Department of Statistics

Office in Statistics Building, Room 102
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stat.colostate.edu (http://www.stat.colostate.edu)

Professor Jean D. Opsomer, Chair
Professor Mary Meyer, Associate Chair for Undergraduate Education
Professor Xiaowen Hu, Undergraduate Advisor

Undergraduate Majors
- Major in Statistics

Minors
- Minor in Applied Statistics
- Minor in Statistics

Graduate Programs in Statistics
The department offers graduate programs leading to Master of Applied Statistics, Master of Science and Doctor of Philosophy degrees. Students interested in graduate work should refer to the Graduate and Professional Bulletin and the Department of Statistics (http://www.stat.colostate.edu).

Master Programs
- Master of Applied Statistics, Plan C (M.A.S.)
- Master of Science in Statistics, Plan A*
- Master of Science in Statistics, Plan B*

Ph.D.
- Ph.D. in Statistics*

* Please see department for program of study.

Courses
Subjects in this department include: Applied Statistics (STAA) and Statistics (STAT).

Applied Statistics (STAA)

STAA 551 Regression Models and Applications Credits: 2 (2-0-0)
Course Description: Estimation/hypothesis testing methods: t-tests, ANOVA, regression, residual analyses, transformations, goodness of fit, interactions, confounding.
Prerequisite: None.
Registration Information: Admission to the M.A.S. program. Written consent of instructor. This is a partial-semester course.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 552 Generalized Regression Models Credits: 2 (2-0-0)
Course Description: Nonlinear regression, iteratively reweighted least squares, dose-response models, count data, multi-way tables, survival analysis.
Prerequisite: STAA 551, may be taken concurrently or STAT 540.
Registration Information: Written consent of instructor. This is a partial-semester course.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 553 Experimental Design Credits: 2 (2-0-0)
Course Description: Design/analysis of experiments. Emphasis on balanced design; use of computing packages SAS and R. Example-based presentation, rather than theoretical.
Prerequisites: (STAA 551 or STAT 540) and (STAA 562 or STAT 530).
Registration Information: Written consent of instructor. This is a partial-semester course.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 554 Mixed Models Credits: 2 (2-0-0)
Course Description: Topics in linear, generalized linear, and nonlinear models with fixed and random predictors, balanced and unbalanced cases.
Prerequisite: STAA 553, may be taken concurrently.
Registration Information: Written consent of instructor. This is a partial-semester course.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 556 Statistical Consulting Credits: 3 (3-0-0)
Course Description: Effective consulting to meet with clients, analyze real data, and prepare reports.
Prerequisite: STAA 500 to 599 - at least 28 credits.
Registration Information: Written consent of instructor.
Term Offered: Summer.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 561 Probability with Applications Credits: 2 (2-0-0)
Course Description: Random variables, continuous and discrete distributions, expectations, joint and conditional distributions, transformations.
Prerequisite: None.
Registration Information: Admission to the M.A.S. program. Written consent of instructor. This is a partial-semester course.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.
STAA 562 Mathematical Statistics with Applications Credits: 2 (2-0-0)
Course Description: Theory and applications of estimations, testing, and confidence intervals. Computer simulations, sampling from the normal distribution.
Prerequisite: STAA 561, may be taken concurrently or STAT 520.
Registration Information: Written consent of instructor. This is a partial-semester course.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 565 Quantitative Reasoning Credit: 1 (1-0-0)
Course Description: Quality management, process control, reliability, decision making.
Prerequisite: STAA 551, may be taken concurrently or STAT 520.
Registration Information: Written consent of instructor. This is a partial-semester course.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 566 Computational and Graphical Methods Credit: 1 (1-0-0)
Course Description: Exploratory data analysis using graphics, effective communication with graphs, data reduction methods.
Prerequisite: None.
Registration Information: Admission to M.A.S. program. Written consent of instructor. This is a partial semester course.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 567 Computational and Simulation Methods Credit: 1 (1-0-0)
Course Description: Methods to estimate probability distribution of nonstandard test statistics, find estimators, test hypotheses, and compute confidence intervals.
Prerequisite: (STAA 551, may be taken concurrently or STAT 540) and (STAA 561, may be taken concurrently or STAT 520).
Registration Information: Written consent of instructor. This is a partial semester course.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 568 Topics Industrial/Organizational Statistics Credit: 1 (1-0-0)
Course Description: Quality management, process control, reliability, decision making.
Prerequisite: (STAA 553, may be taken concurrently) and (STAA 561 or STAT 520).
Registration Information: Written consent of instructor. This is a partial semester course.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 569 Applied Regression Analysis Credit: 2 (2-0-0)
Course Description: Regression analysis of data, influential observations, confounding, types of bias such as selection bias and regression effect bias, Simpson's paradox, experiments versus observational studies.
Prerequisite: STAA 551, may be taken concurrently or STAT 540 and STAT 520, or STAA 567.
Registration Information: Written consent of instructor. This is a partial semester course.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 570 Empirical Methods Credit: 2 (2-0-0)
Course Description: Empirical methods and design, applying them to real-world problems, and communicating results.
Prerequisite: (STAA 551, may be taken concurrently or STAT 540) and (STAA 561 or STAT 520).
Registration Information: Written consent of instructor. This is a partial semester course.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 571 Survey Statistics Credits: 2 (2-0-0)
Course Description: Survey design, simple random, stratified, and cluster samples. Estimation and variance estimation.
Prerequisite: (STAA 551 or STAT 540) and (STAA 562 or STAT 530).
Registration Information: Written consent of instructor. This is a partial semester course.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 572 Nonparametric Methods Credits: 2 (2-0-0)
Course Description: Nonparametric inference and estimation, nonparametric function estimation, environmental applications.
Prerequisite: (STAA 551, may be taken concurrently or STAT 540) and (STAA 562, may be taken concurrently or STAT 530).
Registration Information: Written consent of instructor. This is a partial semester course.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 573 Analysis of Time Series Credits: 2 (2-0-0)
Course Description: Moving average and auto-regression correlation structures, estimation and forecasting, modeling seasonality. Financial and environmental applications.
Prerequisite: (STAA 551, may be taken concurrently or STAT 540) and (STAA 561, may be taken concurrently or STAT 520).
Registration Information: Written consent of instructor. This is a partial semester course.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 574 Methods in Multivariate Analysis Credits: 2 (2-0-0)
Course Description: Multivariate ANOVA, principal components, factor analysis, cluster analysis, discrimination analysis.
Prerequisite: (STAA 551 or STAT 540) and (STAA 561 or STAT 520).
Registration Information: Written consent of instructor. This is a partial semester course.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 575 Applied Bayesian Statistics Credits: 2 (2-0-0)
Course Description: Bayesian analysis of statistical models, prior and posterior distributions, computing methods, interpretation.
Prerequisite: (STAA 552) and (STAA 562 or STAT 530) and (STAA 567).
Registration Information: Written consent of instructor. This is a partial semester course.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAA 576 Methods in Environmental Statistics Credits: 2 (2-0-0)
Course Description: Statistical methodologies used in environmental/ ecological studies. Topics in spatial statistics, abundance estimation for biological populations.
Prerequisite: (STAA 552) and (STAA 561 or STAT 520).
Registration Information: Written consent of instructor. This is a partial semester course.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.
STAT 201 General Statistics Credits: 3 (2-0-1)
Course Description: Graphs, descriptive statistics, confidence intervals, hypothesis tests, correlation and simple regression, tests of association.
Prerequisite: MATH 1**** to 200 - at least 1 credit or MATH 1** to 200 - at least 1 credit or M 1** to 200 - at least 1 credit or M 1**** to 200 - at least 1 credit or M CC 1** to 200 - at least 1 credit or M CC 1**** to 200 - at least 1 credit.
Registration Information: Mathematics placement exam can substitute for coursework. Intended as a one-semester terminal course. Must register for lecture and laboratory. Credit not allowed for both STAT 303 and STAT 201. Sections may be offered: Online.
Term Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 201, STAT 207, STAT 303, STAT 307, ERHS 307, STAT 311, STAT 315. Sections may be offered: Online.

STAT 204 Statistics for Business Students Credits: 3 (2-2-0)
Course Description: Surveys, sampling, descriptive statistics, confidence intervals, contingency tables, control charts, regression, exponential smoothing, forecasting.
Prerequisite: MATH 117 or MATH 118 or MATH 124 or MATH 125 or MATH 126 or MATH 141 or MATH 155 or MATH 160.
Registration Information: Credit allowed for only one course: STAT 301, STAT 307/ERHS 307, STAT 311, STAT 315. Sections may be offered: Online.
Term Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 301 Introduction to Statistical Methods Credits: 3 (3-0-0)
Course Description: Techniques in statistical inference; confidence intervals, hypothesis tests, correlation and regression, analysis of variance, chi-square tests.
Prerequisite: MATH 117 or MATH 118 or MATH 124 or MATH 125 or MATH 126 or MATH 141 or MATH 155 or MATH 160.
Registration Information: Credit allowed for only one course: STAT 301, STAT 307/ERHS 307, STAT 311, STAT 315. Sections may be offered: Online.
Term Offered: Fall, Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option, Traditional.
Special Course Fee: No.

STAT 302 Introduction to Communications Principles Credits: 3 (3-0-0)
Also Offered As: ECE 303.
Course Description: Basic concepts in design and analysis of communication systems.
Prerequisites: MATH 261 with a minimum grade of C and ECE 311, may be taken concurrently.
Registration Information: Credit not allowed for both STAT 303 and ECE 303.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 305 Sampling Techniques Credits: 3 (3-0-0)
Course Description: Sample designs: simple random, stratified, systematic, cluster, unequal probability, two-phase; methods of estimation and sample size determination.
Prerequisite: STAT 301 or STAT 307 or ERHS 307 or STAT 311 or STAT 315.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.
STAT 311 Statistics for Behavioral Sciences I Credits: 3 (3-0-0)
Course Description: Statistical literacy, quantitative reasoning, statistical methods in SPSS including ANOVA, regression, logistic regression, and categorical data.
Prerequisite: MATH 117 or MATH 118 or MATH 124 or MATH 125 or MATH 126 or MATH 141 or MATH 155 or MATH 159 or MATH 160.
Registration Information: Credit allowed for only one of the following: ERHS 307, STAT 301, STAT 307, or STAT 311.
Terms Offered: Fall, Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 312 Statistics for Behavioral Sciences II Credits: 3 (3-0-0)
Course Description: One-way analysis of variance, factorial designs, blocked designs, multiple comparisons of means, and multiple regression.
Prerequisite: STAT 311.
Registration Information: Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 315 Statistics for Engineers and Scientists Credits: 3 (3-0-0)
Course Description: Calculus-based probability and statistics: distribution theory, estimation, hypothesis testing, applications to engineering and the sciences.
Prerequisite: MATH 161 or MATH 255.
Registration Information: Credit allowed for only one course: ERHS 307, STAT 301, STAT 307, or STAT 315.
Terms Offered: Fall, Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 316 Games and Gambling Credit: 1 (1-0-0)
Course Description: Application of probability concepts to games of chance and gambling contests.
Prerequisite: STAT 315.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 321 Elementary Probabilistic-Stochastic Modeling Credits: 3 (3-0-0)
Course Description: Probabilistic and stochastic models of real phenomena; distributions, expectations, correlations, averages; simple Markov chains and random walks.
Prerequisites: (CS 156 or CS 160 or MATH 151 or MATH 152) and (MATH 155 or MATH 160).
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 340 Multiple Regression Analysis Credits: 3 (3-0-0)
Course Description: Estimation and testing for linear, polynomial, and multiple regression models; analysis of residuals; selection of variables; nonlinear regression.
Prerequisite: STAT 301 or STAT 307 or ERHS 307 or STAT 311 or STAT 315.
Terms Offered: Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 341 Statistical Data Analysis I Credits: 3 (3-0-0)
Course Description: Estimation and inference based upon Gaussian linear regression models; residual analysis; variable selection; nonlinear regression.
Prerequisite: STAT 301 or STAT 307 or STAT 311 or STAT 315.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 342 Statistical Data Analysis II Credits: 3 (3-0-0)
Course Description: Single-factor analysis of variance models; multifactor analysis of variance models; randomized block design; Latin squares; split-plot design.
Prerequisites: (STAT 340) and (STAT 341).
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 350 Design of Experiments Credits: 3 (3-0-0)
Course Description: Analysis of variance, covariance; randomization; completely randomized, randomized block, latin-square, split-plot, factorial and other designs.
Prerequisite: STAT 301 or STAT 307 or ERHS 307 or STAT 311 or STAT 315.
Terms Offered: Fall, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 372 Data Analysis Tools Credits: 3 (3-0-0)
Course Description: Data analysis principles and practice, statistical packages and computing: ANOVA, regression and categorical data methods.
Prerequisite: STAT 301 or STAT 307 or ERHS 307 or STAT 311 or STAT 315.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 400 Statistical Computing Credits: 3 (3-0-0)
Course Description: Computationally intensive statistical methods: optimization for statistical problems; simulation & Monte Carlo methods; resampling methods; smoothing.
Prerequisites: (CS 160 or MATH 151 and MATH 153) and (STAT 372).
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 420 Probability and Mathematical Statistics I Credits: 3 (3-0-0)
Course Description: Probability, random variables, distribution functions, and expectations; joint and conditional distributions and expectations; transformations.
Prerequisite: MATH 255 or MATH 261.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 421 Introduction to Stochastic Processes Credits: 3 (3-0-0)
Course Description: Modeling phenomena with stochastic processes and the simulation and analysis of stochastic process models.
Prerequisites: (MATH 229 or MATH 369) and (STAT 420).
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.
STAT 430  Probability and Mathematical Statistics II  Credits: 3 (3-0-0)
Course Description: Theories and applications of estimation, testing, and confidence intervals, sampling distributions including normal, gamma, beta X-squared, t, and F.
Prerequisite: STAT 420.
Term Offered: Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 440  Bayesian Data Analysis  Credits: 3 (3-0-0)
Course Description: Applied Bayesian data analysis, Bayesian inference and interpretation of results, computing methods including MCMC, model selection and evaluation.
Prerequisites: (STAT 315 or STAT 430) and (STAT 342).
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 460  Applied Multivariate Analysis  Credits: 3 (3-0-0)
Course Description: Principles for multivariate estimation and testing; multivariate analysis of variance, discriminant analysis; principal components, factor analysis.
Prerequisite: STAT 340.
Terms Offered: Fall, Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 472  Statistical Consulting  Credits: 3 (0-0-3)
Course Description: Statistical consulting skills including data analysis, problem solving, report writing, oral communication, and planning experiments.
Prerequisite: STAT 372.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 495  Independent Study  Credits: Var[1-18]
Course Description: None.
Registration Information: Written consent of instructor.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

STAT 498  Undergraduate Research in Statistics  Credits: Var[1-3]
Course Description: Research skills and techniques; includes both oral and written communication of results.
Prerequisite: None.
Registration Information: Written consent of instructor.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

STAT 500  Statistical Computer Packages  Credit: 1 (0-2-0)
Course Description: Comparison, evaluation, and use of computer packages for univariate and multivariate statistical analyses.
Prerequisites: STAT 340 and STAT 350.
Registration Information: Admission to the Master of Applied Statistics program can substitute for STAT 350. Sections may be offered: Online.
Terms Offered: Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 501  Statistical Science  Credit: 1 (1-0-0)
Course Description: Overview of statistics theory; use in agriculture, business, environment, engineering; modeling; computing; statisticians as researchers/consultants.
Prerequisite: None.
Term Offered: Fall.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

STAT 511A  Design and Data Analysis for Researchers I: R Software  Credits: 4 (3-0-1)
Course Description: Statistical methods for experimenters and researchers emphasizing design and analysis of experiments using R software.
Prerequisite: STAT 301 or STAT 307 or ERHS 307 or STAT 311 or STAT 315.
Registration Information: Sections may be offered: Online.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 511B  Design and Data Analysis for Researchers I: SAS Software  Credits: 4 (3-0-1)
Course Description: Statistical methods for experimenters and researchers emphasizing design and analysis of experiments using SAS software.
Prerequisite: STAT 301 or STAT 307 or STAT 311 or STAT 315.
Registration Information: Sections may be offered: Online.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 512  Design and Data Analysis for Researchers II  Credits: 4 (3-0-1)
Course Description: Statistical methods for experimenters and researchers emphasizing design and analysis of experiments.
Prerequisite: STAT 511A or STAT 511B.
Registration Information: Sections may be offered: Online.
Term Offered: Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 514  Agricultural Experimental Design and Analysis  Credits: 4 (3-3-0)
Also Offered As: SOCR 514.
Course Description: Design and implementation of agricultural experiments and statistical analysis of resulting data.
Prerequisite: STAT 201 or STAT 301 or STAT 307 or ERHS 307.
Registration Information: Must register for lecture and laboratory.
Credt allowed for only one of the following: STAT 302, STAT 514, SOCR 414, or SOCR 514.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.
STAT 515  Statistical Science and Process Improvement Credits: 3 (2-2-0)
Course Description: Statistical methods in process design; statistical methods; measurement processes; customer evaluation.
Prerequisite: QNT 570 or STAT 511 or STAT 540.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 520  Introduction to Probability Theory Credits: 4 (4-0-0)
Course Description: Probability, random variables, distributions, expectations, generating functions, limit theorems, convergence, random processes.
Prerequisites: MATH 369 and MATH 261 and MATH 317.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 521  Stochastic Processes I Credits: 3 (3-0-0)
Course Description: Characterization of stochastic processes. Markov chains in discrete and continuous time, branching processes, renewal theory, Brownian motion.
Prerequisite: STAT 520.
Term Offered: Spring.
Grade Mode: Traditional.

STAT 522  Stochastic Processes II Credits: 3 (3-0-0)
Course Description: Martingales and applications, random walks, fluctuation theory, diffusion processes, point processes, queueing theory.
Prerequisite: STAT 521.
Terms Offered: Fall, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 523  Quantitative Spatial Analysis Credits: 3 (3-0-0)
Also Offered As: NR 523.
Course Description: Techniques in spatial analysis: point pattern analysis, spatial autocorrelation, trend surface and spectral analysis.
Prerequisite: ERHS 307 or STAT 301 or STAT 307.
Registration Information: Credit not allowed for both STAT 523 and NR 523.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 524  Financial Statistics Credits: 3 (3-0-0)
Also Offered As: FIN 524.
Course Description: Probability and statistical concepts and quantitative tools used in financial modeling and decision-making.
Prerequisites: MATH 345 and STAT 420.
Registration Information: Admission to MSBA program with Financial Risk Management specialization can substitute for MATH 345. Credit not allowed for both STAT 524 and FIN 524. Sections may be offered: Online.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 525  Analysis of Time Series I Credits: 3 (3-0-0)
Course Description: Trend and seasonality, stationary processes, Hilbert space techniques, spectral distribution function, fitting ARIMA models, linear prediction.
Prerequisite: STAT 430.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 526  Analysis of Time Series II Credits: 3 (3-0-0)
Course Description: Spectral analysis; the periodogram; spectral estimation techniques; multivariate time series; linear systems, optimal control; Kalman filtering, prediction.
Prerequisite: STAT 525.
Terms Offered: Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 530  Mathematical Statistics Credits: 3 (3-0-0)
Course Description: Sampling distributions, estimates, testing, confidence intervals, exact and asymptotic theories of maximum likelihood and distribution-free methods.
Prerequisite: STAT 520.
Term Offered: Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 540  Data Analysis and Regression Credits: 3 (3-0-0)
Course Description: Introduction to multiple regression and data analysis with emphasis on graphics and computing.
Prerequisite: STAT 300 to 481 - at least 6 credits.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 544  Biostatistical Methods for Quantitative Data Credits: 3 (3-0-0)
Also Offered As: ERHS 544.
Course Description: Regression and analysis of variance methods applied to both observational studies and designed experiments in the biological sciences.
Prerequisite: STAT 301 or STAT 307 or ERHS 307.
Registration Information: Credit not allowed for both STAT 544 and ERHS 544.
Term Offered: Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 547  Statistics for Environmental Monitoring Credits: 3 (3-0-0)
Also Offered As: CIVE 547.
Course Description: Applications of statistics in environmental pollution studies involving air, water, or soil monitoring; sampling designs; trend analysis; censored data.
Prerequisite: STAT 301.
Registration Information: Credit not allowed for both STAT 547 and CIVE 547. Sections may be offered: Online.
Term Offered: Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.
STAT 548 Bioinformatics Algorithms  Credits: 4 (3-2-0)
Also Offered As: CS 548.
Course Description: Computational methods for analysis of DNA/protein sequences and other biological data.
Prerequisite: STAT 301 or STAT 307 or STAT 315.
Registration Information: Student should have preexisting knowledge of a contemporary programming language. Credit not allowed for both STAT 548 and CS 548.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 560 Applied Multivariate Analysis  Credits: 3 (3-0-0)
Course Description: Multivariate analysis of variance; principal components; factor analysis; discriminant analysis; cluster analysis.
Prerequisites: STAT 520 and STAT 540.
Registration Information: Sections may be offered: Online.
Term Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 570 Nonparametric Statistics  Credits: 3 (3-0-0)
Course Description: Distribution and uses of order statistics; nonparametric inferential techniques, their uses and mathematical properties.
Prerequisite: STAT 430.
Terms Offered: Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 586 Practicum in Consulting Techniques  Credit: 1 (0-0-1)
Course Description: Instruction on planning studies, writing reports, and interacting with clients. Attend and critique consulting sessions.
Prerequisite: STAT 540.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

STAT 592 Seminar  Credit: 1 (0-0-1)
Course Description:
Prerequisite: None.
Terms Offered: Fall, Spring.
Grade Mode: Instructor Option.
Special Course Fee: No.

STAT 600 Statistical Computing  Credits: 3 (3-0-0)
Course Description: Optimization and integration in statistics; Monte Carlo methods; simulation; bootstrapping; density estimation; smoothing.
Prerequisites: STAT 520 and STAT 540.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 604 Managerial Statistics  Credits: 2 (2-0-0)
Also Offered As: BUS 604.
Course Description: Introduction to statistical thinking and methods used to support managerial decision making.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Admission to the MBA program. Credit not allowed for both STAT 604 and BUS 604.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 605 Theory of Sampling Techniques  Credits: 3 (3-0-0)
Course Description: Survey designs; simple random, stratified, cluster samples; theory of estimation; optimization techniques for minimum variance or costs.
Prerequisites: STAT 301 or STAT 307 or ERHS 307 or STAT 311 or STAT 315) and (STAT 430).
Restriction: Must be a: Graduate, Professional.
Term Offered: Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 610 Introduction to Measure Theoretic Probability  Credits: 3 (3-0-0)
Course Description: Introduction to rigorous probability theory in real Euclidean spaces based on a foundation of measure theory.
Prerequisite: STAT 520.
Restriction: Must be a: Graduate, Professional.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 640 Design and Linear Modeling I  Credits: 4 (4-0-0)
Course Description: Introduction to linear models; experimental design; fixed, random, and mixed models.
Prerequisites: MATH 369 and STAT 540.
Restriction: Must be a: Graduate, Professional.
Term Offered: Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 645 Categorical Data Analysis and GLIM  Credits: 3 (3-0-0)
Course Description: Generalized linear models, binary and polytomous data, log linear models, quasilikelihood, survival data models.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Must have concurrent registration in STAT 640.
Term Offered: Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 650 Design and Linear Modeling II  Credits: 3 (3-0-0)
Course Description: Mixed factorials; response surface methodology; Taguchi methods; variance components.
Prerequisite: STAT 640.
Restriction: Must be a: Graduate, Professional.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.
STAT 673  Hierarchical Modeling in Ecology  Credits: 3 (3-0-0)
Also Offered As: FW 673.
Course Description: Hierarchical ecological modeling using common forms of data in fish and wildlife studies and emphasizing spatial and temporal aspects of analysis.
Prerequisite: ESS 575 or STAT 420.
Restriction: Must be a: Graduate, Professional.
Registration Information: Credit not allowed for both STAT 673 and FW 673.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

STAT 675A  Topics in Statistical Methods: Sampling  Credits: Var[1-3]
Course Description:
Prerequisite: STAT 430.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

STAT 675B  Topics in Statistical Methods: Design  Credits: Var[1-3]
Course Description:
Prerequisite: STAT 430.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

STAT 675C  Topics in Statistical Methods: Multivariate and Regression Methods  Credits: Var[1-3]
Course Description:
Prerequisite: STAT 430.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

STAT 675D  Topics in Statistical Methods: Computer Intensive Methods  Credits: Var[1-3]
Course Description:
Prerequisite: STAT 430.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

STAT 675F  Topics in Statistical Methods: Robustness and Nonparametric Methods  Credits: Var[1-3]
Course Description:
Prerequisite: STAT 430.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

STAT 675I  Topics in Statistical Methods: Industrial Statistical Methods  Credits: Var[1-3]
Course Description:
Prerequisite: STAT 430.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

STAT 675J  Topics in Statistical Methods: Reliability  Credits: Var[1-3]
Course Description:
Prerequisite: STAT 430.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 675K  Topics in Statistical Methods: Bayesian Statistics  Credits: Var[1-3]
Course Description:
Prerequisite: STAT 430.
Restriction: Must be a: Graduate, Professional.
Registration Information: Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 675L  Topics in Statistical Methods: Medical/Pharmaceutical Statistical Methods  Credits: Var[1-3]
Course Description:
Prerequisite: STAT 430.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 684  Supervised College Teaching  Credits: Var[1-3]
Course Description: Guidance and instruction in effective teaching of college courses in statistics.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Enrollment in M.S. or Ph.D. program in statistics.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

STAT 695  Independent Study  Credits: Var[1-18]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

STAT 699  Thesis  Credits: Var[1-18]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

STAT 720  Probability Theory  Credits: 4 (4-0-0)
Course Description: Measure theoretic probability, characteristic functions; convergence; laws of large numbers; central limit, extreme value, asymptotic theory.
Prerequisites: MATH 517 and STAT 520.
Restriction: Must be a: Graduate, Professional.
Term Offered: Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Course Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 720</td>
<td>Time Series and Stationary Processes</td>
<td>3 (3-0-0)</td>
<td>Spectral theory of multivariate stationary processes; estimation, testing for spectral, linear, AR-MA representations; best linear predictors, filters.</td>
</tr>
<tr>
<td>STAT 721</td>
<td>Applied Probability and Stochastic Processes I</td>
<td>3 (3-0-0)</td>
<td>General theory of processes; Markov processes in discrete, continuous time; review of martingales, random walks; renewal and regenerative processes.</td>
</tr>
<tr>
<td>STAT 725</td>
<td>Time Series and Stationary Processes</td>
<td>3 (3-0-0)</td>
<td>Spectral theory of multivariate stationary processes; estimation, testing for spectral, linear, AR-MA representations; best linear predictors, filters.</td>
</tr>
<tr>
<td>STAT 730</td>
<td>Advanced Theory of Statistics I</td>
<td>4 (4-0-0)</td>
<td>Minimal sufficiency, maximal invariance; Neyman-Pearson theory; Fisher, Kullback-Leibler information; asymptotic properties of maximum-likelihood methods.</td>
</tr>
<tr>
<td>STAT 731</td>
<td>Advanced Theory of Statistics II</td>
<td>3 (3-0-0)</td>
<td>Decision-theory model; Bayes, E-Bayes, complete, and admissible classes; applications to sequential analysis and design of experiments.</td>
</tr>
<tr>
<td>STAT 740</td>
<td>Advanced Statistical Methods</td>
<td>3 (3-0-0)</td>
<td>Generalized additive models; recursive partitioning regression and classification; graphical models and belief networks; spatial statistics.</td>
</tr>
<tr>
<td>STAT 750</td>
<td>Advanced Theory of Design</td>
<td>3 (3-0-0)</td>
<td>Information theory; design evaluation, factorial designs and optimal designs, orthogonal and balanced arrays, designs with discrete/continuous factors.</td>
</tr>
<tr>
<td>STAT 793</td>
<td>Seminar on Advanced Statistical Methods</td>
<td>3 (0-0-3)</td>
<td>Seminar on Advanced Statistical Methods.</td>
</tr>
<tr>
<td>STAT 795</td>
<td>Independent Study</td>
<td>No</td>
<td>Independent Study.</td>
</tr>
</tbody>
</table>

**Registration Information:**
- **Restriction:** Must be a: Graduate, Professional.
- **Terms Offered:** Fall, Spring.
- **Grade Mode:** Traditional.
- **Special Course Fee:** No.

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**Course Descriptions:**

- **STAT 720:** Time Series and Stationary Processes
- **STAT 721:** Applied Probability and Stochastic Processes I
- **STAT 722:** Applied Probability and Stochastic Processes II
- **STAT 725:** Time Series and Stationary Processes
- **STAT 730:** Advanced Theory of Statistics I
- **STAT 731:** Advanced Theory of Statistics II
- **STAT 740:** Advanced Statistical Methods
- **STAT 750:** Advanced Theory of Design
- **STAT 793:** Seminar on Advanced Statistical Methods
- **STAT 795:** Independent Study
STAT 796  Group Study  Credits: Var[1-18]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

STAT 799  Dissertation  Credits: Var[1-18]
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.