Sociology

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

903. Sociology of Work
Spring. 4(4-0) 430, 310, 884 or approval of instructor.
Theory and research problems in occupational structure, work settings, functions and meanings of work, occupational mobility and career patterns.

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(0-1) 420, 577, 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) 869
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 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 the influence of social positions on personality, and influence of personality and social factors in altering persons to different social positions. Stress will be placed upon qualitative 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.

971. Race, Politics, and Social Structure
Winter. 3(3-0) Approval of department.
Racial inclusion, 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 society 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 changes, planned change, and conscious improvement of modern societies.

974. Theoretical Perspectives in Sociology
Winter. 4 credits. 845 or 846.
Comparison and analyses of concepts, conceptual schemes and theories of outstanding social theorists in relation to modern research.

977. Seminar in Selected Theoretical Issues
Spring of odd-numbered years. 4(4-0)
May re-enroll for a maximum of 8 credits. 845.
Same approach to social theory. Selected themes related to substantive problems in theory, theory construction or the work of a historical or contemporary thinker.

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 emotion, mobility, mass media use, etc. Comparative study of the social psychology of modernization.

983. Comparative Research Methods
Spring. 3 or 4 credits. 981.

991. 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 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.

SOUTH ASIAN LANGUAGES

See Linguistics and Oriental and African Languages.

SPANISH

See Romance and Classical Languages.

STATISTICS AND PROBABILITY

STT

College of Natural Science

Introductory courses are further classified as follows:
315, 316—sequences for undergraduate students of Business Administration.
201—survey course.
431, 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.
861, 863, 865—sequence for students preparing to do advanced work in statistics.

See 983 in analytic probability theory and stochastic processes at graduate mathematics level.
201. Statistical Methods
Fall, Winter, Summer. 4(4-0)
MTH 108 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.

315. Introduction to Probability
Fall, Winter, Spring, Summer. 4(4-0)
MTH 111. Credit may not be earned in more than one of the following: 201, 315, 421.


316. Fundamentals of Statistical Inference
Fall, Winter, Spring, Summer. 4(4-0)
MTH 111. Primarily for students in the College of Business. Interdepartmental with the Department of Marketing and Transportation Administration.

Description of sample data, applications of probability theory, sampling, estimation, tests of hypotheses.

317. Quantitative Business Research Methods
Fall, Winter, Spring, Summer. 4(4-2)
Interdepartmental with and administered by the Department of Marketing and Transportation Administration.

Application of statistical techniques to business decision-making. Topics covered include applications of linear regression and correlation, analysis of variance, selected nonparametric tests, time series, and index numbers.

341. Probability for Teachers
Spring. 4(4-0) MTH 301 or approval of department.

Primarily for majors in mathematical education. Probability theory will be studied as a mathematical structure. Although some examples of the use of the theory will be discussed (the use of some theorems is discussed in a course in plane geometry) the major emphasis will be on understanding the structure of probability theory.

351. Introduction to Statistics
Spring. 4(4-0) MTH 214.

Probability models, discrete random variables, the binomial, hypergeometric and Poisson distributions, statistical inference based on the binomial distribution, continuous random variables, test of hypothesis and confidence intervals based on the normal distribution.

421. Statistics I
Fall, Winter, Spring. 4(4-0)
MTH 108. Credit may not be earned in more than one of the following: 201, 315, 421. This course and 422, 423 form a one year sequence in statistics for those without a calculus background; 421 provides an introduction to a few of the main ideas of probability and statistics. The courses 441-2-3 and 851-3-3 form one year sequences in statistics for those with a calculus background. Those expecting to use statistics as a graduate research tool should complete one of the full year sequences.


422. Statistics II
Fall, Winter, Spring, Summer. 3(3-0)

Nonparametric tests: sign test, Wilcoxon's rank sum test, Spearman's rank correlation test, run tests. Multiple regression analysis. Least squares estimation and tests for simple linear hypotheses.

423. Statistics III
Fall, Winter, Spring, Summer. 3(3-0)

Application of multiple regression analysis to analysis of variance problems. Design of experiments including randomized block designs. Latin square, factorial designs, and balanced incomplete block designs.

441. Probability and Statistics I: Winter
Fall, Winter, Spring. 4(4-0)
MTH 215.

Mathematical probability as a basis for the theory of statistics. Discrete and continuous probability models, conditional probability and independence, random variables, central limit theorem, sampling distributions.

442. Probability and Statistics II: Inference
Winter, Spring. 4(4-0) 441; MTH 334 or concurrently.

Estimation, confidence intervals, test of hypothesis, linear hypotheses.

443. Probability and Statistics III: Inference
Spring. 4(4-0) 442.

Multiple linear regression, analysis of variance, goodness of fit tests, contains non-parametric tests.

480. Theory of Games
Fall of odd-numbered years. 3(3-0)
MTH 215, 334.


490. Statistical Problems
Fall, Winter, Spring. 1 to 6 credits.

Approval of department. Individualized study adapted to the preparation and interests of the student.

825. Sample Surveys
Fall. 3(3-0) 423 or 441 or 442 or 863.

Applications of statistical sampling theory to survey designs involving simple random, stratified, and systematic samples; sub-sampling, double sampling; ratio and regression estimates; other topics.

826. Nonparametric Statistics
Spring. 4(4-0) 443 or 862.

Current tests of hypotheses which may be made without specification of the underlying distribution. Rank tests and tests based on permutation of observations. Tolerance and confidence sets. Large-sample distributions. Applications to research in the social and natural sciences.

833. Mathematical Programming
Spring. 3(3-0) EC 600, or 812A, MTH 334. Interdepartmental with the Department of Agricultural Economics and administered by the Department of Agricultural Economics.

Linear programming. Theory of linear economic models. Topics in nonlinear programming.

851. Linear Statistical Models
Fall. 4(4-0) 443 or 863.

Use of linear statistical models. Curve fitting, simple and multiple regression analysis, multiple and partial correlation coefficients, the analysis of variance, simultaneous confidence intervals, more complex experimental designs.

852. Methods in Operations Research I
Winter. 3(3-0) 441 or 861.

Optimization techniques and probability models with a wide variety of applications: linear programming, including special problems; network analysis, including PERT; dynamic programming; game theory; queuing theory; Acquaintance with matrices advisable.

853. Methods in Operations Research II
Spring. 3(3-0) 852.

Continuation of 852. Inventory theory, Markov chains with applications; simulation as adjacent to mathematical models; advanced topics in linear programming; non-linear programming.

861. Theory of Probability and Statistical I
Fall. 4(4-0) MTH 424 or 427 or concurrently.

Discrete probability models, random variable expectation, combinatorial analysis, conditional probability and independence, generating functions, some special discrete distributions, continuous probability models.

862. Theory of Probability and Statistical II
Winter. 4(4-0) 861; MTH 425 or 428 or concurrently.

Continuous probability models, density transformations, some special continuous distributions, limit laws. Introduction to statistical inference, estimation of parameters, hypothesis testing.

863. Theory of Probability and Statistical III
Spring. 4(4-0) 862; MTH 334, 426 or 429 or concurrently.

Continuation of hypotheses testing, sufficiency, Rao-Blackwellization, some nonparametric methods, linear models.

864. Stochastic Models in Biology
Fall. 3(3-0) 441 or 861.

Stochastic processes. Selected topics from growth processes, epidemic theory, prey-predator models, mathematical genetics.

865. Theory of Experimental Design
Fall of even-numbered years. 3(3-0) 873 or approval of instructor.

Experimentation: Cochran's theorem; review of sampling theory; simple designs and statistical analyses; factorial designs and confounding and the group theoretic aspects of these designs; geometrical problems of construction of sets of Latin and Graeco-Latin squares.

871. Theory of Probability and Statistical I
Fall. 3(3-0) 863; MTH 891 or concurrently.

Statistics

872. Theory of Probability and Statistics II
Winter. 3(3-0) 871; MTH 822 or concurrently.
Basic concepts of decision theory. Most powerful tests. Standard statistical methods for use in the binomial, Poisson and normal situation; sequential and nonparametric methods; linear models.

873. Theory of Probability and Statistics III
Spring. 3(3-0) 872; MTH 927 or concurrently; or approval of department.

876. Statistical Inference in Economics I
Fall. 3(3-0) 443 or 863; EC 812A or 801; or approval of department. Interdepartmental with Agricultural Economics and Economics and administered by the Department of Economics. Review of basic probability distributions. Estimation of parameters of single-equation regression models. Properties of least-squares estimators under alternative specifications. Problems of analyzing nonexperimental data. Errors in variable, autoregressive and heterocedastic models.

877. Statistical Inference in Economics II

878. Statistical Inference in Economics III
Spring. 3(3-0) EC 877 or approval of department. Interdepartmental with Agricultural Economics and Economics and administered by the Department of Economics. Validation and application of dynamic econometric models. Bayesian approach to estimation problems. Recent developments in econometric methods and in applied econometric research.

882. Probability and Stochastic Processes II
Winter. 3(3-0) MTH 922 or concurrently.

883. Probability and Stochastic Processes III
Spring. 3(3-0) MTH 923 or concurrently.

886. Stochastic Processes and Technological Applications
Winter. 3(3-0) 441 or 861.

887. Stochastic Models in the Physical Sciences
Spring. 3(3-0) 895 or approval of department.
Selected models from the physical sciences. These may include topics from the theory of queues, the theory of dams, and branching processes in cosmic ray theory.

890. Statistical Problems
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

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

907. Theory of Measure and Integration
Spring. 3(3-0) MTH 822. Interdepartmental with and administered by the Department of Mathematics. Introduction to the theory of integration over abstract spaces. Topics may include: measure spaces; measurable and integrable functions; modes of convergence, theorems of Egoroff, Luzin, Riesz-Fischer, Lebesque absolute continuity, and the Radon-Nikodym theorem; product measures and Fubini's theorem. Applications to some of the classical theories of integration and summability.

923. Measure Theory Applications to Probability
Fall. 3(3-0) MTH 927.

929. Foundations of Decision Theory
Winter. 3(3-0) 925.

937. Systems Simulation
Fall. 4(4-0) MGT 835, STT 433, MTH 238. Interdepartmental with and administered by the Department of Management. The concept of a model, model building, characteristics of simulation models. Techniques of computer simulation. Simulation models in research and management planning/control. Validation and experimental design. Special purpose languages.

948. Mathematical Programming For Business
Spring. 4(4-0) MGT 836, MTH 334, 426, STT 883. Interdepartmental with and administered by the Department of Management. Large mathematical programs with special structures. Duality and decomposition in mathematical programming. Basic theory of dynamic programming; multistage decision processes and the principle of optimality. Risk, uncertainty, and introduction to stochastic and adaptive control processes.

949. Advanced Applied Stochastic Processes
Winter. 4(4-0) MGT 838, 537. Interdepartmental with and administered by the Department of Management. Selected topics from the following areas: Semi-Markov, Markov renewal and regenerative processes models; Markov and semi-Markov decision processes; decision theory, applications from production, inventory, reliability, queuing, and gaming theory.

951. Advanced Theory of Nonparametric Statistics
Fall of odd-numbered years. 3(3-0) 873; 928 or concurrently.
Possible topics include small and large sample properties of distribution free tests; robust estimation of location, scale and regression parameters; nonparametric ANOVA.

952. Asymptotic Theory
Spring of even-numbered years. 3(3-0) 873; 929.
Possible topics include large sample behavior of likelihood functions; consistency, Bahadur and Pitman efficiency of statistical procedures.

953. Advanced Theory of Linear Statistical Models
Fall of even-numbered years. 3(3-0) 873; 928 or concurrently.
Possible topics include construction and analysis of linear models; regression; ridge regression; optimality criteria, relationships and merits; existence and construction of optimal designs.

954. Sequential Analysis
Spring of odd-numbered years. 3(3-0) 873; 929.
Possible topics include sequential estimation, testing and design, optimal stopping.

961. Convergence of Measures and Random Variables
Fall of odd-numbered years. 3(3-0) 873; 928 or concurrently.

962. Martingales
Winter of even-numbered years. 3(3-0) 873; 929.
Convergence, sampling, decomposition and stopping of sub and super-martingales. Relationship with differentiation of measures. Applications to sequential analysis and boundary crossing probabilities.

963. Diffusion and Brownian Motion
Spring of even-numbered years. 3(3-0) 873; 928.
One dimensional diffusion, speed and drift measures, local time, stochastic integral, Itô's theorem.

964. Renewal Theory and Random Walk
Fall of even-numbered years. 3(3-0) 873; 928 or concurrently.

965. Second Order Processes
Winter of odd-numbered years. 3(3-0) 873, 928.
Stochastic processes studied by the methods of linear spaces. Sample path properties, representativeness, estimation, prediction, multiplicity.

966. Semi-Groups and Applications
Spring of odd-numbered years. 3(3-0) 873, 928.
Hille-Yosida theorem, processes of independent increments, infinitely divisible processes, Markov processes in several dimensions.
613. Orthopedic Clerkship  
Fall, Winter, Spring, Summer. 1 to 17 credits. May re-enroll for a maximum of 34 credits. H M 620. Diagnostic and management information and skills, including emergencies, in common orthopedic problems.

614. Neurosurgery Clerkship  
Fall, Winter, Spring, Summer. 1 to 17 credits. May re-enroll for a maximum of 34 credits. H M 602. A hospital-based experience to provide the student with familiarity with the field and understanding of the contribution of neurosurgery in medicine generally.

615. Ophthalmology Clerkship  
Fall, Winter, Spring, Summer. 1 to 17 credits. May re-enroll for a maximum of 34 credits. H M 620. Development of skills and knowledge in ophthalmology, neuro-ophthalmology, visual function, and management of problems such as glaucoma, the red eye, and trauma.

616. Thoracic Surgery Clerkship  
Fall, Winter, Spring, Summer. 1 to 17 credits. May re-enroll for a maximum of 34 credits. H M 620. Problem-solving in thoracic medicine and surgery, also stressing pulmonary physiology, use of diagnostic tools and tests, and indications for surgical procedures.

618. Anesthesiology Clerkship  
Fall, Winter, Spring, Summer. 4 to 16 credits. May re-enroll for a maximum of 16 credits. H M 602. Introduces common anesthetic agents and provides opportunity for performing anesthetic procedures under faculty supervision.

630. Emergency Medicine Clerkship  
Fall, Winter, Spring, Summer. 4 to 8 credits. May re-enroll for a maximum of 8 credits. 608, H D 608 or MED 608; H M 602. Interdepartmental and administered by the Department of Medicine. Pathophysiology and other basic concepts will be used to explain the development of emergent conditions. Clinical diagnosis and treatment of emergencies seen in community emergency departments will be discussed.

619. Urology Clerkship  
Fall, Winter, Spring, Summer. 1 to 17 credits. May re-enroll for a maximum of 34 credits. H M 602. Demonstration of clinical manifestations of genito-urinary disease, investigative methods and techniques of diagnosis and management, familiarity with urologic emergencies and performance of basic urologic skills.

612. Rectal Surgery  
Fall, Winter, Spring, Summer. 1 to 17 credits. May re-enroll for a maximum of 34 credits. H M 620. Data collection, physical examination, and problem formulation relating to colon and rectal disease. Involvement in special techniques, examinations, and surgical procedures is an important aspect of the experience.

210. Telecommunication Processes  
Fall, 3(0-0) Sophomores. Human communication processes and behavior as modified by telecommunication. Audiences of telecommunication. Functions and dysfunctions of telecommunication. Contemporary implications of telecommunication media on society.

220. History and Economics of Telecommunication  
Winter, 4(3-3) 210. Institutional and cultural development and underlying economic principles of the telecommunication field, including broadcast programs.

230. Basic Telecommunication Technology  
Spring, 4(3-2) 220. An analysis of technical factors involved in electronic communication: transmission, sound physics and aural technology, light physics, visual behavior and image technology, computer and automation controls, technical telecommunication policy formulation.

250. History of the Motion Picture  
Fall, Winter, 4(3-4) Sophomores. Development of the motion picture from its beginning to the present, emphasizing social background and cultural values. Screening of significant films from various periods and countries.

301. Basic Audio Production  
(901.) Fall, Winter, Spring, Summer, 4(2-4) 230. Basic orientation to audio and radio studios, with laboratory experiences in production, writing and performance.

302. Basic Video Production  
(902.) Fall, Winter, Spring, Summer, 4(2-4) 301. Basic orientation to video and television studios, with lab experiences in production, writing and performance.

310. Basic Telecommunication Policy  
Fall, Winter, 4(4-0) Juniors, approval of department. Essential U.S. public communication policy is treated through rigorous methodological analysis of case and statutory law, public documents and related primary materials.

335. Audience Survey and Analysis  
Winter, Summer, 4(4-0) Juniors. Designing research for the study of telecommunication audiences. Survey research, sampling, questionnaire construction, research administration, analysis and interpretation of research results. Audience measurement services and feedback systems.

350. Advanced Radio Production  
Winter, Spring, 4(2-4) 301 and approval of department. Planning, coordinating and producing the radio program. Emphasis on documentary and studio productions utilizing original ideas and methods.

351. Television Studio Production  
Fall, Spring, 4(2-4) Junior majors, 302 and approval of department. Advanced television crew operation. Writing and production of programs directed by students in 451.

361. Television Directing  
(933.) Fall, Winter, Spring, Summer, 4(2-4) 302 and approval of department. Television producing and directing methods with assigned experiences in the television studios.

Overall, the page contains a list of courses offered with details about their credits, duration, and prerequisites. The courses are categorized under different disciplines such as Surgery, Studio Art, Systems Science, and Telecommunication. Each course description includes information about the course content, prerequisites, and learning objectives.