

STAT 5305. Advanced Probability and Statistics.

This course covers the mathematical and probabilistic theories and methods used in statistical inference. Topics include data description, probability distributions, sampling, sampling distributions, confidence intervals, and hypothesis testing, with applications to both categorical and quantitative data analyses.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing

Grade Mode: Standard Letter

STAT 5315. Mathematical Statistics.

This course discusses theoretical aspects of estimation theory and hypothesis testing procedures, with some of their important applications. The main topics include convergence of random variables, parameter estimation, properties of estimators, interval estimation, sufficiency and applications to the exponential family, hypothesis testing, decision theory, and Bayesian inference. Prerequisite: Instructor approval.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

STAT 5325. Design and Analysis of Experiments.

This course introduces fundamental concepts in the design of experiments, justification of linear models, randomization and principles of blocking. It also discusses the construction and analysis of basic designs including fractional replication, composite designs, factorial designs, and incomplete block designs. Prerequisite: Instructor Approval.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

STAT 5335. Survival Analysis.

This course introduces concepts and methods in the analysis of survival data. Topics include characteristics of survival data; basic functions; parametric models for survival time; maximum likelihood estimation of survival functions; two-sample test techniques; regression analysis with parametric and semi-parametric models; and mathematical and graphical methods for model checking. Prerequisite: Math 5305 or STAT 5305 with a grade of "B" or better or instructor approval.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

STAT 5345. Regression Analysis.

This course introduces formulation and statistical methodologies for simple and multiple regression, assessment of model fit, model design, and criteria for selection of optimal regression models. Students will develop skills with the use of statistical packages and the writing of reports analyzing a variety of real-world data.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

STAT 5347. Introduction to Data Science.

This course introduces basic concepts and methods in the field of data science. Topics include data wrangling, data exploration and visualization, and supervised learning methods for regression and classification problems. In addition, tree-based models, neural networks and unsupervised learning methods such as principal component analysis and cluster analysis will also be covered. The material will be approached with a blend of theory and application, and will include programming in R, Python, or another modern, popular language of the instructor's choice.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

STAT 5376B. Analysis of Variance.

This course introduces basic methods, one-way, two-way ANOVA procedures, and multifactor ANOVA designs. Prerequisite: Approval of instructor.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Topics

Grade Mode: Standard Letter

STAT 5376D. Statistical Applications in Genetics and Bioinformatics.

This course covers the applications of statistical methods and tools in genetics and bioinformatics. Students will learn how to address important and challenging questions arising in the analysis of large genetic and bioinformatic data. Topics include applying analysis of variance, regression analysis, and hidden Markov models to analyze high throughput genetic and epigenetic data (e.g., microarray and sequencing data). Prerequisite: Math 4305 or equivalent with a grade of "C" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Topics

Grade Mode: Standard Letter

STAT 5390. Statistics.

This course will cover not only some of the basic statistical ideas and techniques but also the mathematical and probabilistic underpinnings of these techniques with an emphasis on simulations and modeling. The planning, conducting, analysis, and reporting of experimental data will also be covered.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

STAT 7325. Statistics I.

This course covers the study of the mathematical and probabilistic underpinnings of the techniques used in statistical inference. Topics covered include sampling, sampling distributions, confidence intervals, and hypothesis testing with an emphasis on both simulations and derivations.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

STAT 7335. Statistics II: Linear Modeling.

This course is a study of the formulation and statistical methodologies for fitting linear models. Topics include the general linear hypothesis, least-squares estimation, Gauss-Markov theorem, assessment of model fit, effects of departures from assumptions, model design, and criteria for selection of optimal regression models. Prerequisite: MATH 7325 or STAT 7325 with a grade of "B" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

STAT 7337. Advanced Mathematical Statistics.

This course covers foundations of classical and modern mathematical statistics. Topics include multivariate normal distributions, central limit theorem (including Lindeberg condition), data reduction principles, delta method, asymptotic theories for likelihood-based method, decision-theoretic formulation of estimation and testing of hypotheses, minimaxity, admissibility, and bootstrap.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Grade Mode: Standard Letter

STAT 7375E. Computational Statistics.

This course focuses on commonly used sampling and optimization algorithms in statistics. Topics include accept-reject method, importance sampling, Markov Chain Monte Carlo algorithms, Fisher scoring algorithm, expectation-maximization algorithm, and minorization-maximization algorithm. Prerequisite: MATH 5305 or STAT 5305 with a grade of "B" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Topics

Grade Mode: Standard Letter

STAT 7375F. Multivariate Data Analysis.

This course focuses on statistical methodologies based on multivariate analysis. Topics include multivariate normal distribution, tests of hypothesis on means, multivariate analysis of variance, discriminant analysis, principal component analysis, factor analysis and canonical correlation analysis. Prerequisite: [MATH 5305 or STAT 5305] with a grade of "B" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Topics

Grade Mode: Standard Letter

STAT 7375G. Bayesian Methods.

This course focuses on Bayesian statistical analysis and associated theories. Topics include one-parameter and multi-parameter Bayesian models, choices of priors, formulation of regression models in the Bayesian framework, and related data analysis. Prerequisite: MATH 5305 or STAT 5305 with a grade of "B" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Topics

Grade Mode: Standard Letter

STAT 7375I. Advanced Statistical Learning.

This course covers the theoretical foundations in statistical learning and deep learning. Topics include the framework of empirical risk minimization, metric entropy, Vapnik-Chervonenkis dimension, Rademacher and Gaussian complexity, symmetrization and chaining techniques, contraction principle, uniform law of large numbers, sample complexity, and neural networks. Prerequisite: MATH 7337 or STAT 7337 with a grade of "B" or better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing|Topics

Grade Mode: Standard Letter

STAT 7387. Consulting.

This course focuses on developing skills in the collaborative practice of mathematics and statistics. This will be done through class discussion, readings, and different projects. Students will learn how to apply mathematics or statistics to solve real-world problems through case studies and collaborative projects. They will also learn how to apply ethical considerations to their professional practice. Taking this course will allow students to gain skills in problem solving and providing consulting services. Prerequisite: STAT 7325 with a grade of "B" or better.

3 Credit Hours. 2 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Exclude from 3-peat Processing

Grade Mode: Credit/No Credit