875. Individual Research Projects Fall, Winter, Spring, Summer. Variable credits. Approval of department.

877. Seminar in Complex Organizations Winter. 4(4-0) 521 or 477 or approval of department. Major theoretical and methodological problems in studying complex organizations. Using a comparative approach, special emphasis will be given to the design and execution of empirical research.

880. Individual Readings Fall, Winter, Spring, Summer. Variable credits. Approval of department.

884. Seminar in Social Stratification Spring. 3(3-0) Approval of department. Theory and research in societal systems of stratification. The articulation of stratification orders to institutional structures. Research design in stratification studies.

895. Computer Simulation of Social Behavior Winter. 4(3-2) Approval of department. Survey of research in the simulation of human behavior. Training in the basic technological and conceptual tools necessary for independent research in the area. Working in detail through an operating large simulation program to appreciate how the tools apply in practice. Designing and writing a simulation program.

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

901. Educational Sociology: Seminar (901-D) Fall, Winter. 3 to 4 credits. Approval of department. Interdepartmental with the College of Education.

930. Sociology of Work Spring. 4(4-0) 310, 430, 584 or approval of instructor. Theory and research problems in occupational structure, work settings, functions and meanings of work, occupational mobility and career patterns.

940. Topics in Mathematical Sociology Fall, Winter, Spring. 5(5-0) Approval of department. Seminar in the mathematical analysis of selected topics in sociology, such as, kinship systems, stratification systems, formal organization, social mobility, population and migration, social influence, mass behavior.

941. Human Ecology Fall. 4(4-0) Approval of department. The analysis of population aggregates in terms of their place in a total ecosystem, defined as the structure of interdependencies involving population, environment, technology, and pattern of organization.

942. Urban Theory Winter. 4(4-0) 941; 812 and 967 recommended. Examination and critique of competing theories of urban structure and process: theories of evolution of human settlement, classic location theories, human ecology, communication and system theories.

935. Techniques of Population Analysis Spring, 4(3-1) 420; STT 422; or approval of department. Techniques for the analysis of population size and composition, mortality, fertility, migration, population estimates, and forecasts, population labor force distribution, and selected techniques of ecological analysis.

953. Experimental Methods Winter. 4(3-2) 860. The design and analysis of social experiments, with special emphasis on laboratory investigation of social processes.

954. Social Survey Methods Spring. 4(4-0) 860. The design and analysis of theoretically oriented survey research. Sampling, questionnaire construction, interviewing, and data processing.

955. Field Research Methods Spring. 4 credits. 312; approval of department. An overview of the design and execution of social research.

964. Seminar in Small Group Research Fall. 3 to 5 credits. Thirty graduate credits including 812, or approval of department. The experimental and theoretical investigation of organizational processes in small groups.

966. Social Structure and Personality Winter. 3 credits. 811 or approval of department. Theoretical and research problems in analysis of influence of social positions on personality, and influence of personality and social factors in allocating persons to different social positions. Stress will be placed upon quantitative research and contemporary theories of social structure and personality.


988. Symbolic Interactionism: Theory and Research Spring. 1 to 4 credits. 811; social psychology concentration. Theoretical and research problems within the framework of symbolic interaction. The socialization process and the development, maintenance, and enhancement of the self. Critique of the literature and proposals for new research directions.

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

Soil Science — Descriptions of Courses

973. Values, Crises and Utopias in a Post-Modern Society Spring. 3(3-0) Approval of department. Macro-sociological approach to study of social problems and stresses, planned change, and conscious improvement of modern societies.

976. Contemporary Social Systems Winter. 4 credits. 311 or approval of department. Comparison and analysis of concepts, conceptual schemes and theories of outstanding sociologists in relation to modern research.

978. Comparative Rural Social Organization Spring. 4 credits. Structure and function of social organizations ranging from societies to small groups. The comparative approach will be used in studying phenomena involved in the transitions from agrarian to industrial societies.

981. Comparative Sociology Fall. 3 or 4 credits. Doctoral student in sociology, completion of core courses. Macro-sociological studies of societies. The relationship of the whole to the varied parts of societies, the connection between societies, and the patterns of change in different societies. The development of research with respect to the cross-cultural study of social structures, social institutions, and social systems.

982. Comparative Social Psychology Winter. 3 or 4 credits. 981. Social psychological research problems involving a comparative methodology. Social psychological functions of education, mobility, mass media use, etc. Comparative study of the social psychology of modernization.

983. Comparative Research Methods Spring. 3 or 4 credits. 981. Sampling problems, data collection strategies, problems of translation and concept equivalence. Management, analysis and interpretation of cross-cultural data.

999. Research Seminar in Work and Organization Winter. 2(2-0) May re-enroll for a maximum of 6 credits. Thirty graduate credits and approval of department. An advanced seminar devoted to analysis of designs used in current research in work and organization.

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

SOIL SCIENCE SLS

College of Agriculture and Natural Resources

202. Soils and Man's Environment Winter. 3(3-0) Interdepartmental with Fisheries and Wildlife and Resource Development Departments and Natural Resources. Use of soil-water resources in a technological society; relations to environmental quality. Nature of pollution problems and their possible solutions. Food production and world population.
Descriptions — Soil Science
of Courses

210. **Fundamentals of Soil Science**
Fall, Winter. 5 credits.
Principles of the origin and development of soils. Relationship of properties to utilization and soil fertility to plant composition and animal health. Emphasis is placed on changing soils to serve man.

331. **Soil Management**
Winter. 4(4-0) 210.
Management of soils, drainage and irrigation, organic matter, tillage, rotation, conservation practices, soil reaction, lime, fertilizers, and micronutrients. Soil management vs. soil conservation. Special study in general crops, horticultural crops, greenhouse crops, turf and organic soils.

390. **Soil Conservation and Land Use**
Spring. 3(3-0) 210.
Soil resources of the United States and methods and plans for soil conservation including control of erosion. Interpretation of soil survey maps and land evaluation for farm crops, fruits, forestry, engineering and wildlife. Soil judging.

410. **Special Soil Problems**
Fall, Winter, Spring, Summer. 1 to 3 credits. May re-enroll for a maximum of 6 credits. Approval of department.
Independent study topics include: Special soil problems, fertility, geography, classification, conservation, soil management, organic soils and turfgrass soils.

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

424. **Forest Soils**
Spring. 4(3-3) 210; FOR 220, Interdepartmental with and administered by the Forestry Department.
Interrelationships of forest site and the growth of forests. Classification and productivity of forest soils. Effects of silvicultural and forest management practices on the soil. Two-day field trip required.

430. **Soil Fertility and Fertilizers**
Spring. 5(4-1) 210.
Assessment of the fertility of soils and alteration of fertility by the use of fertilizers, lime, manures, and cropping systems. The role of colloids in ion fixation and exchange. Soil and tissue tests. The history, technology, and use of fertilizers.

442. **Soil Microbiology**
Spring. 4(3-3) MPH 200, 301 or 401. Interdepartmental with and administered by the Microbiology and Public Health Department.
Major groups of microorganisms of importance in soils are studied with emphasis on ecological, biochemical, and physical aspects.

470. **Soil Classification and Mapping**
Fall, Spring; Summer of odd-numbered years. 4(0-8) 210 or approval of department.
Classification of soils. Interpretation of profiles in relation to land utilization for farm crops, fruits, forestry, highway-airport engineering, county and township planning, urban development and wildlife. Preparation of land use reports based upon soil maps of assigned areas.

480. **Soil Geography and Land Use of North America**
Spring. 3(2-2) 210 or approval of department.
Properties, geography and dominant land use of the major soils of North America.

IDC. **The Impact of Animal Resource Management Upon the World’s Developing Nations**
For course description, see Interdisciplinary Courses.

810. **Advanced Studies in Soil Science**
Fall, Winter, Spring. Summer. 1 to 5 credits. May re-enroll for a maximum of 6 credits. Approval of instructor.
Areas of work to include: advanced studies in soil science, chemistry, classification, conservation, fertility, geography, management, microbiology and biochemistry, micronutrients, microbiology, pedology, mineralogy, organic soils and physics.

820. **Seminar**
Winter, Spring. 1(1-0) May re-enroll for a maximum of 3 credits. Interdepartmental and administered jointly with Crop Science.
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 Geology Department.
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. **Soil Fertility and Plant Nutrition**
(830) Winter of even-numbered years. 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.

835. **Organic Soils**
Spring. 2(2-0) Approval of department.
Information pertinent to organic soils formation, classification, water control, conservation, plant nutrients, soil testing, commercial utilization, special crops, road construction, and real estate development will be presented. Field trip included.

840. **Soil Physics**
Fall. 5(3-3) 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. 3(3-4) 430; CEM 162, 383; or approval of department.
Chemistry of mineral weathering and soil formation, ion activities, ionic exchange and equilibria, reactions, soil pH, specific elements and their chemical analysis, and availability of nutrients to plants.

850. **Soil Biochemistry**
Spring of even-numbered years. 4 credits. 850; MPH 445.
Biological 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(3-3) 470, 840, or approval of department.

880. **Fertility and Management of Tropical and Subtropical Soils**
Winter. 3(3-0) Approval of department.
Fertility and management of tropical and subtropical soils, the use of soil testing techniques with field studies to evaluate the fertility status and develop cropping systems for optimum production.

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

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

SOUTH ASIAN LANGUAGES
See Linguistics and Oriental and African Languages.

SPANISH
See Romance Languages.

STATISTICS AND PROBABILITY

College of Natural Science
Introductory courses are further classified as follows:

315, 316-sequence for undergraduate students of Business Administration.
201—survey course.
421, 422, 423—minimal sequence for students planning to use statistical methods in their research.
441, 442, 443—minimal sequence in theory of statistics. Qualified students should take the 861, 862, 863 sequence instead.
851, 862, 863—sequence for students preparing to do advanced work in statistics.
881, 882, 883—sequence in analytic probability theory and stochastic processes at graduate mathematics level.

201. **Statistical Methods**
Fall, Winter, Spring, Summer. 4(4-0) MPH 103 or 111. Primarily for students in psychology, sociology, anthropology, political science, economics, agriculture, and forestry. Credit may not be earned in more than one of the following: 201, 315, 421.
Descriptive statistics, elementary probability and combinatorics. The binomial distribution. Random variables, their expectations and variances. Central Limit Theorem, estimation and inference. Simple tests based on the binomial, normal, t, chi-square and F distributions.