STS - STATISTICS

STS 210 Principle of Study Design (3 Credit Hours)
This course is an introduction to the design of observational studies and experiments. Topics include sampling techniques, major experimental and treatment design structures, power and sample size considerations, and analysis of variance.
Academic Level: Undergraduate

STS 220 Probability (3 Credit Hours)
This course is a rigorous introduction to probability. Topics include probability spaces, conditional probability, counting, Bayes' Theorem, discrete and continuous random variables and distributions, expectation, transformations of random variables, parametric families, and limit theorems. Concepts are explored using both mathematical analysis and simulation.
Academic Level: Undergraduate

STS 250 Statistical Methods I: Linear Models (3 Credit Hours)
This course is an introduction to the design, training, and application of linear models. Topics include simple and multiple linear regression; polynomial, principal components, and weighted least squares regression; inference for regression parameters, model diagnostics, model performance, outlier analysis, transformations, model selection, resampling methods, and extensions to generalized linear models.
Academic Level: Undergraduate

STS 280 Statistical Computing (3 Credit Hours)
Computational techniques for data management, cleaning, and processing. Topics include imputation, data reduction and feature engineering, variable transformations, data wrangling, writing scripts and functions, setting up and working with databases, and working with text, spatial, and time/date data. Computational techniques for data management, cleaning, and processing. Topics include imputation, data reduction and feature engineering, variable transformations, data wrangling, writing scripts and functions, setting up and working with databases, and working with text, spatial, and time/date data.
Academic Level: Undergraduate

STS 320 Statistical Inference (3 Credit Hours)
This course provides an introduction to the principles of statistical inference. Students will be provided with theory, simulation, and data to explore frequentist and Bayesian approaches to model building and drawing inferences. Students will learn how to analyze sample data to infer an underlying probability distribution, test hypotheses, and predict relationships between variables.
Academic Level: Undergraduate

STS 350 Statistical Methods II (3 Credit Hours)
This course builds on foundational knowledge of linear models to explore Generalized Linear Models (GLMs). Topics include logistic, Poisson, and other GLMs, as well as model diagnostics, inference, and interpretation. Additional topics may include survival, multi-level/hierarchical, and zero-inflated models. The course emphasizes both theoretical understanding and practical data analysis.
Academic Level: Undergraduate

STS 360 Time Series Analysis (3 Credit Hours)
This course provides an introduction to the analysis of time series data, focusing on both theoretical foundations and practical applications. Topics include time series decomposition, autocorrelation, ARIMA models, spectral analysis, and forecasting.
Academic Level: Undergraduate

STS 400 Bayesian Methods (3 Credit Hours)
This course provides an in-depth introduction to Bayesian methods, focusing on their theoretical foundations, computational techniques, and applications. Topics include Bayesian inference, prior and posterior distributions, Markov Chain methods, and hierarchical models.
Academic Level: Undergraduate

STS 430 Stochastic Process (3 Credit Hours)
This course provides an introduction to the theory and applications of stochastic processes. Topics include Markov chains, Poisson processes, Brownian motion, and martingales. The course emphasizes both theoretical understanding and practical applications in various fields such as finance, biology, and engineering.
Academic Level: Undergraduate

STS 470 Technical Skills for Statisticians (3 Credit Hours)
This course focuses on statistics as professional practice in real world health, business, industry, government, and public service applications. Topics include creation of reports and executive summaries, presentation strategies, project organization and management, ethical considerations and impacts, and collaboration.
Academic Level: Undergraduate

STS 480 Statistical Consulting and Research (3 Credit Hours)
Students act as consultants with a partner from science, health, business, industry, government, or public service, and complete at least one end-to-end project.
Academic Level: Undergraduate