



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

For this course you will need to purchase the following materials:

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

https://odamid.oda.sas.com/SASLogon/login?service=https%3A%2F%2Fodamid.oda.sas.com%252%20FSASStudio%2Fj_spring_cas_security_check

- SPSS software (*free trial version, OPTIONAL*): https://www.ibm.com/account/reg/us-en/signup?formid=urx-19774&a=IBMSPSSStatistics&ctx=C001&cc=us&lc=en&trial=yes&quantity=1&catalogName=Master&partNumber=SPSS_S_TRIAL&source=mrsaas-trial-ibmid&pkg=ov5354&S_TACT=000000OA&S_OFF_CD=10000400&siteID=ECOM

- 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.

Visit the [Tiffin University Library](#) for access to databases, research help, and writing tips. A link is available in the Start Here section (Quick Links). You might consider registering for one of the library's many webinars on library research, source evaluation, copyright, and other topics, at the [Library Events - Upcoming Events](#) web page. If you register but cannot attend a live session, the library will email you a link to the session recording after the event. For further assistance email a librarian, at: library@tiffin.edu.

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 Activity 1.1 (20) Activity 1.2 (40)	Discussions Activity 2.1 (40)	Discussions Activity 3.1 (40)	Discussions Activity 4.1 (50)	Discussions Activity 5.1 (50)	Discussions Activity 6.1 (50)	Discussions Activity 7.1 (40)	330
Assignments Activity 1.4 (20) Activity 1.5 (50)	Assignments Activity 2.2 (20) Activity 2.3 (50)	Assignments Activity 3.2 (20) Activity 3.3 (50) Activity 3.4 (20)	Assignments Activity 4.2 (20) Activity 4.3 (40) Activity 4.4 (20)	Assignments Activity 5.3 (20) Activity 5.4 (40) Activity 5.5 (20)	Assignments Activity 6.3 (20) Activity 6.4 (40)	Final Project Activity 7.2 (180)	630
Knowledge Check Activity 1.3 (10)	--	Knowledge Check Activity 3.5 (10)	--	Knowledge Check Activity 5.2 (10)	Knowledge Check Activity 6.2 (10)	--	40
140	110	140	130	140	120	220	1000

Grading Scale

Grade	Percentage
A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	<60%

Please see the [Academic Bulletin](#) for grade appeal information.

Course Schedule and Weekly Checklist

Topic	Learning Activities (Due by 11:55 p.m. ET on day designated)
Start Here	☐ MON: Activity 1.1 – Initial Post
Week 1: Introduction to statistics Descriptive statistics SAS introduction (setup)	☐ WED: Activity 1.2 – Initial Post ☐ SAT: Activity 1.2 – Secondary Posts ☐ SUN: Activity 1.3 - Terminology ☐ SUN: Activity 1.4 – Logging Into SAS ☐ SUN: Activity 1.5 – Current Events Assignment

SUN: <Activity

Week 2: Importing and displaying data Descriptive statistics, continued Graphical presentations	☐ WED: Activity 2.1 – Initial Post ☐ SAT: Activity 2.1 – Secondary Posts ☐ SUN: Activity 2.2 SAS Importing Data ☐ SUN: Activity 2.3 Current Events Summary (Graphical Illustration)
Week 3: Probability Distributions Relationships between Distributions SAS Importing (code) SAS Descriptive Statistics (code) SAS Graphical Illustration of data (code)	☐ WED: Activity 3.1 – Initial Post ☐ SAT: Activity 3.1 – 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: Standard Normal Curve Confidence Intervals Hypothesis Testing Overview Hypothesis Testing (using SAS) t-test / One-Way ANOVA / Kruskal Wallis - Statistical Tests	☐ WED: Activity 4.1 – Initial Post ☐ SAT: Activity 4.1 – 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: Causation vs. Correlation w/ SAS Benford's Law Tableau & Prezi Presentation and Analytics	☐ WED: Activity 5.1 – Initial Post ☐ SAT: Activity 5.1 – 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: Simple and Multiple Regression Regression using SAS Regression Analysis SPSS/Excel	☐ WED: Activity 6.1 – Initial Post ☐ SAT: Activity 6.1 – 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: SAS Regression Analysis SPSS Regression Analysis	☐ WED: Activity 7.1 – Initial Post ☐ SAT: Activity 7.1 – Secondary Posts ☐ SUN: Activity 7.2 – Final Project

Tips for Success

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

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

Your Instructor Will Expect You to:

- Thoroughly review orientation materials (Start Here) within the first 48 hours of the term.
- Monitor your TU email account **daily** for important updates and announcements.
- Take ownership of your learning experience and act in a proactive, self-directed manner. That means:
 - Fully participate in all learning activities.
 - Complete assignments as described in rubrics or other instructions.
 - Submit all work on time and in the specified format (e.g. APA format for citations).
 - Utilize and incorporate instructor provided feedback to improve your work.
 - Ask questions so you can better understand course material or assignments.

- Use the highest standards of intellectual honesty and integrity. For more information, see the TU Library guide: [Digital Literacy: Netiquette and Internet Safety](#).
- Treat others respectfully and demonstrate "netiquette" (online politeness and respectfulness) at all times. TU celebrates cultural uniqueness and expects all students to be considerate and thoughtful throughout their learning experiences.

You Should Expect Your Instructors to:

In general, your instructors should advocate for your success as a learner and help guide you toward successful completion of the course activities and most importantly, attainment of the course learning outcomes. To accomplish this, your instructors should:

- Post an introductory announcement/email at the beginning of each week to provide updates and help you prepare for the week's activities.
- Maintain an active and engaged presence in all course activities and throughout the course.
- Respond to your emailed questions within 48 hours, if not sooner.
- Clearly communicate any absences or expected non-participation due to extenuating circumstances. For example, "I will be traveling to attend a funeral this week and may not be able to respond to questions or participate in forums for a couple of days."
- When grading your work, your instructors should:
 - clearly indicate their grading approach (what they like to see in submitted work as well as what types of errors they tend to penalize more harshly),
 - thoroughly review and evaluate your submissions in a timely manner (in less than 5 days for most assignments), and
 - provide constructive feedback that indicates the strengths and weaknesses of your work and provides suggestions on how you can improve your performance on future assignments.

Accommodations

The **Office for Disability Services** supports the institutional commitment to diversity by providing educational opportunities for qualified individuals with disabilities through accessible programs and services in compliance with Section 504 of the Rehabilitation Act of 1973 and Title III of the Americans with Disabilities Act (ADA) of 1990.

If you need reasonable accommodations due to a documented disability, contact the Office for Equity, Access, & Opportunity 419.448.3021 or via email at disabilityservices@tiffin.edu.

Additional Resources & Support

For technical support, either email moodlesupport@tiffin.edu or call the 24/7 Technical Support Call Center at 855-664-1200.

If you need to consult an academic advisor refer to TU's [Meet the Team](#) page.

For information about TU's peer tutoring program see the Murphy Center's [Tutoring Policies and Procedures](#) page. Veterans and active military can seek assistance from TU's [Veteran and Military Services Web Page](#).

Comments or Concerns

TU's online programs are designed to be student *driven*: to empower you with a voice and stake in your learning. Our courses feature multiple and varied ways that you can share feedback, and we invite you to become an active voice and help drive our improvement efforts. In addition to providing in-course feedback, we encourage you to submit questions or comments directly to the online team at online@tiffin.edu.