

## Economics

Though economics is variously defined, modern-day definitions generally suggest that it is the study of the principles that govern the efficient allocation of resources. One of the greatest of the 19th century economists who did much to uncover these principles suggested a broader definition. Alfred Marshall described economics as "a study of mankind in the ordinary business of life and a part of the study of man." This dual nature of economics, technical and humanistic, is reflected in the fact that at Lehigh the economics major is available to students in the College of Arts and Sciences as well as in the College of Business and Economics.

**Professors.** Shin-Yi Chou, PhD (Duke University); James A. Dearden, PhD (The Pennsylvania State University); Mary E. Deily, PhD (Harvard University); Frank R. Gunter, PhD (Johns Hopkins University); Thomas J. Hyclak, PhD (University of Notre Dame); Judith A. McDonald, PhD (Princeton University); Vincent G. Munley, PhD (State University of NY, Binghamton University); Larry W Taylor, PhD (University of North Carolina Chapel Hill); Robert J. Thornton, PhD (University of Illinois Upper Chicago); Todd A. Watkins, PhD (Harvard University)

**Associate Professors.** Ernest Kong-Wah Lai, PhD (University of Pittsburgh); Chad Meyerhoefer, PhD (Cornell University); Oleksandr Nikolsko Rzhevskyy, PhD (University of Houston University Park); Muzhe Yang, PhD (University of California Berkeley)

**Assistant Professors.** Weijia Dai, PhD (University of Maryland); Alberto Lamadrid, PhD (Cornell University); Irina Panovska, PhD (Washington University); Seth Richards-Shubik, PhD (University of Pennsylvania)

**Professor Of Practice.** Marija Baltrusaitiene, MA (University of Iowa)

**Emeriti.** J. Richard Aronson, PhD (Clark University); Nicholas W. Balabkins, PhD (Rutgers University); Jon T. Innes, PhD (University of Oregon); Arthur E. King, PhD (Ohio State University); John R. Mc Namara, PhD (Rensselaer Polytechnic Institute); Anthony Patrick O'Brien, PhD (University of California Berkeley)

### COLLEGE OF BUSINESS AND ECONOMICS

#### Major in Economics

Students in the College of Business and Economics electing to major in economics must take the college core courses listed in the College of Business and Economics section of this catalog. They must also take ECO 119 and at least 12 credit hours of 200- and 300-level economics courses beyond the core requirements. These courses may be chosen so as to form an area of specialization or to provide a broad exposure to the various aspects of the discipline. In any case, students should consult with the major advisor in forming their programs.

#### Major in Business Economics

The business economics major prepares students for careers as business consultants or analysts by teaching the application of microeconomic theory to the analysis of critical business issues. The emphasis is on rigorous, quantitative business analysis through the use of theoretical and mathematical models and econometric analysis of data. Students electing the major in business economics must take the college core courses, ECO 245, ECO 322, ECO 333, two elective courses from an approved list, and a course involving student research on a problem identified by an external client. Students should consult with the major advisor in forming their program.

#### Minor in International Economics

The minor in International Economics aims to prepare non-economics majors in the CBE, as a complement to their major programs, with a fundamental understanding of international trade, finance and economic development, and to develop skills in applying economic analysis to international economic issues and social problems. This minor is open to any CBE undergraduate student not majoring in economics or business economics.

#### International Economics Minor Requirements

ECO 119	Intermediate Macroeconomic Analysis	3
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ECO 339 or ECO 340	International Trade International Finance	3
Select two of the following (at least one at the 300 level):		6
ECO 203	Microfinance: Financial Inclusion for the Poor	
ECO 209	Comparative Economic Systems	
ECO 303	Economic Development	
ECO 339	International Trade	
ECO 340	International Finance	
ECO 345	Political-Economy of Iraq	

**Total Credits** 12

#### Minor in Public Policy Economics

The minor in Public Policy Economics aims to prepare non-economics majors in the CBE, as a complement to their major programs, with a fundamental understanding of the main economic policy issues and the role of government in markets, and to develop skills in applying economic analysis to the development of public policies and potential solutions to social problems. This minor is open to any CBE undergraduate student not majoring in economics or business economics.

#### PUBLIC POLICY MINOR REQUIREMENTS

ECO 119	Intermediate Macroeconomic Analysis	3
ECO 353	Public Finance: Federal	3
Select two of the following:		6
ECO 235	Labor Economics	
ECO 311	Environmental Economics	
ECO 336	Business and Government	
ECO 354	Public Finance: State and Local	
ECO 365	Business, Government, and Macroeconomic Policy	
ECO 368	Health Economics	
Or approval by Minor Advisor		

**Total Credits** 12

### COLLEGE OF ARTS AND SCIENCES

#### Major in Economics

The B.A. major in economics is designed to prepare students for graduate study in economics or law, and for entry into careers in business, government or service organizations. The requirements for the economics major are:

#### Economic Core

ECO 001	Principles of Economics	4
ECO 119	Intermediate Macroeconomic Analysis	3
ECO 029	Money, Banking, and Financial Markets	3
ECO 045	Statistical Methods	3
ECO 146	Applied Microeconomic Analysis	3

#### Collateral Calculus Courses

Select one of the following:		7-8
MATH 021 & MATH 022	Calculus I and Calculus II <sup>1</sup>	
or		
MATH 081 & MATH 022	Calculus with Business Applications and Calculus II <sup>2</sup>	
or		
MATH 081 & MATH 052	Calculus with Business Applications and Survey of Calculus II	
or		
MATH 051 & MATH 052	Survey of Calculus I and Survey of Calculus II <sup>3</sup>	

**Electives**

Select five courses in economics at the 200- or 300- level. <sup>4</sup> 15

**CBE's Excel competency exam** <sup>5</sup>

**Total Credits** **38-39**

- <sup>1</sup> MATH 021 and MATH 022 are for students considering careers or graduate programs that require a stronger math background.
- <sup>2</sup> Students who take MATH 081 must receive permission of the mathematics department to use MATH 081 as a prerequisite for MATH 022.
- <sup>3</sup> MATH 051 and MATH 052 are terminal math classes for students planning on careers in fields that are primarily non-quantitative.
- <sup>4</sup> Students may count only two 200-level courses toward the completion of the economics major.
- <sup>5</sup> To take economics courses numbered 100 or above, students must pass the CBE's Excel competency exam; contact the CBE Undergraduate Center for more information.

Students are free to select any five economics courses to meet their elective requirements. However, the faculty of the economics department has developed recommended course clusters to meet the differing needs of students. These include course recommendations for those interested in:

- Graduate study in economics
- Careers in consulting and financial services
- International economics and global markets
- Political economy and public policy

Interested students are encouraged to consult with the major advisors in the economics department to select elective courses that match their needs and interests.

**MAJOR IN INTERNATIONAL RELATIONS AND ECONOMICS**

IR-Eco Major (<http://catalog.lehigh.edu/coursesprogramsandcurricula/artsandsciences/jointirecomajor>) (60-61 credits)

**Honors in Economics**

Economics majors who wish to be considered for departmental honors must consult with their major advisor and request such consideration by the beginning of their senior year. The criteria for departmental honors are:

1. Completion of the major program with at least 33 credits of economics and a grade point average in those courses of 3.5 or better.
2. Submission of an acceptable research paper to the Departmental Honors committee. This paper must report on original research conducted by the student. An economics faculty member will direct the honors paper. Students who successfully complete the paper will receive independent study credit, which can be applied to economics major requirements. The committee will notify students of submission deadlines and other requirements for satisfying this criterion.

**Minor in Economics**

This minor is available only to students in the College of Arts and Sciences and in the College of Engineering and Applied Science. Interested students should contact the minor advisor.

A minor in economics consists of 12 credit hours beyond ECO 001. Required courses in the minor are:

ECO 105	Intermediate Microeconomic Analysis	3
or ECO 146	Applied Microeconomic Analysis	
ECO 119	Intermediate Macroeconomic Analysis	3
or ECO 029	Money, Banking, and Financial Markets	
Two elective courses <sup>1</sup>		6

- <sup>1</sup> Elective courses must be chosen from among the 200- and 300-level economics offerings with at least one 300-level elective. ECO 371 does not count towards the minor.

**Courses****ECO 001 Principles of Economics 4 Credits**

A one-semester course in the principles of economics. General topics covered are: supply and demand; pricing and production decisions of firms; the role of government in the economy; the determination of national income; money and banking; monetary and fiscal policy; and government finance.

**Attribute/Distribution:** SS

**ECO 029 Money, Banking, and Financial Markets 3 Credits**

The nature and functions of money. Global money and financial markets. The role of commercial and central banks. Effects of the interest rate, exchange rate, and the money supply on the economy. Examination and evaluation of current and past monetary policies.

**Prerequisites:** ECO 001

**Attribute/Distribution:** SS

**ECO 045 Statistical Methods 3 Credits**

Descriptive statistics, probability and probability distributions, sampling, estimation, hypothesis testing, chi-square tests, simple regression and correlation. Note: CBE students may not take MATH 012 as a replacement for ECO 045.

**ECO 105 Intermediate Microeconomic Analysis 3 Credits**

Determination of prices in terms of the equilibrium of the business enterprise and consumer choice in markets of varying degrees of competition; analysis of market structures; determination of wages, rent, interest and profits. Not available for credit to students who have taken ECO 146.

**Prerequisites:** ECO 001 and (MATH 021 or MATH 051 or MATH 081 or MATH 076)

**Attribute/Distribution:** SS

**ECO 119 Intermediate Macroeconomic Analysis 3 Credits**

Macroeconomic measurement, theory and policy. The use of alternative macroeconomic models to analyze the level of national income, inflation, unemployment, economic growth; the balance of payments, and exchange rate determination.

**Prerequisites:** ECO 001

**Attribute/Distribution:** SS

**ECO 146 Applied Microeconomic Analysis 3 Credits**

The application of economic analysis to managerial and public policy decision-making. Not available for credit to students who have taken ECO 105. Note: MATH 012 does not serve as a pre-requisite for ECO 146.

**Prerequisites:** (ECO 145 or ECO 045 or PSYC 110 or ISE 111 or IE 111 or CEE 012 or MATH 231) and (ECO 001) and (MATH 021 or MATH 031 or MATH 051 or MATH 076 or MATH 097 or MATH 081)

**Attribute/Distribution:** SS

**ECO 201 Federal Reserve Challenge Competition 1-3 Credits**

To prepare for the Federal Reserve Challenge Competition. Course may be repeated for credit. Credits are assigned based on role - 1 credit for 1st time researchers, 2 credits for 2nd time researchers, and 3 credits for speakers. Up to three credits of the course can be counted toward the economics major, but the course cannot count toward the economics minor. Department permission is required for enrollment.

**Repeat Status:** Course may be repeated.

**Prerequisites:** ECO 119

**Can be taken Concurrently:** ECO 119

**ECO 203 Microfinance: Financial Inclusion for the Poor 3 Credits**

Non-technical survey of the global microfinance industry, which provides financial services to the poor on a large scale, mostly in developing nations. Historical origins and industry evolution. Nature and developmental role of microenterprises and informal finance. Methods and technologies used by microfinance institutions (MFIs). Case studies of leading MFIs and the lives of their clients. Policy and regulatory environments. Debates over profiting from the poor, and over health and environmental goals. Conflicting evidence on economic and social impact. Meetings with practitioners.

**Prerequisites:** ECO 001

**Attribute/Distribution:** SS

**ECO 209 Comparative Economic Systems 3 Credits**

An analysis of the micro- and macro-economic, institution and political dimensions of various economic systems, with particular emphasis on former centrally planned economies in their transition to a market orientation.

**Prerequisites:** ECO 001 or ECO 011 or ECO 012

**Attribute/Distribution:** SS

**ECO 211 Introduction to Environmental Economics 3 Credits**

An examination of the interactions between our economic systems and the environment. Pollution as a consequence of human activity within a framework for analyzing the relationships between environmental quality, scarcity of resources and economic growth. How to develop appropriate policies to deal with these issues.

**Attribute/Distribution:** SS

**ECO 235 Labor Economics 3 Credits**

The economic analysis of labor markets, with emphasis on labor supply and demand, wage and employment theory, and the economics of unionism and other labor market institutions.

**Prerequisites:** ECO 001 or (ECO 011 and ECO 012) or (ECO 011 and ECO 022) or (ECO 012 and ECO 021)

**Attribute/Distribution:** SS

**ECO 245 Statistical Methods II 3 Credits**

This course is a continuation of Economics 045, and gives broader coverage of linear regression and the construction of empirical models. Topics include the analysis of variance, simple and multiple regression, index numbers, forecasting, nonparametric methods, and statistical methods for quality control.

**Prerequisites:** MATH 012 or MATH 231 or ECO 145 or ECO 045

**Attribute/Distribution:** ND

**ECO 246 Business Cycles and Forecasting 3 Credits**

A study of short-term business fluctuations, growth, forecasting and stabilization.

**Prerequisites:** (ECO 001 or ECO 011 or ECO 012) and (ECO 145 or MATH 012 or ECO 045 or MATH 231 or SR 111 or PSYC 110) and (ECO 145 or MATH 012 or MATH 231 or ISE 111 or IE 111 or SR 111)

**Attribute/Distribution:** ND

**ECO 247 Sabermetrics 3 Credits**

The class will discuss the development and theory of quantitative analysis in baseball. Students will be introduced to modern sabermetric theory and introduced to various data sets, publications, database skills, and research methods commonly used in the sabermetric industry. Topics will include hitting, pitching, and defensive analysis, player valuation and the free agent market, in-game strategy, and the amateur draft.

**Prerequisites:** ECO 001 and (ECO 045 or PSYC 110 or ISE 111 or CEE 012 or MATH 231 or MATH 012)

**Attribute/Distribution:** SS

**ECO 259 Athletic Complex Design 3 Credits**

This course is for students to participate in cross discipline Integrated Learning Experience (ILE) research projects. The twin purposes of the course are to provide real-world, team-oriented learning experiences and to apply economic analysis in evaluating the costs and benefits of newly proposed, or renovations and expansions of, existing athletic facilities.

**Prerequisites:** ECO 105 or ECO 146

**ECO 273 Community Consulting Practicum 3 Credits**

This course involves teams of students in community-oriented research projects. The twin purposes of the are to provide real-world, team-oriented learning experiences and to provide a resource for local governments and community organizations that would allow them to draw upon the expertise of our students as consultants in analyzing problems and formulating policy.

**Prerequisites:** ECO 001

**ECO 274 Supervised Research 1-3 Credits**

Apprenticeship in ongoing faculty research program. Literature review, experimental design, data collection and analysis, and professional writing under faculty supervision. Consent of faculty sponsor required. Up to three research credits can be used toward the CAS and CBE economics majors, and three credits may be used to satisfy the consulting project requirement of the business economics major. Supervised research credits may not be applied to the economics minor.

**Repeat Status:** Course may be repeated.

**Prerequisites:** ECO 119 or ECO 146 or ECO 245

**Attribute/Distribution:** SS

**ECO 300 Apprentice Teaching 1-3 Credits****ECO 301 Econometric Software 1 Credit**

An opportunity to become proficient in the powerful statistical package, Stata, which which has been widely and heavily used by economic consulting firms and economists from academia and the private and public sectors. Students will learn how to utilize Stata to bridge the gap between source data and final analysis. Working with World Bank data will provide hands-on, practical experience. Upon completion of this course students will be able to manage data to boost their research and analysis skills.

**ECO 303 Economic Development 3 Credits**

Economic development, economic growth and their political environment are discussed in detail. The principal economic development theories are examined. These theories are used to examine a variety of development issues including planning, poverty, rural-urban relationships, physical and human capital accumulation, international trade, and the environment. Emphasis on institutions and development policy.

**Prerequisites:** ECO 105 or ECO 115 or ECO 146

**Attribute/Distribution:** SS

**ECO 311 Environmental Economics 3 Credits**

Resource allocation implications of environmental degradation. Analysis of the benefits and costs associated with alternative pollution control programs and strategies.

**Prerequisites:** ECO 105 or ECO 115 or ECO 146

**Attribute/Distribution:** SS

**ECO 314 Energy Economics 3 Credits**

The economic theory of natural resource allocation over time. Economics of exhaustible and renewable resources. Environmental effects of energy production and consumption. Government regulation of the energy industry. Computer models for energy system forecasting and planning.

**Prerequisites:** ECO 105 or ECO 146

**Attribute/Distribution:** SS

**ECO 315 Industrial Organization 3 Credits**

Structure of American industry. Development of economic models to describe behavior in markets with varying degrees of competition. Technological innovation, relationship between industry concentration and rates of return on capital, role of information and advertising, dynamics of monopoly and oligopoly pricing.

**Prerequisites:** ECO 105 or ECO 146

**Attribute/Distribution:** SS

**ECO 322 Competitor and Market Analysis 3 Credits**

Competitors, partners, and firms and governments strategically interact. This course uses game theory to analyze issues like pricing by competitors, vertical integration and contracting issues in supplier-buyer relationships, collective actions and joint ventures, and research and development programs. Students use both mathematical models and cases to analyze these interactions.

**Prerequisites:** (ECO 105 or ECO 115 or ECO 146) and (ECO 145 or ECO 045 or MATH 012 or MATH 231 or ISE 111 or IE 111 or SR 111) and (MATH 021 or MATH 031 or MATH 051 or MATH 081 or MATH 076)

**Attribute/Distribution:** SS

**ECO 323 Evolution of Business Strategy 3 Credits**

Analyzes how business firms have adapted to changes in technology, relative factor prices, globalization, and the extent of government intervention in the market. Material will be presented through discussion of case studies from the nineteenth and twentieth centuries.

**Prerequisites:** (ECO 001)

**Attribute/Distribution:** SS

**ECO 324 The Economics of the Sports Industry 3 Credits**

This course analyzes the role of basic economic forces in shaping today's sports industry. Topics include: competition in the market for professional franchises; public subsidies for stadiums and arenas; compensation of professional athletes; the NCAA as an economic enterprise; and the impact of athletics on a university's budget.

**Prerequisites:** ECO 105 or ECO 146

**Attribute/Distribution:** SS

**ECO 325 (MKT 325) Consumer Insights through Data Analysis 3 Credits**

Explores marketing analytic approaches aimed to improve the understanding of customer and customer perceptions thereby enhancing the effectiveness of marketing decision making and implementation. Foundational data analysis techniques are examined in such areas as advertising, customer acquisition and retention (customer relationship management), segmentation, customer loyalty, lifetime-value analysis of the customer, pricing, sales force management, sales promotions and new products. The development, implementation, and utilization of quantitative models on customer data are emphasized. Prerequisites as noted below.

**Prerequisites:** MKT 111 and ECO 146

**Attribute/Distribution:** ND

**ECO 327 Real Options and Investment Strategy 3 Credits**

This is an introductory course in financial economics. It focuses on the principles underlying financial decision-making, with applications to stocks, bonds, and real estate. It is intended for students with strong technical backgrounds who are comfortable with mathematical arguments. The course is divided into three main parts: deterministic finance, single-period uncertainty finance, and options theory.

**Prerequisites:** FIN 323

**Attribute/Distribution:** ND

**ECO 328 (ECE 328) Electricity Economics 3 Credits**

The course is intended primarily for students who are interested in an exploration of the electricity market, its operation and the main considerations to implement it, in the wake of a smart grid implementation, with basic college-level calculus.

**Repeat Status:** Course may be repeated.

**Prerequisites:** ECO 001 and (MATH 023 or ECO 146)

**Attribute/Distribution:** ND

**ECO 332 Monetary-Fiscal Policy 3 Credits**

Monetary, credit and fiscal policies of governments and central banks with particular reference to the policies of the United States Treasury and the Federal Reserve System.

**Prerequisites:** ECO 119 or ECO 129 or ECO 029

**Attribute/Distribution:** SS

**ECO 333 The Economics of Business Decisions 3 Credits**

Students analyze business problems using economic logic and techniques like mathematical programming, marginal analysis, and decision making under risk and uncertainty. New topics like asymmetric information and the analysis of organizations are introduced. Case studies are emphasized.

**Prerequisites:** (ECO 105 or ECO 115 or ECO 146) and (ECO 145 or ECO 045 or MATH 012 or MATH 231 or ISE 111 or IE 111 or SR 111) and (MATH 021 or MATH 031 or MATH 051 or MATH 081 or MATH 076)

**Attribute/Distribution:** SS

**ECO 336 Business and Government 3 Credits**

Analysis of government involvement in the private sector. The problems of monopoly, oligopoly, and externalities in production and consumption. Optimum responses to market failure and analysis of the performance of actual government policies.

**Prerequisites:** ECO 105 or ECO 146

**Attribute/Distribution:** SS

**ECO 339 International Trade 3 Credits**

The theory of international trade; the theory of tariffs; United States commercial policies; the impact of growth and development of the world economy.

**Prerequisites:** ECO 105 or ECO 146

**Attribute/Distribution:** SS

**ECO 340 International Finance 3 Credits**

The monetary side of an open economy and the financial transactions that accompany trade in goods and services. Macroeconomic links among participants in the global economy; currency and financial crises illustrate how difficult it is for countries to remain insulated from external shocks. Topics include: balance-of-payments accounting; exchange-rate models; and macroeconomic policies under different exchange-rate regimes and capital-mobility assumptions.

**Prerequisites:** ECO 119

**Attribute/Distribution:** SS

**ECO 342 Economic Development in China 3 Credits**

An examination of the economic, political and social forces at work in the development process in China since 1949. Special emphasis on post-1978 market reforms, the rural-urban divergence, the role of foreign trade and investment, the accumulation of human capital, and the deterioration of the physical environment. Concludes with a detailed discussion of possible futures of the Chinese economy.

**Prerequisites:** ECO 303

**Attribute/Distribution:** SS

**ECO 343 European Economic Integration 3 Credits**

Study of the problems of economic integration throughout Europe, especially in the Post-Cold War era among Western, Central and Eastern European nations.

**Prerequisites:** ECO 209

**Attribute/Distribution:** SS

**ECO 345 Political-Economy of Iraq 3 Credits**

An examination of the economic, political and social forces at work in Iraq with emphasis on the post-2002 period. Major topics include petroleum production and transport, corruption, education and other forms of human capital accumulation in an Islamic state, the agricultural transition, the rural-urban divergence, the economic impact of the ongoing conflict, unemployment and underemployment, poverty and population, the economic and political role of the state owned enterprises, entrepreneurship and the informal economy, traditional banking and micro-finance, and the inconsistencies between current political and economic development policies. concludes with a discussion of the possible futures for the Iraqi economy.

**Prerequisites:** ECO 303 or (ECO 105 and ECO 119)

**ECO 346 Numerical Methods for Business Decisions 3 Credits**

This course provides a connection between textbook economics/finance and the problems of real world business. It emphasizes practical numerical methods rather than mathematical proofs. Problems in finance are emphasized. The course teaches students how to use EXCEL macros and advanced VBA (the industry standard) programming techniques to model and manipulate financial data.

**Prerequisites:** FIN 323

**Attribute/Distribution:** ND

**ECO 353 Public Economics 3 Credits**

A course on the economic analysis of government. Major topics include the theory of public goods, the economics of taxation, the design of tax structures, externalities, and social insurance.

**Prerequisites:** ECO 105 or ECO 115 or ECO 146

**Attribute/Distribution:** SS

**ECO 354 Public Finance: State and Local 3 Credits**

A course dealing with the expenditures and revenues of state and local governments. Major topics include the theory of fiscal federalism, intergovernmental fiscal transfers, the design of state and local tax structures, capital budgeting and debt finance, pension funds, and school finance.

**Prerequisites:** ECO 105 or ECO 115 or ECO 146

**Attribute/Distribution:** SS

**ECO 357 Econometrics 3 Credits**

Problems in construction, evaluation and use of econometric models. Applications based on research and case studies.

**Prerequisites:** (ECO 105 or ECO 115 or ECO 119 or ECO 146 or MATH 012 or MATH 231 or ISE 111 or IE 111 or SR 111) and (ECO 245)

**Attribute/Distribution:** ND

**ECO 358 (ISE 358) Game Theory 3 Credits**

A mathematical analysis of how people interact in strategic situations. Applications include strategic pricing, negotiations, voting, contracts and economic incentives, and environmental issues.

**Prerequisites:** (ECO 105 or ECO 115 or ECO 146) and (MATH 021 or MATH 031 or MATH 051 or MATH 081 or MATH 076)

**Attribute/Distribution:** SS

**ECO 360 Time Series Analysis 3 Credits**

This course provides an introduction to time series analysis as it is applied in macroeconomics and finance. The class will emphasize hands-on implementation of macroeconomic and time series models for macroeconomic, financial, and policy analysis. Topics include macroeconomic data, linear and nonlinear univariate time series models, practical issues with likelihood-based inference in time series models, forecasting, multivariate models, and structural identification in multivariate models.

**Prerequisites:** ECO 245

**ECO 362 Martindale Research Seminar 1-3 Credits**

This course prepares students to undertake research on various topics in business and/or economics. Admission to this course is limited to student associates of the Martindale Center for the Study of Private Enterprise. Consent of the instructor is required. This course does not count towards an Economics major or minor.

**Repeat Status:** Course may be repeated.

**Attribute/Distribution:** ND

**ECO 365 Business, Government, and Macroeconomic Policy 3 Credits**

This course analyzes particular domestic and foreign macroeconomic policy episodes. Through the case study method, the provides both an historical and an international context for understanding current macroeconomic policy issues.

**Prerequisites:** ECO 029 or ECO 119

**Attribute/Distribution:** SS

**ECO 367 Applied Microeconometrics 3 Credits**

An empirical class with concentration in Applied Microeconometrics. Its goal is to give you knowledge (various econometrics methods) and a tool (Stata) to solve real-life problems.

**Prerequisites:** ECO 245 or ECO 357

**ECO 368 Health Economics 3 Credits**

Supply and demand in the health service markets for the U.S. and Canada. Unique features of health care which interfere with competitive market allocation and pricing. Overview of insurance systems and other payment methods.

**Prerequisites:** ECO 145 or ECO 045 or MATH 012 or MATH 231 and (ECO 105 or ECO 146)

**Attribute/Distribution:** SS

**ECO 371 Special Topics in Economics 1-3 Credits**

Study in various fields of economics, designed for the student who has a special interest in a subject not included in the regular course schedule or for the student interested in pursuing a significant supervised research project in economics. Students interested in enrolling in this course must submit a written proposal to a member of the faculty with expertise in the proposed subject area and to the department chair prior to the registration period for the relevant semester. This course may count towards the ECO major only once; it does not count towards the ECO minor.

**Repeat Status:** Course may be repeated.

**Prerequisites:** (ECO 105 or ECO 146 or ECO 119)

**Attribute/Distribution:** ND

**ECO 389 Honors Project 1-6 Credits**

**Repeat Status:** Course may be repeated.

**Attribute/Distribution:** ND

**ECO 401 Basic Statistics for Business and Economics 3 Credits**

Descriptive statistics, probability and probability distributions, estimation, hypothesis testing, correlation and regression, chi-square analysis, and analysis of variance. Computer applications.

**ECO 402 Managerial Economics 3 Credits**

Application of economic and statistical analysis to managerial decision-making. Business and economic forecasting. Empirical estimation of demand, production, and cost functions. Resource allocation and pricing strategies in various market structures. Decisions under risk and uncertainty. Government regulation of business cases.

**Prerequisites:** MATH 021 and (MATH 022 or MATH 096) and ECO 401

**ECO 403 Econometric Software 1 Credit**

An opportunity to become proficient in the powerful statistical package, Stata, which has been widely and heavily used by economic consulting firms and economists from academia and the private and public sectors. Students will learn how to utilize Stata to bridge the gap between source data and final analysis. Working with World Bank data will provide hands-on, practical experience. Upon completion of this course students will be able to manage data to boost their research and analysis skills.

**Repeat Status:** Course may be repeated.

**ECO 404 Applied Microeconometrics 3 Credits**

The purpose of this course is to expose students to econometric techniques frequently used in applied microeconomic research. The course features critical reading of empirical research papers and the implementation of econometric methods on actual data sets.

**ECO 409 Money, Banking and Macroeconomic Analysis 2 Credits**

The role of financial intermediation in the U.S. economy, the process of money creation, impacts of fiscal and/or monetary policy on the goals of macroeconomic policy, inflation and unemployment.

**ECO 412 Mathematical Economics 3 Credits**

Applications of various mathematical techniques in the formation and development of economic concepts and theories. Consent of instructor required.

**ECO 413 Advanced Microeconomics Analysis 3 Credits**

A survey of methods of decision-making at the microeconomic level; price theory and econometric applications.

**Prerequisites:** ECO 402

**ECO 414 Advanced Topics in Microeconomics 3 Credits**

Resource allocation and price determination. Theories of choice of consumers, firms, and resource owners under various market forms.

**Prerequisites:** ECO 413

**ECO 415 Econometrics I 3 Credits**

Computer applications of standard econometric techniques using regression analysis in a single-equation context. Discussion of problems of multicollinearity, heteroscedasticity and autocorrelation. An introduction to simultaneous equation models, identification and estimation problems.

**Prerequisites:** ECO 401

**ECO 416 Econometrics II 3 Credits**

Mathematical and statistical specification of economic models. Statistical estimation and tests of parameters in single and multiple equation models. Prediction and tests of structural change.

**Prerequisites:** ECO 415

**ECO 417 Advanced Macroeconomic Analysis 3 Credits**

Macroeconomic theory and policy. Emphasis on theoretical models and policy implications.

**ECO 418 Advanced Topics in Macroeconomics 3 Credits**

Models of employment, income and growth in monetary economies. Policies for economic stability and growth.

**Prerequisites:** ECO 417

**ECO 423 Real Options 3 Credits**

This is an introductory graduate level course in financial economics. It is intended for students with strong technical backgrounds who are comfortable with mathematical arguments. The course is divided into three major parts: deterministic finance, single-period uncertainty finance, and options theory and its applications.

**Prerequisites:** GBUS 420

**ECO 425 Cost-Benefit Analysis 3 Credits**

Theory and methods of cost-benefit analysis; efficiency and equity as criteria in program evaluation; proper measurement of market and non-market costs and benefits; consideration of risk, uncertainty, appropriate discounting techniques, and distributional consequences; applications to the evaluation of health care policies and therapies.

**Prerequisites:** ECO 402 and (ECO 357 or ECO 415)

**ECO 427 Statistical Analysis for Management 2 Credits**

Descriptive statistical measures, probability and probability distributions, statistical inference (estimation and hypothesis testing), correlation and regression. EXCEL will be used for statistical computing.

**ECO 429 Monetary Theory 3 Credits**

The role of money in the economy from theoretical and empirical perspectives. The influence of money and prices, interest rates, output, and employment.

**ECO 430 Public Finance 3 Credits**

The economics of public spending and taxation; principles of government debt management; theories of budgeting and cost-benefit analysis and public choice.

**ECO 440 Labor Economics I 3 Credits**

The economics of labor markets and various labor-market institutions with emphasis on current theoretical and empirical research. Topics include labor supply and demand, human capital, the structure of labor markets, labor market regulation, information and job search, labor mobility, unionism, and labor market discrimination.

**Prerequisites:** ECO 401 and ECO 402

**ECO 441 Labor Economics II 3 Credits**

An examination of empirical research in labor economics, focusing on topics such as human resource management and internal labor market outcomes, wage and income inequality and poverty, unemployment, and other issues current in the literature.

**Prerequisites:** ECO 402 and ECO 415

**ECO 447 Economic Analysis of Market Competition 3 Credits**

Mathematical models based on game theory and industrial organization. Cases are used to analyze the strategic interaction of firms and governments as competitors and partners.

**Prerequisites:** ECO 402

**ECO 448 Business Economics 3 Credits**

Applications of economic analysis to business decision-making; technology in economic systems; resource allocation and pricing strategies in various market structures; decisions under risk and uncertainty; and government regulation and support of business and innovation.

**ECO 454 Economics of Environmental Management 3 Credits**

Economic theory of natural resources. Optimal policies for the development of renewable and nonrenewable resources and environmental quality.

**Prerequisites:** ECO 402

**ECO 455 Health Economics I 3 Credits**

Economic theory and empirical analysis of health production, the demand for health services, and health insurance. Implications for the current institutional structure of health care and health delivery systems will also be discussed. Additional topics and extensions will be selected based on developments in the literature.

**Prerequisites:** ECO 402 and ECO 415

**ECO 456 Industrial Organization 3 Credits**

The goal of the course is to review theoretical and empirical attempts by economists to understand market structures lying between the extremes of perfect competition and monopoly. The course will focus first on describing the current U.S. industrial structure and reviewing models of imperfect competition. The course then shifts to a closer study of individual firm behavior. The final segment of the course is an overview of two significant relationships between government and industry caused by the existence of imperfect.

**Prerequisites:** ECO 415 and ECO 447

**ECO 457 Bio-Pharmaceutical Economics 3 Credits**

Characteristics of the market for pharmaceuticals; barriers to entry, competition and innovation; pricing and regulation; physician prescribing behavior; commercialization and financing of biotech startups; international comparisons of public policy.

**Prerequisites:** ECO 401 and ECO 402

**ECO 460 Time Series Analysis 3 Credits**

Classical decomposition of time series, trend analysis, exponential smoothing, spectral analysis and Box-Jenkins autoregressive and moving average methods.

**ECO 461 Forecasting 3 Credits**

Methods of economic and business forecasting.

**ECO 463 Topics in Game Theory 3 Credits**

A mathematical analysis of how people interact in strategic situations. Topics include normal-form and extensive-form representations of games, various types of equilibrium requirements, the existence and characterization of equilibria, and mechanism design. The analysis is applied to micro-economic problems including industrial organization, inter-national trade, and finance. Must have completed two semesters of calculus.

**Prerequisites:** ECO 412 and ECO 413

**ECO 464 Applied Econometrics I 3 Credits**

This course focuses on the identification of causal relationships using cross-sectional and panel data. The objectives are to 1) familiarize students with identification assumptions for causal inference; and 2) enable students to select appropriate econometric tools for empirical economic problems and policy evaluation. Topics include robust inference and bootstrap; instrumental variables and generalized method of moments (GMM); quantile and nonparametric regression methods; treatment effect analysis, and models for discrete choices, panel data, and social interactions.

**Prerequisites:** ECO 416

**ECO 465 Applied Econometrics II 3 Credits**

Econometric analysis of skewed and truncated distributions, discrete outcomes, and missing or incomplete data. The first part of this course will involve the functional specification and testing of appropriate estimators in these situations, while the second part of the course will focus on conducting causal inference using nonlinear models in the presence of unobserved heterogeneity. Emphasis will be given to common applications in health and labor economics.

**Prerequisites:** ECO 416

**ECO 466 Health Economics II 3 Credits**

Selected topics in the literature on health economics with an emphasis on the application and evaluation of econometric techniques and identification strategies. Both demand and supply side issues will be addressed. Examples of the former include the demand for health, health insurance and health care services, while examples of the latter include the regulation of supplier behavior and industrial organization issues.

**Prerequisites:** ECO 402 and ECO 416

**ECO 472 International Trade Theory 3 Credits**

Theories of comparative advantage, factor price equalization, trade and welfare, tariffs, trade and factor movements.

**Prerequisites:** ECO 413

**ECO 473 International Monetary Economics 3 Credits**

Theory of the balance of payments, the microeconomics of international finance, various approaches to balance-of-payments adjustments, theories of foreign exchange-rate determination, and macroeconomic policy under fixed and flexible exchange rates.

**Prerequisites:** ECO 417

**ECO 490 Master's Thesis 0-6 Credits****ECO 492 Special Topics in Economics 1-3 Credits**

Extended study of an approved topic not covered in scheduled courses.

**Repeat Status:** Course may be repeated.

**ECO 493 Doctoral Pre-Dissertation Research Project - Independent Study 1-9 Credits**

Independent study on a topic that is being pursued to fulfill the third year paper requirement, and has been approved by the student's interim advisor.

**ECO 499 Dissertation 1-15 Credits**

**Repeat Status:** Course may be repeated.