STATISTICS (STAT)

Courses

STAT 115 Statistical Reasoning Credits: 3
This course is intended for majors in less quantitative fields. The focus of the course will be on developing critical thinking abilities and decision making using data in everyday life. Emphasis will be on statistical reasoning underlying the methods of sampling, statistical inference in terms of evaluating the accuracy of an estimate in the context of uncertainty, drawing conclusions from data and studying relationships in data. Students will be trained to perform hands-on-analysis of real data sets using a computer package. No previous computing experience is required.
STAT 115 - MOTR MATH 110: Statistical Reasoning

STAT 235 Elementary Statistics Credits: 3
An introduction to descriptive and inferential statistics. Organization and presentation of data, averages and variations, elementary probability, random variables, special discrete distributions, normal distributions, sampling distributions, point estimation, confidence intervals, and hypothesis testing.
Prerequisites: MATH 110 with a grade of C- or higher; or MATH 120 or higher with a grade of C- or higher; or ALEKS Score of 61 or higher; or MyMathTest College Algebra score of 70% or higher.

STAT 340L Introduction to Data Visualization Credit: 1
This course covers the basics of data visualizations. It introduces basic methods to acquire, cleanse and process data with an emphasis on interactive statistical charts and diagrams. The students will learn how to design, build, and evaluate visualizations for different types of data.
Prerequisites: STAT 115 or STAT 235 or MATH 116 or CIV-ENGR 319 or CJC 303 or PSYCH 316.

STAT 355L Introduction to Diagnostic Analytics Credit: 1
This course introduces basic methods to identify anomalies in data and to determine causal relationships. Students will be able to provide logical explanations for abnormal conditions and root causes to those conditions.
Prerequisites: STAT 340L.

STAT 360L Introduction to Predictive Analytics Credit: 1
This course introduces basic methods of predictive modelling. Students will learn how to build a mathematical or statistical model to project or predict what could happen in the future.
Prerequisites: STAT 340L.

STAT 400 Machine Learning and Statistical Modeling Credits: 3
This course introduces fundamentals of statistical modeling and practices of machine learning, various supervised and unsupervised machine learning methodologies, and advanced modeling techniques. Through real-life examples, students will implement the methods with statistical programming software.
Prerequisites: STAT 340L or STAT 355L or STAT 360L or STAT 235

STAT 415 Statistical Design of Experiments Credits: 3
This course provides a comprehensive introduction to statistical methods of designing experiments and a review of statistical concepts for analyzing data. A variety of experimental designs such as Resolution III and Resolution IV designs will be covered. This course will also cover methods of optimizing of the location parameter in linear situations and minimizing the dispersion parameter in linear situations.
Prerequisites: MATH 300.

STAT 436 Introduction To Mathematical Statistics I Credits: 3
This course is the first of a calculus-based statistics sequence. It begins with basic concepts of probability, discrete and continuous distributions, expectation and variance, and ends with the central limit theorem. Recommended preparation: MATH 301 or COMP-SCI 191.
Prerequisites: MATH 220.

STAT 441 Introduction To Mathematical Statistics II Credits: 3
This course is the second of a calculus-based statistics sequence. It includes sampling distributions, point estimation, internal estimation, hypothesis testing, analysis of variance, nonparametric methods, statistical software applications, and topics in Applied Statistics.
Prerequisites: STAT 436.

STAT 451 Applied Statistical Analysis Credits: 3
This course presents methods for analyzing data from experiments and observational studies; including the fundamentals of design-based and model-based inferences; model assessment; power analysis and Analysis of Variance (ANOVA). Programing and computing algorithms will be utilized for the data analysis.
Prerequisites: STAT 235 and STAT 436.

STAT 480 Statistical Models in Actuarial Science Credits: 3
This course covers the statistical foundation of actuarial models and their applications. Topics include survival and severity models, Kaplan-Meier and Nelson-Aalen estimators, aggregate and credibility models for insurance losses, discrete time Markov chains, ruin theory, and simulation.
Prerequisites: STAT 441.

STAT 482 Statistical Models for Life Contingencies Credits: 3
The basic statistical theory of actuarial models for life uncertainties such as time of death. Multiple life and multiple decrement models, statistical models for life and contingent insurance; last survivor, disability, withdrawal, retirement and reserving models for life insurance.
Prerequisites: STAT 441.

STAT 496 Internship/Practical Training in Mathematics or Statistics Credits: 1-3
This course provides an internship or other practical training arrangement using mathematics or statistics in an industrial, academic or other professional setting. Department approval of internship experience or practical experience required. Repeatable with up to a combined 3 credits toward the major. Recommended preparation: MATH 250.