learning, writing exams, planning and evaluating courses. Students design and teach a module that includes class discussion and hands-on learning. Targeted to beginning teaching assistants.
Grading status: Letter grade.

ECON 810. Game Theory I. 3 Credits.
Noncooperative games in strategic and extensive form, with perfect and imperfect information. Other topics from: information economics, mechanism design, auctions, repeated games, bargaining, bounded rationality, learning, evolutionary games, cooperative games.
Requisites: Prerequisite, ECON 710 and 711; permission of the instructor for students lacking the prerequisites.
Grading status: Letter grade.

ECON 811. Game Theory II. 3 Credits.
This course is a continuation of ECON 810. Topics covered will be chosen from those listed, but not covered in ECON 810.
Requisites: Prerequisite, ECON 810; permission of the instructor for students lacking the prerequisite.
Grading status: Letter grade.

ECON 820. Monetary Theory. 3 Credits.
This course focuses on econometric testing of macroeconomic theories. Topics will vary from year to year, but will include for example, modern theories of short-run fluctuations: sources of business cycle and the evolution of income, employment, interest rate, and prices, monetary and fiscal policy theories in the presence of real and nominal rigidities.
Grading status: Letter grade.

ECON 821. Topics in Macroeconomics II. 1-3 Credits.
This course covers topics in macroeconomics such as economic growth, human capital, wealth inequality, and trade. The precise topics depend on the instructor.
Grading status: Letter grade.

ECON 840. Advanced Finance: Expenditure. 3 Credits.
Analysis of market failure and reasons for public spending, cost-benefit analysis and program budgeting, public decision making, redistribution and fiscal equity, intergovernmental transfers.
Grading status: Letter grade.
ECON 841. Advanced Public Finance: Revenues. 3 Credits.
Criteria for judging tax structures, incidence and impact of taxation, user charges and debt finance, intergovernmental coordination, and macroeconomic effects.
**Requisites:** Prerequisite, ECON 840; permission of the instructor for students lacking the prerequisites.
**Grading status:** Letter grade.

ECON 845. Advanced Business Organization and Social Control. 3 Credits.
Permission of the instructor. Extensive readings in the literature are required. Emphasis is placed upon the role of economic analysis in dealing with problems in this field.
**Grading status:** Letter grade.

ECON 846. Theoretical Industrial Organization. 3 Credits.
This course covers theoretical industrial organization (IO). Topics typically covered include: price discrimination, product bundling, foreclosure analysis, vertical relations between firms, two-sided markets, dynamic games, and markets with switching costs and network effects.
**Grading status:** Letter grade.

ECON 847. EMPIRICAL INDUSTRIAL ORGANIZATION I. 3 Credits.
This course covers empirical methods in industrial organization (IO), and is typically presented as the first part of a two-course empirical IO sequence. Topics typically covered include: demand estimation, information issues, vertical relations between firms, and productivity.
**Grading status:** Letter grade.

ECON 848. EMPIRICAL INDUSTRIAL ORGANIZATION II. 3 Credits.
This course covers empirical methods in industrial organization (IO), and is typically presented as the second part of a two-course empirical IO sequence. Topics typically covered include: static games of complete and incomplete information, dynamic demand, dynamic games, and auctions.
**Grading status:** Letter grade.

ECON 850. Health Economics. 3 Credits.
Measurement and modeling of the demand for medical care, the demand for and supply of health insurance, and the incorporation of health, medical care, and health insurance in determining both short and long run supply.
**Requisites:** Prerequisites, ECON 710 and 771; permission of the instructor for students lacking the prerequisites.
**Grading status:** Letter grade.

ECON 851. Health Economics for Developing Countries. 3 Credits.
Major topics are: how health and development are related, the demand for health services, cost-benefit and cost-effectiveness analysis, and methods for financing health care in developing, resource-constrained nations.
**Requisites:** Prerequisites, ECON 710 and 771; permission of the instructor for students lacking the prerequisites.
**Grading status:** Letter grade.

ECON 855. Economics and Population. 3 Credits.
Analysis of economic-demographic interrelationships including: population and economic development; population, environmental decay, and zero population growth; models of fertility, migration, and spatial organization; population policy. (Not regularly offered.)
**Requisites:** Prerequisite, graduate standing in economics or permission of the instructor.
**Grading status:** Letter grade.

ECON 860. Theory of International Trade. 3 Credits.
Graduate standing in economics or permission of the instructor. The theory of international values; comparative advantage and the gains from trade; commercial policy.
**Grading status:** Letter grade.

ECON 861. International Monetary Economics. 3 Credits.
Graduate standing in economics or permission of the instructor. Analysis of the international monetary system; exchange rates; the process of adjustment in the balance of payments.
**Grading status:** Letter grade.

ECON 865. Economic Development: Theory and Policy. 3 Credits.
Permission of the instructor. Intensive study of the development processes and problems of the less developed countries, with emphasis on theories of growth and development, internal and external policies, and planning strategies.
**Grading status:** Letter grade.

ECON 866. Selected Topics in Economic Development and Development Planning. 3 Credits.
Examination of various topics in economic progress of the less developed countries, with special emphasis on the role of international issues.
**Requisites:** Prerequisite, ECON 865.
**Grading status:** Letter grade.

ECON 867. Comparative Economic Systems. 3 Credits.
This course focuses on alternative theories of United States capitalism, French indicative planning, Yugoslavian worker-managed market socialism, Soviet central planning, and the Chinese worker-controlled decentralized planning model.
**Grading status:** Letter grade.

ECON 868. Socialist Economic Thought in Historical Perspective. 3 Credits.

ECON 870. Advanced Econometrics. 3 Credits.
ECON 870 constitutes a one-semester treatment of the fundamental theory of econometrics. Topics covered include asymptotic distribution theory, linear and nonlinear models, specification testing techniques, and simultaneous equations models.
**Requisites:** Prerequisites, ECON 770, 771, and MATH 547.
**Grading status:** Letter grade.

ECON 871. Time Series Econometrics. 3 Credits.
Advanced introduction to time series analysis. Covers stationarity, ergodicity, autoregressive and moving average models, unit roots and spurious regression, vector autoregressive models, cointegration, structural breaks/parameter instability and models with time-varying parameters.
**Requisites:** Prerequisites, ECON 770 and ECON 771.
**Grading status:** Letter grade.

ECON 872. Nonlinear Econometric Methods. 3 Credits.
**Requisites:** Prerequisite, ECON 870.
**Grading status:** Letter grade.

ECON 873. Microeconometrics. 3 Credits.
Limited dependent variable models such as binary outcome models, multinomial outcome models, and censored and truncated outcome models. Count data models. Duration models. Panel data analysis.
**Requisites:** Prerequisite, ECON 870.
**Grading status:** Letter grade.
ECON 876. Advanced Topics in Empirical Finance. 3 Credits.
This course will cover a selected list of current empirical research topics in finance and related econometric methods.
Requisites: Prerequisite, ECON 871.
Grading status: Letter grade.

ECON 877. Foundations for Continuous Time Asset Pricing. 3 Credits.
This course introduces students to mathematical foundations and economic interpretation of the main probabilistic tools (stochastic calculus, martingale methods) in continuous time finance.
Requisites: Prerequisites, STOR 634 and 635.
Grading status: Letter grade.

ECON 880. Labor Economics I. 3 Credits.
Analysis of short- and long-run aspects of supply and demand of labor, including empirical analysis of labor force behavior of males, females, blacks, and whites. Microeconomic effects of marriage, fertility, mobility on labor supply, and macroeconomic effects of unemployment on inflation.
Requisites: Prerequisite, ECON 710; permission of the instructor for students lacking the prerequisite.
Grading status: Letter grade.

ECON 881. Labor Economics II. 3 Credits.
This course covers a range of topics in labor economics, with a unifying theme of understanding how economics informs policies for alleviating inequality. Topics include social interactions, education, early childhood intervention, and discrimination.
Grading status: Letter grade.

ECON 882. Topics in Labor Economics-Dynamics and Search. 3 Credits.
The course covers specific topics in labor economics by paying particular attention to dynamic considerations. The focus is on two groups of contributions, organized by methodology. The first group emphasizes search frictions in the labor market; the second uses discrete choice models to treat labor market dynamic. Specific topics covered in the course include: equilibrium unemployment, returns to Schooling, gender differentials, household interaction.
Grading status: Letter grade.

ECON 883. Search Theory. 3 Credits.
Search frictions have long been recognized as a reason for the existence of labor and capital unemployment. It is also a leading explanation for the price and wage dispersion, a standard tool in monetary economics. This course covers a number of widely used models of search frictions, and discusses how they relate to imperfect information about individual or match-specific characteristics and or coordination problems.
Grading status: Letter grade.

ECON 890. Seminar. 1-15 Credits.
Permission of the instructor. Individual research in a special field under direction of a member of the department.
Repeat rules: May be repeated for credit; may be repeated in the same term for different topics.
Grading status: Letter grade.

ECON 892. Research Practicum. 1-3 Credits.
Students complete a pre-approved internship under the direction of a faculty member and the director of graduate studies. A paper summarizing the research work is required.
Repeat rules: May be repeated for credit.
Grading status: Letter grade.

ECON 895. Econometrics and Financial Econometrics. 3 Credits.
Permission of the instructor. Discussion of current research in econometrics and financial econometrics. Oral and written reports on dissertation research. May be repeated for credit.
Repeat rules: May be repeated for credit.
Grading status: Letter grade.

ECON 896. Independent Study. 1-3 Credits.
Varied.
Repeat rules: May be repeated for credit; may be repeated in the same term for different topics.
Grading status: Letter grade.

ECON 899. Experimental. 1-3 Credits.
Varied.
Repeat rules: May be repeated for credit.
Grading status: Letter grade.

ECON 900. Dissertation Workshop: Topics in Economics. 1-3 Credits.
Permission of the instructor. Discussion of current research with topics varying from year to year. Oral and written reports on dissertation research. May be repeated for credit.
Repeat rules: May be repeated for credit.
Grading status: Letter grade.

ECON 910. Dissertation Workshop in Microeconomic Theory. 1-3 Credits.
Permission of the instructor. Discussion of current research in microeconomic theory and industrial organization. Oral and written reports on dissertation research. May be repeated for credit.
Repeat rules: May be repeated for credit.
Grading status: Letter grade.

ECON 920. Dissertation Workshop in Macroeconomics. 1-3 Credits.
Permission of the instructor. Discussion of current research in macroeconomics and monetary economics. Oral and written reports on dissertation research. May be repeated for credit.
Repeat rules: May be repeated for credit.
Grading status: Letter grade.

ECON 958. Seminar in Population. 3 Credits.
Graduate standing in economics required. For advanced population students, this course addresses the newest and most advanced economic demography literature.
Grading status: Letter grade.

ECON 960. Dissertation Workshop in International and Development Economics. 1-3 Credits.
Permission of the instructor. Discussion of current research in international and development economics. Oral and written reports on dissertation research. May be repeated for credit.
Repeat rules: May be repeated for credit.
Grading status: Letter grade.

ECON 966. Seminar in Economic Development. 1-3 Credits.
This course is an introduction to the literature and research methods of economic development and transition economies. May be repeated for credit.
Repeat rules: May be repeated for credit.
Grading status: Letter grade.

ECON 968. Seminar in Soviet Economics. 3 Credits.
Permission of the instructor. Studies of selected problems of the Soviet economy and related aspects of Soviet economic thought. Seminar members are expected to present reports on assigned research topics.
Grading status: Letter grade.

ECON 970. Dissertation Workshop in Econometrics and Financial Econometrics. 1-3 Credits.
Permission of the instructor. Discussion of current research in econometrics and financial econometrics. Oral and written reports on dissertation research. May be repeated for credit.
Repeat rules: May be repeated for credit.
Grading status: Letter grade.
ECON 971. Research in Econometrics. 3 Credits.
The course introduces students to theoretical and applied research topics in econometrics. May be repeated for credit.
Grading status: Letter grade.

ECON 981. Seminar in Labor. 1-3 Credits.
The course introduces students to research topics in labor economics.
May be repeated for credit.
Repeat rules: May be repeated for credit.
Grading status: Letter grade.

ECON 985. Dissertation Workshop in Applied Microeconomics. 1-3 Credits.
Permission of the instructor. Discussion of current research in applied microeconomics. Student presentations of dissertation and other research. Oral and written reports on dissertation research.
Repeat rules: May be repeated for credit.
Grading status: Letter grade.

ECON 990. Special Topics. 1-3 Credits.

ECON 992. Master's (Non-Thesis). 3 Credits.

ECON 994. Doctoral Research and Dissertation. 3 Credits.