STATISTICS (STAT)

Courses

STAT 101   ELEMENTARY STATISTICS - TRANSFER   3 Units
Transfer courses that meet the UW System expectations for a gateway statistics course and fulfill the UW-Whitewater mathematics proficiency requirement.

STAT 230   INTRODUCTION TO STATISTICAL REASONING AND ANALYSIS   3 Units
A course on the principles, procedures, and concepts surrounding the production, summarization, and analysis of data. Emphasis on critical reasoning and interpretation of statistical results. Content includes: probability, sampling, and research design; statistical inference, modeling, and computing; practical application culminating in a research project.
PREREQ: C OR BETTER IN (MATH 139 OR MATH 142 OR STAT 101)

STAT 263   INTRODUCTION TO R   1 Units
This course will cover basic topics in R, a statistical computing framework. Topics include writing R functions, manipulating data in R, accessing R packages, creating graphs, and calculating basic summary statistics.
COREQ: MATH 250 OR MATH 253

STAT 342   APPLIED STATISTICS   3 Units
This course will cover the basics of statistical testing, regression analysis, experimental design, analysis of variance, and the use of computers to analyze statistical problems. This course contains a writing component.
PREREQ: (MATH 250 OR MATH 253) WITH A GRADE OF C OR BETTER AND (STAT 263 OR COMPSCI 172 OR COMPSCI 174)

STAT 362   APPLIED NONPARAMETRIC STATISTICS   3 Units
This course covers theory and applications of commonly used distribution-free tests such as the sign test and the Wilcoxon signed rank test. Other topics include: the Kruskal-Wallis and Friedman tests for analysis of variance, nonparametric regression, and nonparametric bootstrapping.
PREREQ: (STAT 342 WITH A GRADE OF C OR BETTER) OR (MATH 343 WITH A GRADE OF C OR BETTER)

STAT 420   APPLIED REGRESSION ANALYSIS   3 Units
This is a second course in regression analysis and its applications. Topics include correlation, simple and multiple linear regression, logistic regression, model assumptions, inference of regression parameters, regression diagnostics and remedial measures, categorical predictors, interaction effects of predictors, multicollinearity, and model selection. Real data are emphasized and analyzed using statistical software.
PREREQ: STAT 342 OR INSTRUCTOR CONSENT

STAT 423   EXPERIMENTAL DESIGN AND ANALYSIS OF VARIANCE   3 Units
An introduction to applied experimental design with emphasis on the construction of causal knowledge, analytical techniques, and statistical publication requirements. Topics include single and multiple factor, randomized block, and repeated measure designs; model selection, underlying assumptions, inference, diagnostics, multiple comparison procedures, confidence intervals, effect sizes, and difficulties in applied research settings. The R computing platform will be used.
PREREQ: STAT 342 WITH A GRADE OF C OR BETTER

STAT 430   SAMPLING, DESIGN, AND ANALYSIS OF SURVEY DATA   3 Units
Practical issues in sampling, applied survey research, analysis of complex survey data, and professional reporting are emphasized. Topics include random and non-random sampling, parameter estimation, bias, questionnaire design and wording, psychology of participant response, data imputation, weighting, finite population correction, analysis of categorical data and hierarchical linear models. Students will conduct survey research and complete a data analysis project.
PREREQ: STAT 342 WITH A GRADE OF C OR BETTER

STAT 440   STATISTICAL LEARNING FOR DATA SCIENCE   3 Units
This course introduces the core statistical concepts for machine learning, including both supervised and unsupervised learning. Topics include classification, regression, clustering, and dimensionality reduction, with particular emphasis on the underlying mathematical principles. Practical implementation using Python is included, along with essential skills in data preprocessing, cleaning, and transformation to address real-world data challenges. By the end of the course, students will be able to analyze data sets, build predictive statistical models, and evaluate their performance.
PREREQ: STAT 342 AND MATH 355

STAT 445   APPLIED MULTIVARIATE STATISTICS   3 Units
Introduction to the fundamentals of multivariate statistics, emphasizing the implementation of various statistical methods and how to interpret their outputs. Topics covered include matrix algebra, graphical techniques, the multivariate normal distribution, inferences on mean vectors, principal component analysis, multidimensional scaling, factor analysis, and cluster analysis. Extensive use of appropriate statistical software programs.
PREREQ: STAT 342

STAT 498R   INDEPENDENT STUDY - UNDERGRADUATE RESEARCH   *Repeatable*   1-3 Units
Study of a selected topic or topics under the direction of a faculty member. Repeatable. Department Consent required.