

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. 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, and Botany and Plant Pathology. Administered by 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 and Forestry. Administered by 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 and Forestry. Administered by 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.

930. Advanced Forest Genetics

Fall of odd-numbered years. 2(2-0) Interdepartmental with Forestry and Horticulture. Administered by Forestry.
P: HRT 819 or HRT 836.
Applications of genetics, plant breeding, and biotechnology to the improvement, and preservation of diversity, of tree species.

940. Advanced Soil Physics

Fall of odd-numbered years. 2(2-0)
P: CSS 840. R: Open only to graduate students in College of Agriculture and Natural Resources, College of Engineering, or College of Natural Science.
Modelling major physical transport mechanisms in the soil profile. Aeration, temperature and solute movement. Water movement and evaporation.

941. Quantitative Genetics in Plant Breeding

Spring of even-numbered years. 3(3-0) Interdepartmental with Forestry and Horticulture.
P: CSS 450, STT 422.
Theoretical genetic basis of plant breeding with emphasis on traits exhibiting continuous variation. Classical and contemporary approaches to the study and manipulation of quantitative trait loci.

943. Techniques of Analyzing Unbalanced Research Data

Spring. 4(4-0) Interdepartmental with Animal Science, Forestry, Horticulture, and Fisheries and Wildlife. Administered by Animal Science.
P: STT 464. R: Open only to graduate students in the College of Agriculture and Natural Resources.
Linear model techniques to analyze research data characterized by missing and unequal number of observations in classes. Simultaneous consideration of multiple factors. Estimable comparisons. Hypothesis testing. Computational strategies. Variance and covariance components. Breeding values.

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.

EARTH SCIENCE

ES

**Department of Geological Sciences
College of Natural Science**

445. Field Studies 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.
Field experience and techniques in geological sciences, meteorology, soil science, or oceanology.

446. Laboratory Investigations 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.
P: ES 445 or concurrently. R: Approval of department.
Laboratory techniques and investigations in geological sciences, meteorology, soil science, or oceanology.

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
The Eli Broad College of Business
and The Eli Broad Graduate
School of Management**

201. Introduction to Microeconomics

Fall, Spring, Summer. 3(3-0)
R: 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)
R: 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.

251H. Microeconomics and Public Policy

Fall, Spring. 4(4-0)
R: 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: EC 251H; or EC 201, EC 301. R: 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.

301. Intermediate Microeconomics

Fall, Spring, Summer. 3(3-0)
P: EC 201, EC 202. R: 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: EC 201, EC 202. R: 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: EC 201 or EC 251H; 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.

330. Money, Banking, and Financial Markets

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

335. Survey of Public Economics

Fall, Spring, Summer. 3(3-0) Interdepartmental with Public Resource Management.
P: EC 201 or EC 251H. R: 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: EC 201 or EC 251H; EC 202 or EC 252H. R: 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: 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.

**Descriptions — Economics
of
Courses**

380. Labor Relations and Labor Market Policy

Fall, Spring, Summer. 3(3-0)

P: 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.

401. Advanced Microeconomics

Fall, Spring. 3(3-0)

P: 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: EC 251H or EC 301; EC 252H or EC 302.

Consumption, investment, and monetary theories. The role of expectations. Theories of economic growth and cycles. Stabilization policies.

403. Economic Thought I

Fall. 3(3-0)

P: EC 201 or EC 251H; EC 202 or EC 252H.

Forerunners of classical economics. Classical economic thought from Adam Smith to J.S. Mill. The socialist reaction.

404. Economic Thought II

Spring. 3(3-0)

P: EC 201 or EC 251H; EC 202 or EC 252H.

Decline of classical economics and rise of marginalist value and distribution theory. Marxism and institutionalism.

405. The Development of the American Economy

Spring. 3(3-0)

P: EC 201 or EC 251H; 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 the Soviet Union and Transition Economy

Spring of even-numbered years. 3(3-0)

P: EC 201 or EC 251H; EC 202 or EC 252H.

History and analysis of Soviet planning, banking, and pricing systems. Analysis of labor markets and capital allocation under planning and transition.

410. Principles of Economic Development

Fall. 3(3-0)

P: EC 201 or EC 251H; EC 202 or EC 252H.

Growth and transformation of low-income countries. Discontinuities, dualism. Capital, total factor productivity. Agriculture, natural resources. Population, health, nutrition. Labor, education. Entrepreneurship, technological change. Urbanization.

411. Issues in Economic Development

Spring. 3(3-0)

P: EC 201 or EC 251H; EC 202 or EC 252H.

Mobilizing and allocating capital for raising productivity. Monetary policy, financial intermediaries. Investment criteria and project analysis. Taxes and public expenditures. Trade policy, foreign capital, international disequilibrium, and structural adjustment.

412. Economic Analysis of Latin America

Fall of even-numbered years. 3(3-0)

P: EC 201 or EC 251H; EC 202 or EC 252H.

Population growth, agriculture, and urbanization. Dependence on primary exports and import protection. Inequality and populist-orthodox policy cycles. Hyperinflation, international debt crises, and adjustments. United States policy interests and interventions.

413. Economic Analysis of Asia

Spring of odd-numbered years. 3(3-0)

P: EC 201 or EC 251H; 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-numbered years. 3(3-0)

P: EC 201 or EC 251H; EC 202 or EC 252H.

African economic development in historical perspective. Contemporary development issues including population growth, agricultural and industrial development, and foreign trade. Alternative strategies for African economic development.

420. Introduction to Econometric Methods

Fall, Spring. 3(3-0)

P: EC 251H or EC 301; EC 252H or EC 302; STT 315 or STT 421.

Specification, estimation, and interpretation of econometric models. Evaluation of current quantitative work in economics.

435. Public Expenditures

Fall. 3(3-0)

P: 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: EC 251H or EC 301.

Principles and theory of efficiency and the incidence of taxation. Income and sales taxes and other major revenue sources.

437. State and Local Public Finance

Fall of even-numbered years. 3(3-0)

P: EC 201 or EC 251H.

Theoretical and policy analysis of state and local government fiscal behavior. Revenues, expenditures, borrowing, intergovernmental fiscal relations. Applications to such areas as education, transportation, and economic development. Intergovernmental comparisons.

440. International Trade

Fall. 3(3-0)

P: 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: 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 Public Resource Management and Women's Studies. Administered by Public Resource Management.

P: EC 201 or EC 202 or PRM 201 or concurrently. R: Not open to freshmen and 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: EC 251H or EC 301.

Market structure and performance. Empirical analysis of market definition, concentration, product differentiation, vertical integration, innovativeness, collusion, and entry deterrence.

461. Regional Economics

Fall. 4(3-2) Interdepartmental with Resource Development and Public Resource Management. Administered by Resource Development.

P: EC 201 or RD 460. R: Not open to freshmen and sophomores.

Location decisions of firms and households. Relevant government policies. Applications of regional analysis to industrial, regional, and community development.

480. Analysis of Labor Markets

Fall, Spring. 3(3-0)

P: EC 251H or EC 301.

Labor supply and demand. Human capital, search, migration, and labor turnover. Analysis of unemployment and wage growth. Structure of wages, including economics of discrimination.

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.

Research and reading course for students interested in doing independent work in economics under faculty supervision.

495. Economics of Poverty and Income Distribution

Fall. 3(3-0)

P: 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.

496. Interpreting Economic News and Research

Spring of even-numbered years. 3(3-0)

P: EC 201 or EC 251H; EC 202 or EC 252H.

Reporting and interpreting economic news and research. Sources of data and research information. Critical examination of written and broadcast reports through application of economic principles. Case studies.

497. Economics of Education

Spring of odd-numbered years. 3(3-0)

P: EC 201 or EC 251H.

Relationship between education and the economy. Production of education. Analysis of education as an investment. Supply and demand for teacher services. Financing education.

498. Economics of Health Care

Fall of odd-numbered years. 3(3-0)

P: 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 (W)

Fall, Spring. 3(3-0)

P: EC 251H or EC 301; EC 252H or EC 302; EC 420 or concurrently. R: Open only to seniors in Economics. Completion of Tier I writing requirement.

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)
P: MTH 120 or MTH 124 or MTH 132. R: Open only to graduate students in Economics, Agricultural Economics, and Business Administration.
Applications of mathematical tools in economic analysis. Matrix algebra, derivatives, partial derivatives, optimization, integration and linear differential equations.
- 803. Managerial Economics**
Fall, Spring, 3(3-0)
R: Open only to MBA students. Not open to students with credit in EC 805 or EC 812A.
Analysis of the firm. Economizing in the use of resources, optimal combinations of products, pricing, competitive forces in regional and international markets affecting the firm.
- 804. Macroeconomics**
Fall, Spring, 3(3-0)
P: EC 803. R: Open only to MBA students. Not open to students with credit in EC 809 or EC 813A.
Determinants of national income, employment, and inflation. National income accounting. Business fluctuations, fiscal and monetary policy, international trade, and capital flows.
- 805. Microeconomic Analysis**
Fall, 3(3-0)
P: EC 301; EC 801 or MTH 126, or concurrently. R: Open only to graduate students in Economics, Agricultural Economics, and Business Administration. 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: 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: EC 302; EC 801 or MTH 126, or concurrently. R: 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 and Resource Development. Administered by Agricultural Economics.
Relationships among institutions, individual and collective actions, and economic performance. Public choice, property rights, and behavioral theories of firms and bureaucracies.
- 811. The Structure of Economic Analysis**
Fall, 3(3-0)
P: MTH 133 or EC 801. R: Open only to graduate students in Economics, Agricultural Economics, and Business Administration.
Static and dynamic decision models in economics. Concepts of equilibrium, stability, comparative statics and duality.
- 812A. Microeconomics I**
Fall, 3(3-0)
P: EC 811 or 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: EC 812A.
Introduction to social choice. Market failure, including externalities, public goods, imperfect information and market power.
- 813A. Macroeconomics I**
Fall, 3(3-0)
P: EC 811 or concurrently.
Static and dynamic macroeconomic models. Theories of consumption, investment, money demand and supply. Rational expectations and the government budget constraint.
- 813B. Macroeconomics II**
Spring, 3(3-0)
P: EC 813A.
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, Romantic, and Marxist 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.
- 817. The Industrial Revolution**
Spring of even-numbered years, 3(3-0)
Preconditions that led to economic changes in agriculture and industry beginning in the eighteenth century.
- 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.
- 820. Econometrics I**
Spring, 3(3-0) Interdepartmental with Agricultural Economics, and Statistics and Probability.
P: EC 801, STT 430.
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, and Statistics and Probability.
P: EC 820, STT 442.
Estimation and hypothesis testing. Asymptotic properties of optimization estimators. Analysis of cross-sectional economic data. Qualitative and limited dependent variables. Probit, logit, tobit, and sample selectivity. Duration models. Count data.
- 822. Econometrics III**
Spring, 3(3-0) Interdepartmental with Agricultural Economics, and Statistics and Probability.
P: EC 820, STT 442.
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: EC 820.
Problems of estimating models and testing hypotheses from economic theory. Applications of various econometric models to economic problems.
- 829. The Economics of Environmental Resources**
Fall, 3(3-0) Interdepartmental with Agricultural Economics, Resource Development, Forestry, and Park and Recreation Resources. Administered by 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: EC 812B; 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: EC 809 or EC 813A; EC 820.
Empirical models of money, output, prices and interest rates. Goals and techniques of monetary policy.
- 835. Public Expenditures**
Fall, 3(3-0)
P: 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: 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: EC 805 or EC 812A.
Commodity composition of trade. Welfare and distributional effects. Measures such as tariffs, quotas, and export subsidies. International economic policy. Theory and practice of regional economic integration.
- 841. Exchange Rates and Capital Flows**
Spring, 3(3-0)
P: EC 805, EC 809; or EC 812A, 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.
- 842. Managerial Economics and Public Policy**
Fall, 3(3-0)
R: Open only to MBA students in the Advanced Management Program.
Analysis of the firm. Demand and revenues, optimal production, cost minimization, supply, profitability, and pricing. Competitive forces and public policies in the firm's regional and international markets.

Descriptions — Economics of Courses

850. **Growth, Development, and Human Resources**

Fall, 3(3-0)

P: EC 805 or EC 812A.

Theory and measurement of long-run growth. Population growth, technological change, capital formation, urbanization, entrepreneurship, and structural change.

851. **Domestic and Foreign Development Policies**

Spring, 3(3-0)

P: EC 805, EC 809; or EC 812A, EC 813A.

Problems of economic development. Market formation, financial markets and monetary policy, fiscal policy, investment criteria and externalities, trade policy, foreign capital, international disequilibrium.

852. **Macroeconomics**

Spring, 3(3-0)

R: Open only to MBA students in the Advanced Management Program.

Determinants of the national income, employment, and inflation. National income accounting. Analysis of business fluctuations, fiscal and monetary policy, international trade, and capital flows.

860. **Market Structure and Behavior**

Fall, 3(3-0)

P: 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: 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: EC 805 or EC 812A.

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: EC 805, EC 809; or EC 812A, EC 813A.

Theories of human capital. Internal labor markets and the economics of personnel. Economics of discrimination. Wage distributions. Job search and matching. Macroeconomic issues.

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: 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: 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. **Theory of Resource and Environmental Economics**

Spring of even-numbered years, 3(3-0) Interdepartmental with Agricultural Economics, Resource Development, Forestry, and Park and Recreation Resources. Administered by Agricultural Economics.

P: AEC 829, EC 805.

Economic theory of environmental change and control. Market and non-market allocation mechanisms. Temporal issues of conservation and growth. Contemporary issues in research and policy.

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.

EDUCATIONAL ADMINISTRATION EAD

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.

451. **Models of Special Education Administration and Services**

Spring, 3(3-0) Interdepartmental with Counseling, Educational Psychology and Special Education. Administered by Counseling, Educational Psychology and Special Education.

R: Open only to students seeking endorsement in special education. Approval of department.

Application of theory and research to special education program design and implementation.

SA: CEP 851

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. **Staff and Professional Development**

Spring, 3(3-0)

Staff and professional development interventions in educational organizations.

803. **Planning, Budgeting, and Evaluation**

Spring, Summer of even-numbered years.

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.

813. **Education, Development and Social Change**

Spring of odd-numbered 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.

851. **Models of Special Education Administration and Services**

Spring, 3(3-0) Interdepartmental with Counseling, Educational Psychology and Special Education. Administered by Counseling, Educational Psychology and Special Education.

R: Open only to graduate students in College of Education.

Application of theory and research to special education program design and implementation.

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.

852B. **Secondary School Administration**

Fall, Summer, 3(3-0)

Administration and supervision of secondary schools. Alternative organizational arrangements, curricula, and practices. Problems and strategies for improving secondary schools.

853A. **Legal, Fiscal, and Policy Environment of Schools**

Fall, Summer, 3(3-0)

External determinants of school policy and practice. Nature of policy-making process. History of school finance. Effect of fiscal policy on education. Equity issues. Impact of constitutional, legislative, and administrative requirements.

853B. **Schools, Families, and Communities**

Fall, Summer of odd-numbered years, 3(3-0)

Comparative and historical analysis of education within the broader social context. Families, communities, and the private sector. Social problems, social policies, and school practice.

853C. **Instructional Supervision**

Spring, Summer, 3(3-0)

P: EAD 800.

Supervision and evaluation of teaching and learning, and strategies for improvement of K-12 education.

855. **Research in Educational Administration**

Fall, Spring, Summer, 3(3-0)

P: CEP 822, EAD 800.

Applications of research techniques to educational organizations. Developing research proposals, conducting research, and writing formal papers.