

Descriptions — Sociology

of Courses

- 916. Theoretical Perspectives in Sociology**
(SOC 976.) Spring of even-numbered years. 4 credits. SOC 815.
Comparisons and analyses of concepts, conceptual schemes and theories of outstanding social theorists in relation to modern research.
- 919. Seminar in Selected Theoretical Issues**
(SOC 977.) Winter. 2 to 4 credits. May reenroll for a maximum of 8 credits. SOC 815.
Issue approach to social theory. Selected themes relate to substantive problems in theory, theory construction or the work of a historical or contemporary thinker.
- 920. Sociological Analysis of Work**
(SOC 930.) Spring of odd-numbered years. 4(4-0) SOC 310, SOC 430, SOC 831N or approval of instructor.
Theory and research problems in occupational structure, work settings, functions and meanings of work, occupational mobility and career patterns.
- 921. Sociological Analysis of Organizations**
Fall of odd-numbered years. 4(4-0) SOC 820N or approval of instructor.
Contemporary research in complex organizations, internal labor markets, organizational networks, ecological approach to organizational analysis, organizations and public policy.
- 922. Seminar in Occupations and Organizations**
(SOC 991.) Winter. 2 to 4 credits. May reenroll for a maximum of 16 credits. Thirty graduate credits and approval of instructor.
Selected topics in the sociology of work, occupations, and complex organizations.
- 931. Crises and Alternatives in Post-Modern Societies**
(SOC 973.) Fall of odd-numbered years. 3(3-0) Approval of department.
Ecological, political-economic, and social crises besetting contemporary highly industrialized societies. Alternative solutions to those conditions possible through intentional social change.
- 932. Theories of Conflict and Change**
(SOC 970.) Fall of even-numbered years. 3(3-0) Approval of department.
Major theoretical European and American contributions to the study of conflict and change.
- 933. Seminar in Conflict and Change**
Winter. 2 to 4 credits. May reenroll for a maximum of 16 credits. Approval of department.
Analysis of selected theoretical and substantive sociological topics from the perspective of critical sociology, with emphasis on inequality, political economy, and social change.
- 943. Social Attitudes**
(SOC 853.) Fall of even-numbered years. 4(4-0) SOC 840, SOC 882, thirty graduate credits or approval of department.
Measurement of attitudes; theories of attitude structure and change; relationship to behavior; formalization.
- 944. Small Group Research**
(SOC 964.) Fall of odd-numbered years. 4(4-0) Thirty graduate credits including SOC 840 or approval of department.
The experimental and theoretical investigation of organizational processes in small groups.
- 945. Social Structure and the Individual**
(SOC 966.) Winter of odd-numbered years. 4(4-0) Thirty graduate credits including SOC 840 or approval of department.
Contemporary theory and research on the influence of social structure on the individual and the interaction of the individual and social structure as determinants of behavior.
- 946. Symbolic Interactionism**
(SOC 968.) Spring of even-numbered years. 4(4-0) Thirty graduate credits including SOC 840 or approval of department.
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.
- 947. Comparative Social Psychology**
(SOC 982.) Winter of even-numbered years. 4(4-0) Thirty graduate credits including SOC 840 or approval of department.
Social psychological research problems using comparative methodology in cross-national and cross-cultural contexts. Topics may include socialization; achievement motivation; status attainment and transitions; intergenerational relations; intercultural interaction; values and social change.
- 948. Seminar in Social Psychology**
Spring. 2 to 4 credits. May reenroll for a maximum of 16 credits. Approval of department.
Specialized topics in sociological social psychology, such as bargaining and power, friendship relationships, life-course dynamics, migration decision-making, comparative socialization.
- 950. Seminar in Population and Social Ecology**
(SOC 864.) Winter. 2 to 4 credits. May reenroll for a maximum of 16 credits. Approval of department.
Special topics in population and social ecology such as mortality, population problems and policies, social dimensions of toxics, energy and society, and technology and society.
- 960. Contemporary Problems in Rural and Community Studies**
(SOC 978.) Spring of odd-numbered years. 4 credits. SOC 860N or approval of instructor.
Recent developments in rural and community studies. Applications of concepts and theories to different field situation. Integration of previous courses.
- 961. Seminar in Rural and Community Studies**
(SOC 837.) Spring. 4(4-0) May reenroll for a maximum of 16 credits. Approval of instructor.
Special topics in rural and community studies such as farmers' organizations, adoption of innovations, fisheries sociology, comparative extension programs, comparative rural social organization, community structure and stratification, and community dynamics.
- 975. Urbanization in Comparative Perspective**
(SOC 903.) Fall of odd-numbered years. 3(3-0)
Comparative research and theory on urbanization in the world system. Relationship of urbanization to development.
- 980. Documentary and Bibliographic Research Methods.**
(SOC 831.) Spring. 4(4-0) Approval of department.
Systematic and detailed exploration of source materials relevant to documentary and bibliographic social science research. Emphasis on research strategy and techniques.
- 984. Techniques of Population Analysis**
(SOC 952.) Spring. 4(4-0) SOC 420; STT 422 or SOC 882 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.
- 985. Field Research Methods**
(SOC 955.) Fall. 4 credits. Approval of department.
An overview of the design and execution of social research.
- 986. Survey Research Principles**
(SOC 954.) Winter. 4(4-0) SOC 882, STT 422.
The design and analysis of theoretically oriented survey research. Sampling, questionnaire construction, interviewing, and data processing.
- 987. Survey Research Practices**
Spring. 4(1-6) SOC 882, SOC 986.
Practicum in use of survey skills in study design, sampling, data collection, processing, and analysis.
- 988. Comparative Research Methods**
(SOC 983.) Spring of odd-numbered years. 4(4-0) Thirty graduate credits or approval of department.
Sampling problems, data collection strategies, problems of translation and concept equivalence. Management, analysis and interpretation of cross-cultural data.
- 999. Doctoral Dissertation Research**
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

SPANISH

See Romance and Classical Languages.

STATISTICS AND PROBABILITY

STT

College of Natural Science

Introductory courses are further classified as follows:

315—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.

861, 862, 863—sequence for students preparing to do advanced work in statistics.

201. Statistical Methods

Fall, Winter, Spring, Summer. 4(4-0) MTH 108 or MTH 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: STT 201, STT 315, STT 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.

290. Special Topics in Statistics and Probability

Fall, Winter, Spring. 1 to 6 credits. May reenroll for a maximum of 6 credits. MTH 108 or approval of department.

315. Introduction to Probability and Statistics for Business

Fall, Winter, Spring, Summer. 4(5-0) MTH 111. Credit may not be earned in more than one of the following: STT 201, STT 315, STT 421.

Descriptive statistics, elementary probability, random variables, probability models, sampling distributions, the Central Limit Theorem, confidence intervals and one-sample tests based on normal, t and chi-square with applications to business problems.

317. Quantitative Business Research Methods

Fall, Winter, Spring, Summer. 4(5-0) STT 315. 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.

351. Probability and Statistics for Engineers

Fall, Winter, Spring. 4(4-0) MTH 215.

Discrete and continuous probability models, conditional probability, independence, random variables. Estimation and testing, including one- and two-sample tests and confidence intervals. Applications to engineering problems.

421. Statistics I

Fall, Winter, Spring, Summer. 4(4-0) MTH 108. Credit may not be earned in more than one of the following: STT 201, STT 315, STT 421. This course and STT 422, STT 423 form a one year sequence in statistics for those without a calculus background; STT 421 provides an introduction to a few of the main ideas of probability and statistics. The course sequences STT 441-2-3 and STT 861-2-3 form one year sequences in statistics for those with a calculus background. Those expecting to use statistics in their graduate research should complete one of the full year sequences.

Descriptive statistics, elementary probability, combinatorics. Binomial distribution. Random variables, expectations and variances. Central Limit Theorem, point estimation. One sample confidence intervals, tests based on the binomial, normal, t, chi-square distributions.

422. Statistics II

Fall, Winter, Spring, Summer. 3(3-0) STT 421.

Two sample confidence intervals and tests based on the normal and t-distributions. Nonparametric models, contingency table analysis, simple linear regression, one-way analysis of variance.

423. Statistics III

Fall, Winter, Spring. 3(3-0) STT 422.

Multiple regression. Analysis of variance for various experimental designs such as randomized block, factorial, nested and Latin square designs.

441. Probability and Statistics I: Probability

Fall, Winter, Spring, Summer. 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) STT 441; MTH 334 or concurrently.

Estimation, confidence intervals, tests of hypotheses, linear models.

443. Probability and Statistics III: Inference

Spring. 4(4-0) STT 442.

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

461. Computations in Statistics and Probability

Spring. 4(4-0) STT 441, MTH 334, one course in computer science or approval of department.

Computer algorithms for evaluation, simulation and visualization: sampling from prescribed distributions; robustness and error analysis of procedures used by statistical packages; graphics for data display; computation of probabilities and percentiles.

471. Statistics for Quality and Productivity

Spring. 4(4-0) STT 351 or STT 422 or STT 442.

Scientific context of quality: Box, Deming, Taguchi; graphical techniques; control charts; design of experiments: factorials and fractional factorials, confounding and aliasing; engineering parameter design through experimentation.

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) STT 423 or STT 442 or STT 862.

Application 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) STT 442 or STT 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.

841. Linear Statistical Models

Fall. 4(4-0) STT 443 or STT 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.

843. Multivariate Analysis

Winter of even-numbered years. 3(3-0) STT 443 or STT 863.

The multivariate normal distribution, tests of hypotheses on means, discriminant analysis, multivariate analysis of variance, principal components, factor analysis, analysis of multivariate categorical data.

844. Time Series Analysis

Winter of odd-numbered years. 3(3-0) STT 443 or STT 863.

The autocorrelation function and its spectrum, moving average and autoregressive processes, model identification and estimation.

852. Methods in Operations Research I

Winter. 3(3-0) STT 441 or STT 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) STT 852.

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

861. Theory of Probability and Statistics I

Fall. 4(4-0) MTH 424 or MTH 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 Statistics II

Winter. 4(4-0) STT 861; MTH 425 or MTH 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 Statistics III

Spring. 4(4-0) STT 862; MTH 334, MTH 426 or MTH 429 or concurrently.

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

864. Stochastic Models in Biology

Fall of even-numbered years. 3(3-0) STT 441 or STT 861.

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

870. Theory of Measure and Probability

Fall. 3(3-0) MTH 821 or concurrently.

Measures and integrals. Uniqueness of extensions. Algebraic and continuity properties. Densities. Fubini theorem. Convergence concepts. Measurable transformations. Independence. Laws of large numbers, characteristic functions, central limit theorem in iid case.

Descriptions — Statistics and Probability of Courses

872. Theory of Statistics I
 Winter. 3(3-0) STT 870; MTH 822 or concurrently.

Important distributions. Order statistics. Slutsky theorem and additional properties of vague convergence. Basic concepts of decision theory. A survey of basic statistical methods.

873. Theory of Statistics II
 Spring. 3(3-0) STT 872.

Basic concepts and properties of estimation and hypothesis testing. Linear models.

876. Statistical Inference in Economics I
 Fall. 3(3-0) EC 812A or EC 805A; STT 443 or STT 863; or approval of department.

Interdepartmental with the departments of Agricultural Economics and Economics. Administered by the Department of Economics. Review and extension of single-equation regression models. Properties of least-squares estimators under alternative specifications. Problems of analyzing nonexperimental data. Errors in variables, autoregressive and heteroscedastic models.

877. Statistical Inference in Economics II

Winter. 3(3-0) EC 876 or approval of department. Interdepartmental with the departments of Agricultural Economics and Economics. Administered by the Department of Economics.

Specification interpretation and estimation of simultaneous equation models. Nonlinear models. Bayesian approach to estimation problems. Recent developments in econometrics.

878. Statistical Inference in Economics III

Spring. 3(3-0) EC 877 or approval of department. Interdepartmental with the departments of Agricultural Economics and Economics. 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 I

Winter. 3(3-0) STT 870; MTH 822 or concurrently.

Laws of large numbers, random series, central limit problem, stable laws.

883. Probability II

Spring. 3(3-0) STT 882.

Extension theorems for integrals including the Kolmogorov theorem. The Radon-Nikodym theorem. Conditional expectations, transitions. Convergence in L_p spaces.

886. Stochastic Processes and Applications I

Winter. 3(3-0) STT 441 or STT 861.

Discrete and continuous time Markov processes including the ergodic theorem. Other topics selected from: stationary processes, Brownian motion, stochastic differential equations, Counting and Poisson processes, queuing processes, branching processes.

887. Stochastic Processes and Applications II

Spring. 3(3-0) STT 886 or approval of department.

Continuation of STT 886.

890. Statistical Problems

Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 36 credits. Approval of department.

899. Master's Thesis Research

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

929. Foundations of Decision Theory

Fall of even-numbered years. 3(3-0) STT 873, STT 883.

Statistical decision model. Principles of choice. Sufficiency, completeness, invariance, monotonicity, Bayes. Families of probability models: exponential, location-scale.

951. Advanced Theory of Nonparametric Statistics

Spring of even-numbered years. 3(3-0) STT 929.

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

Winter of even-numbered years. 3(3-0) STT 929.

Possible topics include large sample behavior of likelihood functions; contiguity; Bahadur and Pitman efficiency of statistical procedures.

954. Sequential Analysis

Spring of odd-numbered years. 3(3-0) STT 929.

Possible topics include sequential estimation, testing and design; optimal stopping.

955. Estimation and Testing

Winter of odd-numbered years. 3(3-0) STT 929.

Possible topics include completeness and admissibility results for the family of Neyman-Pearson tests, minimum variance estimates, admissibility of estimates in exponential families and estimation in the normal multivariate case.

961. Convergence of Measures and Random Variables

Fall of odd-numbered years. 3(3-0) STT 883.

Topology of vague convergence of measures. Conditions for relative compactness of a set of measures. Relationships between vague, almost sure, and in-measure convergence. Donsker's theorem and its extensions; applications to statistics.

962. Martingales

Winter of even-numbered years. 3(3-0) STT 883.

Convergence, sampling, decomposition and stopping of sub- and super-martingales. Relationship with differentiation of measures. Applications to sequential analysis and boundary crossing probabilities.

963. Stochastic Analysis

Spring of even-numbered years. 3(3-0) STT 883.

Brownian motion. Stochastic integrals. Ito's formula. Stochastic differential equations. Diffusion processes.

964. Renewal Theory and Random Walk

Fall of even-numbered years. 3(3-0) STT 883.

Renewal events and processes, random walk, Wiener-Hopf factorization, Tauberian theorem. Renewal-Type Equations. Branching processes, birth and death processes.

965. Stationary and Second Order Processes

Winter of odd-numbered years. 3(3-0) STT 883.

Stationary, second order, and Gaussian processes. Sample path properties. Linear and nonlinear prediction and estimation. Applications.

966. Markov Processes

Spring of odd-numbered years. 3(3-0) STT 883.

Transition functions, semigroups, generators. Sample path properties. Strong Markov property. Characterization and convergence of Markov processes. Ergodicity.

990. Problems in Statistics and Probability

Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 10 credits. STT 873.

Seminar or individual study on an advanced topic in statistics.

995. Topics in Statistics and Probability

Fall, Winter, Spring. 1 to 4 credits. May reenroll for a maximum of 36 credits.

Nonparametric statistics, multivariate statistical analysis, statistical time series analysis, Bayesian statistics, reliability theory, stochastic approximation, design of experiments, sets of decision problems, stochastic processes, sequential analysis, other topics.

999. Doctoral Dissertation Research

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

STUDIO ART

See Art.

SURGERY

SUR

College of Human Medicine

608. Basic Surgery Clerkship

Fall, Winter, Spring, Summer. 6 to 15 credits. May reenroll for a maximum of 30 credits. FMP 602.

An introduction to the surgical patient, stressing surgical diagnosis, pre-operative evaluation and post-operative care. Objectives are designed to help the student attain acceptable levels of surgical competence for physicians.

609. Otolaryngology Clerkship

Fall, Winter, Spring, Summer. 1 to 17 credits. May reenroll for a maximum of 34 credits. SUR 608.

Common otolaryngologic disorders, emergencies, including diagnosis and treatment, and judgments concerning proper management by primary physicians.

610. Plastic Clerkship

Fall, Winter, Spring, Summer. 1 to 17 credits. May reenroll for a maximum of 34 credits. SUR 608.

Principles of wound healing and tissue repair. Indications and applications of plastic procedures.