

# Department of Economics

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## Why study economics?

Economics offers the tools you need to understand our increasingly interconnected world. With these tools, you can exploit "Big Data" to explore human behavior in numerous economic settings such as labor supply, consumption patterns, health care choices and energy use. You can also examine the overall economy by assessing the links among aggregate output, interest rates, inflation, unemployment levels and international exchange rates.

## Undergraduate Programs

The study of economics offers students insight into some of the most fundamental issues facing societies today. What goods and services should we produce? How should they be produced? How should they be distributed around the world? Economics is outstanding preparation for a career in finance, business, policy analysis, international relations, or any other field that requires rigorous analytic thinking. It also makes an excellent foundation for graduate study in economics, business, law, political science, or public administration.

## Courses for Nonmajors

ECON 104 is recommended for students who want only an introductory course. Students planning to teach social sciences should consult the School of Education. Students who plan to enter the School of Business in the junior year should consult the School of Business. Students who plan to enter the School of Journalism should consult the School of Journalism and Mass Communications.

## Graduate Programs

The Department of Economics offers a master of arts degree, a doctorate degree and, in conjunction with the School of Law, a program in which a student can earn the master of arts and juris doctorate degrees. These programs help students prepare for careers in education, government, and business.

Students who are interested in enrolling in graduate level course work in the Department of Economics without formal admission to a graduate program at KU are encouraged to apply for graduate non-degree seeking student status. See the department's admission (<https://economics.ku.edu/graduate-admission/>) webpage for further details.

## Courses

### **ECON 104. Introductory Economics. 4 Credits. GE3S SBS**

An introduction to modern economics designed primarily for students who do not plan to major in economics. Topics include economic history, the operation of economic institutions, and the formation and execution of economics policies to meet the current problems of the domestic and international economy. Course may be offered in lecture or online format. Prerequisite: MATH 101 or MATH 104, or LA&S 108, or eligibility for MATH 115 or MATH 116 or MATH 125.

### **ECON 105. Introductory Economics, Honors. 4 Credits. GE3S SBS**

An introduction to modern economics designed primarily for students who do not plan to major in economics. Topics include economic history,

the operation of economic institutions, and the formation and execution of economic policies to meet the current problems of the domestic and international economy. Prerequisite: Consent of the Economics Department and MATH 101 or MATH 104, or eligibility for MATH 115 or MATH 116 or MATH 125. Open only to students who have been admitted to the University Honors Program, or by consent of instructor.

### **ECON 110. The Economics of Globalization. 3 Credits. AE42 GLBC**

The course emphasizes the application of economic methods of analysis to the public policy issues that globalization creates. Topics covered may include the following: winners and losers from trade; links between trade and labor markets; links between trade and foreign investment; the international financial system and exchange rates; outsourcing and multinational corporations; international institutions and regional trade agreements.

### **ECON 142. Principles of Microeconomics. 3 Credits. GE12 GE3S SWT SBS**

An analytical introduction to microeconomics. Topics include theory of markets, public policy, international trade, economic efficiency, and equity. Prerequisite: MATH 101 or MATH 103 or MATH 104, or eligibility for MATH 115 or MATH 125 or MATH 126.

### **ECON 143. Principles of Microeconomics, Honors. 3 Credits. GE12 GE3S SBS**

An honors section of ECON 142. An analytical introduction to microeconomics. Topics include theory of markets, public policy, international trade, economic efficiency, and equity. Prerequisite: Consent of the Economics Department and MATH 101 or MATH 103 or MATH 104, or eligibility for MATH 115 or MATH 125 or MATH 126. Open only to students who have been admitted to the University Honors Program, or by consent of instructor.

### **ECON 144. Principles of Macroeconomics. 3 Credits. GE12 GE3S SWT SBS**

An analytical introduction to macroeconomics. Topics include determination of aggregate income, employment, inflation, exchange rates, and the role of fiscal and monetary policy in dealing with unemployment, inflation, and economic growth. Prerequisite: MATH 101 or MATH 103 or MATH 104, or eligibility for MATH 115 or MATH 125 or MATH 126.

### **ECON 145. Principles of Macroeconomics, Honors. 3 Credits. GE12 GE3S SBS**

An honors section of ECON 144. An analytical introduction to macroeconomics. Topics include determination of aggregate income, employment, inflation, exchange rates, and the role of fiscal and monetary policy in dealing with unemployment, inflation, and economic growth. Prerequisite: Consent of the Economics Department and MATH 101 or MATH 103 or MATH 104, or eligibility for MATH 115 or MATH 125 or MATH 126. Open only to students who have been admitted to the University Honors Program, or by consent of instructor.

### **ECON 150. Study Abroad Topics in: \_\_\_\_\_. 1-5 Credits.**

This course is designed for the study of special topics in economics at the freshman/sophomore level. Coursework must be arranged by the office of KU Study Abroad and approved by the Economics Department. Formerly known as ECON 252. This course may be repeated for credit if content varies.

### **ECON 164. Topics in Applied Economics: \_\_\_\_\_. 3 Credits.**

This course will focus on an area of applied economics of current interest. This course cannot be used to fulfill the elective course requirements for the Economics major or the Economics minor.

### **ECON 177. First Year Seminar: \_\_\_\_\_. 3 Credits. GE11 GLBC**

A limited-enrollment, seminar course for first-time freshmen, addressing current issues in Economics. Course is designed to meet the Global Culture goal of the KU Core 34. First-Year Seminar topics are coordinated and approved by the Undergraduate Education Office within Academic Affairs. Prerequisite: Open to Freshmen only (less than 30 hours).

**ECON 199. Data I: Dealing with Data. 3 Credits.**

Data science is an interdisciplinary field that uses scientific methods, processes, algorithms and systems to derive knowledge and insights from data. This course teaches students the core concepts of inference and computing, working with real behavioral, economic, geographic, physical, social, and text data. Students obtain basic statistics training from a computational perspective using simulation to answer questions, explore problems, and delve into social issues surrounding data analysis such as privacy and design. (Same as POLS 199, PSYC 199 and SOC 199.)

**ECON 226. Statistics and Data Analysis for Economics. 3 Credits.**

An introduction to probability and statistical methods for empirical work in economics. Probability, random variables, sampling, descriptive statistics, probability distributions, estimation hypothesis testing, introduction to the regression model. Formerly known as ECON 426. Not open to students with credit in ECON 426. Prerequisite: Any of the following: MATH 101, MATH 104, MATH 115, MATH 116, MATH 125, MATH 126, or MATH 127.

**ECON 305. History of Economic Analysis. 3 Credits.**

The history of intellectual efforts to understand economic phenomena and the impact of these efforts on the social and economic development of the modern world. Formerly known as ECON 505. Not open to students with credit in ECON 505. Prerequisite: ECON 104 or ECON 105 or [(ECON 142 or ECON 143) and (ECON 144 or ECON 145)].

**ECON 315. Income Distribution and Inequality. 3 Credits. AE41 USC**

An analysis of the distribution of income and wealth in the United States and a few other developed countries. The concepts of economic inequality, economic justice, statistical measures of inequality and their applications will be discussed. Various theories of income distribution (e.g., Ricardian, Marxian, neoclassical, and neo-Keynesian) will be covered. Prerequisite: ECON 104 or ECON 105 or [(ECON 142 or ECON 143) and (ECON 144 or ECON 145)].

**ECON 335. Economic History of Europe. 3 Credits.**

An introductory study of European economic history from the Middle Ages to the 1980s. Investigates the sources of economic growth, and the interaction between economic forces and social institutions. Topics covered will include the rise of commerce, the agricultural and industrial revolutions, imperialism, the Great Depression, and European recovery after World War II. Formerly known as ECON 535. Not open to students with credit in ECON 535. (Same as HIST 435.) Prerequisite: ECON 104 or ECON 105 or [(ECON 142 or ECON 143) and (ECON 144 or ECON 145)].

**ECON 336. Economic Issues of the European Union. 3 Credits.**

A survey of the economies of the European Union, with a focus on the economic development of the member states since World War II, and an examination of the various economic issues confronting them today. Formerly known as ECON 536. Not open to students with credit in ECON 536. (Same as EURS 336.) Prerequisite: ECON 104 or ECON 105 or [(ECON 142 or ECON 143) and (ECON 144 or ECON 145)].

**ECON 350. Environmental Economics. 3 Credits.**

This course provides an overview of the theory and empirical practice of economic analysis as it applies to environmental issues. Topics include externalities (a type of market failure), the valuation of nonmarket

goods, the practice of benefit-cost analysis, and the efficiency and cost effectiveness of pollution control policies. Most importantly, the course permits students to perform economic field research, using state-of-the-art techniques in a manner accessible to undergraduate students. Formerly known as ECON 550. Not open to students with credit in ECON 550. (Same as EVRN 351.) Prerequisite: ECON 104 or ECON 105 or ECON 142 or ECON 143.

**ECON 351. Philosophy of Economics. 3 Credits.**

This course surveys the central concepts, issues and debates surrounding the philosophy of economics. The course is divided into three parts. The first is focused on the nature of economic science, whether it can be separated from value judgments, along with the foundational and methodological issues that arise in economics. The second part of the course provides a survey of several central topics in the philosophy of economics including rational choice theory, game theory, social choice theory, behavioral and neuroeconomics. The third part concerns welfare economics (broadly understood), including the aims of welfare economics, the nature of well-being, the possibility of interpersonal utility comparisons, and the aims of economic institutional design. At the end of this course, students should have knowledge and understanding of central methodological and substantive debates regarding the nature of economic theories. This course should also enhance students' ability to think critically and analytically about the nature of economic theories and the key concepts in the philosophy of economics, write clearly and cogently about philosophical issues that arise in economic, incorporate the ideas, theories and techniques that arise in both philosophy and economics to understand social and economic issues. (Same as PHIL 351.) Prerequisite: An introductory course in philosophy or economics, or permission of instructor.

**ECON 352. Study Abroad Topics in: \_\_\_\_\_. 1-5 Credits.**

This course is designed for the study of special topics in economics at the junior/senior level. Coursework must be arranged by the office of KU Study Abroad and approved by the Economics Department. This course counts as an economics elective for the Economics major or Economics minor. This course may be repeated for credit if content varies. Prerequisite: ECON 104/ECON 105 or ECON 142/ECON 143 or ECON 144/ECON 145.

**ECON 360. Economic Systems. 3 Credits.**

Critical analysis of economic theories underlying such economic systems as capitalism, different types of socialism, communism, and fascism. Comparative study of economic planning, production, distribution, price formation, economic institutions, and forms of government in countries under different economic systems. Formerly known as ECON 560. Not open to students with credit in ECON 560. Prerequisite: ECON 104 or ECON 105 or [(ECON 142 or ECON 143) and (ECON 144 or ECON 145)].

**ECON 362. The Russian Economy. 3 Credits.**

An analytical survey of Russian economic development, with emphasis on the structure and operation of the Russian economy and transition issues. Formerly known as ECON 562. Not open to students with credit in ECON 562. Prerequisite: ECON 104 or ECON 105 or [(ECON 142 or ECON 143) and (ECON 144 or ECON 145)].

**ECON 363. Current Economic Issues of East Europe. 3 Credits.**

An institutional and theoretical analysis of the issues arising from the transition from a command economy to a free market-oriented economy. With emphasis on the former Soviet Union, topics will include: assessment of the central planning experience; changes in property rights and their effect on resource allocation; market mechanisms and how they work when market institutions are at the formative stage; and public interest under privatization. Formerly known as ECON 563. Not open to

students with credit in ECON 563. Prerequisite: ECON 104 or ECON 105 or [(ECON 142 or ECON 143) and (ECON 144 or ECON 145)].

**ECON 364. Topics in Applied Economics: \_\_\_\_\_. 3 Credits.**

This course focuses on an area of applied economics of current interest. This course can be used to fulfill the elective course requirements for the Economics major or the Economics minor. This course may be repeated for credit if content varies. Formerly known as ECON 310. Prerequisite: ECON 104/ECON 105 or ECON 142/ECON 143 or ECON 144/ECON 145.

**ECON 382. Economic Development. 3 Credits.**

An introduction to economic growth and development in high and low income countries, problems of development, and development policy. Formerly known as ECON 582. Not open to students with credit in ECON 582. Prerequisite: ECON 104 or ECON 105 or ECON 142 or ECON 143.

**ECON 384. Economic Development of Latin America. 3 Credits.**

This course explores development strategies followed in the countries of Latin America and the Caribbean, and analyzes current debates over development strategy. Topics covered include: debt, structural adjustment, and multilateral lending agencies; trade policy, and regional or hemispheric integration; state intervention in the economy; the role of elites; environmental degradation and sustainable development; land reform and agricultural policy; transnational enterprises and foreign investment; women in work and the household; migration (rural-urban, and international); and grassroots development projects. Formerly known as ECON 584. Not open to students with credit in ECON 584. Prerequisite: ECON 104 or ECON 105 or [(ECON 142 or ECON 143) and (ECON 144 or ECON 145)].

**ECON 386. Economic Issues in China. 3 Credits.**

This course studies the Chinese economy, especially during the post-1979 reform period, and its relationship to the development of the Greater China Circle (China, Hong Kong, and Taiwan). Topics to be covered include economic development during the pre-1979 reform period, economic reform, and its impacts on China, Hong Kong, Taiwan, and lessons from the Chinese economic reforms. Formerly known as ECON 586. Not open to students with credit in ECON 586. Prerequisite: ECON 104 or ECON 105 or [(ECON 142 or ECON 143) and (ECON 144 or ECON 145)].

**ECON 387. Economic Development of Africa. 3 Credits.**

This course studies current economic issues facing African countries. It studies the general characteristics of several African economies and examines the impact of economic development policies, including those of international organizations, on the economies of Africa. Topics include poverty, income inequality, debt, foreign investment policies, trade policies, and government regimes. Formerly known as ECON 587. Not open to students with credit in ECON 587. Prerequisite: ECON 104 or ECON 105 or [(ECON 142 or ECON 143) and (ECON 144 or ECON 145)].

**ECON 399. Data 2: Foundations of Data Science. 3 Credits.**

Data science empowers its users to provide data-drive solutions to problems and questions in the world. This course provides foundational skill and knowledge behind this power. This knowledge and skill includes learning to formulate effective questions to answer with data, computer programming, data management and wrangling, exploratory data analysis and visualization, statistical inference and prediction, data-driven decision making, and communication. (Same as POLS 399 and PSYC 399.) Prerequisite: PSYC 199/POLS 199/ECON 199 or EECS 138; and PSYC 210 or MATH 365 or ECON 226 or POLS 206 or SOC 380 or MATH 101 or MATH 104 or MATH 115 or MATH 121.

**ECON 409. Sports Economics. 3 Credits.**

The course covers the microeconomics of the sports industry. Topics include analysis of teams, leagues, players, incomes, strategies, history, and government policy. Formerly known as ECON 509. Not open to students with credit in ECON 509. Prerequisite: ECON 142 or ECON 143.

**ECON 410. Energy Economics. 3 Credits.**

The application of basic economic concepts and methods to the analysis of energy markets, regulation, and policies. Topics covered include energy trends and projections, economic growth and resource exhaustion, the organization and regulation of fossil fuel industries, nuclear power and non-conventional energy technologies, the world oil market, energy conservation, environmental pollution, and national energy policies in the U.S. and other developed as well as developing countries. Formerly known as ECON 510. Not open to students with credit in ECON 510. Prerequisite: ECON 142 or ECON 143.

**ECON 413. Behavioral Economics. 3 Credits.**

Decisions link our thoughts to our actions and as a result define who we are and who people think we are. This makes decision making a fundamental life skill. But, can we make better decisions? This course will introduce you to the science of decision making that has developed as scholars including biologists, economists, mathematicians, philosophers, psychologists, and others have sought to answer this very question. Over the course of the semester we will examine what we have learned so far such as how people predict and mispredict events, how people make decisions and how their decisions can be quite irrational from one perspective but simultaneously appear quite reasonable, how people bargain and why they sometimes choose to cooperate and other times not, and why negotiating can be so difficult. (Same as PSYC 413.) Prerequisite: PSYC 104 or ECON 142; MATH 101 or MATH 103 or MATH 104, or eligibility for MATH 115 or MATH 125 or MATH 126.

**ECON 419. Health Economics. 3 Credits.**

This course introduces students to the subfield of health economics and exposes students to both theory and applied forms of health economics. The course applies the principles of microeconomics to a market that is characterized by asymmetric information and adverse selection, the healthcare sector. Discussed topics include the health production function, the demand for medical care, the supply of healthcare labor, health insurance, hospitals, medical malpractice, and inequalities within the healthcare system. Prerequisite: ECON 142 or ECON 143.

**ECON 450. Study Abroad Topics in: \_\_\_\_\_. 1-5 Credits.**

This course is designed for the study of special topics in economics at the junior/senior level. Coursework must be arranged by the office of KU Study Abroad and approved by the Economics Department. This course counts as an economics elective for the Economics major or the Economics minor. This course may be repeated for credit if content varies. Prerequisite: ECON 142/ECON 143 or ECON 144/ECON 145.

**ECON 464. Topics in Applied Economics: \_\_\_\_\_. 3 Credits.**

This course focuses on an area of applied economics of current interest. This course can be used to fulfill the elective course requirements for the Economics major or Economics minor. This course may be repeated for credit if content varies. Formerly known as ECON 564. Prerequisite: ECON 142/ECON 143 or ECON 144/ECON 145.

**ECON 490. Game Theory. 3 Credits.**

Analysis of strategic choice problems. Firms, voters, bargainers, animals, sports competitors, and persons in everyday life choose alternative options with the outcomes depending on the choices of one or more other similar decision makers. Strategies of rational choices will be derived and analyzed in economic and other environments. Formerly known as ECON 590. Not open to students with credit in ECON 590. Prerequisite: ECON 142 or ECON 143.

**ECON 497. Research in Economics. 1-3 Credits. CAP**

A directed reading and research course for economics majors. The course involves the preparation of a research paper under the supervision of a faculty member whose area of interest and specialization corresponds with the area of study selected by the student. Note that a maximum of 3 credits total of ECON 597 and ECON 697 can count for the elective requirements of any economics degree. Formerly known as ECON 597. Not open to students with credit in ECON 597. Prerequisite: Completion of ECON 520 or ECON 522 or ECON 526, along with approval of the Director of Undergraduate Studies and selected faculty member.

**ECON 520. Microeconomics. 3 Credits.**

The theory of consumption, production, pricing, and resource allocation. Not open for credit to students with credit in ECON 524. Prerequisite: ECON 142 or ECON 143.

**ECON 522. Macroeconomics. 3 Credits.**

The theory of national income and employment, the analysis of aggregate demand, the general degree of utilization of productive resources, the general level of prices, and related questions of policy. Prerequisite: ECON 144 or ECON 145.

**ECON 523. Macroeconomics Honors. 3 Credits.**

The theory of national income and unemployment, the analysis of aggregate demand, the general degree of utilization of productive resources, the general level of prices, and related questions of policy. Prerequisite: ECON 144 or ECON 145. Open only to students who have been admitted to the University Honors Program, or by consent of instructor.

**ECON 526. Introduction to Econometrics. 3 Credits.**

An introduction to the statistical analysis of economic data and its application to economic inquiry. Includes extensive use of statistical software. Prerequisite: ECON 226 (strongly recommended), MATH 526, or EECS 461.

**ECON 600. Money and Banking. 3 Credits.**

The basic principles of money, credit, and banking and their relation to prices and business fluctuations; a study of commercial and central banking and the problems of credit control. Prerequisite: ECON 522 or ECON 523.

**ECON 604. International Trade. 3 Credits.**

An introduction to the nonmonetary theory of international trade, the cause and pattern of trade, the gains from trade, and the contemporary issues in international economic policy. Prerequisite: ECON 520.

**ECON 605. International Finance. 3 Credits.**

This course surveys theories of exchange rate and balance of payments determination. Included are the elasticity approach, Keynesian models, and the monetary approach. The mechanics of foreign exchange trading, balance of payments accounting, and the working of the international monetary system are also discussed. Prerequisite: ECON 522 or ECON 523.

**ECON 620. Elements of Mathematical Economics. 3 Credits.**

Selected aspects of economic theory with emphasis on those parts where the spirit of mathematical analysis, rather than dexterity, is utilized. The simplification of the subject matter is accomplished by stressing complete treatment of special cases such as a two commodity-two individual world. Prerequisite: ECON 520; MATH 116 or MATH 126.

**ECON 622. Public Finance. 3 Credits.**

A general introduction to the science of public finance. Topics covered include public expenditures, public revenues and public credit, and the shifting and incidence of taxation. Prerequisite: ECON 520.

**ECON 630. Industrial Organization and Antitrust Policy. 3 Credits.**

An examination of the structure, conduct and performance of American industry applying the concepts and techniques of economic analysis. Topics covered include the theories of monopoly, competition and oligopoly, concentration, barriers to entry, price-fixing and other restrictive practices, mergers, technological change, and public regulation. The course will also focus on the historical development of American antitrust law. Prerequisite: ECON 520.

**ECON 640. Labor Economics. 3 Credits.**

Analysis of labor markets and differences in wage rates and incomes. Topics include returns to education and training, labor unions, unemployment, anti-poverty programs, and other government policies influencing the labor market. Not open to students with credit in ECON 641. Prerequisite: ECON 520.

**ECON 641. Labor Economics - Capstone. 3 Credits. AE61 CAP**

This course covers the analysis of labor markets and differences in wage rates and incomes. The course covers various topics, such as returns to education and training, labor unions, unemployment, anti-poverty programs, and other government policies influencing the labor market. This course represents the capstone version of Labor Economics (ECON 640) by exploring a package of economic studies in the primary literature. Not open to students with credit in ECON 640. Prerequisite: ECON 520; ECON 526; MATH 115 or MATH 125; ECON 226 or MATH 526.

**ECON 650. Study Abroad Topics in: \_\_\_\_\_. 1-5 Credits.**

This course is designed for the study of special topics in economics at the junior/senior level. Coursework must be arranged by the office of KU Study Abroad, approved by the Economics Department, and may count as an economics elective for economics majors. This course may be repeated for credit if content varies. Formerly known as ECON 652. Prerequisite: ECON 520 or ECON 522.

**ECON 664. Topics in Economics: \_\_\_\_\_. 3 Credits.**

This course focuses on a particular area of applied economics reflecting the current interests of students. Students can use this course to fulfill the elective course requirement for the Economics major. Repeatable for credit if topic varies. Prerequisite: ECON 520 or ECON 522 or ECON 523 or ECON 526.

**ECON 669. The Economics of Financial Markets. 3 Credits. GE3S**

This course introduces the fundamentals of derivatives pricing, leading to the celebrated Black-Scholes formula—a discovery that led to the Nobel Prize for Robert Merton and Myron Scholes in 1997. Students will derive explicitly the formula for themselves. To achieve this objective, the course introduces and applies a wide array of important concepts drawn from economics, finance, mathematics, and statistics, including no-arbitrage, stochastic calculus, self-financing portfolios, risk-neutral measures, hedging, and the fundamental equations for pricing. Prerequisite: MATH 126; MATH 526.

**ECON 680. Economic Growth. 3 Credits.**

This course studies growth with an emphasis on national evidence and macroeconomic policy issues. Classic and modern growth theories are developed and evaluated on the basis of how well they fit empirical evidence. Theories are developed in which productivity growth results from endogenous changes in technology or in the efficiency with which factors are utilized. The fundamental factors that affect productivity are examined, and they may include government policies, income inequality, geography, climate, resources and other factors. Prerequisite: ECON 522 or ECON 523.

**ECON 696. Research Methods in Economics. 3 Credits. AE61 CAP**

The course effectively considers research methods employed in microeconomic studies, macroeconomic studies, and econometric studies. As important, the course focuses strongly on research methods common to any type of economic study, such as effective literature reviews and technical writing tools. This course distinguishes across theoretical methods, empirical methods, and experimental methods. To the extent relevant, the course explores the links between theoretical methods and the other two methods. The course considers common theoretical methods (e.g., utility maximization), established empirical methods (e.g., difference-in-difference estimation), and standard experimental methods (e.g., blocked random assignment). Prerequisite: ECON 520; ECON 522 or ECON 523; and ECON 526.

**ECON 697. Senior Research Honors. 1-3 Credits. AE61 CAP**

A directed reading and research course for qualifying seniors. Involves preparation of a research paper under the supervision of a faculty member whose area of interest and specialization corresponds with the area of study selected by the student. Note that a maximum of 3 credits total of ECON 497 and ECON 697 can count for the elective requirements of any economics degree. Prerequisite: ECON 696 and approval of the selected faculty member and the Director of Undergraduate Studies.

**ECON 700. Survey of Microeconomics. 3 Credits.**

A comprehensive survey of microeconomics, including the theories of consumption, production, distribution, pricing, and resource allocation. Prerequisite: ECON 520; MATH 116 or MATH 126. Students approved to begin coursework in the Accelerated Master's program are exempt from the ECON 520 prerequisite.

**ECON 701. Survey of Macroeconomics. 3 Credits.**

A comprehensive survey of the modern theory of national income determination with particular emphasis on the foundation of macroeconomic models and their empirical implementation. Prerequisite: ECON 522; MATH 116 or MATH 126. Students approved to begin coursework in the Accelerated Master's program are exempt from the ECON 522 prerequisite.

**ECON 705. Development of Economic Thought. 3 Credits.**

The development of economic thought from the time of the physiocrats through the modern period. Consideration is given to the works of the English Classical school, the school of Vienna, the historical school, the Lausanne school, and Cambridge school. In addition, the development of economic thought in the United States during the period is treated. Prerequisite: ECON 520 and ECON 522.

**ECON 715. Elementary Econometrics. 3 Credits.**

An elementary analysis of the problems of estimation, prediction, and hypothesis testing in the context of general linear, stochastic difference equation and simultaneous equations models. Applications of econometric theory to practical economic problems will be emphasized. Prerequisite: ECON 526 or junior/senior standing as a major in mathematics or masters standing in the Economics Department; MATH 116 or MATH 126.

**ECON 716. Econometric Forecasting. 3 Credits.**

An analysis of econometric forecasting techniques, including time-series models, single-equation regression models, and multiple-equation regression models. The course will examine forecasts of (a) macroeconomic variables, such as interest rates, investment, GNP, and the rate of inflation; and (b) market variables, such as price and quantity. Prerequisite: ECON 526 or ECON 715 or permission of instructor.

**ECON 718. Elementary Financial Econometrics. 3 Credits.**

This course covers a set of econometric tools widely used by academics and practitioners in quantitative areas such as risk management,

investment management, and financial engineering. Financial Econometrics is a young and rapidly evolving discipline that emphasizes the use of advanced econometric/statistical techniques for analyzing price and return data and managing financial risks as well as predicting future price trends. In particular, the course will focus on making the transition from an economic model of asset return behavior to an econometric model using financial data. Topics covered include (1) specification of a financial economic model; (2) estimation of an econometric model for financial data; (3) testing of the assumptions of the econometric model; (4) testing the implications of the econometric model; (5) forecasting from the econometric model. The modeling process requires the use of economic theory, probability models, optimization techniques, and statistical analysis. Students will develop programming skills in R, a popular statistical analysis package in the financial sector. Prerequisite: ECON 715 or ECON 716 or consent of instructor.

**ECON 719. Digital Economics. 3 Credits.**

The digitization of the economy is one of the most critical issues of our time. Digital technologies have transformed businesses and people's lives and will continue to do so in the future. This course studies digital economics and how the digital economy influences markets and society. Students will learn how the internet, mobile communications, the sharing economy, social media, blockchains, and cryptocurrencies impact global businesses. The course has two main parts: 1) Basic theory in digital economics, including network effects, value creation models, digital business models and market modeling; 2) How the digital economy influences privacy, regulations, and strategy. Through a combination of theoretical modeling and empirical evidence, the course will analyze key features of digital markets, including network effects, two-sided markets, search and matching, reputation systems, and the use of data. Attention will also be given to individual markets, such as search engines, e-commerce platforms, and the gig economy. Prerequisite: ECON 526 and ECON 700 or consent of instructor.

**ECON 730. Topics in Industrial Organization. 3 Credits.**

Advanced study of recent research in applied microeconomics and business behavior. Topics include vertical integration, collusion, multi-plant and multi-product operations, regulated industries, tying arrangements, and the empirical links between monopoly power and profitability. Prerequisite: ECON 630.

**ECON 740. Theory of Economic Growth and Development. 3 Credits.**

Advanced study of the theory of economic growth and development. Recent growth models, theory of underdevelopment, programming, policies and plans for development. Prerequisite: ECON 520 and ECON 522.

**ECON 769. Financial Economics. 3 Credits.**

An introduction to the economic analysis of choice under uncertainty and asset pricing theory. Topics include the general equilibrium Arrow-Debreu model of complete markets; capital asset pricing model; stochastic dominance; portfolio frontiers; mutual fund separation theorems; arbitrage pricing theory; valuation of derivative securities. Both single-period models and multi-period models will be discussed. Students should have some background in elementary linear algebra, calculus, and probability theory. Prerequisite: MATH 127; ECON 526 or MATH 526; MATH 290 recommended.

**ECON 770. Economics of the Labor Market. 3 Credits.**

A theoretical and empirical analysis of labor supply and demand, human capital, information and labor mobility, unemployment, discrimination, and union behavior and influence. Prerequisite: ECON 520; MATH 116 or MATH 126.

**ECON 780. Topics in Economics: \_\_\_\_\_. 1-3 Credits.**

Selected topics in economics. Prerequisite: Consent of instructor.

**ECON 790. Game Theory and Applications. 3 Credits.**

This course covers basic game theory and applications. Topics covered include strategic games with complete information, Bayesian games (with incomplete information), extensive games with perfect information, and extensive games with imperfect information. Equilibrium concepts covered include Nash equilibrium, mixed-strategy Nash equilibrium, rationalizability, Bayesian Nash equilibrium, sub-game perfect Nash equilibrium, and sequential equilibrium. Depending on availability of time, additional topics may include strictly competitive games and repeated games. The course may include diverse applications such as in business strategy, auctions, voting, international trade, military conflicts, contracts, regulation, and industrial organization. Prerequisite: MATH 127; ECON 526 or MATH 526; MATH 290 recommended.

**ECON 791. Game Theory and Applications II. 3 Credits.**

This course is a continuation of game theory and applications (ECON 790). Topics may include rationality and common knowledge, multi-stage games and repeated games, coalitional games and the core, and sequential rationality, including possible applications such as signaling, reputation, and information transmission. Additional topics may include, among others, strictly competitive games, auctions, and evolutionary game theory. The course may include diverse applications within and outside economics. Prerequisite: ECON 790.

**ECON 800. Optimization Techniques I. 3 Credits.**

Economic models involving the maximization of a scalar (vector) function subject to equality and inequality constraint where the variables are in a finite dimensional Euclidean space. Characterization of optimal points by way of first and second order derivatives and by way of saddle points. Duality theorems of mathematical programming. Prerequisite: Consent of instructor.

**ECON 801. Microeconomics I. 3 Credits.**

An advanced course in price and distribution theory. Prerequisite: ECON 800 or consent of instructor.

**ECON 802. Microeconomics II. 3 Credits.**

The study of the operation of the economic system taking into account the diversity of goods and services. Primary attention is centered upon the competitive economy. A study is made of the existence, uniqueness, stability, and comparative statics of equilibrium positions. In addition, a study is made of ways of evaluating alternative states of the economy in terms of systems of value judgments. This includes a discussion of the Arrow Impossibility Theorem; the notion of a Pareto-satisfactory process is introduced and the relationship between Pareto-optimal states and competitive equilibrium positions is studied. Prerequisite: ECON 800 and ECON 801.

**ECON 809. Optimization Techniques II. 3 Credits.**

Economic models involving the maximization of an integral (a vector of integrals) subject to differential equality (inequality), integral equality (inequality), and finite equality (inequality) constraints. Characterization of optimal paths by way of first and second derivatives. Existence of optimal paths. Prerequisite: Consent of instructor.

**ECON 810. Macroeconomics I. 3 Credits.**

A survey of basic macroeconomic models, including Classical and Keynesian as well as more recent ones. Topics also cover monetary and fiscal stabilization policies, the role of rational expectations, and basic behavioral equations. Tradeoffs of inflation and unemployment are examined both theoretically and empirically. Prerequisite: ECON 809 or consent of instructor.

**ECON 811. Macroeconomics II. 3 Credits.**

Structure of dynamic models and intertemporal optimization. Monetary and real business cycle theories and long-run economic growth. Microeconomic foundations of macroeconomics, theories of explicit and implicit contracts, and implications of overlapping generations models. Prerequisite: ECON 810.

**ECON 816. Probability and Statistics. 3 Credits.**

Basic tools in probability theory, mathematical statistics, and stochastic optimization designed to provide Ph.D. students training in stochastic models useful for all fields in economics. Prerequisite: Ph.D. standing in economics or consent of instructor.

**ECON 817. Econometrics I. 3 Credits.**

An intensive study of the general linear model and distribution theory associated with the multivariate normal; stochastic difference equation; autocorrelation, errors in variables. Prerequisite: MATH 628.

**ECON 818. Econometrics II. 3 Credits.**

The study of estimation and hypothesis testing within the context of the stochastic simultaneous equations model. Prerequisite: ECON 817.

**ECON 830. Game Theory and Industrial Organization. 3 Credits.**

A comprehensive introduction to game theory and the theory of industrial organization. Basic game theoretic equilibrium concepts will be discussed in the context of static games, games of incomplete information, and dynamic games. These concepts will be applied to the theory of industrial organization. Topics may include mechanism design, market failure, monopoly, imperfect competition and oligopoly, limit pricing, predatory pricing, innovation and technical change, advertising and signaling theory, collusion and coordination, regulation under incomplete information, agency and auditing problems, incentives in hierarchies, job market signaling, insurance markets, nonlinear pricing and monopoly, and bargaining and long term relations. Prerequisite: ECON 801 and 802.

**ECON 854. Advanced Environmental Economic Theory. 3 Credits.**

This course covers advanced theoretical models used in the economic analysis of environmental issues. Students learn to apply the criteria of cost-effectiveness, efficiency, and social welfare to the evaluation of environmental policies. Topics explored in the course include market failures stemming from environmental externalities, emission standards, market-based policy instruments (e.g., taxes, subsidies, cap and trade), voluntary approaches, legal liability, and enforcement. Prerequisite: ECON 801 or consent of instructor.

**ECON 869. Advanced Financial Economics. 3 Credits.**

This course presents an analysis of financial markets and instruments, together with the quantitative tools essential for research in the field. The material will be presented in a discrete time setting and will stress the link between financial economics and equilibrium theory. Topics will include securities pricing in the absence of arbitrage, the theory of risk and utility in the basic portfolio problem, mean variance analysis and the CAPM, the Martingale properties of security prices, restricted participation, asymmetric information, and recent research results. Prerequisite: ECON 802 or consent of instructor.

**ECON 870. Applied Microeconomics. 3 Credits.**

This course introduces students to the data and empirical methods used in the fields of applied economics such as labor economics, public finance, and industrial organization. The course will focus on how to adjust for self-selection and identify causal relationships in applied microeconomic fields. Topics covered include economic data and statistical programming, instrumental variables, difference-in-differences, regression discontinuity, count data, sample selection, treatment effects, and duration models. Attention will be given to the suitability of the methods to the research question under consideration. Each topic will

emphasize the proper application of the methods using the standard textbook treatment as well as assigned papers that examine the basic economic issues, the econometric techniques, and the applications to data. Prerequisite: ECON 817 and ECON 818, or consent of instructor. ECON 915 is recommended.

**ECON 880. Advanced Topics in Economic Theory: \_\_\_\_\_. 1-3 Credits.**

Selected topics in economics covered at an advanced level. Prerequisite: Consent of instructor.

**ECON 899. Master's Thesis. 1-10 Credits.**

Investigation and research of a topic for a Master's thesis. Graded on a satisfactory progress/limited progress/no progress basis.

**ECON 901. Advanced Economic Theory I. 3 Credits.**

Advanced study of current general equilibrium analysis, the mathematical tools involved in such analysis, and some applications to other branches of economic theory. Prerequisite: ECON 802 and ECON 810.

**ECON 910. Economic Theory Seminar-Workshop. 1-3 Credits.**

This seminar-workshop is designed to study advanced research topics in the areas of microeconomic and macroeconomic theory, and also provide assistance in the preparation and development of the dissertations of Ph.D. candidates in these areas of specialization.

**ECON 911. Applied Macroeconomics. 3 Credits.**

This course studies tools for applied macroeconomic research. It uses modern analytical methods to investigate economic theories. Econometric techniques to identify structure from time series data are emphasized. The goal is for each student to be able to use this toolkit to answer important macroeconomic questions. Prerequisite: ECON 810.

**ECON 912. Advanced Macroeconomics. 3 Credits.**

An analysis of economic policy in dynamic economic models. The effects of various policies on the equilibrium, stability, and adjustment paths of the models will be considered. Both open and closed economies will be analyzed. Prerequisite: ECON 810. MATH 320 is recommended.

**ECON 913. Monetary Economics. 3 Credits.**

This course examines how money, monetary policy, and monetary institutions influence the macroeconomy. Modern theories of money demand are presented and critiqued. The function of commercial banks, non-bank financial intermediaries, and central banks in the money supply process is addressed. Interrelationships between the tools, the instruments, the operating procedures, the intermediate targets, and the goals of policy are examined. Additional topics may include the monetary transmission mechanism, the effect of uncertainty on optimal policy decisions, the rules versus discretion debate, the monetary implications of fiscal policy, the term structure of interest rates, the causes and consequences of bank runs and financial panics, and the optimal method of constructing weighted monetary aggregates. Prerequisite: ECON 811 or consent of instructor.

**ECON 914. Computational Methods for Economics. 3 Credits.**

This is a course in the basic tools of numerical analysis that can be used to derive theoretical results from economic models without analytical solutions, to assess the quantitative implications of economic theory and to estimate statistical models. While most examples will come from macroeconomics and some from econometrics, the generality with which the techniques will be presented in this course will make them applicable to a wide range of fields like financial economics, marketing, and microeconomics. To enable the efficient application of numerical tools, this course endeavors to explain not only when and how to use various numerical algorithms but also how and why they work; in other words, the intention of the course is to open up some "black boxes" and provide the students with a versatile toolset. The course will cover numerical

algorithms for large systems of equations, complicated optimization problems, functional approximation, numerical integration and simulation. The course will then focus on solving numerically differential equations and dynamic programming problems that do not have analytical solutions through iterative methods. Subsequent advanced topics will include efficient algorithms for diverse high-dimensional heterogeneous agent DSGE models, Bayesian estimation and inference, non-parametric estimation and network studies. Prerequisite: ECON 810, ECON 811, ECON 817, and ECON 818 or consent of instructor.

**ECON 915. Advanced Econometrics I. 3 Credits.**

The study of selected topics in applied cross-section econometrics for uses mainly in applied microeconomics, public finance, and labor economics. Topics include traditional econometrics of production and demand, latent variable models, panel data studies, probabilistic choice models, censored and truncated models, sample selection, disequilibrium models, duration studies, and semi- and non-parametric models. Prerequisite: ECON 818, or consent of instructor.

**ECON 916. Advanced Econometrics II. 3 Credits.**

A study of selected topics in applied time-series econometrics for use mainly in applied macroeconomics, international finance, and development economics. Topics include empirical applications of ARCH models, VAR models (study of impulse response function and variance decomposition), unit-root cointegration and long memory models. Bayesian unit root analysis, estimation and inference of dynamic general equilibrium models, model calibration and simulation are also possible topics of this course. Prerequisite: ECON 818, or consent of instructor.

**ECON 917. Advanced Econometrics III. 3 Credits.**

A study of structural and nonlinear time series approaches to econometric modeling and inference. The course emphasizes techniques needed to use economic theory in system-wide econometrics. Emphasis is placed on selection of functional form for approximation to theoretical functions and the use of duality theorems for derivation of the resulting econometric systems of equation. Inference with those models will be by nonlinear parametric, semi-parametric, and nonparametric methods. Prerequisite: ECON 818.

**ECON 918. Financial Econometrics. 3 Credits.**

This course is designed to provide a variety of new econometric tools useful to investigate financial data. It discusses how to measure and forecast financial volatility using models such as Stochastic Volatility, multivariate GARCH, and Dynamic Conditional Correlation models. It also covers Dynamic Factor models and State Space models, which can be used in many financial data analyses. The course will be particularly helpful for the students preparing dissertations in the field of finance, macro-finance, monetary economics, international finance, and development economics. It will also benefit the students interested in more practical use of tools in the field such as financial risk management, insurance, and commercial banking. Prerequisite: ECON 818. ECON 916 is recommended.

**ECON 919. Advanced Health Economics. 3 Credits.**

An advanced course in the mathematical and graphical representations and classic and current literature in health economics. Students will be asked to read multiple academic papers per lecture. Topics may include measurement of health (height, infant mortality, life expectancy), health insurance, selection, Medicare, Medicaid, geographic variation, household finances, the Affordable Care Act, productivity of spending, international comparisons, health over the business cycle, hospitals, competition, physicians, nurses, health behaviors (alcohol, smoking, obesity, wellness), HIV/AIDS, pollution, malpractice, reproductive health, children, pharma, opioids, and machine learning. Prerequisite: ECON 802 and ECON 818. ECON 870 recommended.

**ECON 940. Economic Seminar-Workshop in: \_\_\_\_\_. 1-3 Credits.**

This seminar-workshop is designed to study advanced research topics in the specified area of applied economics (public finance, monetary analysis, environment-energy, economic growth and development, urban economics, health care economics, natural resources, labor-manpower, international trade and finance, comparative economic systems, Soviet economics), and also provide assistance in the preparation and development of the dissertations of Ph.D. candidates with dissertations in a specific area of applied economics.

**ECON 950. Special Problems in Economics. 1-3 Credits.**

**ECON 999. Doctoral Dissertation. 1-10 Credits.**

Dissertation research. Graded on a satisfactory progress/limited progress/no progress basis.