DAT222x: Essential Statistics for Data Analysis using Excel

Welcome to Essential Statistics for Data Analysis using Excel. This course will help you gain a solid understanding of statistics and basic probability that forms a foundation for further work in data analysis and data science. We really hope you enjoy the course.

The entire course is available in self-paced format and we estimate that it will take anywhere from 24 to 48 hours to complete depending on your current skill set. Of course, you can sit the course all at once, but we recommend allotting four to eight hours per week for six weeks to complete this course. That includes videos, reading materials, homework, quizzes, and the final exam. Also, we encourage you to participate in the discussion forums when you have questions, comments, or concerns.

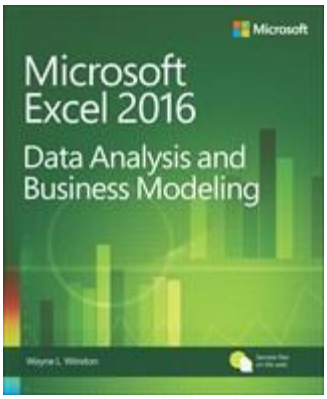
Course Prerequisites

Remember that this course is the second course in a three-part xSeries for Microsoft Excel Data Analysts. The ability to organize and summarize data using Excel analytic tools such as tables, pivot tables, and pivot charts is needed before taking this course. Also, you should be comfortable (or a willingness to try!) creating complex formulas and visualizations. If you think you may need to start with the basics, then check out DAT205x: Introduction to Data Analysis using Excel.

- Secondary school (high school) algebra
- Ability to work with tables, formulas, and charts in Excel
- Ability to organize and summarize data using Excel analytic tools such as tables, pivot tables, and pivot charts
- Excel 2016 is required for the full course experience. Excel 2013 will work but will not support all the visualizations and functions

Course Text Book

This course includes excerpts from the following book from Microsoft Press and authored by course instructor Wayne Winston. The course contains all the text book material you will need to complete the course but if you would like to purchase the full book please select the image below to follow the link to the Microsoft Press Store for more information. The book is available in print and eBook (including EPUB, MOBI, and PDF) formats.



Course Outline

The detailed course outline follows. Each course module ends with a Module Quiz and each lesson has Homework to help you practice the concepts taught in the lesson using Excel.

Module 1: Descriptive Statistics

You will learn how to describe data using charts and basic statistical measures. Full use will be made of the new histograms, Pareto charts, Boxplots, and Treemap and Sunburst charts in Excel 2016.

Lessons

1. Defining Data
2. Histograms and Skewness
3. Descriptive Statistics with Analysis ToolPak
4. Boxplots
5. Categorical Data, PivotTables, and PivotCharts
6. Summarizing Hierarchical Data
7. 80-20 Rule and Pareto Charts

Module 2: Basic Probability

You will learn basic probability including the law of complements, independent events, conditional probability and Bayes Theorem.

Lessons

1. Introduction to Probability
2. Law of Complements
3. Mutually Exclusive and Independent Events
4. Conditional Probability
5. Law of Total Probability and Bayes Rule

Module 3: Random Variables

You will learn how to find the mean and variance of random variables and then learn about the binomial, Poisson, and Normal random variables. We close with a discussion of the beautiful and important Central Limit Theorem.

Lessons

1. Random Variable Definitions
2. Mean, Variance, and Standard Deviation of a Random Variable
3. Mean, Variance, and Standard Deviation for Sum of Random Variables
4. Binomial Random Variable
5. Poisson Random Variable
6. Normal Random Variable
7. Central Limit Theorem
8. Z Scores

Module 4: Sampling and Confidence Intervals

You will learn the mechanics of sampling, point estimation, and interval estimation of population parameters.

Lessons

1. Populations and Samples
2. Point Estimation of a Population Mean and Proportion
3. The Standard Normal
4. Confidence Interval Estimation
5. Sample Size Determination
6. The Finite Correction Factor

Module 5: Hypothesis Testing

You will learn null and alternative hypotheses, Type I and Type II error, One sample tests for means and proportions, Tests for difference between means of two populations, and the Chi Square Test for Independence.

Lessons

1. Defining Hypothesis
2. Type I and Type II Errors
3. One Sample Z-Test
4. One Sample T-Test
5. Single Sample Test for Population Proportion
6. Testing Equality of Variances
7. Testing the Difference Between Two Population Means
8. Chi-Squared Test for Independence

Course Schedule and Grading

This entire course is available in self-paced format. Deadlines associated with the homework, graded quizzes, and final exam are set to the end date of the course, which is displayed on the course Home page. You can watch the videos, attempt the quizzes, and work on the homework at any time prior to the deadline.

In the module quizzes and final exam, you have only **one attempt** at each problem. In the homework, you have **unlimited attempts** at each problem. The homework is designed to help you practice and master the concepts before attempting the quizzes and final exam and may include tips and hints to

help you learn. The homework is part of your grade, but you earn homework credit by working the problems and practicing not by getting the problems right on the first try. The homework problems have unlimited attempts. So, when doing the homework, don't worry, relax and use the time to practice and learn.

The module quizzes account for 40% of the total grade, the final exam accounts for 40% of the total grade, and the homework (including the course surveys) accounts for the final 20%. You must achieve an overall score of 70% to pass the course. You can check your progress on the Progress page, and when you have achieved a passing grade, you can click the Request Certificate button to request for your certificate.

Again, we hope you enjoy this course on the essential statistics for data analysis. Thanks for joining us!