STATISTICS (STAT)

STAT 100 Career Explorations in Statistics
Description: Introduction to the field of statistics, and exploration of careers available to those trained in statistics.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Grading Option: Graded

STAT 101 Introduction to Data
Notes: Removal of all entrance deficiencies in mathematics.
Description: An introduction to statistics through exploratory data analysis and data visualization. Topics include data types, chart types, methods for working with and reducing data, simple regression, regression diagnostics. Focuses on how to communicate statistical information and how to critically consume statistical information presented in the media and popular press.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Prerequisite for: STAT 102

STAT 102 Principles of Statistical Analysis
Prerequisites: STAT 101; concurrent STAT 151
Description: Introduction to formal statistical inference and elementary probability for statistics majors. Explores the practical application of statistical techniques to meaningful scientific problems. Inference topics will be implemented using both simulation-based approaches and classical, theory-based methods.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Prerequisite for: STAT 102

STAT 151 Introduction to Statistical Computing
Prerequisites: STAT 102
Description: Techniques for processing, cleaning, and visualizing messy data. Topics include data reduction strategies, data transformations, combining multiple data sources, and special types of data (text, spatial, dates and times, hierarchcial).
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded

STAT 218 Introduction to Statistics
Prerequisites: Removal of all entrance deficiencies in mathematics.
Notes: Credit toward the degree may be earned in only one of: CRIM 300 or ECON 215 or EDPS 459 or SOCI 206. Credit toward the degree cannot be earned in STAT 218 if taken after or taken in parallel with STAT/MATH 380.
Description: The practical application of statistical thinking to contemporary issues; collection and organization of data; probability distributions; statistical inference; estimation; and hypothesis testing.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Prerequisite for: ABUS 341, MRKT 341; ACCT 308; AECN 436; ASCI 330; BLAW 371; BLAW 371H; BLAW 372; ECON 311; FINA 361; FINA 361H; FORS 411; MNGT 301; MNGT 301H; MRKT 345; MRKT 350; MRKT 446; SCMA 250; SCMA 331; SCMA 335; SCMA 350; SCMA 350H; STAT 318
ACE: ACE 3 Math/Stat/Reasoning

STAT 251 Statistical Computing I: Data Wrangling
Prerequisites: STAT 151
Description: Introduction to statistical aspects of study design. Both designed experiments and observational studies are covered. Sampling techniques, major experimental and treatment design structures, as well as power and sample size considerations.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded

STAT 262 Probability for Statisticians
Prerequisites: STAT 102; MATH 208
Description: Probabilistic undergirding of statistical procedures including moments, common parametric families, marginal and conditional densities, sufficient statistics, modes of convergence, laws of large numbers and the central limit theorem and how they apply to estimators.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded

STAT 318 Introduction to Statistics II
Prerequisites: STAT 218 or equivalent.
Description: Tests for means/proportions of two independent groups, analysis of variance for completely randomized design, contingency table analysis, correlation, single and multiple linear regression, nonparametric procedures, design of experiments.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Prerequisite for: STAT 412; STAT 414; STAT 450
STAT 380 Statistics and Applications  
**Crosslisted with:** STAT 380H, RAIK 270H  
**Prerequisites:** A grade of P, C, or higher in MATH 107 or MATH 107H.  
**Notes:** Credit toward the degree can not be earned in STAT 218 if taken after or taken in parallel with STAT/MATH 380.  
**Description:** Probability calculus; random variables, their probability distributions and expected values; t, F and chi-square sampling distributions; estimation; testing of hypothesis; and regression analysis with applications.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Grading Option:** Graded with Option  

**Prerequisite for:**  
- STAT 318 or STAT 380  
- STATS 430, RAIK 270H  

**ACE:** 3 Math/Stat/Reasoning  
**Groups:** Advanced Mathematics Courses  

**STAT 380H Statistics and Applications**  
**Crosslisted with:** STAT 380, RAIK 270H  
**Prerequisites:** A grade of P, C, or higher in MATH 107 or MATH 107H.  
**Notes:** Credit toward the degree can not be earned in STAT 218 if taken after or taken in parallel with STAT/MATH 380.  
**Description:** Probability calculus; random variables, their probability distributions and expected values; t, F and chi-square sampling distributions; estimation; testing of hypothesis; and regression analysis with applications.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Grading Option:** Graded with Option  

**Prerequisite for:**  
- ABUS 341, MRKT 341; BLAW 371; BLAW 371H; BLAW 372; BSAD 371H, RAIK 371H; ECEN 325; ECEN 350; ECEN 450; ECON 311; FINA 361; FINA 361H; MATH 435; MECH 343; MNGT 301; MNGT 301H; MRKT 345; MRKT 350; MRKT 446; RAIK 370H, CSCE 370H; SCMA 250; SCMA 331; SCMA 350; SCMA 350H; STAT 318; STAT 412; STAT 414; STAT 450  
- A grade of P, C, or higher in MATH 107 or MATH 107H.  

**ACE:** 3 Math/Stat/Reasoning  
**Groups:** Advanced Mathematics Courses  

**STAT 318 Introduction to Experimental Design**  
**Prerequisites:** STAT 318 or STAT 380  
**Description:** Survey of elementary experimental designs and their analyses completely randomized, randomized block, factorial, and split-plot designs.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Grading Option:** Graded with Option  

**Prerequisite for:**  
- STAT 318 or STAT 380  
- A grade of P, C, or higher in MATH 208 or MATH 107H.  

**Notes:** Previous knowledge of matrix algebra is beneficial.  

**Description:** General linear models for estimation and testing problems, analysis and interpretation for various experimental designs.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Grading Option:** Graded with Option  

**STAT 414 Introduction to Survey Sampling**  
**Prerequisites:** STAT 318 or STAT 380  
**Description:** Sampling Techniques: simple random sampling, sampling proportions, estimation of sample size, stratified random sampling, ratio and regression estimates.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Grading Option:** Graded with Option  

**Prerequisite for:**  
- ACTS 401; STAT 463  

**Description:** Food evaluation using sensory techniques and statistical analysis.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Grading Option:** Graded with Option  

**STAT 432 Introduction to Spatial Statistics**  
**Prerequisites:** STAT 463 (could be concurrent)  
**Description:** Spatial point patterns, test of randomness, Morans I statistic and similar measures, checking assumptions for independence of observations, variography, estimation (point and global), Kriging, nearest neighbor techniques, cokriging, mixed models and their role in designed spatial experiments.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Grading Option:** Graded with Option  

**STAT 442 Computational Biology**  
**Crosslisted with:** BIOC 842, STAT 842, BIOC 442  
**Prerequisites:** Any introductory course in biology, or genetics, or statistics.  
**Description:** Databases, high-throughput biology, literature mining, gene expression, next-generation sequencing, proteomics, metabolomics, system biology and biological networks.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Grading Option:** Graded with Option  

**STAT 450 Introduction to Regression Analysis**  
**Prerequisites:** STAT 318 or STAT 380  
**Notes:** Previous knowledge of matrix algebra is beneficial.  
**Description:** General linear models for estimation and testing problems, analysis and interpretation for various experimental designs.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Grading Option:** Graded with Option  

**STAT 462 Introduction to Mathematical Statistics I: Distribution Theory**  
**Prerequisites:** Grade of C or better in MATH 208 or MATH 107H.  
**Notes:** STAT 380 or equivalent is strongly recommended.  
**Description:** Sample space, random variable, expectation, conditional probability and independence, moment generating function, special distributions, sampling distributions, order statistics, limiting distributions, and central limit theorem.  
**Credit Hours:** 4  
**Max credits per semester:** 4  
**Max credits per degree:** 4  
**Grading Option:** Graded with Option  

**STAT 463 Introduction to Mathematical Statistics II: Linear Models**  
**Prerequisites:** Grade of C or better in MATH 208 or MATH 107H.  
**Notes:** STAT 380 or equivalent is strongly recommended.  
**Description:** Sample space, random variable, expectation, conditional probability and independence, moment generating function, special distributions, sampling distributions, order statistics, limiting distributions, and central limit theorem.  
**Credit Hours:** 4  
**Max credits per semester:** 4  
**Max credits per degree:** 4  
**Grading Option:** Graded with Option  

**STAT 495 Undergraduate Research**  
**Offered:** FALL
STAT 463 Introduction to Mathematical Statistics II: Statistical Inference
Prerequisites: C or better in STAT 462
Description: Interval estimation; point estimation, sufficiency, and completeness; Bayesian procedures; uniformly most powerful tests, sequential probability ratio test, likelihood ratio test, goodness of fit tests; elements of analysis of variance and nonparametric tests.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Grading Option: Graded with Option
Offered: SPRING
Prerequisite for: STAT 432

STAT 494 Topics in Statistics and Probability
Prerequisites: Permission.
Description: Special topics in either statistics or the theory of probability.
Credit Hours: 1-5
Min credits per semester: 1
Max credits per semester: 5
Max credits per degree: 24
Grading Option: Graded with Option

STAT 496 Independent Study
Prerequisites: Prior arrangement with a faculty member and submission of proposed study plan to department office.
Credit Hours: 1-5
Min credits per semester: 1
Max credits per semester: 5
Max credits per degree: 5
Grading Option: Graded with Option