

BUAN/OPRE 6359: Advanced Statistics for Data Science
University of Texas at Dallas

Course Syllabus

Disclaimer:

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the instructor.

Course Information:

Course Number/Section: BUAN/OPRE 6359.003
Course Title: Advanced Statistics for Data Science
Term: Fall 2023
Lecture Time: Monday, 4:00 pm – 6:45 pm
Lecture Location: JSOM 1.217
Instructional Mode: Face to Face

Instructor: Negin Enayaty Ahangar, Ph.D.
Office Information: JSOM 14.409
Office Hours: Tuesday/Thursday, 10:00 am – 11:00 am
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Teaching Assistant: Muhammad Ahson Riaz
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Teaching Assistant: Amogh Mahesh Bhagwath
Office Hours: Tuesday/Thursday, TBA (online via MS Teams)
Email: AmoghMahesh.Bhagwath@UTDallas.edu

Course Pre-requisites, Co-requisites and/or Other Restrictions:

Credit cannot be received for both OPRE 6301 and (OPRE 6359 or BUAN 6359).

Course Description:

This course uses statistical methods to analyze data from observational studies and experimental designs to communicate results to a business audience. The course mandates prior knowledge of fundamental statistical concepts such as measures of central location, standard deviations, histograms, the normal and t-distributions (knowledge of calculus is not required). The course also emphasizes interpretation and inference, as well as computation using a statistical software package such as R or STATA.

Learning Outcomes:

Upon completion of this course, students will be able to accomplish the following:

- Develop and test hypotheses using multiple statistical methods.
- Understand differences between observational and experimental studies.
- Learn how randomization and sampling influence the scope of inference.
- Explore experimental and observational designs that compare multiple populations when the response is continuous or binary.
- Communicate the findings of statistical analysis from these new methods in a clear, concise, and scientific manner.
- Integrate and analyze real-world data sets using common software packages.

Course Materials:

Required textbook:

1. The Statistical Sleuth: A Course in Methods of Data Analysis - 3rd edition
 - Author: Fred Ramsey and Daniel Schafer
 - Book files: www.statisticalsleuth.com

Recommended textbooks:

1. Statistics for Management and Economics - 11th edition
 - Author: Gerald Keller
2. The Book of R: A First Course in Programming and Statistics - 1st edition
 - Author: Tilman M. Davies

Required software: R & R-Studio, Microsoft Excel

Grading Criteria:

Final grades are assigned based on the following weighting. Final letter grades are determined based on the following grading scheme.

Final Grade		Final Letter Grade			
Assignment Average	25%	90 – 100	<i>A</i>	73 – 77	<i>B</i> ⁻
Highest Exam Grade	30%	88 – 89	<i>A</i> ⁻	69 – 72	<i>C</i> ⁺
Median Exam Grade	25%	83 – 87	<i>B</i> ⁺	65 – 68	<i>C</i>
Lowest Exam Grade	20%	78 – 82	<i>B</i>	0 – 64	<i>F</i>

Course Calendar:

Week	Date	Topic	Assignment	Due Date
1	Monday, August 21	Descriptive Statistics		
2	Monday, August 28	Probability		
3	Monday, September 4	Labor Day		
4	Monday, September 11	Probability Distributions		
5	Monday, September 18	Sampling Distributions and Confidence Intervals		
6	Monday, September 25	Hypothesis Testing	Assignment 1	October 6
7	Monday, October 2	Drawing Statistical Conclusions Inference Using t-distributions A Closer Look at Assumptions		
8	Monday, October 9	Exam 1		
9	Monday, October 16	Comparisons Among Several Samples Linear Combinations and Multiple Comparisons of Means	Assignment 2	November 3
10	Monday, October 23	Simple Linear Regression		
11	Monday, October 30	A Closer Look at Assumptions for Simple Linear Regression		
12	Monday, November 6	Exam 2		
13	Monday, November 13	Multiple Regression Inferential Tools for Multiple Regression	Assignment 3	December 1
14	Monday, November 20	Fall Break		
15	Monday, November 27	Strategies for Variable Selection		
16	Monday, December 4	Exam 3		

Course Policy:**1. General:**

- It is your responsibility to read the syllabus and check the eLearning for announcements/changes daily.
- You must pay close attention to all the due dates from the first day of class and schedule your personal activities around those dates.
- For any grade posted on eLearning, you have one week after it is posted to request for regrading.

2. Exams:

- Exams will be administered by the UTD Testing Center. Students should see the UTD testing center page to register for a seat and for more information.
- Students should register for a seat no later than one week prior to the exam date. Failure to do so will result in a 10-point penalty on the exam grade.
- The instructor reserves the right to deduct points from the student's exam grade for not following the exam instructions and announcements.
- Exams will NOT be available to students after submission. However, you have one week after grades are posted on eLearning to review your graded exam during the instructor's office hours and have the instructor's feedback.
- There will be NO make-up for any missed exam except for medical emergencies in which a written statement is required to justify the situation along with the physician's address and phone number.

3. Assignments:

- The assignments will be assessed through eLearning.
- There will be NO make-up for any missed assignment.

4. Extra Credit:

- Extra credit will NOT be offered.

5. Academic Dishonesty/Cheating:

- Students are required to read, understand and abide by the university policy on academic honesty.
- Any student found responsible for committing an act of academic dishonesty will receive a grade of zero on that exam or assignment.
- The instructor reserves the right to change the grading policy without any notice due to unforeseen circumstances such as dishonesty, cheating, etc.

6. Mobile Phones, Laptops & Electronic Devices:

- Taking unauthorized pictures or recording during the lecture/classroom from presented materials with a mobile phone, laptop, camera or any other device is an infringement of privacy rights and is prohibited.

7. Class Recordings: Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the AccessAbility Resource Center has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved AccessAbility Resource Center accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

8. **Class Materials:** The instructor may provide class materials that will be made available to all students registered for this class as they are intended to supplement the classroom experience. These materials may be downloaded during the course; however, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class, or uploaded to other online environments except to implement an approved AccessAbility Resource Center accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Comet Creed:

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

As a Comet, I pledge honesty, integrity, and service in all that I do.

Academic Support Resources:

The information contained in the following link lists the University's academic support resources for all students. Please go to Academic Support Resources webpage for these policies.

UT Dallas Syllabus Policies and Procedures:

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please review the catalog sections regarding the credit/no credit or pass/fail grading option and withdrawal from class. Please go to UT Dallas Syllabus Policies webpage for these policies.