STATISTICS (STAT)

Statistics Undergraduate Courses

STAT 1100 DATA LITERACY AND VISUALIZATION (3 credits)
Designed to help students become familiar with different types of data that are available in business, non-profit and governmental organizations. Students will learn basic data organization and manipulation as well as appropriate visualization techniques including charts, maps, and dashboards using cutting edge software tools. Students will apply this knowledge and skills to real-world data and develop skills in presentation of research results, strategic decision making and forecasting analysis. (Cross-listed with MATH 1100).
Distribution: Math

STAT 1530 ELEMENTARY STATISTICS (3 credits)
An elementary introduction to the basic concepts of probability, descriptive statistics, and statistical inference, including point estimation, confidence intervals, and hypotheses testing.
Prerequisite(s): One of the following within the last two years: ALEKS score of at least 3, ACT Math sub score at least 19, Math SAT at least 460, Math SAT2016 at least 500, Accuplacer score at least 3, or MATH 1000 or MATH 1210 (each with a C- or better)
Distribution: Math

STAT 3000 STATISTICAL METHODS I (3 credits)
An introduction to descriptive statistics, measures of central value and dispersion, probability and distributions, population and sample, simple linear regression, statistical inference: point estimation, confidence intervals, hypotheses testing, two population comparison, goodness-of-fit tests, analysis of variance. Statistical software like Minitab or Excel will be utilized in the course. (Cross-listed with STAT 8005).
Prerequisite(s): MATH 1220 or MATH 1300 or MATH 1320 or equivalent with a grade of C- or better, or permission of instructor

STAT 3800 APPLIED ENGINEERING PROBABILITY AND STATISTICS (3 credits)
An introduction to the application of probability and statistics to engineering problems. Topics include: probability and probability distributions, mathematical expectation, distribution of random variables, binomial, Poisson, hypergeometric, gamma, normal, and t-distributions, Central Limit Theorem, confidence intervals, hypothesis testing. If time allows, some linear regression and contingency tables. Credit for both MATH 4740 and STAT 3800 will not be given. (Cross-listed with STAT 8805)
Prerequisite(s): MATH 1970

STAT 4410 INTRODUCTION TO DATA SCIENCE (3 credits)
Topics covered in this course include Data Technology, Methods of gathering and cleaning structured or unstructured data, Exploratory data analysis & Dynamic and interactive data visualization, Modeling data for prediction, forecasting or classification. (Cross-listed with STAT 8416)
Prerequisite(s): MATH 4740 with at least C- or concurrent or STAT 3800 with at least C- or permission of instructor. Students enrolling in this course should be comfortable with computer programming & have knowledge of data structures & preliminary statistical methods.

STAT 4420 EXPLORATORY DATA VISUALIZATION AND QUANTIFICATION (3 credits)
Topics covered in this course include Exploratory Data Visualization for categorical/qualitative single/multivariate data, Grammar of Graphics, Organizing Data for Visualization, Methods of Displaying Data that include dynamic and interactive visualization, Visual Diagnostics of Statistical Models and Visual Statistical Inference. Students planning to enroll in this course should be comfortable with computer programming and have knowledge of data structures and preliminary statistical methods. (Cross-listed with STAT 8426)
Prerequisite(s): STAT 3800 or STAT 8805 or MATH 4740 or MATH 8746 with a grade of C- or better or another introductory probability/statistics course with a grade of C- or better, and MATH 3200 or CSCI 1620 with a grade of C- or better, or permission of instructor.

STAT 4430 LINEAR MODELS (3 credits)
This is an introduction to linear statistical models which will include: simple linear regression models, multiple linear regression models, ANOVA models including one way ANOVA, randomized block design,and other designs. Also, logistic regression models, Poisson regression models, bootstrapping/resampling models, survival analysis. Some necessary linear algebra and mathematical statistics ideas will be covered in the course also. If time allows, some mixed models and/or survival models. Much use of computer software will be made. (Cross-listed with STAT 8436)
Prerequisite(s): MATH 4750 or MATH 8756 w/ a C- or better or STAT 3800 or STAT 8805 w/ a C- or better or instructor permission based on students' having taken a basic statistics course w/ a grade of C- or better & having at least a basic knowledge of calculus.

STAT 4440 TIME SERIES ANALYSIS (3 credits)
The objective of this course is to learn and apply statistical methods for the analysis of data that have been observed over time. Topics covered include: Models for Stationary and Non-Stationary Time Series, Model Specification, Parameter Estimation, Model Diagnostics, Forecasting, Seasonal Models, Time Series Regression, and Spectral Analysis. Statistical software will be used. (Cross-listed with STAT 8446)
Prerequisite(s): MATH 4750 or MATH 8756 w/ a grade of C- or better or STAT 3800 or STAT 8805 w/ a C- or better or another introductory probability/statistics course w/ a C- or better, or permission of instructor.

STAT 4450 INTRODUCTION TO MACHINE LEARNING AND DATA MINING (3 credits)
This is an introduction to machine learning and data mining which covers the following topics with an emphasis on mathematical and statistical analysis: linear and nonlinear regression models, model selection and regularization methods, resampling methods, classification models, tree-based models, and unsupervised learning topics. If time allows, text mining and deep learning will also be introduced in the course. Statistical software will be used. (Cross-listed with MATH 4450, MATH 8456, STAT 8456)
Prerequisite(s): MATH 4740/8746 with a C- or better or STAT 3800/8805 with a C- or better or permission of instructor.