

**822. Comparative Law Enforcement Administration**  
*Spring. 3(3-0) Approval of school.*

Comparative study of police organization and administration in various governmental and social systems. Evaluation of government's role, its limitations, the selection and training of leaders.

**823. Community Relations in the Administration of Justice**  
*Fall. 5(5-0) Approval of school.*

Seminar in the field of community relations, encompassing the spectrum of the administration of justice and community responsibility, utilizing the interdisciplinary approval in case and situational analysis.

**840. Seminar in Highway Traffic Administration**  
*Winter. 3(3-0) or 5(3-0) Approval of school.*

Traffic problems in their broad social setting. Inventory and critical review of the traffic safety movement and role of various professions therein. Future problems and developments.

**868. Review and Evaluation of Correctional Research**  
*Winter. 3(3-0) or 5(3-0) Approval of school.*

Correctional research systems review, analysis and critical evaluation of correctional research findings and conclusions pertaining to correctional decision making in the treatment process.

**870. Administration of Criminal Law**  
*Winter. 3(3-0) or 5(3-0) Approval of school.*

Major provisions of the Constitution of the United States that safeguard personal liberties. Judicial processes are examined in the light of historical experience, and social change.

**875. Seminar in Deviant Behavior**  
*Spring. 3(3-0) or 5(3-0) Approval of school.*

Evaluation of current major hypotheses, review of recent developments, contributions by agencies and academic institutions and review of current literature in the field of deviant behavior.

**890. Field Training**  
*Fall, Winter, Spring, Summer. 1(0-4) to 6(0-24) Approval of school.*

Field service training provided with federal, state, and local enforcement agencies; crime laboratories; commercial, industrial, and financial organizations with security programs; agencies working in crime and delinquency prevention; correctional agencies; and organizations engaged in highway safety.

**899. Research**  
*Fall, Winter, Spring, Summer. Variable credit. Approval of school.*

**CROP SCIENCE CSC**  
**College of Agriculture and Natural Resources**

**101. Crop Science**  
*Fall. 3(3-0)*

Principles of identification, adaptation, management, and utilization of field crops for food and fiber. Fundamentals of crop management, breeding, weed control, crop quality, and tropical crops in world agriculture.

**250. Plant and Animal Genetics**  
*Spring. 4(4-0) B S 211.*

Fundamental genetic principles with particular reference to problems in plant and animal biology.

**251. Plant and Animal Genetics Laboratory**  
*Spring. 1(0-2) 250 concurrently.*

**301. Forage Crops**  
*(201.) Fall. 3(2-2) Sophomores.*

Distribution, morphology, identification, physiology, management and utilization of forage crops for hay silage, and pasture for livestock and for soil improvement and conservation.

**380. Ecology and Physiology of Agricultural Plants**  
*Spring. 3(3-0) FOR 220 or BOT 301.*

Interrelationships of physiological processes and environmental manipulation for higher yield of agricultural plants.

**402. Principles of Weed Control**  
*Fall. 3(2-2) Juniors. Interdepartmental and administered jointly with the Horticulture Department.*

Comprehensive study of principles underlying weed control practices, and factors involved in both mechanical and chemical control.

**406. Crop Improvement and Seed Production**  
*Winter. 4(3-2)*

Practical methods of crop improvement, seed production, storing, cleaning, packing, and distribution, seed certification of small grains, legumes, corn, beans, potatoes, visits to seed agencies and seed farms.

**407. Special Crop Problems**  
*Fall, Winter, Spring, Summer. 1 to 3 credits. May re-enroll for a maximum of 6 credits. Approval of department.*

Independent comprehensive study of some area of crop science.

**408. Principles of Plant Breeding**  
*Spring. 4(3-2) 250. Interdepartmental and administered jointly with the Horticulture Department*

Application of genetics and other sciences to breeding and improvement of agronomic and horticultural crops.

**415. Turfgrass Management**  
*Spring. 3(2-2)*

Adaptation characteristics and utilization of turf grasses, management principles and physiological bases for the establishment and maintenance of turf for lawns, athletic fields, golf courses, cemeteries, parks, highways and airfields.

**420. Seminar**  
*Winter. 1(1-0) May re-enroll for a maximum of 4 credits. Interdepartmental and administered jointly with Soil Science.*

**485. Seed Science**  
*(912.) Spring. 3(3-2) Approval of department.*

Morphological and physiological changes during seed formation, development, maturation and germination. Practical and biological aspects of seed drying, storage, deterioration, dormancy and quality. Current problems and research in seed science.

**488. The Impact of Animal Resource Management Upon the World's Developing Nations**  
*Winter. 3(4-0)*

For course description, see Interdisciplinary Courses.

**801. Crop Ecology**  
*Fall. 3(3-0) Approval of department.*

Environment within the crop community and the environmental stresses limiting crop survival. Temperature, light, water and atmospheric stresses and variations in the crop canopy will be discussed.

**803. Crop Physiology**  
*Spring. 3(3-0) Approval of department.*

Role of physiological factors determining maximum crop yields and quality.

**805. Herbicidal Action and Metabolism**  
*Spring. 3(3-0) 402; BOT 415 or concurrently.*

A study of the properties and characteristics of herbicides, the fundamental processes involved in the physiological action, behavior, and metabolism of herbicides.

**814. Advanced Field Crop Studies**  
*(914.) Fall, Winter, Spring, Summer. 1 to 3 credits. Approval of department.*

Opportunity for students to prepare graduate level reports on specific fields.

**830. Physiological Genetics**  
*Winter. 3(3-0) Approval of department. Interdepartmental with and administered by the Forestry Department.*

Physiological bases for genetic variation in higher plants including adaptive physiology, quantitative genetics, growth correlations, biochemical genetics, hybrid physiology, and genecology.

**831. World Crop Adaptation**  
*Spring. 3(3-0)*

Distribution, adaptation, and importance of crops in world agriculture and their production as influenced by climate, soil, people and markets.

**851. Quantitative Genetics in Plant Breeding**  
*Fall of odd-numbered years. 4(3-1)*

One course in genetics or breeding, and one course in biometry, or approval of department. Genetic systems and quantitative inheritance in relation to the establishment of superior populations.

**899. Research**  
*Fall, Winter, Spring, Summer. Variable credit.*

**904. Seminar**  
*Fall, Winter, Spring. 1(1-0) Required of majors; others: approval of department.*

Studies and presentation of research in crop science.

**920. Design and Analysis of Agronomic Experiments**  
*Spring. 3(3-0) STT 423 or approval of department.*

Constructing and analyzing designs for experimental investigations in the biological sciences.

**951. Cytogenetics in Plant Breeding**  
*Winter of odd-numbered years. 3(3-0)*

BOT 427, 919, or approval of department. Interdepartmental with the Horticulture Department.

Application of cytogenetic principles to plant breeding. Significance of recombination, role of induced mutations, polyploid, chromosome substitution, and aneuploid analyses as they apply to the field of plant breeding.

**952. Plant Breeding Biometrics**  
*Winter of even-numbered years. 4(3-2) Approval of department.*

Biometrical genetics as it applies to plant breeding. Includes studies of path coefficients, partitioning of variance, and the principles of selection in a changing environment.

999. **Research**  
Fall, Winter, Spring, Summer. Variable credit.

**DAIRY SCIENCE DRY**

**College of Agriculture and Natural Resources**

214. **Dairy Production**  
Fall, Spring. 4(3-2)

Dairy cattle in modern agriculture. Normal cow behavior. Feeding, breeding and management of herd. Commercial milk production and marketing milk.

323. **Dairy Cattle Judging**  
Spring. 3(0-6)

Desired type in dairy cattle. Judging and show ring procedures. Competitive judging. Teams selected to represent Michigan State University in national competition.

371. **Dairy Seminar**  
(471.) Spring. 1(1-0) Juniors.

Major issues pertinent to the dairy industry are described by authorities from MSU and the dairy industry of Michigan. Students are provided an opportunity for an exchange in ideas.

413. **Dairy Farm Management**  
Spring. 3(2-2)

Analysis of dairy farm organization and operations. Dairy herd management practices. Dairy cattle housing with emphasis on economical and efficient usage. Use of dairy records in the farm operation.

424. **Dairy Cattle Breeding**  
Spring. 4(2-4) ANS 461.

Applications of population genetics to improving dairy cattle. Use of selection, aids to selection, and systems of mating to formulate breeding plans. Inheritance of economic traits. Breed improvement programs.

433. **Dairy Cattle Nutrition**  
Winter. 4(3-2) ANS 325.

Principles of ruminant nutrition and application to actual feeding practices in commercial dairy herds. Rumen fermentation as related to feed utilization, milk production and milk composition.

444. **Milk Secretion**  
Winter. 4(3-2) Interdepartmental and administered jointly with the Physiology Department.

Anatomy of mammary gland. Hormonal and nervous control of mammary growth, initiation and maintenance of lactation. Biochemistry of milk secretion. Physiology of milking; physiological, pathological and management factors affecting lactation.

445. **Endocrinology and Reproduction of Farm Animals**  
Fall. 4(3-2) PSL 240. Interdepartmental and administered jointly with the Physiology Department.

Endocrine and reproductive systems are presented with emphasis upon characteristics which can be altered for economic benefit and upon causes, prevention, and treatment of endocrine abnormalities.

460. **Special Problems**  
Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 10 credits. Approval of department.

488. **The Impact of Animal Resource Management Upon the World's Developing Nations.**  
Winter. 3(4-0)

For course description, see Interdisciplinary Courses.

850. **Topics in Dairy Science**  
Fall, Winter, Spring. Variable credit. May re-enroll for credit. Approval of department.

Topics from breeding, management, nutrition, or physiology, changing from term to term to include recent technical advances.

899. **Research**  
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

999. **Research**  
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**EARTH SCIENCE**

See Geology.

**ECONOMICS EC**

**College of Business**

Courses are classified as follows:

- Applied Welfare Economics—380, 390, 410.
- Labor Economics and Industrial Relations—305, 455, 456, 457.
- Money and Banking—318, 322, 330.
- International Economics—427.
- Public Finance—406, 407, 408.
- Price and Value Theory—324, 325, 426.
- Income and Employment Theory—320, 322, 451, 452.
- History of Economic Thought—421, 422.
- Industrial Organization and Control—444, 445, 446, 448.
- Economic Development, Regional Studies, and Comparative Economics Systems—360, 430, 431, 434.

200. **Introduction to Economics**  
Fall, Winter, Spring, Summer. 4(4-0)  
Open to Freshmen. Students may begin sequence with either 200 or 201.

Problem of unemployment; meaning and determination of national income; the multiplier; the accelerator; fiscal policy; deficit spending; monetary policy; banks creation of money; international aspects of the employment problems.

201. **Introduction to Economics**  
Fall, Winter, Spring, Summer. 4(4-0)  
Open to Freshmen. Students may begin sequence with either 200 or 201.

Problem of resource allocation; price determination (demand, supply), applications to agricultural policy; diminishing returns; behavior of the firm (determination of quantity of output, hiring of factors); aspects of international trade.

210. **Fundamentals of Economics**  
Fall, Winter. 4(4-0) MTH 215 or 228; or concurrently. Students may not earn credit in 210 if they have credit in either 200 or 201.

Introductory course in economic theory, employing mathematics, when useful, as a tool analysis. Covers consumer and business behavior, markets and the price system, income distribution, and elements of employment theory.

251H. **Households, Firms and Markets**  
Fall. 5(5-0) Honors College students.

Microeconomic theory and its applications to analysis and policy. Substitutes for 201, 324 and 325.

252H. **Aggregative Economics and Public Policy**  
(250H.) Winter. 5(5-0) Honors College students.

Theory of national income and its application to analysis and policy. Substitutes for 200, 320, and 321.

305. **Industrial Relations and Trade Unionism**  
Fall, Winter, Spring, Summer. 5(5-0)

Development, aims, structure, and functions of labor and employer organizations. Their relation to economic, political, and legal institutions and their impact on society. Primary issues in collective bargaining.

318. **Money, Credit and Banking**  
Fall, Winter, Spring, Summer. 4(4-0) 200 or 210.

Commercial banking and the money supply. The Federal Reserve System, the Treasury, and other financial institutions. Sources and uses of funds in the financial market.

320. **Macroeconomics I**  
Fall, Winter, Spring, Summer. 3(3-0) 200 and 201 or 210.

Measurement of economic activity. Determination of equilibrium aggregate output and the theory of underemployment equilibrium. Role of consumption, investment, government and foreign sectors in determining national income.

321. **Macroeconomics II**  
Fall, Winter, Spring, Summer. 3(3-0) 320.

Expansion of role of monetary factors in macroeconomic theory. Theories of economic growth and cycles. Study of macroeconomic problems of inflation, unemployment, and other current policy problems.

324. **Microeconomics I**  
Fall, Winter, Spring, Summer. 3(3-0) 200 and 201, or 210.

Theory of production and cost. Theory of the firm under varying market structures.

325. **Microeconomics II**  
Fall, Winter, Spring, Summer. 3(3-0) 200 and 201, or 210, and 324.

Consumer choice and theory of demand. Theory of distribution and factor rewards. Welfare economics and general equilibrium theory.

330. **Investments and Security Markets**  
Fall, Spring. 3(3-0) 200 or 210, Juniors.

The stock market; principles of investment; analysis of selected industries and corporations; regulation by the Securities and Exchange Commission.

337. **American Social and Economic History: Foundations**  
Winter. 4(4-0) Juniors. Interdepartmental with and administered by the History Department.

Multiple sources of economic growth in economic, social and political change, education, science and technology, political action, and other factors, mid-19th century.

338. **American Social and Economic History: Modern Trends**  
Spring. 4(4-0) Juniors. Interdepartmental with and administered by the History Department.

Urbanization, origins and implications of large-scale organizations in business and other sectors of society, and sources of economic growth since mid-19th century.