Crop and Soil Sciences—CSS

850 Soil Chemistry
Spring. 3(3-3) R: Open only to graduate students in College of Agriculture and Natural Resources, College of Engineering, or College of Natural Science.
Ion activities, ionic exchange and equilibrium reactions. Soil pH, macro- and micronutrients, saline soils and availability of nutrients to plants.

853 Plant Mineral Nutrition
Fall of odd years. 3(3-0) Interdepartmental with Horticulture. RB: (BOT 301)
Inorganic ion transport in plant cells and tissues. Physiological responses and adaptation to problem soils. Genetic diversity in nutrient uptake and use by plants. Physiological roles of elemental nutrients in crop growth.

856 Plant Molecular Biology
Spring. 3(3-0) Interdepartmental with Plant Biology; Biochemistry and Molecular Biology. Administered by Department of Plant Biology. RB: (ZOL 341) SA: BOT 856
Recent advances in genetics and molecular biology of higher plants.

863 Mineral-Water Interactions
Fall of even years. 4(3-2) Interdepartmental with Geological Sciences. Administered by Department of Geological Sciences. R: Open only to graduate students in Crop and Soil Sciences or Geological Sciences or Geography.
Mineralogy, petrology and geochemistry of fluid-rock reactions in geologic, sedimentary and geochemical cycles. Rock and mineral weathering, soil formation, genesis and burial diagenesis of sediments and sedimentary rocks, and metamorphism.

865 Organic Chemistry of Soils
Spring of odd years. 2(2-0)
Chemistry of natural and anthropogenic organic substances in soils.

870 Techniques of Analyzing Unbalanced Research Data
Spring. 4(4-0) Interdepartmental with Animal Science; Forestry; Fisheries and Wildlife; Horticulture. Administered by Department of Animal Science. RB: (STT 464) R: Open only to graduate students in the College of Agriculture and Natural Resources. SA: ANS 943 Not open to students with credit in ANS 943.
Linear model techniques to analyze biological research data characterized by missing and unequal number of observations in classes. Simultaneous consideration of multiple factors. Prediction of breeding values and estimation of population parameters from variance and covariance components.

880 Scientific Communication and Professional Development
Spring. 1(0-2)
Interactive professional experiences including grant-preproposal preparation and presentation, scientific presentations, mock position interviews, and resume preparation.

890 Independent Study
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open only to graduate students in College of Agriculture and Natural Resources, College of Engineering, or College of Natural Science.
Individual study on field, laboratory, or library research.

891 Current Topics in Ecology and Evolution
Summer. 1 credit. Summer: Given only at W.K. Kellogg Biological Station. A student may earn a maximum of 8 credits in all enrollments for this course. Interdepartmental with Zoology; Plant Biology. Administered by Department of Zoology.
Presentation and critical evaluation of theoretical and empirical developments by visiting scientists.

891B Selected Topics in Plant Breeding and Genetics
Fall, Spring, Summer. 1 to 2 credits. A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with Horticulture; Forestry. Administered by Department of Horticulture. R: Open only to graduate students in Plant Breeding and Genetics or Genetics. Approval of department.
Selected topics in plant breeding.

892 Plant Breeding and Genetics Seminar
Fall, Spring, Summer. 1(1-0) A student may earn a maximum of 8 credits in all enrollments for this course. Interdepartmental with Horticulture; Forestry. Administered by Department of Horticulture.
Experience in review, organization, oral presentation, and analysis of research.

893 Selected Topics
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to graduate students in College of Agriculture and Natural Resources, College of Engineering, or College of Natural Science.
Selected topics in crop and soil sciences of current interest and importance.

899 Master's Thesis Research
Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to master's students in Crop and Soil Sciences.
Master's thesis research.

921 Contemporary Statistical Models in Biology
Fall of odd years. 3(3-0) RB: (STT 465) or approval of department. Working knowledge of SAS software.
Estimating functions. Growth models, generalized linear models, linear and non-linear mixed models. Field experiments with spatial trends. Longitudinal data. Modeling in the presence of spatial and temporal correlations.

941 Quantitative Genetics in Plant Breeding
Spring of even years. 3(2-2) Interdepartmental with Forestry; Horticulture. RB: (CSS 819 and STT 464)
Theoretical and genetic basis of statistical analysis of quantitative traits using genetic markers. Computational tools for the study of quantitative traits.

999 Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to doctoral students in Crop and Soil Sciences.
Doctoral dissertation research.

EARTH SCIENCE   ES

Department of Geological Sciences
College of Natural Science

800 Special Problems in Earth Science
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Approval of department.
Individual faculty directed study on topics in earth science.

ECONOMICS   EC

Department of Economics
College of Social Science

201 Introduction to Microeconomics
Fall, Spring, Summer. 3(3-0) Not open to students with credit in EC 251H.
Economic institutions, reasoning and analysis. Consumption, production, determination of price and quantity in different markets. Income distribution, market structure and normative analysis.

202 Introduction to Macroeconomics
Fall, Spring, Summer. 3(3-0) Not open to students with credit in EC 252H.
Determinants of Gross National Product, unemployment, inflation and economic growth. National income accounting and fiscal policy. Aggregate demand, supply management and monetary policy.

210 Economics Principles Using Calculus
Fall. 3(3-0) P:M: (MTH 133 or MTH 153H or MTH 126) Not open to students with credit in EC 201 or EC 202.
A combined microeconomics and macroeconomics course. Emphasis on topics of interest in engineering and management, such as discounting, cost-benefit analysis, innovation, externalities, and the role of government regulation.

251H Microeconomics and Public Policy
Fall, Spring. 4(4-0) Not open to students with credit in EC 301.
Theories of consumer behavior, production and cost. Output and price determination in competition and monopolies. Welfare economics, general equilibrium, externalities, and public goods.

252H Macroeconomics and Public Policy
Fall, Spring. 3(3-0) P:M: (EC 201 and EC 301) or (EC 251H) Not open to students with credit in EC 302.
Theory of national income, unemployment, inflation and economic growth and its application to economic analysis and policy.

293   Cooperative Education for Business Students
Fall, Spring. 1(1-0) A student may earn a maximum of 3 credits in all enrollments for this course. Interdepartmental with Marketing and Supply Chain Management; Accounting; Finance; Management; Hospitality Business. Administered by Department of Marketing and Supply Chain Management. R: By permission of the Department only.
Integration of pre-professional educational employment experiences in industry and government with knowledge and processes taught in the student's academic program. Educational employment assignment approved by the Department of Marketing and Supply Chain Management.

301   Intermediate Microeconomics
Fall, Spring, Summer. 3(3-0) P:M: (EC 201) RB: (EC 202) Not open to students with credit in EC 251H.
Theories of consumer choice, production, cost, perfect competition, and monopoly. Welfare economics, general equilibrium, externalities and public goods.

302   Intermediate Macroeconomics
Fall, Spring, Summer. 3(3-0) P:M: (EC 201 and EC 202) Not open to students with credit in EC 252H.
National income accounting. Determination of aggregate output, employment, price level, and inflation rate. Policy implications.

306   Comparative Economic Systems
Fall. 3(3-0) P:M: (EC 201 or EC 251H) and (EC 202 or EC 252H)
Characteristics and functions of economic systems. Alternative patterns of economic control, planning, and market structure. Theories, philosophies, and experiences associated with capitalism, socialism, and mixed economies.

310   Economics of Developing Countries
Spring. 3(3-0) P:M: (EC 201 or EC 251H)
Overview of economic patterns and policy issues of developing countries such as modern economic growth and structural transformation, state controls versus markets, poverty and human welfare, investments in human resources, and trade and industrialization.

320   Analysis of Economic Data
Fall, Spring. 3(3-0) P:M: (EC 201 or EC 251H) and (EC 202 or EC 252H) R: Not open to students in the Department of Accounting or Department of Finance or School of Hospitality Business or Department of Management or Department of Marketing and Supply Chain Management.
Sources of economic data. Techniques for presenting and summarizing economic data. Testing theories of economic behavior. Methods for forecasting in uncertain economic environments. Evaluation of current quantitative work in economics.

330   Money, Banking, and Financial Markets
Fall, Spring, Summer. 3(3-0) P:M: (EC 201 or EC 251H) and (EC 202 or EC 252H)
Money markets and financial intermediation. Money, the Federal Reserve System, and monetary policy. Regulation of money markets.

335   Taxes, Government Spending and Public Policy
Fall, Spring, Summer. 3(3-0) Interdepartmental with Environmental Economics and Policy. P:M: (EC 201 or EC 251H) SA: PRM 335 Not open to students with credit in EC 435 or EC 436.
Economics of the public sector. Public goods, externalities, design and incidence of the tax system. Equity and efficiency effects of government programs.

340   Survey of International Economics
Fall, Spring, Summer. 3(3-0) P:M: (EC 201 or EC 251H) and (EC 202 or EC 252H) Not open to students with credit in EC 440 or EC 441.
Comparative advantage. Costs and benefits of trade. International economic policies. Balance of payments. Foreign exchange markets. The international monetary system. Contemporary trade and international currency issues.

360   Private Enterprise and Public Policy
Fall, Spring, Summer. 3(3-0) P:M: (EC 201 or EC 251H)
Effects of antitrust, economic regulation, and other public policies on competition, monopoly, and other market problems in the United States economy.

380   Labor Relations and Labor Market Policy
Fall, Spring, Summer. 3(3-0) P:M: (EC 201 or EC 251H)
Development, functions, legal framework, and economic effects of unions and collective bargaining. Institutions and economic impacts of government programs. Minimum wages, workers' compensation, unemployment insurance, and antidiscrimination policies.

391   Special Topics in Economics
Fall, Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. P:M: (EC 201 or EC 251H) and (EC 202 or EC 252H) R: Approval of department.
Special topics supplementing regular course offerings.

401   Advanced Microeconomics
Fall, Spring. 3(3-0) P:M: (EC 301 or EC 251H)
Economics of uncertainty and incomplete information. Game theory and theories of oligopoly. Transaction costs. Advanced topics in welfare economics, general equilibrium, externalities, and public goods.

402   Advanced Macroeconomics
Fall, Spring. 3(3-0) P:M: (EC 251H or EC 301) and (EC 252H or EC 302)
Consumption, investment, and monetary theories. The role of expectations. Theories of economic growth and cycles. Stabilization policies.

405   The Development of the American Economy
Spring. 3(3-0) P:M: (EC 201 or EC 251H) and (EC 202 or EC 252H)
Causes and consequences of American economic development. Economic analysis of topics such as British trade policies, slavery, industrialization, immigration, the Great Depression, wars and income distribution.

406   Economic Analysis of Russia and the Commonwealth of Independent States
Spring of even years. 3(3-0) P:M: (EC 201 or EC 251H) and (EC 202 or EC 252H)
Analysis of structure and performance of planning, transition economy, and post-transition economy in Russia and the commonwealth of independent states (CIS) with focus on micro foundations of macroeconomic outcomes.

410   Issues in the Economics of Developing Countries
Fall. 3(3-0) P:M: (EC 201 or EC 251H) and (EC 202 or EC 252H)
Topics in development economics, such as growth, technological change, structural transformation, poverty and inequality, investment in human resources, trade, international capital flows and the political economy of policy formation and governance.

412   Economic Analysis of Latin America
Fall of even years. 3(3-0) RB: (EC 201 or EC 251H) and (EC 202 and EC 252H)
Population growth, agriculture, and urbanization. Dependence on primary exports and import protection. Inequality and populist-orthodox policy cycles. Hyper-inflation, international debt crises, and adjustments. United States policy interests and interventions.

413   Economic Analysis of Asia
Spring of odd years. 3(3-0) P:M: (EC 201 or EC 251H) and (EC 202 or EC 252H)
Development of agriculture, industry, labor markets, and trade in some of the following: India and South Asia, China, the Pacific Rim countries, and Japan. Productivity, income distribution, finance, and planning.

414   Economic Analysis of Sub-Saharan Africa
Fall of odd years. 3(3-0) P:M: (EC 201 or EC 251H) and (EC 202 or EC 252H)
African economic development in historical perspective. Contemporary development issues including agricultural policies, industrial development, foreign trade and aid, human resource investments, AIDS, and the political economy of economic and political policies and reforms.

420   Introduction to Econometric Methods
Fall, Spring. 3(3-0) P:M: (EC 201 or EC 210 or EC 251H) and (EC 202 or EC 252H) and (STT 315 or STT 421 or STT 430 or STT 441) and (MTH 124 or MTH 132 or MTH 152H)
Specification, estimation, and interpretation of econometric models. Evaluation of current quantitative work in economics.

421   Advanced Econometric Methods
Spring of even years. 3(3-0) P:M: (EC 420)
Panel data methods, instrumental variables, limited dependent variables, time series analysis, and other advanced topics.

425   Law and Economics
Fall. 3(3-0) Interdepartmental with Finance. P:M: (EC 201 or EC 251H)
Application of economic analysis to the law. Property rights, takings, the Coase Theorem. The economics of regulation, crime and punishments, liability law, and public choice.

435 Public Expenditures
Fall. 3(3-0) P:M: (EC 251H or EC 301)
Expenditure theory. Objectives and rationale of government activity in the market system. Efficiency criteria in government decision-making. Public choice. Cost benefit analysis.

436 Public Revenues
Spring. 3(3-0) P:M: (EC 251H or EC 301)
Principles and theory of efficiency and the incidence of taxation. Income and sales taxes and other major revenue sources.

440 International Trade
Fall. 3(3-0) P:M: (EC 251H or EC 301)
Neoclassical and modern theories regarding trade patterns and commercial policies. Applications of theory to United States policy. Contemporary issues involving international trade of goods, services, and productive factors.

441 International Finance
Spring. 3(3-0) P:M: (EC 252H or EC 302)
Neoclassical and modern theories pertaining to balance of payments and exchange rate determination. Macroeconomic performance under alternative exchange rate regimes. Contemporary issues involving international monetary arrangements.

453 Women and Work: Issues and Policy Analysis
Spring. 3(3-0) Interdepartmental with Environmental Economics and Policy; Women's Studies. Administered by Department of Agricultural Economics. RB: (EC 201 or EC 202 or EEP 201 or concurrently) R: Not open to freshmen or sophomores.
Current and past quantity and quality of women's participation in the labor force. Gender differentials in earnings and occupations. Employment discrimination. Laws, especially affirmative action laws. Social policy effects. International issues.

460 American Industry: Structure and Behavior
Fall, Spring. 3(3-0) P:M: (EC 251H or EC 301)
Market structure and performance. Empirical analysis of market definition, concentration, product differentiation, vertical integration, innovativeness, collusion, and entry deterrence.

480 Analysis of Labor Markets
Fall, Spring. 3(3-0) P:M: (EC 251H or EC 301) and (EC 201 or EC 251H)
Labor supply and demand. Human capital, search, migration, and labor turnover. Analysis of unemployment and wage growth. Structure of wages, including economics of discrimination.

489 Senior Seminar for Policy and Applied Economics Majors (W)
Fall. 3(3-0) P:M: (EC 251H or EC 301) and (EC 320) and completion of Tier I writing requirement. R: Open only to seniors in the Policy and Applied Economics major.
Capstone course for policy and applied economics majors. Reading and discussion concerning selected economics topics. Preparation and presentation of student research project.

490 Independent Study
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 3 credits in all enrollments for this course. R: Approval of department.
Research and reading course for students interested in doing independent work in economics under faculty supervision.

491 Advanced Topics in Economics
Fall, Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. P:M: (EC 301 or EC 251H) and (EC 302 or EC 252H) and (MTH 124 or MTH 132 or MTH 152H) R: Approval of department.
Advanced work in specialized topics of economics.

495 Economics of Poverty and Income Distribution
Fall. 3(3-0) P:M: (EC 201 or EC 251H)
Theory of the distribution of income and wealth. Concepts and measurement of welfare. Definitions of poverty. Effects of public and private programs on the poor.

498 Economics of Health Care
Fall of odd years. 3(3-0) RB: (EC 201 or EC 251H)
Economic factors in determining health care costs, utilization, quality, and efficiency. Demand and insurance. Comparative health care systems. Public policy issues.

499 Senior Seminar for Economics Majors (W)
Fall, Spring. 3(3-0) P:M: (EC 251H or EC 301) and (EC 252H or EC 302) and (EC 420) and completion of Tier I writing requirement. R: Open only to seniors in Economics.
Capstone course for economics majors. Reading and discussion concerning selected economics topics. Preparation and presentation of student research project.

801 Mathematical Applications in Economics
Fall. 3(3-0) RB: (MTH 124 or MTH 132) R: Open only to master's students in Economics. Open only to graduate students in the Department of Agricultural Economics and doctoral students in the Business Administration major or approval of department.
Applications of mathematical tools in economic analysis. Matrix algebra, derivatives, partial derivatives, optimization, integration and linear differential equations.

805 Microeconomic Analysis
Fall. 3(3-0) R: Open only to master's students in Economics. Open only to graduate students in the Department of Agricultural Economics and doctoral students in the Business Administration major or approval of department. Not open to students with credit in EC 812A.
Microeconomic theory with calculus. Production, costs, demand, markets, general equilibrium and welfare theory.

807 Applied Microeconomic Analysis
Spring. 3(3-0) P:M: (EC 805)
Applications of microeconomic theory taken from public finance, labor economics, international trade, and industrial organization.

809 Macroeconomic Analysis
Spring. 3(3-0) P:M: (EC 801) Not open to students with credit in EC 813A.
Closed- and open-economy macroeconomic theory with calculus. Inflation, unemployment, growth, business cycles, consumption, investment, and money demand. Policy debates and macroeconomic forecasting.

810 Institutional and Behavioral Economics
Fall. 3(3-0) Interdepartmental with Agricultural Economics; Resource Development. Administered by Department of Agricultural Economics.
Relationships among institutions, individual and collective actions, and economic performance. Public choice, property rights, and behavioral theories of firms and bureaucracies.

811A Mathematical Applications in Economics
Fall. 2(2-0) R: Open only to Ph.D. students in Economics, the Department of Agricultural Economics, and the Business Administration major or approval of department. C: EC 812A concurrently.
Applications of mathematical tools in economic analysis for Ph.D. students. Matrix algebra, derivatives, partial derivatives, optimization, integration and linear differential equations.

811B The Structure of Economic Analysis
Fall. 2(2-0) P:M: (EC 811A) SA: EC 811 C: EC 813B concurrently.
Static and dynamic decision models in economics. Concepts of equilibrium, stability, comparative statics and duality.

812A Microeconomics I
Fall. 3(3-0) C: EC 811A concurrently.
Consumption theory, including choice under uncertainty. Theory of production in perfectly competitive markets. General equilibrium in the presence of perfect competition. Efficiency properties of competitive equilibria.

812B Microeconomics II
Spring. 3(3-0) P:M: (EC 812A)
Introduction to social choice. Market failure, including externalities, public goods, imperfect information and market power.

813A Macroeconomics I
Fall. 3(3-0) R: Open only to Ph.D. students in Economics, the Department of Agricultural Economics, and the Business Administration major or approval of department.
Static and dynamic macroeconomic models. Search asset pricing, new classical theories of business cycles and growth. Rational expectations and the government budget constraint.

813B Macroeconomics II
Spring. 3(3-0) P:M: (EC 813A) C: EC 811B concurrently.
New classical theories of business cycles and growth. Theories of price and wage rigidities, search, imperfect competition, and credit rationing in macroeconomic models. Asset pricing.

815 Economic Thought I
Fall. 3(3-0)
Ancient, scholastic, and mercantilist economic thought. Origins and development of classical political economy. Socialist and Romantic reactions to classicism.

816   Economic Thought II
Spring. 3(3-0)
German and English economic historicism. Austrian and general equilibrium economics. Neoclassical economics. Institutionalism. Origins and development of Keynesian economics. History of economic thought in retrospect.

818   Introduction to Econometrics
Spring. 3(3-0) Interdepartmental with Agricultural Economics; Statistics and Probability. P:M: (EC 801 and STT 430) R: Not open to Economics Ph.D. students. SA: EC 820
The single equation regression model. Properties of least-squares estimators under various specifications. Multicollinearity, heteroskedasticity, serial correlation, generalized least squares.

819   Economic Role of Government
Spring. 3(3-0)
The legal system and legal foundations of economic structure and performance. Property rights, the taking issue, and compensation.

820A   Econometrics IA
Fall. 3(3-0) Interdepartmental with Statistics and Probability. RB: Multivariate Calculus R: Open only to Ph.D. students in Economics, in the Department of Agricultural Economics, and the Business Administration major or approval of department.
Statistical tools for econometrics. Applications of statistical tools, including probability distributions, estimation, hypothesis testing, and maximum likelihood to econometric problems.

820B   Econometrics IB
Fall. 3(3-0) P:M: (EC 811A and EC 820A)
The single equation regression model. Properties of least-squares estimators under various specifications. Multicollinearity, generalized least-squares, errors in variables, seemingly unrelated regressions. Identification and estimation in simultaneous equations models.

821   Econometrics II
Fall. 3(3-0) Interdepartmental with Agricultural Economics; Statistics and Probability. P:M: (EC 820A and EC 820B)
Analysis of cross-sectional economic data. Qualitative and limited dependent variables. Probit, logit, tobit, and sample selectivity. Duration models. Count data. Analysis of panel data.

822   Econometrics III
Spring. 3(3-0) Interdepartmental with Agricultural Economics; Statistics and Probability. P:M: (EC 820A and EC 820B)
Dynamic models and time series data. ARMA models. ARCH models. Unit roots, cointegration and error correction. Rational expectations models.

823   Applied Econometrics
Fall. 3(3-0) P:M: (EC 820A and EC 820B) or (STT 430 and EC 818)
Problems of estimating models and testing hypotheses from economic theory. Applications of various econometric models to economic problems and policy analysis.

824   Advanced Topics in Econometrics
Spring of even years. 3(3-0) P:M: (EC 820A and EC 820B and EC 821 and EC 822) R: Open only to Ph.D. students in Economics or approval of department.
Advanced study in a specialized topic in econometrics.

827   Economic Forecasting
Spring. 2(2-0) P:M: (MBA 814) R: Open only to MBA students.
Concepts, sources, measurement, and forecasts of economic data. Forecasting techniques. Time series analysis and economic models. Uses of economic models and forecasts in business decision making.

829   The Economics of Environmental Resources
Fall. 3(3-0) Interdepartmental with Agricultural Economics; Forestry; Park, Recreation and Tourism Resources; Resource Development. Administered by Department of Agricultural Economics.
Economic principles related to environmental conflicts and public policy alternatives. Applications to water quality, land use, conservation, development, and global environmental issues.

830   Advanced Macroeconomics and Monetary Theory
Fall. 3(3-0) P:M: (EC 812B and EC 813B)
General equilibrium models of monetary economies. Money and growth. Monetary and financial models of the business cycle. Hyperinflation. Bubbles, sunspots, cycles, and multiple equilibria.

831   Problems in Monetary Theory and Policy
Spring. 3(3-0) P:M: (EC 809 or EC 813A) and (EC 820A and EC 820B)
Surveys several topics on macroeconomics with a strong applied emphasis.

835   Public Expenditures
Fall. 3(3-0) P:M: (EC 805 or EC 812A)
Allocative and distributional effects of public expenditure. Public goods and externalities. Selected topics in public expenditure analysis such as cost-benefit analysis, fiscal federalism, mechanism design, public choice, general equilibrium models.

836   Public Revenues
Spring. 3(3-0) P:M: (EC 805 or EC 812A)
Theory of taxation. Allocative and distributional effects of taxation, user charges, and deficit finance. Positive and normative aspects. General equilibrium models. Dynamic models. Issues of fiscal federalism.

840   International Trade: Theory and Commercial Policy
Fall. 3(3-0) P:M: (EC 805 or EC 812A)
Commodity composition of trade. Welfare and distributional effects of measures such as tariffs, quotas, and export subsidies. International economic policy. Regional and multilateral trade policy.

841   Exchange Rates and Capital Flows
Spring. 3(3-0) P:M: (EC 805 and EC 809) or (EC 812A and EC 813A)
The balance of payments statement. Mechanisms of balance of payments adjustment. Exchange rate determination. Domestic policies under alternative exchange rate regimes. Regional monetary integration. The international currency system.

843   Advanced Topics in International Trade
Spring. 3(3-0) P:M: (EC 812A and EC 812B and EC 840)
Selected topics in international trade.

844   Open Economy Macroeconomics
Fall. 3(3-0) P:M: (EC 813A and EC 813B)
Balance of payments. Dynamic models of the open economy. Effects of uncertainty on international financial markets. Global issues in economic growth. Money and exchange rates in models with sticky or flexible prices. Nominal price rigidities.

850   Growth, Development, and Human Resources
Fall. 3(3-0) P:M: (EC 805 or EC 812A)
Theoretical and empirical models of the microeconomics of development, focusing on household and individual behavior related to investment in human resources and its consequences.

851   Microecon Dynamics in Develop
Spring. 3(3-0) P:M: (EC 805 and EC 809) or (EC 812A and EC 813A)
Theoretical and empirical models of the microeconomics of development, focusing on land, labor, credit and insurance markets. Analysis of household and individual responses to risk, dynamic decisions with respect to savings, consumption and labor supply, and models of learning. EC 851 is designed to be a continuation of EC 850.

860   Market Structure and Behavior
Fall. 3(3-0) P:M: (EC 805 or EC 812A)
The consequences of concentration and entry conditions. Theory of the firm as it relates to size, scope, integration, motivation. Static market behavior. Antitrust treatment of cartels and mergers.

861   Dynamic Market Behavior and Performance
Spring. 3(3-0) P:M: (EC 805 or EC 812A)
Theoretical and empirical treatments of dynamic aspects of industry behavior. Strategic behavior, predation, and antitrust treatment. Research, development, innovation. Government controls. Public utilities and regulation.

880   Labor Economics I
Fall. 3(3-0) P:M: (EC 805 or EC 812A) and (EC 820A and EC 820B) or (STT 430 and EC 818)
Labor supply and measurement of the labor force. Labor demand. Mobility, turnover, and migration. Equalizing wage differentials. Trade union growth, goals, bargaining and effects.

881   Labor Economics II
Spring. 3(3-0) P:M: (EC 805 or EC 812A) and (EC 820A and EC 820B) or (STT 430 and EC 818)
Theories and empirical evidence on the human capital model and alternatives to the human capital model. Economics of discrimination and gender differences in labor markets. Employment and distributional effects of minimum wages.

895   Graduate Reading in Economics
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
Faculty guided research projects.

911   Strategic Behavior in Economic Environments
Fall. 3(3-0) P:M: (EC 812B)
Topics in cooperative and non-cooperative game theory. Applications include: oligopoly and bargaining theories, strategic voting and principal agent models, endogenous coalition formation, signalling, strategic trade, and auctions theories.

912   Risk, Uncertainty and Information
Spring. 3(3-0) P:M: (EC 812A and EC 812B) RB: (EC 812A)
Effects of risk in economic environments. Topics include: expected utility theory, risk aversion, stochastic dominance, mean-variance models, state preference models, general equilibrium models with risk, information theory.

923 Advanced Environmental and Resource Economics
Fall. 3(3-0) Interdepartmental with Agricultural Economics; Forestry; Park, Recreation and Tourism Resources; Resource Development. Administered by Department of Agricultural Economics. RB: (AEC 829 and EC 812A)

Advanced economic theory of environmental management and policy. Treatment of externalities and market and non-market approaches to environmental improvement. Topics in conservation and sustainable economic growth. Applications to research and policy.

925 Advanced Natural Resource Economics
Spring. 3(3-0) Interdepartmental with Agricultural Economics; Forestry; Resource Development; Park, Recreation and Tourism Resources. Administered by Department of Agricultural Economics. RB: (EC 812A and AEC 829 and FOR 866) SA: AEC 991H

Economic theory of managing nonrenewable and renewable resources, including optimal use, the incentives for use under decentralized markets, and public policy design. Analysis of the co-evolution of economic and ecological systems.

950 Research Seminar in Applied Economics
Spring. 3(3-0) R: Open only to Ph.D. students in Economics.

Current research topics in applied economics.

951 Research Seminar in Economic Theory
Spring. 3(3-0) R: Open only to Ph.D. students in Economics.

Current research topics in economic theory.

952 Research Seminar in Econometrics
Spring. 3(3-0) R: Open only to Ph.D. students in Economics.

Current research topics in econometrics.

992 Advanced Topics in Economics
Fall of odd years. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. RB: (EC 811A and EC 811B and EC 812A and EC 812B and EC 813A and EC 813B and EC 820A and EC 820B) R: Open only to Ph.D. students in Economics or approval of department.

Advanced work in a specialized topic in economics.

999 Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to Ph.D. students in Economics.

Doctoral dissertation research.

EDUCATION ED

College of Education

870 Capstone Seminar
Summer. 3(3-0) R: Open only to students in the Master of Arts in Education. Approval of college.

Reflection and synthesis of learning experiences in online masters program. Creation and exhibition of electronic portfolio on the Web. Participation in online discussion groups.

EDUCATIONAL EAD ADMINISTRATION

Department of Educational Administration
College of Education

315 Student Leadership Training
Fall, Spring. 3(2-2)

Student leadership role, skills, and technique, consistent with the principles and demands of a democratic multicultural society.

800 Organization Theory in Education
Fall, Spring, Summer. 3(3-0)

Organizational theory and research applied to educational administration. Topics include comparative organization settings, external environments, organizational effectiveness, and ethics.

801 Leadership and Organizational Development
Spring, Summer. 3(3-0)

Interaction of leadership with organizational culture and development within a variety of educational organizations.

802 Building a Learning Organization
Spring. 3(3-0)

Disciplines and practices for crafting a learning organization. Examination of Eastern, Western, and Quantum models of organization dynamics. Emphasis on strategies and skills for increasing human capacity.

803 Planning, Budgeting, and Evaluation
Spring. 3(3-0)

Planning, budgeting, and evaluation in educational organizations. Topics include needs assessment, funding sources, and processes for estimating costs and revenues.

804 Administration of Human Resources in Education
Fall, Summer. 3(3-0)

Tasks of personnel management in schools, colleges, and other educational organizations, including recruitment, selection, orientation, development, compensation, and evaluations. Focus on attracting and retaining a quality workforce in education.

805 Administration in Higher Education
Fall. 3(3-0)

Theories, systems, structures and processes of college and universities. Comparison of the organization, leadership, and governance of higher education institutions to other non-profit organizations.

806 Learning Leadership and Organizational Analysis I
Fall. 3(3-0) R: Open only to graduate students in K-12 Educational Administration.

Leadership of K-12 schools and associated community organizations. Theory and skills needed to discern organizational dynamics of schools and community. Professional ethics of K-12 school leadership. Skills and methods of disciplined reflection applied to issues of leadership practice. Methods of reflection and applications of multiple theories to cases of practice.

807 Learning Leadership and Organizational Analysis II
Spring. 2(2-0) P:M: (EAD 806) R: Open only to graduate students in K-12 Educational Administration.

Data-based organizational analysis of K-12 schools and school-community relations. Leadership skills to define vision strategies. Case analysis and double-loop learning.

809 Interpersonal Dimensions of Leadership
Spring, Summer. 1(1-0) P:M: (EAD 806 and EAD 807 and EAD 808) RB: (EAD 820 and EAD 821) R: Open only to graduate students in K-12 Educational Administration.

Assessment of different approaches to school leadership. School leader as reflective practitioner and effective communicator in school and community contexts.

810 Use of Technology in School Administration
Fall. 3(3-0)

Learning and leading in the knowledge age with special focus on the role of technology in educational management, communication, and curriculum and instruction.

813 Education, Development and Social Change
Spring of odd years. 3(3-0) Interdepartmental with Teacher Education.

Rise of modern systems of education in developed and developing countries. Education, the state, and national development. Colonial heritage, linkages, and globalization of educational development.

820 Internship in Educational Administration I
Fall, Spring. 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course. R: Open only to graduate students in K-12 Educational Administration.

Supervised internship in an educational institution focused on school leadership issues.

821 Internship in Educational Administration II
Spring, Summer. 1 to 3 credits. R: Open only to graduate students in K-12 Educational Administration.

Supervised internship in an educational and/or community organization focused on school-community leadership issues.

845 Teaching, Learning, and School Restructuring
Spring. 3(3-0)

Relationship between school-wide interventions and improvement in classroom teaching: school restructuring and reculturing, strategies for school improvement, approaches to teaching and learning.

850 Issues and Strategies in Multicultural Education
Spring. 3(3-0)

Historical, pedagogical, and administrative considerations of multicultural education in K-16 educational settings.

852A Elementary and Middle School Administration
Fall, Summer. 3(3-0)

Administration and supervision of elementary and middle schools. Alternative organizational arrangements, curricula, and practices. Problems and strategies for improving K-8 education.