Graduate Economics (ECG)

ECG 505 Applied Microeconomic Analysis (3 credit hours)
Prerequisite: EC 301 and MA 121
Typically offered in Fall only

ECG 506 Applied Macroeconomic Analysis (3 credit hours)
Applied course in aggregate economics. Analysis of aggregate economic fluctuations and stabilization policy; inflation and disinflation; the Federal budget and international balance of trade; and economic growth. Capital markets, monetary and fiscal policy, banking system, foreign exchange markets and their effects on business conditions. Development of standard macroeconomic model in context of specific applications.
Prerequisite: EC 302 and MA 121
Typically offered in Spring only

ECG 512 Law and Economics (3 credit hours)
Economic analysis of sources and effects of law, including common law, statutory law and regulation. Property rights and contracts, liability rules, crime and punishment, statutory enactment, bureaucratic behavior and institutional reform.
Prerequisite: EC(ARE) 301 or EC(ARE) 401
Typically offered in Spring only

ECG 515 Environmental and Resource Policy (3 credit hours)
Application of price theory and benefit-cost analysis to public decisions related to resources and environment. Emphasis on evaluation of water supply and recreation investments, water quality management alternatives, public-sector pricing, common property resources and optimum management of forest and energy resources.
Prerequisite: EC(ARE) 301 or 401
Typically offered in Spring only

ECG 528/FIM 528/MA 528 Options and Derivatives Pricing (3 credit hours)
The course covers (i) structure and operation of derivative markets, (ii) valuation of derivatives, (iii) hedging of derivatives, and (iv) applications of derivatives in areas of risk management and financial engineering. Models and pricing techniques include Black-Scholes model, binomial trees, Monte-Carlo simulation. Specific topics include simple no-arbitrage pricing relations for futures/forward contracts; put-call parity relationship; delta, gamma, and vega hedging; implied volatility and statistical properties; dynamic hedging strategies; interest-rate risk, pricing of fixed-income product; credit risk, pricing of defaultable securities.
Prerequisites: MA 341 and MA 405 and MA 421
Typically offered in Fall only

ECG 530 Topics in Labor Economics (3 credit hours)
This course covers topics in labor economics including labor supply, labor demand, human capital, household production, discrimination, and immigration. The course textbook will be supplemented with readings from academic research papers. Students will learn how empirical research evaluates the predictions of economic theory and the impact of public policy. Students will gain an understanding of how to read and critique empirical research by applying the theory and measurement techniques developed by economists.
Prerequisites: ECG 505 and ECG 561
Typically offered in Spring only

ECG 537 Health Economics (3 credit hours)
Microeconomic analysis of public and private policy issues concerning health care financing and delivery in United States including: choice under conditions of asymmetric information; health insurance; performance of physician, hospital, long-term care and pharmaceutical markets.
Prerequisite: EC(ARE) 401 or ECG 700
Typically offered in Fall only

ECG 540 Economic Development (3 credit hours)
Examination of problems encountered in promoting regional and national economic development. Consideration given to structural changes required for raising standards of living. Some basic principles of economics applied to suggest ways of achieving development goals. Planning strategies, policies and external assistance.
Prerequisite: EC(ARE) 301 or 401
Typically offered in Spring only

ECG 548 International Economics (3 credit hours)
This course covers the determinants of international trade, migration, and investment and their connection with economic growth. It also covers macro/monetary issues, including exchange rates, financial markets and monetary-fiscal policy in open economies.
Prerequisite: EC 301
Typically offered in Spring only

ECG 561/ST 561 Applied Econometrics I (3 credit hours)
Introduction and application of econometrics methods for analyzing cross-sectional data in economics, and other social science disciplines, such as OLS, IV regressions, and simultaneous equations models. Students should have had a statistical methods course at the 300 level or above as well as Calculus I and II.
Typically offered in Fall only

ECG 562 Applied Econometrics II (3 credit hours)
This course is a continuation of Applied Econometrics I (ECG 561). After a review of probability and statistics, and simple and multiple regression models, we explore the following topics: regression using panel (longitudinal) data, instrumental variables regression, regression with a binary dependent variable, prediction with many regressors and "Big Data" methods, and time series regression. The emphasis is on recognizing the conditions in which it is appropriate to apply the various techniques, formulating a relevant model, estimating the model and interpreting the results. This course will also provide the students practical experience in applied econometrics using STATA.
P: ECG 561
Typically offered in Spring only
**ECG 563 Applied Microeconometrics** (3 credit hours)
This course will survey econometric methods for the analysis of panel and limited dependent variable data. Both the theoretical foundation and empirical application of methods will be covered. Topics include fixed and random effects, program evaluation, censored, truncated, discrete choice and count data models. Although not required, ECG 561, ST 511 or ST 512 is encouraged prior to taking this class.

_Typically offered in Fall only_

**ECG 580 Writing in Economics** (3 credit hours)
Developing, writing and presenting economic analyses of empirical issues chosen by each student.
Corequisite: ECG 700 and ECG 703 and ECG 561
_Typically offered in Fall only_

**ECG 590 Special Economics Topics** (1-6 credit hours)
Examination of current problems on a lecture-discussion basis. Course content varies as changing conditions require new approaches to deal with emerging problems.
_Typically offered in Fall, Spring, and Summer_

**ECG 630 Independent Study** (1-3 credit hours)
_Typically offered in Fall, Spring, and Summer_

**ECG 685 Master's Supervised Teaching** (1-3 credit hours)
Teaching experience under the mentorship of faculty who assist the student in planning for the teaching assignment, observe and provide feedback to the student during the teaching assignment, and evaluate the student upon completion of the assignment.
Prerequisite: Master's student
_Typically offered in Fall and Spring_

**ECG 690 Master's Examination** (1-9 credit hours)
For students in non thesis master's programs who have completed all other requirements of the degree except preparing for and taking the final master's exam.
Prerequisite: Master's student
_Typically offered in Fall, Spring, and Summer_

**ECG 695 Master's Thesis Research** (1-9 credit hours)
Prerequisite: ECG 700, MA 231
_Typically offered in Fall only_

**ECG 701 Microeconomics I** (3 credit hours)
Prerequisite: ECG 700, MA 231
_Typically offered in Fall only_

**ECG 702 Microeconomics II** (3 credit hours)
Prerequisite: ECG 701
_Typically offered in Spring only_

**ECG 703 Fundamentals of Macroeconomics** (3 credit hours)
Fundamental topics in macroeconomics, including consumption, investment, government purchases, taxation, government debt, output supply, money and inflation, unemployment, elementary economic growth. Emphasis is on the microeconomic foundations of macroeconomics. Economic intuition is stressed.
Prerequisite: EC(ARE) 301,EC 302,BUS(ST)350,MA 131
_Typically offered in Spring only_

**ECG 704 Macroeconomics I** (3 credit hours)
Rigorous examination of basic macroeconomic theory, including consumption, investment, government purchases, taxation, government debt, output supply, money and inflation, unemployment, elementary economic growth. Emphasis is on the microeconomic foundations of macroeconomics. Economic intuition is stressed. The level of mathematical rigor is high.
Prerequisite: ECG 561, ECG 703, MA 242
_Typically offered in Fall only_

**ECG 705 Macroeconomics II** (3 credit hours)
Continuation of ECG 704. Topics include, but are not limited to, money demand and supply; money and growth; inflation; term structure of interest rates; money and fluctuations, including real and New Keynesian models; theories of unemployment; conduct of policy and problems of time consistency; asset pricing; introduction to open economy models.
Prerequisite: ECG 704
_Typically offered in Spring only_

**ECG 706 Industrial Organization** (3 credit hours)
Survey of microeconomic literature on industrial organization: internal structure of the firm, number and sizes of firms in an industry, pricing and output behavior of firms. Public policy, including antitrust laws, patent and copyright laws, and government regulation of industry.
Prerequisite: ECG 700
_Typically offered in Fall only_
ECG 707  Topics In Industrial Organization  (3 credit hours)  
Advanced study of selected topics such as oligopoly theory, empirical models of industry, principal-agent contracts, economic theories of firm organization, antitrust issues, economic theories of regulation and economics of property rights.

Prerequisite: ECG 700
Typically offered in Fall only

ECG 708  Advanced Microeconomic Theory  (3 credit hours)  
Survey of literature on game theory focusing on applications to numerous areas of economics. Course will cover the classic literature on auctions, matching theory and non-cooperative game theory. Special focus on applying these theoretical results to practical problems of market design.

Prerequisite: ECG 702
Typically offered in Fall only

ECG 709  Behavioral and Experimental Economics  (3 credit hours)  
Survey of literature on behavioral and experimental economics from a broad perspective, with coverage of numerous fields of economics, including both laboratory and field experiments. Methodology of experimental economics and design of laboratory and field experiments will be covered.

Prerequisite: ECG 702
Typically offered in Fall only

ECG 710  Economic Growth and Development  (3 credit hours)  
Survey of literature on economic growth and development with theoretical tools and empirical techniques necessary for understanding the dynamic framework. Discussions of causes of economic growth, possible policies and approaches to nonmarket valuation. Analysis of resource use over time using control theory for both renewable and nonrenewable resources.

Prerequisite: ECG 700
Typically offered in Fall only

ECG 715  Environmental and Resource Economics  (3 credit hours)  
Theoretical tools and empirical techniques necessary for understanding of resource and environmental economics, developed in both static and dynamic framework. Discussions of causes of environmental problems, possible policies and approaches to nonmarket valuation. Analysis of resource use over time using control theory for both renewable and exhaustible resources.

Prerequisite: ECG 700
Typically offered in Fall only

ECG 716  Topics In Environmental and Resource Economics  (3 credit hours)  
Advanced study of selected topics in environmental and resource economics. Topics vary with interests of instructor and students.

Prerequisite: ECG 715
Typically offered in Spring only

ECG 730  Labor Economics  (3 credit hours)  
Application of microeconomic theory and econometric methods to labor market behavior in both static and dynamic contexts. Labor demand analysis, labor force participation, hours of work, household production, human capital, distribution of earnings, information and search, and mobility.

Prerequisite: ECG 700 and one of the following: ECG(ST) 561, ST 422, ST 512, ST 708
Typically offered in Fall only

ECG 739  Empirical Methods for Development Economics and Applied Microeconomics  (3 credit hours)  
This course will provide an in-depth study of the application of the core tools of causal inference and microeconometrics to answer questions in development microeconomics. The class will largely consist of two activities: (1) close reading and guided discussion of seminal and recent papers and (2) the analysis of real data to estimate causal relationships. While the particular applications we study will come largely from development economics, the course is intended to be useful to students in diverse areas of applied micro.

Prerequisite: ECG 751 and ECG 753
Typically offered in Spring only

ECG 741  Agricultural Production and Supply  (3 credit hours)  
Analysis of behavior of individual households and of consumers in aggregate with respect to consumption of agricultural products; impact of these decisions on demand for agricultural resources, competition among agricultural regions and for markets; and interdependence between agriculture and other sectors of the economy.

Prerequisite: ECG 700
Typically offered in Fall only

ECG 742  Consumption, Demand and Market Interdependency  (3 credit hours)  
Analysis of behavior of individual households and of consumers in aggregate with respect to consumption of agricultural products; and impact of these decisions on demand for agricultural resources, competition among agricultural regions and for markets; and interdependence between agriculture and other sectors of the economy.

Prerequisite: ECG 700
Typically offered in Fall only

ECG 744  Farm Economics  (3 credit hours)  
Application of microeconomic theory and econometric methods to labor market behavior in both static and dynamic contexts. Labor demand analysis, labor force participation, hours of work, household production, human capital, distribution of earnings, information and search, and mobility.

Prerequisite: ECG 700 and one of the following: ECG(ST) 561, ST 422, ST 512, ST 708
Typically offered in Fall only

ECG 749  Monetary Aspects Of International Trade  (3 credit hours)  
Macroeconomic problems of an open economy including balance of payments adjustment mechanism, alternative exchange rate systems, external effects of monetary and fiscal policy, optimum currency areas and international monetary reform.

Prerequisite: ECG 703
Typically offered in Fall only
ECG 750/ST 750 Introduction to Econometric Methods (3 credit hours)
Introduction to principles of estimation of linear regression models, such as ordinary least squares and generalized least squares. Extensions to time series and panel data. Consideration of endogeneity and instrumental variables estimation. Limited dependent variable and sample selection models. Attention to implementation of econometric methods using a statistical package and microeconomic and macroeconomic data sets.
Prerequisite: ST 421; Corequisite: ST 422
Typically offered in Spring only

ECG 751/ST 751 Econometric Methods (3 credit hours)
Introduction to important econometric methods of estimation such as Least Squares, instrumental Variables, Maximum Likelihood, and Generalized Method of Moments and their application to the estimation of linear models for cross-sectional economic data. Discussion of important concepts in the asymptotic statistical analysis of vector process with application to the inference procedures based on the aforementioned estimation methods.
Prerequisite: ST 421, ST 422
Typically offered in Fall only

ECG 752/ST 752 Time Series Econometrics (3 credit hours)
The characteristics of macroeconomic and financial time series data. Discussion of stationarity and non-stationarity as they relate to economic time series. Linear models for stationary economic time series: autoregressive moving average (ARMA) models; vector autoregressive (VAR) models. Linear models for nonstationary data: deterministic and stochastic trends; cointegration. Methods for capturing volatility of financial time series such as autoregressive conditional heteroscedasticity (ARCH) models. Generalized Method of Moments estimation of nonlinear dynamic models.
Prerequisite: ECG(ST) 751
Typically offered in Spring only

ECG 753/ST 753 Microeconometrics (3 credit hours)
The characteristics of microeconomic data. Limited dependent variable models for cross-sectional microeconomic data: logit/probit models; tobit models; methods for accounting for sample selection; count data models; duration analysis; non-parametric methods. Panel data models: balanced and unbalanced panels; fixed and random effects; dynamic panel data models; limited dependent variables and panel data analysis.
Prerequisite: ECG 751
Typically offered in Spring only

ECG 765 Mathematical Methods For Economics (3 credit hours)
Linear algebra and matrices, optimization with equality and inequality constraints, comparative statistics, differential and difference equations, intertemporal optimization. Economic applications to utility and profit maximization, national income determination, economic growth, business cycles.
Prerequisite: MA 231, introductory course in linear algebra
Typically offered in Fall only

ECG 766 Computational Methods in Economics and Finance (3 credit hours)
Fundamental methods for formulating and solving economic models numerically will be developed. Emphasis on defining the mathematical structure of problems and practical computer methods for obtaining model solutions. Major topics include solution of systems of equations, complementarity relationships and optimization. Finite and infinite dimensional problems will be addressed, the latter through the use of finite dimensional approximation techniques. Particular emphasis placed on solving dynamic asset pricing, optimization and equilibrium problems.
Prerequisite: (MA 305 or MA 405) and MA 341 and EC 301 and EC 302 and (CSC 112 or 114) or equivalents.
Typically offered in Fall only

ECG 784 Advanced Macroeconomics (3 credit hours)
Advanced study of macro-economics. Emphasis on business cycles and behavior of real variables. Real, incomplete information and disequilibrium theories of the business cycle; rational expectations; contract theory and indexation; investment; and effects of government expenditure, taxes and debt.
Prerequisite: ECG 704
Typically offered in Spring only

ECG 785 Monetary Economics (3 credit hours)
Field course for students desiring a specialization in monetary economics or macroeconomics. Survey of current topics in monetary theory and policy.
Prerequisite: ECG 705
Typically offered in Spring only

ECG 790 Advanced Special Topics (1-6 credit hours)
Typically offered in Fall and Spring

ECG 830 Independent Study (1-3 credit hours)
Typically offered in Fall and Spring

ECG 885 Advanced Topics in Microeconomics (1-3 credit hours)
Typically offered in Fall and Summer

ECG 886 Doctoral Supervised Teaching (1-3 credit hours)
Teaching experience under the mentorship of faculty who assist the student in planning for the teaching assignment, observe and provide feedback to the student during the teaching assignment, and evaluate the student upon completion of the assignment.
Prerequisite: Doctoral student
Typically offered in Fall and Spring

ECG 890 Doctoral Preliminary Examination (1-9 credit hours)
For students who are preparing for and taking written and/or oral preliminary exams.
Prerequisite: Doctoral student
Typically offered in Fall and Spring

ECG 895 Doctoral Dissertation Research (1-9 credit hours)
Dissertation research.
Prerequisite: Doctoral student
Typically offered in Fall, Spring, and Summer