

# STATISTICS

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Not all courses are offered every semester. Refer to the schedule of courses for each term's specific offerings.

More Info (<https://one.ufl.edu/soc/>)

*Unless otherwise indicated in the course description, all courses at the University of Florida are taught in English, with the exception of specific foreign language courses.*

## Department Information

The mission of the Department of Statistics is to provide its students with a fundamental understanding of statistical reasoning and methodology, to train them to apply this knowledge to the collection and analysis of data, and to prepare them for careers in a highly technological society in which science and decision-making are increasingly driven by a rapid expansion in the quantity and availability of data.

**Website** (<https://stat.ufl.edu/>)

### CONTACT

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Map (<http://campusmap.ufl.edu/#/index/0010>)

### Curriculum

- Actuarial Science Minor
- Combination Degrees
- Data Analytics Certificate
- Data Science
- Statistics
- Statistics Minor

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## Courses

### STA 2023 Introduction to Statistics 1 3 Credits

**Grading Scheme:** Letter Grade

In this course, students will utilize descriptive and inferential statistical methods in contextual situations, using technology as appropriate. The course is designed to increase problem-solving abilities and data interpretation through practical applications of statistical concepts. This course is appropriate for students in a wide range of disciplines and programs.

**Attributes:** General Education - Mathematics

### STA 3024 Introduction to Statistics 2 3 Credits

**Grading Scheme:** Letter Grade

An introduction to the analysis of variance. Nonparametric statistical methods and applications. Analysis of count data: chi-square and contingency tables. Simple and multiple linear regression methods with applications.

**Prerequisite:** STA 2023 or the equivalent.

### STA 3032 Engineering Statistics 3 Credits

**Grading Scheme:** Letter Grade

Basic concepts in probability, statistics, engineering applications. Use of computational methods, logic, and reasoning. Formulation of mathematical models, application of statistical techniques, and solution of real-world problems. Topics include probability, random variables, estimation, hypothesis testing, correlation, regression, and analysis of variance.

**Prerequisite:** MAC 2311.

**Attributes:** General Education - Mathematics

### STA 3100 Programming With Data in R 3 Credits

**Grading Scheme:** Letter Grade

Introduction to statistical computing and programming with data. Topics include basic programming in R; data types and data structures in R; importing and cleaning data; specifying statistical models in R; statistical graphics; statistical simulation using pseudo-random numbers; reproducible research and the documentation of statistical analyses.

**Prerequisite:** STA 2023 with a minimum grade of B or (STA 3024 or STA 3032 with a minimum grade of B-) or (AP statistics score of 4 or 5).

**STA 3180 Statistical Modelling 3 Credits****Grading Scheme:** Letter Grade

Overview of modern statistical modeling. Topics include linear regression, binary regression and classification, cross-validation, nonlinear regression and smoothing, tree-based methods, the bootstrap, and causal inference. Approaches will be illustrated in R.

**Prerequisite:** STA 3100.**STA 4183 Theory of Interest 3 Credits****Grading Scheme:** Letter Grade

Measurement of simple and compound interest, accumulated and present value. Annuities, yield rates, amortization schedules, sinking funds, bonds, securities and related funds.

**Prerequisite:** MAC 2312.**STA 4210 Regression Analysis 3 Credits****Grading Scheme:** Letter Grade

Simple linear regression and multiple linear regression models. Inference about model parameters and predictions, diagnostic, and remedial measures about the model, independent variable selection, multicollinearity, autocorrelation, and nonlinear regression. SAS implementation of the above topics.

**Prerequisite:** STA 3100 and (STA 3024 or STA 3032 or STA 4321 or MAS 3114 or MAS 4105).**STA 4211 Design of Experiments 3 Credits****Grading Scheme:** Letter Grade

The basic principles of experimental design: analysis of variance for experiments with a single factor; randomized blocks and Latin square designs; multiple comparison of treatment means; factorial and nested designs; analysis of covariance; response surface methodology.

**Prerequisite:** STA 4210.**STA 4222 Sample Survey Design 3 Credits****Grading Scheme:** Letter Grade

An introduction to the design of sample surveys and the analysis of survey data, the course emphasizes practical applications of survey methodology. Topics include sources of errors in surveys, questionnaire construction, simple random, stratified, systematic and cluster sampling, ratio and regression estimation.

**Prerequisite:** (STA 4321 and STA 2023) or STA 3032 or STA 4322.**STA 4241 Statistical Learning in R 3 Credits****Grading Scheme:** Letter Grade

Overview of the field of statistical learning. Topics include linear regression, classification, resampling methods, shrinkage approaches, tree-based methods, support vector machines, and clustering. Approaches will be illustrated in R.

**Prerequisite:** STA 4322 and STA 4210 and (MAS 3114 or 4105).**STA 4273 Statistical Computing in R 3 Credits****Grading Scheme:** Letter Grade

Overview of computational statistics and how to implement the methods in R. Topics include Monte Carlo methods in inference, bootstrap, permutation tests, and Markov chain Monte Carlo (MCMC) methods.

**Prerequisite:** STA 4210 and STA 4322 and (MAS 3114 or MAS 4105).**STA 4321 Introduction to Probability 3 Credits****Grading Scheme:** Letter Grade

Introduces the theory of probability, counting rules, conditional probability, independence, additive and multiplicative laws, Bayes Rule. Discrete and continuous random variables, their distributions, moments and moment generating functions. Multivariate probability distributions, independence, covariance. Distributions of functions of random variables, sampling distributions, central limit theorem.

**Prerequisite:** MAC 2313 or MAC 3474 with a minimum grade of C.**STA 4322 Introduction to Statistics Theory 3 Credits****Grading Scheme:** Letter Grade

Sampling distributions, central limit theorem, estimation, properties of point estimators, confidence intervals, hypothesis testing, common large sample tests, normal theory small sample tests, uniformly most powerful and likelihood ratio tests, linear models and least squares, correlation. Introduction to analysis of variance.

**Prerequisite:** STA 4321 or the equivalent.**STA 4502 Nonparametric Statistical Methods 3 Credits****Grading Scheme:** Letter Grade

Introduction to nonparametric statistics, including one- and two-sample testing and estimation methods, one- and two-way layout models and correlation and regression models.

**Prerequisite:** STA 2023 or STA 3032 or STA 4210 or STA 4322.**STA 4504 Categorical Data Analysis 3 Credits****Grading Scheme:** Letter Grade

Description and inference using proportions and odds ratios, multi-way contingency tables, logistic regression and other generalized linear models, log-linear models applications.

**Prerequisite:** STA 3100 and (STA 3024 or STA 3032 or STA 4210 or STA 4322).

**STA 4702 Multivariate Statistical Methods 3 Credits****Grading Scheme:** Letter Grade

Review of matrix theory, univariate normal, t, chi-squared and F distributions and multivariate normal distribution. Inference about multivariate means including Hotelling's T<sup>2</sup>, multivariate analysis of variance, multivariate regression and multivariate repeated measures. Inference about covariance structure including principal components, factor analysis and canonical correlation. Multivariate classification techniques including discriminant and cluster analyses. Additional topics at the discretion of the instructor, time permitting.

**Prerequisite:** (STA 3024 or STA 4210 or STA 4322 or STA 6127 or STA 6167) and (MAS 3114 or MAS 4105 or the equivalent).**STA 4712 Introduction to Survival Analysis 3 Credits****Grading Scheme:** Letter Grade

Survival analysis data methods including Kaplan-Meier and Nelson estimators of the survival, accelerated failure time and proportional hazards models and frailty and recurrent event models.

**Prerequisite:** STA 4210.**STA 4821 Stochastic Processes 3 Credits****Grading Scheme:** Letter Grade

Theoretical development of elementary stochastic processes, including Poisson processes and their generalizations, Markov chains, birth and death processes, branching processes, renewal processes, queuing processes and genetic and ecological processes.

**Prerequisite:** STA 4321 or equivalent.**STA 4853 Introduction to Time Series and Forecasting 3 Credits****Grading Scheme:** Letter Grade

Stationarity, autocorrelation, ARMA models; frequency domain methods and the spectral density; forecasting methods; and computationally-oriented application to case studies.

**Prerequisite:** STA 4210 and STA 4321.**STA 4905 Individual Work 1-5 Credits****Grading Scheme:** Letter Grade

Special topics designed to meet the needs and interests of individual students.

**Prerequisite:** department permission.**STA 4911 Undergraduate Research in Statistics 0-3 Credits****Grading Scheme:** S/U

Provides firsthand, supervised research. Projects may involve inquiry, design, investigation, scholarship, discovery, or application.

**STA 4930 Special Topics 3 Credits****Grading Scheme:** Letter Grade

Variable topics designed to meet the students' needs and interests.

**Prerequisite:** department permission.**STA 4940 Internship 1-3 Credits****Grading Scheme:** S/U

Supervised activity associated with planning and/or analyzing data from a research project. Supervision by a faculty member or delegated authority and a post-internship written report are required.

**Prerequisite:** STA 4211 and undergraduate coordinator permission.**STA 4956 Overseas Studies 1-15 Credits****Grading Scheme:** Letter Grade

Provides a mechanism by which coursework taken as part of an approved study abroad program can be recorded on the UF transcript and counted toward graduation.

**Prerequisite:** undergraduate coordinator permission.