DA 6223 Data Analytics Tools & Techniques
Fall 2023 Syllabus

Instructor Information

Instructor: Isil Koyuncu
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Office Location: SPI 260L.

Office Hours: Mondays and Wednesdays from 10:00 to 11:30 AM. *If you will join the office hours online, please make an appointment.*
To make an appointment: Canvas > Zoom > Appointments > Office Hours. Then, select the time slot.

Course Information

Format: In-person
Meeting Time: Wednesdays from 1:00 PM – 3:45 PM
Campus: Downtown Campus
Building: San Pedro I - Data Science
Room: 250

Course Description
As the recent advance in technology, more and more data are collected, and big data analytics have become more popular and essential for extracting information from abundant data sources. Unlike the data sets you have seen or used in the textbook, most real business data sets are complicated and usually are not quite "clean." They contain a lot of missing values, typos, and other issues. You can also encounter datasets with many predictors (or variables), some of which have strange (interesting) distributions or patterns.

Hence, in this course, we will be given the opportunity to learn how to handle complex data from different aspects using SAS Enterprise Guide. Here are some selective topics:

- Importing data from various formats (sources)
- Effectively joining data sets (tables) together
- Restructuring the table by splitting and stacking columns
- Recoding data using functions
- Conditional processing
- Summarizing data through summary statistics
- Data visualization

Prerequisite
A course on statistical analysis (e.g., STA 3523 or equivalent).

Textbook
There is **NO textbook required** for this course. The following book is **recommended (not required):**

- The Little SAS Book for Enterprise Guide (ISBN 978-1629603803), by S. J. Slaughter and L. D. Delwiche.

This book is not required but is available for purchase online. While I will provide my lecture notes throughout the term, the book complements the lecture notes and give more details.

Software

The course will be heavily computer-oriented. We will learn how to use **SAS Enterprise Guide** to analyze different types of data. SAS software is installed in the COB Virtual Desktop Infrastructure (VDI). More details on how to download the necessary components, such as VMware Horizon, to access the COB VDI will be given in class. You can also use an online free version at http://www.sas.com/en_us/industry/higher-education/on-demand-for-academics.html. Additional tools such as SAS 9.4, SAS Studio, SAS Enterprise Miner, and JMP may be introduced briefly if time permits. SAS Enterprise Miner is also on the online platform, and JMP is free to UTSA students.

Canvas

Announcements, lecture notes, homework assignments, quizzes, exercises, project descriptions, and other related material will be posted on Canvas. Some video lectures will also be available on Canvas. **You are responsible for all announcements given in class and all announcements sent through Canvas**. Using Canvas discussions to ask questions and help fellow students is highly encouraged. Please make sure that you have full access to the Canvas.

Assignments

Solutions for all exercises, quizzes, homework assignments, exams, and project flows are submitted through Canvas.

Due dates: Tuesdays at 11:59 PM unless otherwise stated.

In-class Exercises

Each chapter is accompanied by one or more corresponding exercises, which help familiarize you with the procedures and reinforce understanding. Each week, you will practice these exercises towards the end of the lecture. You can work together in groups, and I'll also be there to answer your questions. At the end of this study session, you will submit your answers. There are **ten exercises, each worth 10 points towards the final grade.** There is no time constraint for working on the exercises, i.e., it's all right if you cannot finish it all in the classroom. You can continue working on the questions at home. **Availability:** In-class (Only if you attend the class). **Time Limit:** N/A **Due date:** At the end of class time unless otherwise stated.

Quizzes

Quizzes are similar to the exercises, except they are **take-home assignments expected to be finished within a given time**. The students can choose when to start the quiz. Once the quiz starts, it must be completed within a given time. Please be aware that quizzes are only available during a specific time window. There are, in total, **six quizzes, each worth 30 points towards the final grade**. Every quiz will be counted towards the final grade. **Availability:** A week. **Time Limit**: 2,880 Minutes.

Homework

There are **two homework assignments** during the term. These homework assignments are small independent projects analyzing real-world data to answer specific business questions. While discussions are allowed for a homework assignment, each student must submit their own solution to Canvas. **Each assignment is worth 100 points.** Every HW will be counted. **Availability:** A week. **Time Limit**: A week.

Project

There will be a course project **(worth 200 points)** for the course. It is a group project, and the students will be divided into groups containing **three students** (the groups will be announced later). Every group must deliver a formal business report (two to five pages), including the background introduction, data exploration, analysis results, and conclusions. In addition, there will be virtual presentations for each project. **The projects will be submitted to the SAS Curiosity Cup. More details of the project will be provided in class and on Canvas.**

Exams

There are **two take-home exams, each worth 160 points**. Each exam will focus on different parts of the course. While you can use any resource to find solutions for the exam questions, each student is expected to work on the example independently without consulting other people. Similar to the quizzes, students can choose when to start the exam. **Once the exam begins, it must be finished within a given time. Availability:** A week. **Time Limit:** 2,880 Minutes.

Grades

The composition of your course grade will be based on the following table:

	Count	Unit Points	Total
Exercise	10	10	100
Quiz	6	30	180
Project	1	200	200
Homework 1	1	100	100
Homework 2	1	100	100
Exam 1	1	160	160
Exam 2	1	160	160
Overall			**1000**

The final course grades will be assigned based on the total points earned:

Points	Letter Grades
980-1000	A+
920-979	A
900-919	A-
880-899	B+
820-879	B
800-819	B-
780-799	C+
720-779	C
700-719	C-
680-699	D+
620-679	D
600-619	D-
0-599	F

Academic Misconduct

Students are responsible for learning and understanding the UTSA policy on academic misconduct. The student code and related matters can be found at: http://www.utsa.edu/infoguide/appendices/b.htmlundersection203. The Quality Enhancement Plan (QEP) is a course of action designed to enhance student learning. It is a required component of the accreditation process conducted by the Southern Association of Colleges and Schools (SACS).

Accommodations

The Office of Disability Services is the only university body that may issue instructions for special academic accommodations. If you require such accommodations, you must register at that office; see http://www.utsa.edu/disability/students.htm.

The University of Texas at San Antonio Academic Honor Code

- **Preamble**: The University of Texas at San Antonio community of past, present and future students, faculty, staff, and administrators share a commitment to integrity and the ethical pursuit of knowledge. We honor the traditions of our university by conducting ourselves with a steadfast duty to honor, courage, and virtue in all matters both public and private. By choosing integrity and responsibility, we promote personal growth, success, and lifelong learning for the advancement of ourselves, our university, and our community.
- **Honor Pledge**: In support of the ideals of integrity, the students of the University of Texas at San Antonio pledge: "As a UTSA Roadrunner I live with honor and integrity."
- **Shared Responsibility**: The University of Texas at San Antonio community shares the responsibility and commitment to integrity and the ethical pursuit of knowledge and adheres to the UTSA Honor Code.

The Roadrunner Creed

The University of Texas at San Antonio is a community of scholars, where integrity, excellence, inclusiveness, respect, collaboration, and innovation are fostered.

As a Roadrunner, I will:

- Uphold the highest standards of academic and personal integrity by practicing and expecting fair and ethical conduct;
- Respect and accept individual differences, recognizing the inherent dignity of each person;
- Contribute to campus life and the larger community through my active engagement; and
- Support the fearless exploration of dreams and ideas in the advancement of ingenuity, creativity, and discovery.

Guided by these principles now and forever, I am a Roadrunner!

Tentative Schedule

Week	Wednesday	Contents	In-Class Activities	Take-home Activities
Week 1	23-Aug-23	Greetings and Course Introduction	Install VDI; Download and save the course dataset	Complete the survey: Getting to Know the Audience
			Launch the first SAS EG project	Watch the posted videos
Week 2	30-Aug-23	Explore the Orion Dataset	Exercise 1	Watch the posted videos
		Accessing Data		
Week 3	6-Sep-23	Getting Started with Tasks	Exercise 2	Quiz 1
		Introduction to PROC SQL		
Week 4	13-Sep-23	Creating Simple Queries with Tasks – 1	Exercise 3	Quiz 2
		PROC SQL: Generating Reports		
Week 5	20-Sep-23	Creating Simple Queries with Tasks – 2	Exercise 4	Quiz 3
		PROC SQL: Summarizing and Grouping Data		
		PROC SQL: Create Table		
Week 6	27-Sep-23	Transforming Data – 1: Split/Stack Columns	Exercise 5	Quiz 4
		Manipulating Data Values		
Week 7	4-Oct-23	PROC SQL: Joins	Exercise 6	Quiz 5
Week 8	11-Oct-23	Project Conceptualization; Catch-up		Homework 1
		Work on HW #1		
Week 9	18-Oct-23	Exam 1	No in-class meeting	Exam 1
Week 10	25-Oct-23	Transforming Data – 2: Recoding Values	Exercise 7	
		Creating Custom Formats		
Week 11	1-Nov-23	PROC SQL: Subqueries	Exercise 8	Quiz 6
Week 12	8-Nov-23	Exploring and Describing Data	Exercise 9	
		Customized Summary Outputs, Using Prompts		
Week 13	15-Nov-23	Data Visualization with SAS EG	Exercise 10	
		Bar chart, scatter and line plots, map charts		
Week 14	22-Nov-23	Work on HW #2	No in-class meeting	Homework 2
Week 15	29-Nov-23	Project	Final Project Presentations	Final Report
Week 16	6-Dec-23	Exam 2 (Date:TBD)		Exam 2