STATISTICS (STAT)

STAT 200 Probability and Statistics - GTMA13 Credits
Descriptive statistical methods, elementary probability, sample distribution, binomial, normal, T and F distributions, parameter estimation, one and two sample tests of hypothesis, simple correlation and regression analysis, one-way analysis of variance, nonparametric inference, time permitting. Introduction to statistical software.
Prerequisites: MATH 110 or MATH 113 or permission of instructor.

STAT 215 Statistics for Social and Behavioral Sciences4 Credits
Descriptive and inferential statistical techniques within the Social and Behavioral Science realm. Topics include: Types of Random Variables, Studies, and Sampling Methods; Plots and Descriptive Statistics; Correlation and Regression; Probability Theory; Hypothesis Testing & Inference including one and two sample t-tests, Chi-Squared Test for Independence, One and Two Factor ANOVA, t-test for Linear Regression Co-variates. SPSS will be used for data analysis.
Prerequisites: MATH 110 or higher, and PSYC 150 or SOCO 260 or CRMJ 201 or POLS 101.

STAT 241 Introduction to Business Analysis3 Credits
Introduction to descriptive, predictive, and inferential analysis techniques, data interpretation, business research skills, and techniques for analysis and modeling of business problems in the workplace using appropriate software.
Prerequisites: MATH 113 or higher.
Equivalent Course(s): CISB 241

STAT 301 Computational Statistics3 Credits
Introduction to computational methods within statistical software, with a primary focus on R, SPSS, and Excel. Topics include inference on population means and variances, sampling from probability distributions, linear regression and correlation, analysis of variance, power of statistical tests, nonparametric methods, categorical data techniques, and graphics.
Prerequisites: STAT 200 or STAT 215 or STAT 241 or CISB 241.
Terms Typically Offered: Fall, Spring.

STAT 305 Statistics and Quality Control for Engineering3 Credits
Introduction to descriptive and inferential statistics, and principles of quality management. Includes descriptive statistics, probability distributions, hypothesis testing, regression analysis, control charts, total quality management, quality improvement process, process capability, gauge repeatability and reproducibility, six-sigma, risk assessment, quality audit and ISO 9000.
Prerequisites: MATH 135 or MATH 151, and CSCI 130.

STAT 311 Statistical Methods3 Credits
Power of statistical tests, categorical data techniques, inference about population means and variances, nonparametric methods, simple and multiple linear regression and correlation, analysis of variance, multiple comparisons, introduction to some experimental designs. Use of statistical software.
Prerequisites: STAT 200.

STAT 312 Correlation and Regression3 Credits
Graphical, numerical, and theoretical least-squares analysis for simple and multiple regression and correlation, including inference methods, diagnostics and remedial measures, simultaneous inference methods, the matrix approach to regression and correlation analysis, and stepwise regression procedures. Use of statistical software.
Prerequisites: STAT 301.
Terms Typically Offered: Spring.

STAT 313 Sampling Techniques3 Credits
Methodology of simple random sampling, stratified, systematic cluster, and two-stage sampling is developed. Estimation of sample size determination, and minimized costs of sampling are discussed. Use of resampling statistical software.
Prerequisites: STAT 301.

STAT 350 Mathematical Statistics I3 Credits
Calculus based mathematical development of discrete and continuous random variables. Topics include probability axioms and rules, Bayes' Theorem, discrete and continuous distributions, expectation, variance, moment generating functions, marginal and conditional distributions, bivariate distributions, transformations, sampling distributions and the central limit theorem.
Prerequisites: STAT 200 and MATH 253 (may be taken concurrently).

STAT 351 Mathematical Statistics II3 Credits
This course is a continuation of STAT 350 Mathematical Statistics I. This course is a calculus-based theoretical study of point estimators by method of moments and maximum likelihood, confidence intervals, hypothesis testing, simple linear regression, analysis of variance, and nonparametric methods. Additional topics may include experimental design, quality control, multiple linear regression, and survival analysis.
Prerequisites: STAT 350.

STAT 395 Independent Study1-3 Credits
Course may be taken multiple times up to maximum of 6 credit hours.

STAT 396 Topics1-3 Credits
Course may be taken multiple times up to maximum of 15 credit hours.

STAT 425 Design and Analysis of Experiments3 Credits
Design and analysis of single and multiple factor experiments, fixed, mixed and random effects designs including multiple comparison procedures, transformations, fixed, mixed and random effects designs, completely randomized designs, randomized block designs, Latin square designs, and nested designs.
Prerequisites: STAT 301; and MATH 121 or MATH 135 or MATH 146 or MATH 151.

STAT 430 Categorical Data Analysis3 Credits
Study of appropriate methods for the collection and analysis of qualitative data. Topics include inference for contingency tables, chi-square and nonparametric tests, logistic regression, modelling for multinominal responses, and generalized linear models.
Prerequisites: STAT 301.
Terms Typically Offered: Fall, Spring.

STAT 435 Introduction to Time Series3 Credits
Statistical methods for analyzing time series. Topics include stationarity, autocorrelation, ARIMA models, spectral analysis, filtering, forecasting, and GARCH models.
Prerequisites: STAT 301.
Terms Typically Offered: Fall, Spring.

STAT 460 Actuarial Exams Preparation3 Credits
Preparation for the Probability Exam (P Exam) as well as the Financial Mathematics Exam (FM Exam) from the Society of Actuaries.
Prerequisites: STAT 351.
Terms Typically Offered: Spring.

STAT 492 Senior Capstone1 Credit
Independent capstone research project under the guidance of a faculty member.
Prerequisites: MATH 484.
Terms Typically Offered: Spring.
**STAT 494 Seminar** 1 Credit  
Discussions of specialized topics by students, faculty, or visiting professors. One-hour meeting per week.  
Course may be taken multiple times up to maximum of 10 credit hours.

**STAT 495 Independent Study** 1-3 Credits  
Course may be taken multiple times up to maximum of 6 credit hours.

**STAT 496 Topics** 1-3 Credits  
Course may be taken multiple times up to maximum of 15 credit hours.