

DAX521 Applied Statistics for Data Analytics

(3 credit hours)

Course Syllabus

Course Description

This course will explore techniques to analyze data, produce graphical illustrations and draw conclusions using statistical, data analysis and visualization software packages. Focusing on the central tendency, data exploration and analytics, probability distributions and random variables, students will compare and contrast the basics of statistical inference, testing hypothesis and building confidence intervals, correlation and causation, and simple and multiple regression analysis.

Course Learning Outcomes

By the end of this course, you will be able to:

1. Examine various statistical techniques using statistical software to efficiently and effectively analyze data.
2. Analyze data based on various statistical techniques.
3. Design graphical illustrations of data.
4. Demonstrate a working knowledge of interactive data visualization software.

Prerequisites/Corequisites

DAX511: Data Mining and Structure

Required Textbook(s) and Resources

SAS software (*free trial version*) Instruction provided in Week 1:

<https://welcome.oda.sas.com/login>

SPSS software (*free trial version, OPTIONAL*): <https://www.ibm.com/account/reg/us-en/signup?formid=urx-19774>

Students may also use Microsoft Excel, Microsoft MegaStat (add-on), SPSS or Minitab software to conduct statistical analysis.

Note: this course may contain additional resources for specific activities. Be sure to read the instructions carefully for individual assignments or activities for those requirements. Where applicable, Tiffin University has obtained permission to use copyrighted material.

Be sure to also review the weekly **Explore** sections for additional library or web resources. For access to databases, research help, and writing tips, visit the [Tiffin University Library](#).

Time Commitment

Effective time management is possibly the single most critical element to your academic success. To do well in this online class you should plan your time wisely to maximize your learning through the completion of readings, discussions, and assignments. Because of our accelerated, seven-week term, TU online courses are designed with the expectation that you dedicate a little over **six (6)** hours per credit hour to course activities and preparation **each week**. For example, for successful completion of a three-credit, seven-week online course you should reserve roughly **twenty (20) hours per week**.

To help plan your time and keep on track toward successful course completion, note the distinctive rhythm of assignment due dates:

1. All times assume Eastern Time (GMT-4).
2. Weeks begin at 12:00 a.m. ET on Monday and end at 11:55 p.m. ET on Sunday.
3. Unless otherwise noted, initial assignments or discussion posts are due by **11:55 p.m. ET on Wednesdays**.
4. Additional assignments or follow-up discussion posts are due by **11:55 p.m. ET on Saturdays, and**
5. Major assignments and reflections are typically due by **11:55 p.m. ET on Sundays**.

Learning Activities

The course centers on activities using SAS Data Analytic software and offers an introduction to the functionality provided by SAS Visual Analytics and is designed for those with little to no SAS or programming experience. Through the weekly lectures and activities students will be introduced to data preparation, data discovery, SAS Analytics and report creation with Tableau. Students will evaluate current events that align with the statistic's subject for the week.

In addition, you will:

1. Generate descriptive statistics and explore data with graphs.
2. Perform analysis of variance and apply multiple comparison techniques.
3. Perform linear regression and assess the assumptions.
4. Use regression model selection techniques to aid in the choice of predictor variables in multiple regression.

5. Use diagnostic statistics to assess statistical assumptions and identify potential outliers in multiple regression.
6. Use Chi-square statistics to detect associations among categorical variables.
7. Fit a multiple logistic regression model.
8. Import existing and new data using developed models.

Grading

The chart below identifies the individual contributions from each type of activity, per week.

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Total
Discussions 20 40	Discussions 40	Discussions 40	Discussions 50	Discussions 50	Discussions 50	Discussions 40	330
Assignments 20 50	Assignments 20 50	Assignments 20 50 20	Assignments 20 40 20	Assignments 20 40 20	Assignments 20 40	Assignments 180	630
Knowledge Check 10	-	Knowledge Check 10	-	Knowledge Check 10	Knowledge Check 10	-	40
140	110	140	130	140	120	220	1000

Grading Scale

A: 90-100% | B: 80-89% | C: 70-79% | F: <69%

Course Schedule and Weekly Checklist

Week 1: Descriptive Statistics and SAS Setup

- WED: Activity 1.1: Meet Your Classmates! - Initial Post
- WED: Activity 1.2: Identifying Descriptive/Inferential Statistics - Initial Post
- SAT: Activity 1.2: Identifying Descriptive/Inferential Statistics - Secondary Posts
- SUN: Activity 1.3: Terminology
- SUN: Activity 1.4: Logging Into SAS
- SUN: Activity 1.5: Current Events Assignment

Week 2 - Descriptive Statistics

- WED: Activity 2.1: Descriptive Statistics Using Data - Initial Post
- SAT: Activity 2.1: Descriptive Statistics Using Data - Secondary Posts
- SUN: Activity 2.2: SAS Importing Data
- SUN: Activity 2.3: Current Events Summary (Graphical Illustration)

Week 3 - Probability

- WED: Activity 3.1: Probabilities - Initial Post
- SAT: Activity 3.1: Probabilities - Secondary Posts
- SUN: Activity 3.2: SAS Importing Data, Descriptive Statistics, and Graphical Illustration of Data
- SUN: Activity 3.3: Current Events Summary
- SUN: Activity 3.4: Descriptive and Inferential Statistics
- SUN: Activity 3.5: Probability

Week 4 - Normal Distribution and Hypothesis Testing

- WED: Activity 4.1: Hypothesis Testing - Initial Post
- SAT: Activity 4.1: Hypothesis Testing - Secondary Posts
- SUN: Activity 4.2: Statistical Tests in SAS 1
- SUN: Activity 4.3: Statistical Tests in SAS 2
- SUN: Activity 4.4: One-Way ANOVA with SAS

Week 5 - Correlation

- WED: Activity 5.1: Causation/Correlation - Current Events Summary - Initial Post
- SAT: Activity 5.1: Causation/Correlation - Current Events Summary - Secondary Posts
- SUN: Activity 5.2: Causation/Correlation
- SUN: Activity 5.3: Causation/Correlation w/SAS
- SUN: Activity 5.4: Tableau/Prezi Presentation/Analytics Downloads
- SUN: Activity 5.5: Benford's Law

Week 6 - Introduction to Regression Analysis

- WED: Activity 6.1: Linear Regression - Real World Application - Initial Post

- SAT: Activity 6.1: Linear Regression - Real World Application - Secondary Posts
- SUN: Activity 6.2: Regression
- SUN: Activity 6.3: Simple Regression Analysis in SAS
- SUN: Activity 6.4: Current Events Summary

Week 7 - Final Project

- WED: Activity 7.1: Predictive Analytics - Initial Post
- SAT: Activity 7.1: Predictive Analytics - Secondary Posts
- SUN: Activity 7.2: Final Project

Tips for Success

Online learning requires self-discipline and self-direction. As seekers of the truth, we should be willing to challenge one another's academic work in a spirit of respectful comradery. Your course is a place for you to grow as you benefit from the expertise, experience, and diverse perspectives of your instructor and peers. Constructive feedback will challenge you to stretch your own thinking, thereby expanding your knowledge and understanding.

To get the most out of your learning experience, you should actively engage (participate) in **ALL** course activities. Course elements are arranged chronologically. To complete a week, simply work your way "down the page" through all of the course materials and activities.

For More Information:

Be sure to review the [Support, Policies, and Procedures](#) addendum.