

formulation. Administrative implications of training, practice, supervision, consultation and research. Integral practicum component.

874. Social Work Consultation

Winter. 4 credits. Second-year social work graduate students; approval of school.

Consultation as a problem-solving process in social work. Emphasis on role relationships, types of consultation, and intervention models. Differentiation from client treatment, psychotherapy, supervision and collaboration. Integral practicum component.

875. Research in Social Welfare I

(895.) Fall. 3(3-0) Second-year social work graduate students.

Consideration of issues related to the logic and methods of scientific verification. Emphasizes the systematic analysis of research strategies pertinent to social welfare research.

876. Research in Social Welfare II

(895.) Winter. 3(3-0) 875.

Application of statistical concepts and techniques to the analysis and evaluation of research data. Interpretation of statistical tests and criteria for employing given statistical techniques in various situations are discussed.

877. Research in Social Welfare III

(895.) Spring. 3(3-0) 876.

Design of research project developed from work of prior two terms and interest of the student. Provides an opportunity to relate theoretical research knowledge to an applied situation.

881. Social Work in Special Settings

Fall, Winter, Spring, Summer. 3(3-0) May re-enroll for a maximum of 6 credits with approval of school. Majors or approval of school.

Social work concepts, methods and program development in selected settings such as school, medical, psychiatric, correctional, family, or child welfare. Significance of organizational arrangements for social work practice.

882. Seminars in Social Work

Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 12 credits. Approval of school.

Seminars on selected issues, trends, programs or methods in social work.

885. General Seminar

Spring. 3(3-0) Majors.

Current issues and trends in the development of social work as a profession. Students participate in selection of topics to be considered.

890. Special Problems in Theory and Practice

Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 18 credits. Majors or approval of school.

Individual or group study of special settings or of specific social work problems.

893. Social Gerontology

Fall. 3(3-0) Approval of school.

Aging and years of later maturity, with respect to social and personal difficulties and opportunities. Aging process, retirement, living arrangements, social relationships, community resources, and implications for social welfare.

985. Advanced Seminar in Social Work

Winter, Spring. 3(3-0) May re-enroll for a maximum of 12 credits. Multidisciplinary social science doctoral student.

Critical study of current issues and problems in social work. Students participate in selection of topics to be considered.

990. Independent Study in Social Work

Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 12 credits. Approval of school.

Individual study of a theoretical or applied problem in social work.

SOCIOLOGY SOC

**College of Human Medicine
College of Osteopathic Medicine
College of Social Science**

150. The Individual in Modern Society

Fall, Spring. 4(4-0)
Recognition and description of social conditions which lead to individual human development. Exploration of ways in which society facilitates and fails to facilitate individual human development.

160. Contemporary Social Problems

Fall. 3(3-0)
Identification of the factors and issues involved in mankind's fight for survival in our technological society. Relationship of humanism and technology. Examination of and suggestions for dealing with problems of warfare, cybernation, human rights.

241. Introduction to Sociology

Fall, Winter, Spring, Summer. 4(4-0) Sophomores.
Introduction to nature of sociological inquiry and to concepts and principles of sociology. Analysis focuses on institutional features of modern society and of structure and dynamics of social organization.

335. Criminology

Winter, Spring. 3(3-0) 241.
Cultural nature, origin and development of crime; trends in criminal law; psychological and sociological factors involved in criminal behavior; current programs for treatment and prevention.

351. Social Psychology

Fall, Winter, Spring, Summer. 5(4-0) 241. Students may not receive credit in both 351 and PSY 335.
Social psychology from a sociological perspective. Relation of the individual to his social environment with special reference to group process and interaction, social structure and personality, mass phenomena, and social attitudes.

353. Sex Roles

Winter. 4(4-0) 241.
A sociological inquiry into traditional and changing roles of women and men in Western societies; sex roles in economic and family institutions; variations by culture, class, ethnicity; socialization.

390. Survey of Subsaharan Africa.

For course description, see Interdisciplinary Courses.

391. Survey of Subsaharan Africa

For course description, see Interdisciplinary Courses.

400H. Honors Work

Fall, Winter, Spring, Summer. 1 to 4 credits. May re-enroll for a maximum of 20 credits. Approval of department.

401. Sociology of Education

Winter, Summer. 3(3-0) 241. Interdepartmental with Education.
School as a social institution, school-community relations, social control of education, and structure of school society.

420. Dynamics of Population

Spring. 4(3-0) 241.
General demographic theories, especially those concerning population growth. Population distribution and density, age, sex, and ethnic composition. Emphasis on fertility, mortality, and migration and their influences on population change.

421. Industrial Sociology

Winter, Spring. 3(3-0) 241.
Industrialization in Western and non-Western societies; social organization of work; internal dynamics of work plant as a social system; and labor-management relations in various cultural settings.

422. Political Sociology

Fall. 4(3-0) 241.
Political action in the United States in relation to theory and practice of democracy. Nature of social pressures, political group, politician and effect of local community situation on political activity will be considered.

423. Sociology of the Family

Winter. 3(3-0) 241.
Sociological analysis of the family, its development as a social institution, its relationship to society, and its contribution to personality.

424. Sociology in Mental Health

Spring. 3(3-0) 351 or PSY 335.
Sociological theories of etiology of mental disorder; research on social epidemiology and ecology; impact of social structure; popular conceptions of mental health and deviancy; emerging ideologies of mental health disciplines.

427. Social Movements and Ideologies

Winter, Spring. 4(4-0) 241.
The analysis of the collective response to situations of social tension and change that take the form of social movements and their accompanying ideologies. Both historical and contemporary cases will be examined.

428. Contemporary Communities

Winter, Summer. 4(3-0) 241.
An examination of the contemporary community. Emphasis will be placed on associational and institutional organization in communities of varying complexity. Particular attention will be paid to social organizational theory as it applies to the problems of American community life.

429. Urban Sociology

Fall, Winter, Spring. 4(4-0) 241.
Urban theory and research techniques emphasizing the demography, ecology and social organization of American cities and sociological aspects of urban planning and redevelopment.

430. Sociology of Occupations and Professions

Winter. 3(3-0) 241.
Social significance of work. Forces changing contemporary occupational structure. Factors associated with typical career patterns of occupations and professions. Social organization of occupational groups with emphasis on their ideology and politics.

431. Comparative Urban Sociology
Spring. 4(4-0) 429 or approval of department.

Urban demography, ecology, and social organization viewed historically and cross-culturally and emphasizing the contemporary urbanization processes. Theory, techniques, and data of international comparative urban analysis.

432. Behavior of Youth
Fall, Winter, Spring. 3(3-0) 241 or 351.

Sociological analysis of normal and deviant behavior of youth. Issues related to the existence of youth subcultures. Relation of social change to behavior of youth.

433. Minority Peoples
Winter, Spring, Summer. 4(3-0) 241.

Sociology of majority-minority relations in contemporary, particularly American, society. Attention to specific ethnic, religious, and racial minorities in terms of prejudice and discrimination, with particular concern for minority status of the American Negro.

434. Social Deviance and Control
Spring. 3(3-0) 335 and one of the following: 160, 432, or C J 355 or approval of department.

The relationship between social structure, social control and social deviance; a survey and criticism of present social science theories in light of empirical research and application of theories to selected problem areas.

437. Rural Sociology
Fall, Spring, Summer. 4(4-0) 241 or approval of department.

Structure, function and change in rural areas of the United States. The major social systems, social class, demographic characteristics, commodity organizations and value orientations of rural people.

438. Sociology of Developing Societies
Winter. 4(4-0) 241.

Sociological elements of modernization. Process of technological change and type of programs to induce change. Emergence and accommodation of institutions to change. The changing population, family, community and ideological structures.

440. Sociology of Religion
Spring. 3(3-0) 241.

Relationship to society, with particular emphasis on modern society. Religion as a social institution; its relation to stratification and to political and economic organization. Forms of religious organizations. Religious believing and the rational, empirical orientation in modern culture.

443. Personality and Social Structure
Spring. 4(3-0) 351.

Effects of social structural variables upon personality development, adult socialization, role behavior, self image, and self evaluation.

445. Social Knowledge in the Modern World
Winter. 4(3-0) 241.

A sociological examination of the continuing effort to achieve a viable basis for relating social knowledge to the modern world. The sociology of knowledge, concerned with the relation of ideas to social life will provide the framework for the course. Attention will be given to such issues as: the role of the intellectual as cultural and political critic, and as man of knowledge; the relation of empirical knowledge to cultural values and social ideologies; the uses of reason and knowledge in human affairs; and the relation of intellect to power.

448. Small Group Interaction
Winter. 4(4-0) 351 or PSY 335.

Properties of social interaction in small groups. Relationship between group structure and social interaction.

451. Public Opinion and Propaganda
Fall, Spring. 3(3-0) 241.

The nature of public opinion, its development and change, its measurement. The nature of propaganda, principles of persuasion, and methods of analysis.

466. Cross-Cultural Relations in the Modern World
Winter of even-numbered years. 3(3-0)

473. Interdepartmental with the Anthropology Department.

Relationship of native peoples to world-wide forces and reactions of native peoples to world struggle for power. Problems involved in administration of programs for non-Western societies.

471. Modern American Society
Winter, Spring, Summer. 4(3-0) 241; Juniors.

Cultural patterns and social structures of contemporary American life. Relationship of these patterns and structures to individual and group adjustment.

473. Culture and Personality
Fall, Spring, Summer. 4(3-0) 241 or ANP 171. Interdepartmental with the Anthropology Department.

Human nature in evolutionary and cross-cultural perspective. Special attention to relating theories of anthropology and psychology to methods of studying personality in non-Western societies.

475. Individual Research Projects
Fall, Winter, Spring, Summer. 1 to 4 credits. May re-enroll for a maximum of 12 credits. Nine credits in sociology and approval of department.

477. Complex Organizations
Fall. 4(4-0) 241 and 3 credits at the 300-400 level from the social science disciplines.

Bureaucracies and complex formal organizations in various institutional settings and the relationship among organizations in the community. Informal structures, internal conflict, integrative mechanisms, and the dilemmas of professional and administrative demands will be emphasized.

484. Social Stratification
Winter. 4(4-0) 241.

Survey of literature on the formation and changes in social class systems in modern and traditional societies. Social mobility in class, status and political orders.

485. Wealth and Poverty
Winter. 4(4-0) 241.

Distribution of income and wealth in contemporary industrial societies; relevance of wealth to prestige and political orders of societies; social consequences of public and private programs.

492. Introduction to Methods of Social Research
Fall, Spring. 5(3-2) Nine credits in sociology; STT 201.

Elements of scientific logic; procedures and problem formation; development of concepts, hypotheses, theory; research design, sampling, measurement, data gathering; analysis, interpretation, and reporting research findings.

493. Selected Exercises in Social Research
Winter. 5(2-3) 492.

A laboratory course providing training in the application of social research methods, under

laboratory and field situations, to problems in the major substantive areas of sociology, social psychology and anthropology.

494. Sociological Theory
Fall, Winter. 5(4-0) Eighteen credits in sociology.

Significant theoretical contributions to the development of sociological theory, both European and American.

499. Senior Seminar
Fall, Winter, Spring. 5(3-0) May re-enroll for a maximum of 15 credits. Senior majors or approval of department.

Selected issues in sociological research and theory.

803. Seminar in Industrial Relations
For course description, see Interdisciplinary Courses.

810. General Social Organization
(977.) Fall. 4 credits. Majors or approval of department.

Research and literature on the structure and function of social organizations ranging from societies to small groups.

811. Research Problems and Literature in Social Psychology
(963.) Fall. 4(4-0) Majors or approval of department.

Central points of view and concepts of contemporary social psychology with emphasis upon symbolic interaction. Collective behavior, small groups, attitudes and behavior, and culture and personality.

812. Theory of Sociological Inquiry
(956.) Spring. 4(4-0) Majors or approval of department.

Critical review of some of the procedures followed by sociologists and social psychologists in their attempts to achieve reliable knowledge.

823. Organizational Behavior in Labor and Industrial Relations
Fall. 4(4-0) Approval of school. Interdepartmental with and administered by the School of Labor and Industrial Relations.

Analysis of why organizations, individuals and groups in unions, management and government act as they do in industrial relations situations with emphasis on sociological, psychological and cultural factors.

825. Seminar in Cross-Cultural Relations
Winter of odd-numbered years. 4(3-0) Approval of department. Interdepartmental with the Anthropology Department.

Analysis of the relations between superordinate and subordinate societies and between coordinate societies and cross-cultural exchange programs.

827. Social Movements and Ideologies
Spring. 3(3-0) Approval of department.

Organizational structure and supporting belief systems of groups and collectivities which desire major institutional changes in society.

837. Special Topics in Rural Sociology
Fall, Winter, Spring. 3 to 8 credits. Approval of department.

Special fields of rural sociology such as farmers' organizations, population, migration, adaption of practices, changing ideologies, political behavior, stratification, and attitudes.

838. Interdisciplinary Seminar on Africa
For course description, see Interdisciplinary Courses.

- 840. Violence and Social Change**
Fall. 3(3-0) Approval of department.
Conditions of violence in situations of conflict and change, legitimization of violence, and response to violence by institutional elites and by publics.
- 842. Seminar in Conflict and Change**
Winter. 3(3-0) Approval of department.
Overview of the substantive and research literature in Conflict and Change; and explores possibilities for student research and involvement in the area.
- 853. Social Attitudes**
Spring. 4(4-0) Approval of department.
Origin, development, classification, and measurement. Relationship between attitudes and behavior. Students will conduct field research.
- 860. Social Statistics and Research: Seminar**
Fall, Winter, Spring. 4(4-0) May re-enroll for a maximum of 12 credits. 492 and a statistics course.
Applications of probability and statistical models to social research.
- 862. Industry and Community**
Spring. 4(4-0) 421, approval of department.
Seminar analyzing the research literature and theoretical developments in the sociology of industry and community.
- 864. Population Studies: Research Problems and Literature: Seminar**
Winter. Variable credit. Approval of department.
Theoretical and substantive literature relating to demographic change, and research problems of special interest.
- 866. Selected Research and Literature In Social Institutions**
Fall, Winter, Spring. Variable credit. May re-enroll with approval of department.
A review and analysis of the significant literature concerning major problems in the institutional structure of modern society. A. Economic and Industrial; B. Political; C. Religious; D. Family.
- 868. Social Organization and Administration**
Fall, Spring. 3(3-0) Approval of department.
General principles of inter and intra organizational change in the administrative process.
- 872. Seminar in Special Subject Fields**
Fall, Winter, Spring. Variable credit. Approval of department.
Special fields of study will include any area of sociology and social psychology selected.
- 875. Individual Research Projects**
Fall, Winter, Spring, Summer. Variable credits. Approval of department.
- 877. Seminar in Complex Organizations**
Winter. 4(4-0) 421 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.
- 901D. Educational Sociology: Seminar**
Fall, Winter, Spring. Variable credit. Approval of department. Interdepartmental with Education.
- 930. Sociology of Work**
Spring. 4(4-0) 430, 484 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 patterns 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.
- 952. 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 and 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. 492; 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 811, 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.
- 967. Introduction to Formal Theory in Sociology**
Spring. Variable credit. 966.
Analysis of the structure of formal theory in sociology and of the problems of interpretation and verification of deterministic and probabilistic theories. Examination of specific practices of theory construction.
- 968. 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.
- 970. Theories of Conflict and Change**
Fall. 3(3-0) Approval of department.
Major theoretical European and American contributions to the study of conflict and change.
- 971. Race, Politics, and Social Structure**
Winter. 3(3-0) Approval of department.
Racism, including the social mechanisms by which it is created, maintained, and lessened, and the variant forms of political action related to racism and social structure.
- 972. War and International Conflict**
Spring. 3(3-0) Approval of department.
Causes, structure and patterns of wars between societies, revolutions within societies and the relation of war and revolution to cross-cultural conflict and change.
- 973. Values, Crises and Utopias in a Post-Modern Society**
Fall. 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. 494 or approval of department.
Comparison and analyses of concepts, conceptual schemes and theories of outstanding social theorists 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.

991. Research Seminar in Work and Organization

Fall, Winter, Spring. 2(2-0) May re-enroll for a maximum of 6 credits. Thirty graduate credits and approval of instructor.

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 as it relates to environmental quality. Nature of pollution problems and their possible solutions. Food production and world population.

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, manure, 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

(481.) Spring. 4(3-2) 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(0-3) 210 or approval of department.

Classification of soils. Interpretation of profiles in relation to land utilization for farm crops, fruits, forestry, highway-airfield 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 the World

Spring. 4(4-0) 210 or approval of department.

Survey of the great soil groups and their use throughout the world, their location, significant characteristics, how they are and can be utilized, and the relation of each to food and population increase.

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

Winter. 3(4-0)

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, conserva-

tion, fertility, geography, management, microbiology and biochemistry, micronutrients, micropedology, mineralogy, organic soils and physics.

820. Seminar

Fall, 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

(945.) 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

(930.) Spring. 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.

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.

880. Soils and Land Use in Tropical and Subtropical Regions

Spring. 3(3-0) Approval of department. Interdepartmental with Agriculture.

Problem oriented studies of soils and land use in the tropics and subtropics in relation to their genesis, morphology, taxonomy, and management.

899. Research

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

999. Research

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