DEPARTMENT OF STATISTICS

Office in Statistics Building, Room 102
(970) 491-5269 or (970) 491-6546
stat.colostate.edu (http://www.stat.colostate.edu)

Don Estep, Department Chair
Professor Dan Cooley, Associate Chair
Professor Benjamin Prytherch, Undergraduate Advisor

Undergraduate

Majors
- Major in Statistics (No new students are being admitted to the stand alone major.)
  - General Statistics Concentration
  - Mathematical Statistics Concentration

Minors
- Minor in Applied Statistics
- Minor in Statistics

Graduate

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).

Certificates
- Data Analysis
- Theory and Applications of Regression Models

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.
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 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: 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.
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 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: Rank-based methods, nonparametric inferential techniques, scatterplot smoothing, 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, may be taken concurrently and STAA 561.
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.

STAA 577 Statistical Learning and Data Mining Credits: 2 (2-0-0)
Course Description: Applications-oriented overview into how to use statistical methods to do data mining, inference, and prediction.
Prerequisite: STAA 551, may be taken concurrently and STAA 561.
Registration Information: This is a partial semester course. Sections may be offered: Online.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.
Statistics (STAT)

STAT 158 Introduction to R Programming  Credit: 1 (1-0-0)
Course Description: Programming using the R Project for the Statistical Computing. Data objects, for loops, if statements, using packages.
Prerequisite: None.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 192 First-Year Seminar in Statistics  Credit: 1 (0-0-1)
Course Description: Explore careers in statistics and the variety of problems encountered by statisticians.
Prerequisite: None.
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 100 to 200 - at least 1 credit.
Registration Information: Mathematics placement exam or one credit of 100-level mathematics. Intended as a one-semester terminal course. Must register for lecture and recitation. Credit not allowed for both STAT 201 and STAT 204.
Terms Offered: Fall, Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

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 100 to 200 - at least 1 credit.
Registration Information: Mathematics placement exam or one credit of 100-level mathematics. Must register for lecture and laboratory. Credit not allowed for both STAT 204 and STAT 201.
Terms 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 141 or MATH 155 or MATH 159 or MATH 160.
Registration Information: Credit allowed for only one course: STAT 301, STAT 307/ERHS 307, STAT 311, STAT 315.
Terms Offered: Fall, Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option, Traditional.
Special Course Fee: No.

STAT 303 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.
Prerequisite: (MATH 261 with a minimum grade of C) and (MATH 340, may be taken concurrently or MATH 345, may be taken concurrently).
Registration Information: Credit not allowed for both ECE 303 and STAT 303.
Term Offered: Spring.
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 307 Introduction to Biostatistics  Credits: 3 (3-0-0)
Course Description: Biostatistical methods; confidence intervals, hypothesis tests, simple correlation and regression, one-way analysis of variance.
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 of the following: STAT 301, STAT 307/ERHS 307, STAT 311, or STAT 315.
Terms Offered: Fall, Spring, Summer.
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 160.
Registration Information: Credit allowed for only one of the following: ERHS 307, STAT 301, STAT 307, STAT 311 or STAT 315.
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 155 or MATH 160.  
Registration Information: Credit allowed for only one of the following courses: ERHS 307, STAT 301, STAT 307, STAT 310 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.  
Prerequisite: (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; non-linear regression.  
Prerequisite: (STAT 158) and (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.  
Prerequisite: STAT 340 or 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 358  Introduction to Statistical Computing in SAS  Credits: 2 (2-0-0)  
Course Description: Statistical procedures and database operations using the SAS programming language.  
Prerequisite: STAT 315 or STAT 341.  
Term Offered: Spring.  
Grade Mode: Traditional.  
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 384  Supervised College Teaching  Credits: Var[1-3] (0-0-0)  
Course Description: Participation as a statistics tutor.  
Prerequisite: STAT 342.  
Registration Information: Sophomore standing. Written consent of advisor. A maximum of 10 combined credits for all 384 and 484 courses are counted toward graduation requirements.  
Terms Offered: Fall, Spring, Summer.  
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.  
Prerequisite: (CS 160 or CS 163 or CS 164 or MATH 151 and MATH 153) and (STAT 420, may be taken concurrently).  
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.  
Prerequisite: (MATH 229 or MATH 369) and (STAT 420).  
Term Offered: Spring.  
Grade Mode: Traditional.  
Special Course Fee: No.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Course Description</th>
<th>Prerequisite</th>
<th>Term Offered</th>
<th>Grade Mode</th>
<th>Registration Information</th>
<th>Special Course Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 430</td>
<td>Probability and Mathematical Statistics II</td>
<td>3 (3-0-0)</td>
<td>Theories and applications of estimation, testing, and confidence intervals, sampling distributions including normal, gamma, beta X-squared, t, and F.</td>
<td>STAT 420.</td>
<td>Spring</td>
<td>S/U within Student Option, Trad within Student Option.</td>
<td>Must register for lecture and recitation.</td>
<td>No.</td>
</tr>
<tr>
<td>STAT 440</td>
<td>Bayesian Data Analysis</td>
<td>3 (3-0-0)</td>
<td>Applied Bayesian data analysis, Bayesian inference and interpretation of results, computing methods including MCMC, model selection and evaluation.</td>
<td>(STAT 315 or STAT 430) and (STAT 342).</td>
<td>Fall, Spring, Summer</td>
<td>S/U within Student Option, Trad within Student Option.</td>
<td>Must register for lecture and recitation.</td>
<td>No.</td>
</tr>
<tr>
<td>STAT 460</td>
<td>Applied Multivariate Analysis</td>
<td>3 (3-0-0)</td>
<td>Principles for multivariate estimation and testing; multivariate analysis of variance, discriminant analysis; principal components, factor analysis.</td>
<td>STAT 340 or STAT 341.</td>
<td>Fall, Spring, Summer</td>
<td>S/U within Student Option, Trad within Student Option.</td>
<td>Must register for lecture and recitation.</td>
<td>No.</td>
</tr>
<tr>
<td>STAT 472</td>
<td>Statistical Consulting</td>
<td>3 (0-0-3)</td>
<td>Statistical consulting skills including data analysis, problem solving, report writing, oral communication, and planning experiments.</td>
<td>STAT 342 or STAT 372.</td>
<td>Fall, Spring, Summer</td>
<td>S/U within Student Option, Trad within Student Option.</td>
<td>Must register for lecture and recitation.</td>
<td>No.</td>
</tr>
<tr>
<td>STAT 495</td>
<td>Independent Study</td>
<td>Var[1-18] (0-0-0)</td>
<td>Research skills and techniques; includes both oral and written communication of results.</td>
<td>None.</td>
<td>Fall, Spring, Summer</td>
<td>S/U within Student Option, Trad within Student Option.</td>
<td>Must register for lecture and recitation.</td>
<td>No.</td>
</tr>
<tr>
<td>STAT 498</td>
<td>Undergraduate Research in Statistics</td>
<td>Var[1-3] (0-0-0)</td>
<td>Research skills and techniques; includes both oral and written communication of results.</td>
<td>None.</td>
<td>Fall, Spring, Summer</td>
<td>Instructor Option.</td>
<td>Registration Information: Written consent of instructor.</td>
<td>No.</td>
</tr>
<tr>
<td>STAT 500</td>
<td>Statistical Computer Packages</td>
<td>1 (0-2-0)</td>
<td>Comparison, evaluation, and use of computer packages for univariate and multivariate statistical analyses.</td>
<td>STAT 340 and STAT 350.</td>
<td>Spring, Summer</td>
<td>S/U within Student Option, Trad within Student Option.</td>
<td>Registration Information: Written consent of instructor.</td>
<td>No.</td>
</tr>
<tr>
<td>STAT 511B</td>
<td>Design and Data Analysis for Researchers I: SAS</td>
<td>4 (3-0-1)</td>
<td>Statistical methods for experimenters/researchers emphasizing design and analysis of experiments using SAS software.</td>
<td>STAT 301 or STAT 307 or STAT 311 or STAT 315.</td>
<td>Spring</td>
<td>S/U Sat/Unsat Only.</td>
<td>Registration Information: Written consent of instructor.</td>
<td>No.</td>
</tr>
<tr>
<td>STAT 512</td>
<td>Design and Data Analysis for Researchers II</td>
<td>4 (3-0-1)</td>
<td>Statistical methods for experimenters and researchers emphasizing design and analysis of experiments.</td>
<td>STAT 511A or STAT 511B.</td>
<td>Fall</td>
<td>S/U Sat/Unsat Only.</td>
<td>Registration Information: Written consent of instructor.</td>
<td>No.</td>
</tr>
<tr>
<td>STAT 514</td>
<td>Agricultural Experimental Design and Analysis</td>
<td>4 (3-3-0)</td>
<td>Design and implementation of agricultural experiments and statistical analysis of resulting data.</td>
<td>STAT 201 or STAT 301 or STAT 307 or ERHS 307.</td>
<td>Spring</td>
<td>S/U Sat/Unsat Only.</td>
<td>Registration Information: Written consent of instructor.</td>
<td>No.</td>
</tr>
<tr>
<td>STAT 515</td>
<td>Statistical Science and Process Improvement</td>
<td>3 (2-2-0)</td>
<td>Statistical methods in process design; statistical methods; measurement processes; customer evaluation.</td>
<td>QNT 570 or STAT 511 or STAT 540.</td>
<td>Spring</td>
<td>S/U Sat/Unsat Only.</td>
<td>Registration Information: Written consent of instructor.</td>
<td>No.</td>
</tr>
</tbody>
</table>
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.
Prerequisite: 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.
Special Course Fee: No.

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.
Prerequisite: 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 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.
Prerequisite: STAT 520 and STAT 540.
Registration Information: Sections may be offered: Online.
Terms 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: 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.
Prerequisite: 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.
Prerequisite: (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 620 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 623 Spatial Statistics Credits: 3 (3-0-0)
Course Description: Spatial autocorrelation, geostatistical models and kriging, analysis/modeling of point patterns, discretely-indexed spatial models.
Prerequisite: STAT 430.
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.
Prerequisite: 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 660 Hierarchical Modeling in Ecology Credits: 3 (3-0-0)
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 660 and FW 673.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.
STAT 675A Topics in Statistical Methods: Sampling Credits: Var[1-3] (0-0-0)
Course Description:
Prerequisite: STAT 430.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 675B Topics in Statistical Methods: Design Credits: Var[1-3] (0-0-0)
Course Description:
Prerequisite: STAT 430.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 675C Topics in Statistical Methods: Multivariate and Regression Methods Credits: Var[1-3] (0-0-0)
Course Description:
Prerequisite: STAT 430.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 675D Topics in Statistical Methods: Computer Intensive Methods Credits: Var[1-3] (0-0-0)
Course Description:
Prerequisite: STAT 430.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 675F Topics in Statistical Methods: Robustness and Nonparametric Methods Credits: Var[1-3] (0-0-0)
Course Description:
Prerequisite: STAT 430.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 675I Topics in Statistical Methods: Industrial Statistical Methods Credits: Var[1-3] (0-0-0)
Course Description:
Prerequisite: STAT 430.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 675J Topics in Statistical Methods: Reliability Credits: Var[1-3] (0-0-0)
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] (0-0-0)
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] (0-0-0)
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] (0-0-0)
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] (0-0-0)
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] (0-0-0)
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: 3 (3-0-0)
Course Description: Measure theoretic probability, characteristic functions; convergence; laws of large numbers; central limit, extreme value, asymptotic theory.
Prerequisite: STAT 620.
Restriction: Must be a: Graduate, Professional.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 721 Applied Probability and Stochastic Processes I Credits: 3 (3-0-0)
Course Description: General theory of processes; Markov processes in discrete, continuous time; review of martingales, random walks; renewal and regenerative processes.
Prerequisite: STAT 720.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.
STAT 722  Applied Probability and Stochastic Processes II  Credits: 3 (3-0-0)
Course Description: Brownian motion, diffusion, stochastic differential equations; weak convergence, central limit theorems. Applications in engineering, natural sciences.
Prerequisite: STAT 720.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 725  Time Series and Stationary Processes  Credits: 3 (3-0-0)
Course Description: Spectral theory of multivariate stationary processes; estimation, testing for spectral, linear, AR-MA representations; best linear predictors, filters.
Prerequisite: STAT 720 and STAT 730.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 730  Advanced Theory of Statistics I  Credits: 4 (4-0-0)
Course Description: Minimal sufficiency, maximal invariance, Neyman-Pearson theory; Fisher, Kullback-Leibler information; asymptotic properties of maximum-likelihood methods.
Prerequisite: STAT 530 and STAT 720.
Restriction: Must be a: Graduate, Professional.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 731  Advanced Theory of Statistics II  Credits: 3 (3-0-0)
Course Description: Decision-theory model, Bayes, E-Bayes, complete, and admissible classes; applications to sequential analysis and design of experiments.
Prerequisite: STAT 730.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 740  Advanced Statistical Methods  Credits: 3 (3-0-0)
Course Description: Generalized additive models; recursive partitioning regression and classification; graphical models and belief networks; spatial statistics.
Prerequisite: STAT 640.
Restriction: Must be a: Graduate, Professional.
Registration Information: Must have concurrent registration in STAT 730.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 750  Advanced Theory of Design  Credits: 3 (3-0-0)
Course Description: Information theory; design evaluation, factorial designs and optimal designs, orthogonal and balanced arrays, designs with discrete/continuous factors.
Prerequisite: STAT 650.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 760  Theory of Multivariate Statistics  Credits: 3 (3-0-0)
Course Description: Theory of multivariate normal; maximum-likelihood inference, union-intersection testing for single sample; theory of a multivariate linear model.
Prerequisite: STAT 640.
Restriction: Must be a: Graduate, Professional.
Registration Information: Must have concurrent registration in STAT 730.
Terms Offered: Fall, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

STAT 770  Approximation Theory and Methods  Credits: 3 (3-0-0)
Course Description: Edgeworth expansions, saddlepoint methods; applications of weak convergence and other approximation methods in mathematical statistics.
Prerequisite: STAT 730.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 792  Seminar  Credit: 1 (0-0-1)
Course Description: 
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

STAT 793  Seminar on Advanced Statistical Methods  Credits: 3 (0-0-3)
Course Description: 
Prerequisite: STAT 640.
Restriction: Must be a: Graduate, Professional.
Registration Information: Must have concurrent registration in STAT 730.
May be taken up to two times for credit.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

STAT 795  Independent Study  Credits: Var[1-18] (0-0-0)
Course Description: 
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

STAT 796  Group Study  Credits: Var[1-18] (0-0-0)
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] (0-0-0)
Course Description: 
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.