

**CRIMINAL JUSTICE**

**836\*.** **Assessment of Police Policies and Operations**  
 Spring. 3(3-0)  
 P: CJ 835. R: Open only to graduate students in Criminal Justice.  
 Recent policy-related research and its application to the deployment of human resources.  
 QP: CJ837 QA: CJ838

**855\*.** **Delinquency Prevention and Control**  
 Fall. 3(3-0)  
 R: Open only to graduate students in Criminal Justice.  
 Historical overview. Theories and methodologies. Models and organization of delinquency prevention and control programs. Law and public policy. Program evaluation.  
 QA: CJ855

**865\*.** **Adult Corrections**  
 Fall. 3(3-0)  
 Traditional and contemporary adult correctional practices. Social, political, economic, and organizational factors affecting correctional policies.  
 QA: CJ 865

**866\*.** **Adult and Juvenile Corrections Programs**  
 Spring. 3(3-0)  
 P: CJ 855 or CJ 865. R: Open only to graduate students in Criminal Justice.  
 Adult and juvenile crime prevention and correctional programs. Application of research findings to management issues.  
 QP: CJ 865 ORCJ 855 QA: CJ866

**885\*.** **Security Management**  
 Fall. 3(3-0)  
 R: Graduate students or approval of instructor  
 The organization and management of security operations in business, industry and government.  
 QA: CJ 885

**886\*.** **Security Administration**  
 Spring. 3(3-0)  
 P: CJ 885.  
 Administrative and quantitative techniques for security operations. Statistical analyses. Analysis of financial statements. Operations research and computer techniques.  
 QP: CJ885 QA: CJ 886

**887\*.** **Quantitative Methods in Criminal Justice Research**  
 Spring. 3(3-0)  
 P: CJ 811. R: Open only to graduate students in Criminal Justice.  
 Descriptive and inferential statistics and computer use in criminal justice research.  
 QP: CJ 811 QA: CJ 892

**890\*.** **Independent Study**  
 Fall, Spring. 1 to 6 credits. May reenroll for a maximum of 6 credits.  
 R: Open only to graduate students in Criminal Justice.  
 Individual research and writing under faculty supervision.  
 QA: CJ801

**894\*.** **Practicum**  
 Fall, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 6 credits.  
 R: Open only to graduate students in Criminal Justice.  
 Observation, study, and work in selected criminal justice agencies. Participation in domestic and foreign criminal justice systems.  
 QA: CJ 890

**896\*.** **Policy Analysis under Conditions of Change**  
 Spring. 3(3-0)  
 P: CJ 811. R: Open only to graduate students in Criminal Justice.  
 Methods of policy analysis in criminal justice settings. Policy analysis for the formulation, adoption and implementation of changes.  
 QP: CJ811 QA: CJ 897

**901\*.** **Seminar in Contemporary Theory and Criminal Justice**  
 Fall. 3(3-0)  
 R: Graduate students Criminal Justice or approval of instructor  
 Theoretical perspectives and issues in criminal justice and criminology theory..  
 QA: CJ 990

**902\*.** **Seminar in Criminal Justice Systems**  
 Spring. 3(3-0)  
 R: Graduate students Criminal Justice or approval of school  
 Contemporary issues in the criminal justice system.  
 QA: CJ930

**903\*.** **Research Utilization in Criminal Justice**  
 Spring. 3(3-0)  
 R: Graduate students Criminal Justice or approval of school  
 Research application in criminal justice theory and practice.  
 QA: CJ 992

**CROP AND SOIL SCIENCES**

**101\*.** **Introduction to Crop Science**  
 Fall. 3(2-2)  
 Principles of crop management, improvement, and fertilization. International and sustainable agriculture. Water quality issues.  
 QA: CSS 101

**110\*.** **Computer Applications in Agronomy**  
 Fall. 2(1-2)  
 R: Open only to College of Agriculture and Natural Resources students. Not open to students with credits in CPS 100  
 Use of computers in agriculture. Basic computer operating systems. Management and use of storage media. Laboratory experience in word processing, spread sheets, data bases, programming languages, networking, and software related to agriculture.

**201\*.** **Forage Crops**  
 Fall. 3(2-2)  
 Forage crop production, management, and utilization. Crop identification. Soil fertilization. Planting and harvesting of grasses and legumes.  
 QA: CSS 301

**210.** **Fundamentals of Soil and Landscape Science**  
 Fall. 3(2-3) Interdepartmental with the Department(s) of Forestry.,  
 P: CEM 141.  
 Agricultural and natural resource ecosystems: soil, vegetation and ground water components. Energy, water and nutrient cycles. Soil classification and mapping. Land management and use issues.

**232\*.** **Introduction to Turfgrass Management**  
 Fall. 3(2-2)  
 P: CSS 110; CSS 210 or concurrently.  
 Turfgrass utilization, identification, establishment and management principles. Responses to various cultural practices.  
 QP: CSS 210 QA: CSS 318

**262\*.** **Turfgrass Management Seminar**  
 Fall. 1(2-0)  
 P: CSS 232 or concurrently.  
 Presentations by individuals involved in turfgrass and golf course management. Topics include golf course construction and operations, preparations for tournaments, and public relations.  
 QP: CSS 318 QA: CSS 417

**310\*.** **Soil Management and Environmental Impact**  
 Spring. 3(2-3)  
 P: CSS 210.  
 Management of soil physical and chemical properties for the production of food and fiber. Soil management systems that reduce the environmental impact on soil, water and air resources and maximize crop production potential.  
 QP: CSS 210 QA: CSS 390

**332\*.** **Advanced Turf Management**  
 Spring. 3(3-0)  
 P: CSS 232.  
 Effect of light, heat, cold, drought, and traffic on turfgrass growth and development. Impact of practices such as mowing, cultivation, and compaction on the growth of grasses.  
 QP: CSS 318 QA: CSS 416

**342\*.** **Turfgrass Soil Management**  
 Fall. 3(3-0)  
 P: CSS 232.  
 Fertility and pH control of turf soils. Drainage, irrigation programming, cultivation, topdressing, and soil amendments. Environmental impacts. Specialized soils.  
 QP: CSS 318 QA: CSS 414

**350\*.** **Introduction to Plant Genetics**  
 Spring. 3(4-0)  
 P: BOT 105 or BS 111. R: Not open to freshmen and sophomores.  
 Fundamentals of plant genetics with applications to agriculture and natural resources.  
 QP: BOT 205 BS 211 QA: CSS 350

**362\*.** **Management of Turfgrass Pests**  
 Fall. 4(3-2)  
 P: CSS 232  
 Chemical, biological, and cultural methods of managing weeds, diseases, and insect pests of turfgrass. Environmental considerations in pest management.  
 QP: CSS 318 QA: CSS 419

**370\*.** **Agricultural Cropping Systems Management**  
 Fall. 3(2-3)  
 P: CSS 101 or CSS 210; MTH 110 or MTH 116. R: Not open to freshmen and sophomores.  
 Interdisciplinary decision making to select crop and production systems based upon soil productivity, climatic adaptation, environmental impacts, and economic constraints.  
 QP: CSS 101 ORCSS 210ANDMTH 108

**380\*.** **Crop Physiology**  
 Spring of even-numbered years. 3(2-3)  
 P: CSS 101; BOT 105 or BOT 301. R: Not open to freshmen and sophomores.  
 Physiological and metabolic function of plants from a whole plant viewpoint. Environmental effects on crop growth, development, and yield.  
 QP: CSS 101 BOT 301 QA: CSS 380

**402\*.** **Principles of Weed Science**  
 Fall. 3(2-2)  
 P: BOT 105, CEM 143. R: Not open to freshmen and sophomores.  
 Weed biology and ecology. Cultural, mechanical, biological, and chemical control practices. Herbicide action, selectivity in plants, and effects on environment.  
 QP: CEM 143 BOT 301 QA: CSS 402

**CROP AND SOIL SCIENCES**

**406\*.** **Seed Production and Technology**  
 Fall. 3(2-2)  
 P: CSS 101, CSS 350. R: Not open to freshmen and sophomores.  
 Principles and practices of field seed production. Crop improvement, variety release, seed production, seed technology and evaluation involved in producing high quality field crop seed.  
 QP: CSS 101 CSS 350 QA: CSS 406 CSS 485

**430\*.** **Soil Fertility and Chemistry**  
 Spring. 3(2-2)  
 P: CSS 210. R: Not open to freshmen and sophomores.  
 Application of chemistry to diagnosing and improving soil fertility. Soil amendments including macro- and micro-nutrients. Reducing environmental degradation.  
 QP: CSS 210 QA: CSS 430

**440\*.** **Soil Biophysics**  
 Fall of even-numbered years. 3(2-2)  
 P: CSS 210. R: Not open to freshmen and sophomores.  
 Plant growth properties and soil physical conditions which influence productivity. Principles and applications of soil texture, structure, mechanical impedance, aeration and water. Root responses to the environment.  
 QP: CSS 210 QA: CSS 440

**450\*.** **Plant Breeding and Biotechnology**  
 Spring. 4(3-2) Interdepartmental with the Department(s) of Horticulture, Forestry.  
 P: CSS 350  
 Plant improvement by genetic manipulation. Genetic variability in plants. Traditional and biotechnological means of creating and disseminating recombinant genotypes/cultivars.  
 QP: CSS 350 QA: CSS 408

**451\*.** **Cellular and Molecular Principles and Techniques for Plant Sciences**  
 Spring. 4(2-6) Interdepartmental with the Department(s) of Forestry, Horticulture.  
 P: CSS 250 or ZOL 241 or BOT 241  
 Principles, concepts, and techniques of agricultural plant biotechnology. Recombinant DNA technology, plant molecular biology, transformation, cell tissue, and organ culture in relation to plant improvement.  
 QP: CSS 350 ORZOL 441 QA: CSS 451 HRT 838

**455\*.** **Pollutants in the Soil Environment**  
 Fall. 3(3-0)  
 P: CEM 143. R: Open only to seniors and graduate students.  
 Chemical and biological reactions of organic and inorganic pollutants in soils.  
 QP: CEM 143 QA: CSS 455

**470\*.** **Soil Resources**  
 Fall. 3(2-3)  
 P: CSS 210. R: Not open to freshmen and sophomores.  
 Evaluation of the properties, genesis, and classification of soil resources to assist in making land-use decisions. Field trips required.  
 QP: CSS 210 QA: CSS 470

**490\*.** **Independent Study**  
 Fall, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 8 credits.  
 P: CSS 101 or CSS 210. R: Approval of department; application required.  
 Individual work on field, laboratory, or library research problem of special interest to the student.  
 QP: CSS 101 ORCSS 210 QA: CSS 411

**491\*.** **Special Topics**  
 Fall, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 8 credits.  
 P: CSS 101 or CSS 210.  
 Topics from crop production, crop physiology, turf-grass management, organic soils, turfgrass soils, soil fertility, plant and soil relationships, genetics, biotechnology, environmental science, or sustainable agriculture.  
 QP: CSS 101 ORCSS 210 QA: CSS 412

**492\*.** **Seminar**  
 Fall. 1(1-0)  
 P: CSS 210; CSS 342 or CSS 370.  
 Synthesis, integration and application of agronomic principles to current issues in agronomy via discussion and oral and written communication.  
 QP: CSS 210 ANDCSS 370ORCSS 342 QA: CSS 420

**800\*.** **Statistical Packages for Analysis of Experiments**  
 Spring. 3(3-0)  
 Use of microcomputers and mainframes for research data analysis and graphical presentations. Software covered includes BMDP, SPSS, SAS, PLOTIT, and MSTAT.  
 QA: CSS 800

**801\*.** **Physiological Crop Ecology**  
 Fall of even-numbered years. 2(2- 0)  
 World climates in relation to crops: Limiting environmental factors in crop distribution and productivity. Physiological basis for stress injury and for resistance to temperature extremes, flooding, drought, and salinity.  
 QA: CSS 801

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

**817\*.** **Plant Breeding Programs**  
 Summer of odd-numbered years. 1(0-3) Interdepartmental with the Department(s) of Horticulture, Forestry.  
 R: None None None  
 Organization, management, and operation of plant breeding programs.

**823\*.** **Methods in Genetic Engineering of Plants**  
 Fall of even-numbered years. 4(0-8) Interdepartmental with the Department(s) of Horticulture, Forestry.  
 Vector construction. Bacterial transformation. Plant transformation via ti-plasmid, protoplast/peg, and electroporation methods. Deletion of foreign gene integration and expression. Construction of cDNA library.

**825\*.** **Clay Mineralogy and Soils Genesis**  
 Spring of even-numbered years. 4(3-2) Interdepartmental with the Department(s) of Geological Sciences.  
 Mineral structures. X-ray diffraction, pedogenic processes, mineral transformations, and mineral stability.  
 QP: CSS 850 CSS 840CSS 470 QA: CSS 825 CSS 870

**827\*.** **Cytogenetics Techniques**  
 Fall of odd-numbered years. 1(0-3) Interdepartmental with the Department(s) of Horticulture, Forestry.  
 Preparation of chromosomes for cytogenetic analysis and other chromosome handling techniques.

**831\*.** **Crop and Soil Resources of the World**  
 Spring of odd-numbered years. 3(3-0)  
 World food production as related to the management of soil, climatic and genetic resources.  
 QA: CSS 831 CSS 480

**840\*.** **Soil Physics**  
 Fall of odd-numbered years. 3(2-3)  
 P: CSS 210 R: Graduate students  
 Physical properties of soils as they relate to plant growth and environmental concerns.  
 QP: CSS 210 CSS 440 QA: CSS 840

**850\*.** **Soil Chemistry**  
 Spring. 3(3-3)  
 R: Graduate  
 Chemistry of soils. Ion activities, ionic exchange and equilibrium reactions. Soil pH, macro- and micro-nutrients, 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 the Department(s) of 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 utilization by plants. Physiological roles of elemental nutrients in crop growth.  
 QP: BOT 301 QA: CSS 853

**855\*.** **Environmental Surface Chemistry**  
 Fall of even-numbered years. 4(4-0)  
 Surface functional groups and surface complexes. The electrified solid-solution interface. Cation and anion adsorption models and mechanisms. Organic compound sorption mechanisms. Colloids and surface reaction kinetics.  
 QP: NONE QA: CSS 812

**865\*.** **Organic Chemistry of Soils**  
 Spring of odd-numbered years. 2(2-0)  
 R: M.S. and Ph.D. students  
 Chemistry of natural and anthropogenic organic substances in soils.  
 QA: CSS 865

**890\*.** **Independent Study**  
 Fall, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 9 credits.  
 Individual study on field, laboratory, or library research.  
 QA: CSS 811

**891\*.** **Selected Topics**  
 Fall, Spring, Summer. 2(2-0) May reenroll for a maximum of 6 credits.  
 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. May reenroll for a maximum of 12 credits.  
 R: M.S.  
 QA: CSS 899

## CROP AND SOIL SCIENCES

**940\*.** **Advanced Soil Physics**  
Fall, even-numbered years. 2(2-0)  
P: CSS 840 R: Graduate students  
Modelling major physical transport mechanisms in the soil profile: aeration, water movement and evaporation, temperature, and solute movement.  
QP: CSS 840 QA: CSS 812

**941\*.** **Quantitative Genetics in Plant Breeding**  
Spring of odd-numbered years. 3(3-0)  
Interdepartmental with the Department(s) of Horticulture, Forestry,.

Theoretical genetic basis of plant breeding with emphasis on traits exhibiting continuous variation. Classical and contemporary approaches to the study and manipulations of quantitative trait loci.  
QA: CSS 941

**999\*.** **Doctoral Dissertation Research**  
Fall, Spring, Summer. 3 to 12 credits in increments of 3 credits. May reenroll for a maximum of 24 credits.  
R: Ph.D

QA: CSS 999

**ECONOMICS** **EC**

**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: NONE 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 201 and EC 324.  
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 OR EC 324

**252H.** **Macroeconomics and Public Policy**  
Fall, Spring. 3(3-0)  
P: EC 251H or EC 201, EC 324. R: Open only to Honors College students. Not open to students with credit in EC 202 and EC 226, EC 326.  
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. 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.  
QP: EC 201 ANDEC 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 ANDEC 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 OREC 251HANDEC 202 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 OREC 251HANDEC 202 QA: EC 318 EC 330

**335\*.** **Survey of Public Economics**  
Fall, Spring, Summer. 3(3-0)  
Interdepartmental with the Department(s) of Agricultural Economics.  
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 OREC 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 OREC 251HANDEC 202 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 OREC 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 OREC 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 OREC 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 OREC 251HANDEC 326 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 OREC 251HANDEC 202 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 OREC 251HANDEC 202 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 OREC 251HANDEC 202 QA: EC 436

**406\*.** **Economy of the Soviet Union**  
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.  
QP: EC 201 OREC 251HANDEC 202 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 OREC 251HANDEC 202 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 ad  
QP: EC 201 OREC 251HANDEC 202 QA: EC 431