967. Introduction to Formal Theory in Sociology

Spring. 4(4-0) STT 422, a course in research methods.

Analysis of the structure of formal theory in sociology and of the problems of interpretation and verification of deterministic and probalistic theories. Examination of specific practices of theory construction.

968. Symbolic Interactionism: Theory and Research

Spring. 4(4-0) SOC 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.

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. Theoretical Perspectives in Sociology

Winter. 4 credits. SOC 845 or SOC 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 reenroll for a maximum of 8 credits. SOC 845.

Issue approach to social theory. Selected themes relate 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. SOC 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. SOC 981.

Sampling problems, data collection strategies, problems of translation and concept equivalence. Management, analysis and interpretation of cross-cultural data.

991. Seminar in Work and Organizations

Winter. 4(4-0) May reenroll for a maximum of 8 credits. Thirty graduate credits and approval of instructor.

Selected topics in the sociology of work, occupations, and complex organizations.

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 combinatories. 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

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.

Set and algebra of sets. Chance experiments, outcomes and events. Probabilities of events. Conditional probability, independent trials, Bayes' theorem. Introduction to statistical inference relevant to business decision 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. Introduction to Statistics

Spring. 4(4-0) MTH 214.

Probability models, discrete random variables, the binomial, hyper-geometric 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, 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 and combinatorics. The binomial distribution. Random variables, their expectations and variances. The Central Limit theorem, Estimation and inference. Simple tests based on the binomial, normal, t, chi-square and F distributions.

422. Statistics II

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

Nonparametric models, contingency table analysis, sample survey methods, simple linear regression, one-way analysis of variance.

423. Statistics III

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

Multiple regression. Anlysis of variance for various experimental designs, including randomized block, two and three way 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, test of hypotheses, linear hypotheses.

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.

490. Statistical Problems

Fall, Winter, Spring. 1 to 6 credits. Approval of department.

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

520. Biostatistical and Epidemiological Reasoning

Fall. 4(4-0) Approval of instructor. Interdepartmental with and administered by the Department of Community Health Science.

Concepts and principles from biostatistics and epidemiology to facilitate critical reading literature relevant to clinical medicine and community health. Emphasis on design and interpretation.

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.

833. Mathematical Programming

Spring. 3(3-0) EC 800, or EC 812A, MTH 334. Interdepartmental with the departments of Agricultural Economics and Economics. Administered by the Department of Agricultural Economics.

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

837. Systems Simulation

Fall. 4(4-0) MGT 833. 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.

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 texting, 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.

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 Lp 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. 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.

948. Mathematical Programming For Business

Spring of even-numbered years. 4(4-0) MGT 835. Interdepartmental with and administered by the Department of Management.

Large mathematical programs with special structure. Duality and decomposition. Dynamic programming; multistage decision processes and the principle of optimality. Integer programming.

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 Probablility

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. H M 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. H M 602.

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. H M 602.

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

611. Urology Clerkship

Fall, Winter, Spring, Summer. 1 to 17 credits. May reenroll 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.

613. Orthopedic Clerkship

Fall, Winter, Spring, Summer. 1 to 17 credits. May reenroll for a maximum of 34 credits. H M 602.

Diagnostic and management information and skills, including emergencies, in common orthopedic problems.

614. Neurosurgery Clerkship

Fall, Winter, Spring, Summer. 1 to 17 credits. May reenroll 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 reenroll for a maximum of 34 credits. H M 602.

Development of skills and knowledge in ophthalmoscopy, neuro-opthalmology, 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 reenroll for a maximum of 34 credits. H M 602.

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 reenroll for a maximum of 16 credits. H M 602.

Introduces common anesthetic agents and provides opportunity for performing anesthetic procedures under faculty supervision.

619. General Surgery Elective Clerkship

Fall, Winter, Spring, Summer. 4 to 16 credits. May reenroll for a maximum of 16 credits. H M 602 and SUR 608.

Experiences in clinical general surgery.

620. Advanced Surgery Clerkship

Fall, Winter, Spring, Summer. 6 to 8 credits. May reenroll for a maximum of 16 credits. SUR 608; MED 608.

Focus on advanced clinical and surgical skills. Students have more responsibility for patient care and direct learning to specific topics in general or subspecialty surgery. Clerkship options vary by community.

621. Nutritional Care of Surgical Patients

Fall, Winter, Spring, Summer. 4 to 12 credits. SUR 608, MED 608, approval of instructor.

Clinical experience on the Nutrition Team in dealing with surgical and medical patients requiring therapeutic nutrition as a result of metabolic derangement and nutritional deficiencies. Major emphasis on nutritional assessment and formulation of plans of management through intravenous support.