

**Descriptions—Crop and Soil Sciences  
of  
Courses**

**805. Herbicide Action and Metabolism**  
*Spring of even-numbered years. 2(2-0)*  
Properties and characteristics of herbicides. Processes involved in herbicide action, transport, and fate in plants and soils.  
QA: CSS 805

**823. Methods in Genetic Engineering of Plants**  
*Fall of even-numbered years. 4(0-8) Interdepartmental with Horticulture and Forestry.*  
Bacterial transformation. Plant transformation via Ti-plasmid, protoplast/PEG, and electroporation methods. Detection of foreign gene integration and expression.

**825. Clay Mineralogy and Soils Genesis**  
*Spring of odd-numbered years. 4(3-2) Interdepartmental with Geological Sciences.*  
R: Open only to graduate students in College of Agriculture and Natural Resources, College of Engineering, or College of Natural Science.  
Mineral structures. X-ray diffraction, pedogenic processes, and mineral transformations and stability.  
QP: CSS 850, CSS 840, CSS 470 QA: CSS 825, CSS 870

**827. Techniques in Cytogenetics**  
*Fall of odd-numbered years. 1(0-3) Interdepartmental with Horticulture and Forestry.*  
Preparation of chromosomes from commercially important plants for cytogenetic analysis.

**831. Soil and Plant Resources for Sustained World Food Production**  
*Spring of even-numbered years. 3(3-0)*  
World food production capacities related to soil and climatic resources. Management and utilization of genetic resources for sustained production of human foods and animal feeds.  
QA: CSS 831, CSS 480

**840. Soil Physics**  
*Fall of even-numbered years. 3(2-3)*  
R: Open only to graduate students in College of Agriculture and Natural Resources, College of Engineering, or College of Natural Science.  
Physical properties of soil including texture, structure, consistency, aeration, moisture content, and temperature. Quantitative measurement of plant growth. Agronomic and engineering practices.  
QA: CSS 840

**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.  
QP: CEM 383 QA: CSS 850

**853. Plant Mineral Nutrition**  
*Fall of odd-numbered years. 3(3-0) Interdepartmental with Horticulture.*  
P: 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.  
QP: BOT 301 QA: CSS 853

**855. Interfacial Environmental Chemistry**  
*Fall of even-numbered years. 4(4-0)*  
R: Open only to graduate students in College of Agriculture and Natural Resources, College of Engineering, or College of Natural Science.  
Principles and mechanisms of reactions at solid-liquid interfaces emphasizing environmental chemistry. Sorption of ionic and organic compounds. Properties of colloids. Kinetics of surface reactions.  
QA: CSS 812

**865. Organic Chemistry of Soils**  
*Spring of even-numbered years. 2(2-0)*  
Chemistry of natural and anthropogenic organic substances in soils.  
QA: CSS 865

**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.  
QA: CSS 811

**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.  
QA: CSS 812

**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.  
QA: CSS 899

**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.  
QP: CSS 840 QA: CSS 812

**941. Quantitative Genetics in Plant Breeding**  
*Spring of odd-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.  
QA: CSS 941

**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.  
QA: CSS 999

**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.  
QA: ES 445

**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.  
QP: ES 445 QA: ES 446

**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.  
QA: ES 800

**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.  
QA: EC 201

**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.  
QA: EC 202

**251H. Microeconomics and Public Policy**  
*Fall, Spring. 4(4-0)*  
R: Open only to Honors College students. 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.  
QA: EC 251H, EC 324

**252H. Macroeconomics and Public Policy**  
*Fall, Spring. 3(3-0)*  
P: EC 251H; or EC 201, EC 301. R: Open only to Honors College students. 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.  
QA: EC 252H or EC 326

**301. Intermediate Microeconomics**  
*Fall, Spring, Summer. 3(3-0)*  
P: EC 201, 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.  
QP: EC 201, EC 202 QA: EC 324

**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.  
QP: EC 201, EC 202 QA: EC 326

**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.  
QP: EC 201 or EC 251H, EC 202 or EC 252H QA: EC 434

- 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.  
QP: EC 201 or EC 251H, EC 202 or EC 252H QA: EC 318, EC 330
- 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.  
QP: EC 201 or EC 251H QA: EC 406, EC 407
- 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.  
QP: EC 201 or EC 251H, EC 202 or EC 252H QA: EC 428, EC 429
- 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.  
QP: EC 201 or EC 251H QA: EC 444, EC 445
- 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.  
QP: EC 201 or EC 251H QA: EC 305, EC 306, EC 455
- 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.  
QP: EC 324 or EC 251H QA: EC 325, EC 426
- 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.  
QP: EC 324 or EC 251H, EC 326 or EC 252H QA: EC 327, EC 470
- 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.  
QP: EC 201 or EC 251H, EC 202 or EC 252H QA: EC 421
- 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.  
QP: EC 201 or EC 251H, EC 202 or EC 252H QA: EC 422
- 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.  
QP: EC 201 or EC 251H, EC 202 or EC 252H QA: EC 436
- 406. Economic Analysis of the Soviet Union and Transition Economy**  
Spring of odd-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.  
QP: EC 201 or EC 251H, EC 202 or EC 252H QA: EC 438
- 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.  
QP: EC 201 or EC 251H, EC 202 or EC 252H QA: EC 430
- 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.  
QP: EC 201 or EC 251H, EC 202 or EC 252H QA: EC 431
- 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.  
QP: EC 201 or EC 251H, EC 202 or EC 252H QA: EC 362
- 413. Economic Analysis of Asia**  
Spring of even-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.  
QP: EC 201 or EC 251H, EC 202 or EC 252H QA: EC 361
- 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.  
QP: EC 201 or EC 251H, EC 202 or EC 252H QA: EC 363
- 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.  
QP: EC 324 or EC 251H, EC 326 or EC 252H, STT 315, STT 421 QA: EC 451
- 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.  
QP: EC 324 or EC 251H
- 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.  
QP: EC 324 or EC 251H
- 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.  
QP: EC 201 or EC 251H QA: EC 408
- 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.  
QP: EC 324 or EC 251H
- 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.  
QP: EC 326 or EC 252H
- 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.  
QP: EC 324 or EC 251H
- 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.  
QP: EC 324 or EC 251H QA: EC 457
- 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.  
QA: EC 400
- 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.  
QP: EC 201 or EC 251H, EC 202 or EC 252H QA: EC 412
- 496. Interpreting Economic News and Research**  
Spring of odd-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.  
QP: EC 201 or EC 251H, EC 202 or EC 252H QA: EC 401

**Descriptions—Economics  
of  
Courses**

**497. Economics of Education**

Spring of even-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.

QP: EC 201 or EC 251H QA: EC 463

**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.

QP: EC 201 or EC 251H QA: EC 410

**499. Senior Seminar**

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. Capstone course for economics majors. Reading and discussion concerning selected economics topics. Preparation and presentation of student research project.

QP: EC 324 or EC 251H, EC 326 or EC 252H, EC 451

**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.

QP: MTH 112 or MTH 122 QA: EC 480, MTH 480

**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.

QA: EC 803

**804. Macroeconomics**

Fall, Spring. 3(3-0)

P: EC 803. R: Open only to MBA students. R: 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.

QP: EC 803 QA: EC 804

**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.

QP: EC 324, MTH 113 or EC 480 or MTH 480 QA: EC 805A

**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.

QP: EC 805A or EC 812A QA: EC 807

**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.

QP: EC 326, MTH 113 QA: EC 809

**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.

QP: MTH 113 or EC 480 or MTH 480

**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.

QA: EC 812A

**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.

QP: EC 812A QA: EC 812B

**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.

QA: EC 813A

**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.

QP: EC 813A QA: EC 813C

**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.

QA: EC 841A

**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.

QA: EC 841C

**817. The Industrial Revolution**

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

Preconditions that led to economic changes in agriculture and industry beginning in the eighteenth century.

QA: EC 855

**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.

QA: EC 806D

**820. Econometrics I**

Spring. 3(3-0) Interdepartmental with

Agricultural Economics, and Statistics and Probability.

P: EC 801, STT 440.

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.

QP: STT 442, EC 480 or MTH 480 QA: EC 876, EC 835

**821. Econometrics II**

Fall. 3(3-0) Interdepartmental with Agri-

cultural 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.

QP: EC 876, STT 442 QA: EC 877

**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.

QP: STT 442, EC 876 QA: EC 878

**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.

QP: EC 835 or EC 876 QA: EC 891

**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.

QP: EC 812C, EC 813C QA: EC 818A

**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.

QP: EC 809 or EC 813A, EC 835 or EC 876 QA: EC 818C

**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.

QP: EC 805A or EC 812A QA: EC 806A

**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.

QP: EC 805A or EC 812A QA: EC 806B

**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.

QP: EC 805A or EC 812A QA: EC 826A

**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.

QP: EC 805A, EC 809 or EC 812A, EC 813A QA: EC 826C

**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.

QA: EC 803

**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.

QP: EC 805A or EC 812A QA: EC 850, EC 851

**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.

QP: EC 805A, EC 809 or EC 812A, EC 813A QA: EC 852

**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.

QA: EC 804

**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.

QP: EC 805A or EC 812A QA: EC 821A

**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.

QP: EC 805A or EC 812A QA: EC 821C

**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.

QP: EC 805A or EC 812A QA: EC 857A

**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.

QP: EC 805A, EC 809 or EC 812A, EC 813A QA: EC 857C

**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.

QA: EC 895

**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.

QP: EC 812C QA: EC 900

**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.

QP: EC 812A QA: EC 900

**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.

QA: EC 999

**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.

QA: EAD 415A, EAD 415B

**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.

QA: EAD 862, EAD 951F

**802. Staff and Professional Development**

Spring, 3(3-0)

Staff and professional development interventions in educational organizations.

QA: EAD 874A, EAD 874B

**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.

QA: EAD 851D, EAD 971B

**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.

QA: EAD 951E

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

Spring of even-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.

QA: EAD 805A, EAD 805B, EAD 805C

**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.

QA: EAD 852A

**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.

QA: EAD 852B

**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.

QA: EAD 852G, EAD 852D

**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.

QA: EAD 852C

**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.

QP: EAD 851A, EAD 851B, CEP 803 QA: EAD 855

**860. The Concept of the Learning Society**

Fall, Summer. 3(3-0)

Lifelong education in the United States and other countries. origins, forms, purposes, sponsors, content, and theory.

QA: EAD 860

**861A. Adult Learning**

Fall, Summer. 3(3-0)

P: EAD 860.

Adult development and life transitions. Motivation and barriers to participation. Theories of adult learning.

QA: EAD 861

**861B. Strategies for Teaching Adults**

Spring. 3(3-0)

P: EAD 861A.

Assessing program goals, setting expectations, developing resources, choosing strategies, and evaluating outcomes.

QA: EAD 864, EAD 964, EAD 872A

**861C. Literacy in the Community and Workplace**

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

Psychological, sociological, economic and political implications of illiteracy. Literacy campaigns and specific approaches to reducing illiteracy. Workforce literacy programs and techniques in schools, business, industry and labor.

QA: EAD 866A, EAD 866B

**862B. Adult Career Development**

Spring. 3(3-0)

Personal, social and economic aspects of careers. Theories, practices and systems available to professionals in assisting client groups.

QA: EAD 869A, EAD 869B