STAT-STATISTICS

STAT 371. Statistics for Engineers and Scientists I
3 Credits (3)
Modern probability and statistics with applications to the engineering sciences.
Prerequisite(s): C - or better in MATH 1521G or MATH 1521H.

STAT 400. Undergraduate Research
1-3 Credits
Arrangements must be made with supervising professor before registration. May be repeated for a maximum of 6 credits.

STAT 470. Probability: Theory and Applications
3 Credits (3)
Basic probability distributions including binomial, normal; random variables, expectation; laws of large numbers; central limit theorem.
Prerequisite(s): C- or better in MATH 2530G and C- or better in at least one-300 level Math course.

STAT 480. Statistics: Theory and Applications
3 Credits (3)
Point and interval estimation; sufficiency; hypothesis testing; regression; analysis of variance; chi-square tests.
Prerequisite(s): C- or better in STAT 470.

STAT 515. Probability: Theory and Applications
3 Credits (3)
Same as STAT 470 with additional work for graduate students.

STAT 525. Statistics: Theory and Applications
3 Credits (3)
Same as STAT 480 with additional work for graduate students.

STAT 535. Elementary Stochastic Processes
3 Credits (3)
Markov chains, Poisson processes, Brownian motion, branching processes, and queuing processes, with applications to the physical, biological, and social sciences.
Prerequisite: STAT 515 or consent of instructor.

STAT 540. Directed Reading
1-6 Credits
May be repeated for a maximum of 6 credits. Graded S/U.
Prerequisite: consent of instructor and graduate committee.

STAT 562. Foundations of Probability
3 Credits (3)
Probability spaces, expectation and conditional expectation, limit theorems and laws of large numbers.
Prerequisite: MATH 593.

STAT 563. Advanced Topics in Stochastic Processes
3 Credits (3)
Markov processes, martingales, Brownian motion, the Ito calculus, stochastic differential equations.
Prerequisite: STAT 562.
Learning Outcomes
1. Understand the notion of a stochastic process.
2. Learn the basic properties of special stochastic processes: Markov processes and martingales.
3. Study and assimilate the fine properties of a particular instance of the stochastic process known as Brownian motion that is both a Markov process and a martingale.
4. Understand the application of Brownian motion known the Ito calculus and become fluent in its use.
5. Apply the Ito calculus to study stochastic differential equations.

STAT 571. Continuous Multivariate Analysis
3 Credits (3)
Theory and applications of the multivariate normal distribution. May be repeated up to 3 credits. Consent of Instructor required.
Prerequisite(s): STAT 525, or consent of instructor.

STAT 572. Linear Models
3 Credits (3)
Core topics include distribution of quadratic forms, theory of regression, analysis of variance and covariance in linear models. Advanced topics chosen from random and mixed linear models, generalized linear, growth curve, and nonlinear models, quartile and copula regression. May be repeated up to 6 credits.
Prerequisite(s): STAT 571.

STAT 581. Advanced Theory of Statistics I
3 Credits (3)
Testing hypotheses, probability and sufficiency, uniformly most powerful tests, unbiasedness, invariance, and minimax principle.
Prerequisite: STAT 525 or consent of instructor.

STAT 582. Advanced Theory of Statistics II
3 Credits (3)
Estimation of parameters; unbiased estimators; equivariance; Bayes properties; large sample theory and optimality.
Prerequisite: STAT 581 or consent of instructor.

STAT 598. Special Research Problems
1-3 Credits
Individual investigations or consulting programs. Maximum of 3 credits.