### Statistics (STAT)

#### 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

**Format:** LEC

**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; NUTR 486; NUTR 886; SCMA 331; SCMA 335; SCMA 350; SCMA 350H; SCMA 350L

**ACE:** ACE 3 Math/Stat/Reasoning

**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

**Format:** LEC

**Prerequisite for:** STAT 802

#### STAT 380 Statistics and Applications

**Crosslisted with:** MATH 380, MATH 380H, STAT 380H, RAIK 270H

**Prerequisites:** MATH 107 or 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

**Format:** LEC

**Prerequisite for:** ABUS 341, MRKT 341; BLAW 371; BLAW 371H; BLAW 372; ECEN 325; ECEN 355; ECEN 850; ECON 450; ECON 311; FINA 361; FINA 361H; MATH 809, MATH 409; MECH 343; MNGT 301; MNGT 301H; MRKT 345; MRKT 350; MRKT 446; SCMA 331; SCMA 335; SCMA 350; SCMA 350H; SCMA 350L

**ACE:** ACE 3 Math/Stat/Reasoning

** Groups:** Advanced Mathematics Courses

#### STAT 380H Statistics and Applications

**Crosslisted with:** MATH 380, MATH 380H, STAT 380, RAIK 270H

**Prerequisites:** MATH 107 or 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

**Format:** LEC

**Prerequisite for:** ABUS 341, MRKT 341; BLAW 371; BLAW 371H; BLAW 372; ECEN 325; ECEN 355; ECEN 850; ECON 450; ECON 311; FINA 361; FINA 361H; MATH 809, MATH 409; MECH 343; MNGT 301; MNGT 301H; MRKT 345; MRKT 350; MRKT 446; SCMA 331; SCMA 335; SCMA 350; SCMA 350H; SCMA 350L

**ACE:** ACE 3 Math/Stat/Reasoning

** Groups:** Advanced Mathematics Courses

#### STAT 412 Introduction to Experimental Design

**Prerequisites:** 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

**Format:** LEC

#### STAT 414 Introduction to Survey Sampling

**Prerequisites:** STAT/MATH 380 or IMSE 321 or permission.

**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

**Format:** LEC

#### STAT 430 Sensory Evaluation

**Crosslisted with:** FDST 430, FDST 830, STAT 830

**Prerequisites:** Introductory course in statistics.

**Description:** Food evaluation using sensory techniques and statistical analysis.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Format:** LEC

#### STAT 432 Introduction to Spatial Statistics

**Prerequisites:** STAT 218 or equivalent.

**Description:** Spatial point patterns, test of randomness, Morans I statistic; 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

**Format:** LEC
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
Format: LEC

STAT 450 Introduction to Regression Analysis
Prerequisites: STAT/MATH 380 or IMSE 321, and knowledge of matrix algebra.
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
Format: LEC

STAT 462 Introduction to Mathematical Statistics I: Distribution Theory
Prerequisites: MATH 208 or 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
Format: LEC
Prerequisite for: ACTS 401; STAT 463

STAT 463 Introduction to Mathematical Statistics II: Statistical Inference
Prerequisites: 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
Format: LEC

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
Format: LEC

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
Format: IND