

# STA: STATISTICS

## Courses

### STA 200. Introduction to Statistics II. 3 Credits.

Continuation of MAT 121/MAT 125. Topics include inference about the means, standard deviations and proportions, goodness of fit, analysis of variance, regression analysis, correlation, and nonparametric tests. In addition, students will learn to use SPSS, a statistical analysis software that is available for free through the Ram Cloud. Finally, students will hone their technical writing skills by summarizing their statistical analyses with written reports. STA 200 Prerequisite: Successful completion of ECO 251, MAT 121, or MAT 125, with minimum grades of C-. Distance education offering may be available.

### STA 201. Statistical Methods for Political Polling. 3 Credits.

The purpose of this course is to introduce students to the statistical methodology used in the analysis of data from a political survey. Topics will include sampling techniques, hypothesis testing, sample size calculation, categorical data analysis, simple linear regression, and ANOVA. There will be a field trip to the Center for Opinion Research at Franklin and Marshall College at the beginning of the semester.

STA 201 Prerequisite: Successful completion of MAT 121 or PSC 200, with minimum grades of D-.

### STA 202. Sports Analytics. 3 Credits.

In this course we will apply concepts such as regression, classification, clustering, decision trees and others to evaluate players and teams from baseball, basketball, football, hockey and soccer. We will also introduce the statistical programming language R in order to analyze recent (and large!) data sets.

STA 202 Prerequisite: Successful completion of ECO 251, MAT 121, or MAT 125, with minimum grades of C-.

### STA 203. Probability and Statistics in Gaming. 3 Credits.

In this class students will learn the important role that probability and statistics play in the enjoyment and development of games ranging from blackjack and the lottery to Battleship and World of Warcraft. Statistical topics include descriptive statistics, probability, discrete random variables, and multivariate linear modeling. Throughout the course students will use statistical tools to not only develop optimal strategies while gaming but also to analyze the current trends in contemporary gaming, determine which factors correlate with a game's popularity, and how to develop algorithms for computer opponents.

STA 203 Prerequisite: Successful completion of MAT 121 or MAT 125, with minimum grade of D-.

### STA 311. Intro Statistical Computing and Data Management. 3 Credits.

Course will give students the ability to manage and manipulate data effectively, conduct basic statistical analysis, and generate reports and graphics primarily using the SAS Statistical Software Program.

STA 311 Prerequisite: Successful completion of MAT 121 or MAT 125, with minimum grades of D-.

Distance education offering may be available.

### STA 319. Applied Statistics. 3 Credits.

This course will cover simple and multiple linear regression methods and linear time series analysis with an emphasis on fitting suitable models to data and testing and evaluating models against data.

STA 319 Prerequisite: Successful completion of MAT 121 or MAT 125; and MAT 143, MAT 145 or MAT 161, all with minimum grades of C.

### STA 320. Experimental Design. 3 Credits.

The purpose of this course is to guide students in learning how to design, conduct and analyze the results of scientific studies so that valid and objective inferences about the population are obtained. It will cover ANOVAs, block, factorial, and split plot designs, as well as response surface analysis.

STA 320 Prerequisite: Successful completion of MAT 121 or MAT 125, with minimum grades of C.

### STA 321. Topics in Advanced Statistics. 3 Credits.

Course will cover select topics in categorical analysis, nonparametrics and time series analysis. Emphasis will be placed on statistical programming, particularly simulations.

STA 321 Prerequisite: Successful completion of STA 311, STA 319, STA 320, and MAT 421, with minimum grades of C.

### STA 419. Basics of Statistical Learning. 3 Credits.

This course will provide an introduction to statistical learning and predictive modeling. Tools will be developed for visualizing and understanding complex data sets. All data analysis will be done using the statistical programming language R.

STA 419 Prerequisite: Successful completion of STA 319, with a minimum grade of C. Distance education offering may be available.

### STA 490. Capstone Course in Statistics. 3 Credits.

Course will synthesize lessons learned throughout the students career with the goal of preparing students for work as professional statisticians. Topics will include report writing, presentations, statistical consulting, sampling design, and resume writing.

STA 490 Prerequisite: Successful completion of ENG 368 or ENG 371 or ENG 375, with minimum grades of D-; and STA 320 and STA 321, with minimum grades of C.