The University of Texas at San Antonio
College of Business

STA 6443: DATA ANALYTIC ALGORITHMS 1

COURSE SYLLABUS – FALL 2023

COURSE INSTRUCTOR

Yeonjoo Park (email: yeonjoo.park@utsa.edu)
Note: I usually make my email response within 24 hours during weekdays.

CLASS LOCATION AND TIME

1:00 - 3:45 pm Downtown Campus | San Pedro1 (SP1) | Room 250

OFFICE HOURS

- Zoom office hours
  - Tuesday 12-1:30 pm: email me in advance if you want to join
  - Email me when you want to set up a different day or time
  - https://utsa.zoom.us/j/5826540450
- In-person office hours
  - Thursday 11 am -12 pm
  - SP1 340M

SOFTWARE USED IN CLASS

- R (https://www.r-project.org/)
- R-studio –free version (https://rstudio.com/products/rstudio/download/)

COURSE DESCRIPTION

This course Introduces basic statistical methods with an emphasis on statistical inferences and interpretation. Topics are **exploratory data analysis**, including visualization, quantitative data summary, and outlier detection; **Analysis of Variance** (**ANOVA**) methods for balanced and unbalanced data; **linear regression model**; and **logistic regression models**. We will learn different model selection criteria for various problems, model interpretation, and model diagnostics to validate the data assumptions of chosen models. We will mainly use R for the model fit.

COURSE OBJECTIVES

- Learn fundamental concepts in Statistics
- Choose the proper statistical model/ methodology
- Use R to implement Statistical models
- Able to interpret R output and write a report readable to the general audience

REFERENCE TEXTBOOK

- Basic Statistics: An Introduction with R (2012) by Tenko Raykov and George A. Marcoulides. *Rowman & Littlefield Publishers*.
- Statistics: An Introduction Using R (2nd Edition) by Michael J. Crawley. *Wiley*.
  Note: all are available online at UTSA library

Online Resources

- Data Analytics Bootcamp
- Quick-R: basic R https://www.statmethods.net/index.html
- UCLA IDRE: methodology with data examples https://stats.idre.ucla.edu/r/
- Applied Statistics with R: https://daviddalpiaz.github.io/appliedstats/

Course Materials and Videos

- All will be posted at Canvas; https://utsa.instructure.com/

Grading Policy

- **Assignments**: Total 4 assignments will be assigned over the semester. Every homework assignment will be posted two weeks in advance. There are two options for HW submission depending on your schedule and flexibility; (i)team submission (2 in one team) or (ii) individual submission. Details will be provided in the class.
- **Quizzes**: Multiple-choice quizzes will be given roughly every other week. Unless excused by the instructor, missed quizzes will be assigned a zero score.
- **Exams**: There will be two exams. Each exam will consist of (i) a quiz consisting of multiple-choice and short-answer questions and (ii) a programming section requiring students to analyze and write up their results.

Assignments	25%
Quizzes	10%
First exam	30%
Final exam (not cumulative)	35%
Total	100%

- **Final course grades** will be based on the following schema:
  A+: 97-100%, A: 93-97%, A-: 90-93%; B+: 87-90%, B: 83-87%, B-: 80- 83%;
  C+: 77-80%, C: 73-77%, C-: 70-73%; D+: 67-70%, D: 63-67%, D-: 60-63%; F: < 60%

  Note: Final grade is not negotiable, and there is no round-up

Course Schedule

All HW deadlines fall at 11:59 pm Central Daylight Time (CDT) on Saturday (except the final exam). Late submissions may receive a 10% deduction per week, and it *is better to turn in late work than not at all.* Refer to the Academic Calendar for university deadlines.

Week	Topic Category	Topics	HW due/ Quiz
Week 1 **Mon, Aug 21**	Introduction	Course overview/ Syllabus/ Basic R example	
Week 2 **Mon, Aug 28**	Exploratory Data Analysis	Descriptive Statistics	
Week 3 **Mon, Sept 4**	Exploratory Data Analysis	One- and Two-sample inferential tests	HW1 Quiz1 Saturday, Sep 9
Week 4 **Mon, Sept 11**	ANOVA	One-way ANOVA	

Week	Topic Category	Topics	HW due/ Quiz
Week 5 Mon, Sept 18	ANOVA	One-way and Multi-way ANOVA. Model selection	Quiz2
Week 6 Mon, Sept 25	ANOVA	Multiway-ANOVA examples and review for Exam 1	HW2: Saturday, Sep 30
Week 7 Mon, Oct 2	Exam 1		**Exam1: Saturday, Oct 7**
Week 8 Mon, Oct 9	Linear Regression	Simple Linear Regression	
Week 9 Mon, Oct 16	Linear Regression	Model diagnostics	Quiz3
Week 10 Mon, Oct 23	Linear Regression	Multiple Linear Regression and model selection	
Week 11 Mon, Oct 30	Linear Regression	Multiple Linear Regression	HW3 Quiz4 Saturday, Nov 4
Week 12 Mon, Nov 6	Logistic Regression	Logistic Regression – odds and odds ratio	
Week 13 Mon, Nov 13	Logistic Regression	Interpretation and model diagnostics, classification	Quiz5
Week 14 Mon, Nov 20		Thanksgiving Holiday	
Week 15 Mon, Nov 27	Review	Data examples and review for Final Exam	HW4 Quiz6: Saturday, Dec 2
Finals Week Mon, Dec 4	Final Exam		**Final exam:8**

** Please be aware that the topic of a class may shift (or rollover) depending on the pace of lecture and the completion of previous topic. I will make my best efforts to communicate any changes in the syllabus in a timely manner. Students are responsible for being aware of these changes.*

UTSA Guidelines and Resources

POLICIES

We at UTSA encourage an environment of dialogue and discovery, where integrity, excellence, inclusiveness, respect, collaboration and innovation are fostered as our core values. Refer to the UTSA links below for information about common syllabus information, the Roadrunner Creed, student code of conduct, and scholastic dishonesty.

- UTSA Common Syllabus Information and the Roadrunner Creed
- UTSA Student Code of Conduct
- UTSA Scholastic Dishonesty

TECHNOLOGY

The university lists technology requirements for all online/hybrid courses. In addition, the College of Business requires all students to have access to a Windows-based computer with the recommended specifications outlined in the College of Business Technology Requirements. Requirements for this class include the following:

- [Specify any requirements that supersede, clarify, or augment the laptop policy here]

Refer to the College of Business Technology Resources and the University Student Software pages for useful tools.

SUPPORT

Student Support resources are listed on the UTSA Updates page. Please visit the following sites for information about disability services, counseling services, library resources, and academic coaching and tutoring services, and technology assistance. Online services and resources are specifically noted where applicable. Please ask for clarification as needed.

- Student Disability Services
    - Note: Only those students who have officially registered with Student Disability Services and requested accommodations for this course will be eligible for disability accommodations. Please obtain accommodation letters as early as possible in the semester.
- Counseling Services
- UTSA Library
- The Tomas Rivera Center
- University Technology Solutions (UTS)
- Tech Cafe

DISCLAIMER

All terms and requirements stated on this syllabus are not subject to negotiation. Any petition or appeal must follow university guidelines. Special consideration will not be given without official proof or supporting documentation. Enrollment in this course presumes that you have fulfilled the required prerequisite(s) or possessed similar educational background. You are taking this course at your own risk and surrender the rights to pursue any legal actions in the events of failure and/or not obtaining a satisfactory/anticipated grade for the course. You also understand that any unacceptable behaviors or unjustifiable disturbances to instructional activities may lead to administrative dismissal from the course. Threat and harassment, regardless of their motivation, will be reported to the authority. Student has the responsibility to update the syllabus with any announced changes.

LEGAL DISCLAIMER FROM UTSA LEGAL AFFAIRS OFFICE

"This Syllabus is provided for informational purposes regarding the anticipated course content and schedule of this course. It is based upon the most recent information available on the date of its issuance and is as accurate and complete as possible. I reserve the right to make any changes I deem necessary and/or appropriate. I will make my best efforts to communicate any changes in the syllabus in a timely manner. Students are responsible for being aware of these changes."