Descriptions — Crop and Soil Sciences

Courses

425. Forest Soils Laboratory
Spring, Fall (FY) CSS 210, FOR 305, FOR 402, FOR 424, FOR 425 concurrently. Interdepartmental with and administered by the Department of Forestry.
Exercises and field trips relating to properties, classification, inventing, productivity and management of forest soils. Extended field trips required.

430. Soil Fertility and Fertilizers
Spring, Fall. CSS 210. Major, secondary and micronutrient elements of soils. Role of colloids in ion fixation and exchange, acidity, liming, fertilizer application, technology and soil-plant diagnosis.

440. Soil Biophysics
Winter. 3(0-6) CSS 210 and BOT 301; CSS 390 recommended. Salient features of soil physical and biological properties related to plant growth, principles and applications. Emphasis on root responses to the environment. Bioenergetics of the root-soil interface.

470. Soil Classification
Fall, Spring. 4(0-8) CSS 210 or approval of department. Determination of soil properties by field examination of soils. Classification of soils. Preparation of land use report based upon soil maps of assigned areas. Field trips required.

480. World Soils and Land Use
Spring. 3(2-2) CSS 210 or approval of department. Nature, geography and use of the world’s major soils. Use emphasized will include agriculture, range, and forestry.

485. Seed Science
Spring. 3(3-0) 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.

801. Crop Ecology
Winter. 3(2-0) Approval of department. World climates affecting crops and cropping systems. Limiting environmental factors for crop distribution and productivity. Physiological basis of stress injury and resistance to chilling, freezing, flooding, drought and salinity.

805. Herbicidal Action and Metabolism
Spring. 3(3-0) CSS 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
Fall, Winter, Spring. 1 to 6 credits. May reenroll for a maximum of 9 credits for either a M.S. or Ph.D. degree program, or a maximum of 14 credits for both degree programs, if different topics are 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. Soil 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 reenroll 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.

814. Plant Breeding and Genetics Seminar
Winter. 1(1-0) May reenroll for a maximum of 2 credits. Approval of department. Interdepartmental with the departments of Forestry and Horticulture.

815. Selected Topics in Plant Breeding and Genetics
Fall, Winter, Spring, Summer. 2 to 5 credits. May reenroll for a maximum of 12 credits if different topics are taken. Approval of department. Interdepartmental with the departments of Forestry and Horticulture.
Selected topics in plant breeding including: host-plant resistances, nutrition and quality, computerized records and data analysis, classical literature and strategies for improving field, horticulture, and forestry crops.

816. Special Problems in Plant Breeding and Genetics
Fall, Winter, Spring. 1 to 3 credits. May reenroll for a maximum of 6 credits. Approval of department. Interdepartmental with the departments of Forestry and Horticulture. Administered by the Department of Horticulture.
Students may conduct research in a laboratory, greenhouse or field-plot on a selected subject or study selected published literature under the supervision of a faculty member.

820. Seminar
Winter. Spring. 1(1-0) May reenroll for a maximum of 3 credits. Studies and presentation of research in crop and soil sciences.

821. Genetic Concepts in Plant Breeding
Fall. 3(3-0) CSS 250 or ZOL 441. Interdepartmental with the departments of Forestry and Horticulture. Administered by the Department of Horticulture.
Genetic structure of plant populations, gene action, inbreeding, outbreeding, heterosis, linkage and recombination, genetic architecture of traits, genetic distance.

822. Plant Breeding Systems
Winter. 3(3-0) CSS 821, STT 422. Interdepartmental with the departments of Forestry and Horticulture. Administered by the Department of Horticulture.
Breeding systems for improvement of self and cross pollinated and of vegetatively propagated crops. The genetic basis for parent selection.

823. Plant Breeding Methods
Spring. 3(3-0) HRT 822, STT 423. Interdepartmental with the departments of Forestry and Horticulture. Methods, strategies and practices in organization and operation of plant breeding programs. Emphasis on practical application of classical, modern and futuristic approaches to plant breeding.

825. Clay Mineralogy
Winter. 3(3-0) CSS 840, CSS 850 or approval of department. Interdepartmental with and administered by Geology.
Structure and properties of clays, their origin, occurrence, and utilization. Methods of studying clays including X-ray diffraction, differential thermal analysis, infrared absorption and other chemical and physical techniques.

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
Winter. 3(3-0) CSS 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.

836. Evolution of Crop Plants
Spring of odd-numbered years. 3(3-0) CSS 821 or approval of department. Interdepartmental with the departments of Forestry and Horticulture. Administered by the Department of Horticulture.
Cultural and biological aspects of evolution under domestication; origin and diversity of cultivated plants.

838. Tissue Culture for Plant Breeding (HRT 840)
Winter of even-numbered years. 3(2-2) BOT 414, CSS 821. Interdepartmental with the departments of Forestry and Horticulture. Administered by the Department of Horticulture.
The application of plant cell, protoplast and tissue culture methodologies and principles to crop improvement.

840. Soil Physics
Fall. 3(3-6) CSS 430, CEM 162 or approval of department. Physical properties of soil (texture, structure, cohesion, aeration, water, temperature, etc.), their quantitative measurement, and relation to plant growth, and agronomic and engineering practices.

842. Advanced Soil Microbiology
Fall of odd-numbered years. 3(3-0) MPH 425 or approval of department. Interdepartmental with and administered by the Department of Microbiology and Public Health.
Biochemistry, biology, and community ecology of microorganisms indigenous to soil. Emphasis on current research problems.

843. Soil Microbiology Laboratory
Fall of odd-numbered years. 2(0-6) MPH 842 concurrently or approval of department. Interdepartmental with and administered by the Department of Microbiology and Public Health.
Fundamental techniques of dealing with microorganisms indigenous to soil. Metabolic activity of microorganisms. Interaction between microorganisms and plants.
844. Plant Organelle Genetics
Winter, 3(3-0) BOT 413; CSE 821. Interdepartmental with the departments of Forestry and Horticulture. Administered by the Department of Forestry.
Control of variation in higher plants including adaptive physiology, quantitative genetics, growth correlation, biochemical genetics, hybrid physiology, and genealogy.

909. Doctoral Dissertation Research
Fall, Winter, Spring, Summer. Variable credit.

DAIRY SCIENCE
See Animal Science.

EARTH SCIENCE
See Geological Sciences.

ECONOMICS

College of Business and Graduate School of Business Administration
Courses are classified as follows:

MTH 113, CSE 162, CME 382, or approval of department.
Organization, structure, function, heredity, molecular biology and manipulation of chloroplasts and mitochondria. Biological interactions between the nucleus and organelles.

Soil Chemistry
Winter. 3(3-0) CSE 430; CSE 162, CME 382, 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.

Organic Chemistry of Soils
Spring of odd-numbered years. 3(3-0) CSE 242.
Relationship of natural and synthetic organic chemicals to chemical and biochemical processes in the soil environment.

Origin and Classification of Soils
Winter. 4(3-2) CSE 470, CSE 840, or approval of department.

Theoretical Population Genetics
Winter of even-numbered years. 4(4-0) MTH 113, ST 422, CSE 821. Interdepartmental with the departments of Forestry and Horticulture. Administered by the Department of Forestry.
Discussion of mathematical theories in population genetics and experimental works on natural and laboratory populations.

Quantitative Genetics in Plant Breeding
Spring of even-numbered years. 4(4-0) ST 423, CSE 823, or approval of department. Interdepartmental with the departments of Forestry and Horticulture. Administered by the Department of Forestry.

Physiological Genetics
Winter. 3(3-0) BOT 413; CSE 821. Interdepartmental with the departments of Forestry and Horticulture. Administered by the Department of Forestry.
Control of variation in higher plants including adaptive physiology, quantitative genetics, growth correlation, biochemical genetics, hybrid physiology, and genealogy.

305. Industrial Relations and Trade Unionism
Fall, Winter, Spring, Summer. 4(4-0) EC 200 or EC 210.
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.

306. Government Programs for Workers
Fall, Winter, Spring. 4(4-0) EC 201. Interdepartmental with the departments of Public Affairs Management.
Economics of selected government institutions and programs for workers. Social security, worker's compensation, Unemployment Insurance, OSHA, employment and training programs, wages and hours legislation, anti-discrimination programs.

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

324. Microeconomics I
Fall, Winter, Spring, Summer. 3(3-0) EC 200 and EC 201, or EC 210.
Theory of production and cost. Theory of the firm under varying market structures.

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

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

327. Macroeconomics II
Fall, Winter, Spring. 3(3-0) EC 326.
Consumption theories, investment theories, role of expectations, theories of economic growth and cycles, stabilization policies, and other advanced topics.

330. Investments and Security Markets
Fall, Spring. 3(3-0) EC 200 or EC 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 Department of History.
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 Department of History.
Urbanization, origins and implications of large-scale organizations in business and other sectors of society, and sources of economic growth since mid-19th century.