

Statistics (STAT) - Courses

+ next to a course number indicates a **general education** course

Courses

STAT 045 Cr.2

Pre-Statistics

A preparatory course for elementary statistics. Topics include introductory treatment of algebra, inequalities, interval notation, mathematical formulas and notation, variables, descriptive statistics, elementary probability, normal probability distributions, and the concept of statistical inference. Letter grade, but only "F" calculated in GPA. Credit does not count toward graduation. Transcript credit only. Offered Fall, Spring.

+STAT 145 Cr.4

Elementary Statistics

An introductory course covering fundamentals of modern statistical methods. Topics include descriptive statistics, the binomial and normal distributions, estimation, and hypothesis testing. The z , t , F and chi-square test statistics are introduced. Instruction in computer use is included, and statistics software is used throughout the course for analyzing data files and carrying out statistical procedures. Prerequisite: STAT 045 or MTH 050 or an appropriate placement test score. Offered Fall, Spring, Summer.

STAT 245 Cr.4

Probability and Statistics

An initial course in probability and statistics for students strong in mathematics. Probability topics include sample spaces, random variables, independence, and the binomial, Poisson, normal, and exponential distributions and their applications. Calculus-based methods will be used for analyzing continuous distributions. Statistics topics include descriptive statistics, sampling distributions, confidence intervals, hypothesis testing, regression, and ANOVA. Prerequisite: grade of "C" or better in MTH 208 or concurrent enrollment. Offered Fall, Spring.

STAT 345 Cr.3

Statistical Computing

An introductory course covering fundamentals of modern statistical computing. Topics include core programming concepts such as functions, data structures and debugging. Stochastic simulations and random variable generation are introduced, as well as accessing, filtering, and analyzing data from other resources. The R language will be used. Prerequisite: STAT 245 and CS 120. Offered Spring.

STAT 405/505 Cr.3

Statistical Methods

A survey of statistical methods from the point of view of how these methods are implemented with a standard statistics software package. Topics include descriptive statistics, graphical methods, tests of location, goodness of fit, simple and multiple regression, design of experiments, ANOVA, multiple comparisons, chi-square tests. Both parametric and nonparametric methods are treated. Computer use is an integral part of the course. This course is taught largely at an undergraduate level. Graduate students will have additional course requirements/expectations. Prerequisite: grade of "C" or better in STAT 145 or STAT 245; junior standing. Offered Fall.

STAT 440 Cr.1

Statistical Consulting

Experiences will include interpersonal, written, and oral communication and interdisciplinary exposure as well as opportunities to apply statistical knowledge in a broad variety of situations. Students will take part in consultations (i.e. extracting information, listening, asking appropriate questions), apply knowledge in experimental design, data modeling, use of statistical software, and/or sampling; diagnose and conduct appropriate statistical procedures and interpret and communicate results. Reading past and present literature on statistical consulting also will be required. Repeatable for credit - maximum three. Prerequisites: grade of "C" or better in STAT 445 or STAT 446; consent of the Statistical Consulting Center director. Consent of instructor. Pass/Fail grading. Offered Fall, Spring, Summer.

STAT 441/541 Cr.3

Mathematical Statistics I

Review of discrete and continuous random variables. Moment generating functions, multivariate probability distributions, marginal and conditional probability distributions, functions of random variables, order statistics, Central Limit Theorem, point estimation and confidence intervals. This course is taught largely at an undergraduate level. Graduate students will have additional course requirements/expectations. Prerequisite: grade of "C" or better in STAT 245 and MTH 310; junior standing. Offered Fall.

STAT 442/542 Cr.3

Mathematical Statistics II

Methods of estimating, including method of moments and maximum likelihood. Sufficient statistics, hypothesis testing, power of tests, likelihood ratio tests and introduction to regression and analysis of variance. This course is taught largely at an undergraduate level. Graduate students will have additional course requirements/expectations. Prerequisite: grade of "C" or better in STAT 441; junior standing. Offered Spring.

STAT 443/543 Cr.3

Categorical Data Analysis

An introduction to categorical data analysis covering summaries and inference for categorical response and count data, analysis of contingency tables, generalized linear models for binary and count data, logistic regression, multcategory logit models and log-linear models for contingency tables with an emphasis on applications and implementation using computer software. This course is taught largely at an undergraduate level. Graduate students will have additional course requirements/expectations. Prerequisites: grade of "C" or better in STAT 245 or STAT 405; junior standing. Offered Fall - Even Numbered Years.

STAT 445/545 Cr.3

Correlation and Regression Analysis

An introduction to simple linear regression, multiple regression, polynomial regression. Inferences, appropriateness of model, model diagnostics/adequacy, difficulties in the application of models are discussed. A computer package will be used. Course participants will be involved with hands-on statistical applications and consulting. This course is taught largely at an undergraduate level. Graduate students will have additional course requirements/expectations. Prerequisite: grade of "C" or better in STAT 245 or STAT 405; junior standing. Offered Fall.

STAT 446/546 Cr.3

Analysis of Variance and Design of Experiments

An introduction to single factor, multiple factor, and randomized block designs in analysis of variance. Inferences, appropriateness of model, model diagnostics/adequacy, difficulties in the application of models are discussed. Design or structure of an experiment will be discussed. A computer package will be used. Course participants will be involved with hands-on statistical applications and consulting. This course is taught largely at an undergraduate level. Graduate students will have additional course requirements/expectations. Prerequisite: grade of "C" or better in STAT 245 or STAT 405; junior standing. Offered Spring.

STAT 447/547 Cr.3

Nonparametric Statistics

An introductory course presenting the theory and procedures for using distribution-free methods in data analysis. Standard procedures, such as the Wilcoxon tests, Kruskal-Wallis, Kolmogorov-Smirnov, nonparametric confidence intervals, regression analysis, and powers of the tests will be included. Computer programs will be used when appropriate. This course is taught largely at an undergraduate level. Graduate students will have additional course requirements/expectations. Prerequisite: grade of "C" or better in STAT 245 or STAT 405; junior standing. Offered Spring - Even Numbered Years.

STAT 448/548 Cr.3

Operations Research

An introductory course which applies mathematics/statistics to management decision making. Included are methods of optimizing systems, decision analysis, simulation, and reliability. Various programming techniques are introduced with the computer used as a tool where appropriate. This course is taught largely at an undergraduate level. Graduate students will have additional course requirements/expectations. Prerequisites: grade of "C" or better in STAT 245 or STAT 405; junior standing. Offered Spring - Odd Numbered Years.

STAT 449/549 Cr.3

Applied Multivariate Statistics

An introduction to applied multivariate statistical methods covering multivariate analysis of variance, multivariate analysis of covariance, repeated measures design, factor analysis, principle component analysis, cluster analysis, discriminate analysis, and multivariate regression. Course participants will be involved with hands-on statistical applications. This course is taught largely at an undergraduate level. Graduate students will have additional course requirements/expectations. Prerequisite: grade of "C" or better in STAT 245 or STAT 405; junior standing. Offered Fall - Odd Numbered Years.

STAT 496/596 Cr.1-3

Special Topics in Statistics

Special topics in statistics not covered by regular courses taught in this department. The particular topic is decided by the instructor. This course is taught largely at an undergraduate level. Graduate students will have additional course requirements/expectations. Repeatable for credits - maximum six. Prerequisite: junior standing. Consent of department. Offered Occasionally.

STAT 498 Cr.1-3

Independent Study

Directed readings or presentation of material not available in formal departmental courses under the supervision of a faculty member. Registration by written consent of supervising faculty member and department chair. Repeatable for credit - maximum six. Consent of instructor. Offered Occasionally.

STAT 499 Cr.1-3

Research Topics

An opportunity to pursue individual research topics under the direction of a faculty member. Depending on the nature of the research project, study is expected to involve substantial computational or theoretical work in addition to literature review and instruction. In addition to a written report to the supervising faculty member, expected outcomes may include: software, papers and presentations to the department and regional meetings. Not applicable to a statistics and mathematics major or minor. Registration by written consent of supervising faculty member. Repeatable for credit - maximum six. Offered Occasionally.