

IDC. The Impact of Animal Resource Management Upon the World's Developing Nations

For course description, see Interdisciplinary Courses.

801. Crop Ecology

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

Role of physiological factors determining maximum crop yields and quality.

805. Herbicidal Action and Metabolism

Spring of odd-numbered years. 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.

811. Advanced Problems

(810.) Fall, Winter, Spring, Summer. 1 to 4 credits. May re-enroll for a maximum of 6 credits if different problem is taken. Approval of department.

Field crop problems in management, physiology, ecology, breeding, turfgrass culture, weed control, nutritional quality, tropical crops, crop extension and seed studies. Soils problems in biophysics, chemistry, classification, conservation, fertility, geography, management microbiology, biochemistry, micronutrients, micropedology, mineralogy, organic soils and physics.

812. Selected Topics

Fall, Winter, Spring, Summer. 2(2-0) or 3(3-0) May re-enroll for a maximum of 9 credits if different topics are taken. Approval of department.

Topics will be selected from physiology of herbicides, micronutrients, advanced soil physics, advanced soil chemistry.

820. Seminar

Winter, Spring. 1(1-0) May re-enroll for a maximum of 3 credits.

Studies and presentation of research in crop and soil sciences.

825. Clay Mineralogy

Winter. 4(3-4) 840, 850 or approval of department. Interdepartmental with and administered by the Department of Geology.

Structures and properties of clays; their origins, occurrence, and utilization. Methods of studying clays including x-ray diffraction, differential thermal analysis, infrared absorption and other chemical and physical techniques.

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 geneology.

831. World Food Crops

Spring of odd-numbered years. 3(3-0)
World food crop production and related systems of agriculture which provide this resource. The impact of modern discoveries and opportunities for change.

833. Soil Fertility and Plant Nutrition
(SLS 830, 930.) Winter. 3(3-0)
430 or approval of department.

Fundamental concepts in soil fertility and mineral nutrition of plants; fate of nutrients applied to soils, nutrient uptake, translocation and utilization by plants; principles of laboratory, greenhouse and field research methods.

840. Soil Physics

Fall. 5(3-6) 430; CEM 162 or approval of department.

Physical properties of soil (texture, structure, consistency, aeration, water, temperature, etc.), their quantitative measurement, and relation to plant growth, and agronomic and engineering practices.

850. Soil Chemistry

Winter. 5(3-6) 430; CEM 162, 383; or approval of department.

Chemistry of mineral weathering and soil formation, ion activities, ionic exchange and equilibrium reactions, soil pH, specific elements and their chemical analysis, and availability of nutrients to plants.

851. Developmental Genetics and Plant Breeding

Fall of odd-numbered years. 4(3-1)
One course each in genetics, statistics and plant breeding.

Plant breeding in relation to genetics of growth and development. Problem sets in statistical treatment of plant breeding data.

860. Soil Biochemistry

Spring of even-numbered years. 4 credits. 850; MPH 442.

Biochemical transformations of mineral nutrients and of natural and exotic organic materials in soils, considered in relation to chemical, physical and ecological systems in the complex soil environment.

870. Origin and Classification of Soils

Winter. 4(3-2) 470, 840, or approval of department.

Genesis, morphology and classification of major soils of the world. Relationships among soils in natural and cultural landscapes. How soil properties affect their use, management and conservation. Land classifications for various purposes.

899. Research

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

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, 828, 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.

314. Dairy Herdsman Techniques

Winter. 2(0-4) 214, majors only.

Herd health and management procedures, disease prevention and detection, equipment maintenance and record systems for dairy herds.

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

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.

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(5-0) 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.*

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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.*

925. Advanced Ruminant Nutrition

Fall of even-numbered years. 4(4-0) BCH 452, PSL 801 or approval of department.

Microbiology, physiology and biochemistry of ruminant digestion and the absorption and metabolism of rumen fermentation products.

945. Physiology of Mammalian Reproduction

Winter. 4(5-0) DRY or PSL 445 or approval of department. *Interdepartmental with the Department of Physiology.*

Chemistry and biosynthesis of reproductive hormones. Gonadal, hypothalamic and pituitary development of reproductive potential. Ovulation, fertilization, implantation and placentation will be studied. Relationships of conceptus, uterus and corpus luteum. Parturition.

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—410.
- Labor Economics and Industrial Relations—305, 455, 456, 457.

Money and Banking—318, 330, 470.

International Economics—427.

Public Finance—406, 407, 408.

Price and Value Theory—324, 325, 426.

Income and Employment Theory—320, 451, 470.

History of Economic Thought—421, 422.

Industrial Organization and Control—444, 445.

Economic Development, Regional Studies, and Comparative Economics Systems—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.

IDC. Introduction to Latin America III

For course description, see Interdisciplinary Courses.

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

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) *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) *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.

361. Economic Development of Asia

Fall. 3(3-0) *200 and 201 or 210.*

Population and resources; comparison of three economic systems: Communism in China, free enterprise in Japan and socialism in India; the role of Japan in regional trade and development.

362. Economic Development of Latin America

Winter. 3(3-0) *200 and 201 or 210.*

Concentration of political and economic power as related to income distribution, tax structures, agrarian reform; inflation; trade, exchange rates, integration; population and employment policy.

363. Economic Development of Tropical Africa

Spring. 3(3-0) *200 and 201 or 210. Interdepartmental with Public Affairs Management.*

African economic development in historical perspective. Analysis of contemporary economic development problems faced by tropical African countries. Alternative strategies for African economic development.