



The University of Texas at Dallas
Course Syllabus

COURSE INFORMATION

Course Number: EESC6349 / MECH 6312
Course Title: Probability, Random Variables, and Statistics
Term: SPRING 2026
Class Location/Times: CB 1.223/TTH 1:00pm-2:15pm

PROFESSOR CONTACT INFORMATION

Name: Murat Torlak, Professor
Phone Number: 972-883-4624
Office Location: ECSN 4.908
Office Hours: Tuesdays, 3:30PM-4:30PM or by appointment
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COURSE PRE-REQUISITES, CO-REQUISITES, and/or OTHER RESTRICTIONS

Prerequisites: None

COURSE DESCRIPTION

This course is intended for first year graduate students in Electrical and Telecommunications Engineering or other Engineering Programs. The topics covered include probability theory, random variables, functions of random variables, random vectors, whitening transformation, law of large numbers, sample-mean estimator, confidence interval, and hypothesis tests such as likelihood ratio test and Chi-square test.

STUDENT LEARNING OBJECTIVES/OUTCOMES

1. Compute probability, statistics of random variables, and their functions
2. Compute statistics of random vectors and their functions
3. Compute parameter estimation and hypothesis testing
4. Apply the concepts of probability, random variables/vectors, and statistics to analyze statistical problems in Engineering fields

TEXTBOOK and COURSE MATERIALS

Required Textbook

Probability and Stochastic Processes: A Friendly Introduction for Electrical and Computer Engineers, 3rd Edition
Authors: Roy D. Yates and David J. Goodman.
Publisher: Wiley

Recommended Texts:

1. Introduction to Probability, Statistics, and Random Processes, H. Pishro-Nik, ISBN 978-0-9906372-0-2, Also available <https://www.probabilitycourse.com>
2. Schaum's Outline of Probability, Random Variables, and Random Processes 3rd Edition, Hwei P. Hsu, McGraw-Hill, ISBN: 9780071822985, 0071822984

Required Materials

- Lecture Notes (will be posted at the eLearning course website)

LECTURE SCHEDULE (Tentative)

WEEK:DATES	TOPIC/LECTURE	ASSIGNMENTS (Practice)	TESTS
1: 1/20, 1/22	Probability theory		
2: 1/27, 1/29	Random variables	Homework 1	
3: 2/3, 2/5	Random variables, PDF		
4: 2/10, 2/12	Expectation, Functions of random variables	Homework 2	
5: 2/17, 2/19	MGF		TEST I (2/17)
6: 2/24, 2/26	LLN, CLT	Homework 3	
7: 3/3, 3/5	Entropy, Random Vectors		
8: 3/10, 3/12	Random vectors	Homework 4	
9: 3/16, 3/22	SPRING BREAK		
10: 3/24, 3/26	Whitening		
11: 3/31, 4/2	Estimation		TEST II (3/31)
12: 4/7, 4/9	Estimation	Homework 5	
13: 4/14, 4/16	Hypothesis testing		
14: 4/21, 4/23	Hypothesis testing	Homework 6	
15: 4/28, 4/30	Random processes		
16: 5/5, 5/7	Engineering Applications		

The final examination date and time per UTD's final exam schedule will be posted at the ELearning course page.

COURSE & INSTRUCTOR POLICIES

Tests/Final (Examinations): There will be two tests (midterms) and a final exam. The tests will be closed book. The use of a cheat sheet during tests will be at the discretion of the instructor. If allowed, specific guidelines (e.g., size, content restrictions) will be announced prior to the test. Students are advised to prepare for tests assuming no cheat sheets will be permitted unless explicitly stated otherwise.

The tests' content will be limited to material announced by the instructor prior to the test. Students are required to present a UTD or government-issued picture ID to take examinations and quizzes. **No makeup exams will be given. The credit for any missed exams (only with officially acceptable documentation) will roll over to the next exam.**

Homework Quizzes: There will be about 4-5 quizzes during this course. The lowest quiz grade will be dropped. No excuse for the missed quizzes will be accepted. The quiz question will be chosen from the previously distributed practice assignment problems and will be graded by the TA assigned to the course. The time and location (either at UTD testing center or in class) of each quiz will be announced one class in advance.

Practice Assignments: Homework problems with solutions will be assigned for practice purposes and will not be collected. No homework grade will be assigned.

Classroom Citizenship: **Use of smartphones/cell phones, tablets, laptops or other similar electronic devices ARE NOT ALLOWED in class and exams.** All such devices must be turned off or silenced and not used during classes and exams. The students are expected to participate in class discussions and follow the instructor guidelines.

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 Office of Student Accessibility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

GRADING POLICY: The grade each student earns from this class will be based on the following scale:

TEST I	25 %
TEST II	27 %
FINAL	35 %
Class Attendance (>90%)	3 %
Homework Quizzes	10%
TOTAL	100%

Partial credit will be given only for significant progress in solutions and will be solely at the discretion of the instructor. Final letter grades are assigned by the instructor based on overall performance and may be curved. As a guideline, a **B- or higher** generally corresponds to an overall score of **approximately 75%**. If a curve is applied, the B- cutoff may instead be set near **one-half of a standard deviation below the class mean**, i.e., $\mu - \sigma/2$, where μ and σ are the **mean and standard deviation of the final overall numeric scores** for the class. Students have one week to review graded tests/quizzes with the professor for any possible grading corrections. After one week no changes will be allowed.

Class Attendance. Class attendance is required and may be checked randomly at any time during the class period. Attendance contributes up to **3%** to the overall course grade as follows:

- **+3%: attendance \geq 90%**
- **+2%: 80% \leq attendance < 90%**

If attendance is **< 80%**, the instructor may apply an attendance penalty of up to **10%** of the overall course grade, depending on the extent of absences.

Technical Requirements: In addition to a confident level of computer and Internet literacy, certain minimum technical requirements must be met to enable a successful learning experience. Please review the important technical requirements on the Getting Started with eLearning webpage.

Class Recordings: The instructor may record meetings of this course. Any recordings will be available to all students registered for this class as they are intended to supplement the classroom experience. Students are expected to follow appropriate University policies and maintain the security of passwords to access recorded lectures. Unless the Office of Student AccessAbility has approved the student to record the instruction, students are 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 Office of Student AccessAbility accommodation.

Course Access and Navigation This course can be accessed using your UT Dallas NetID account on the eLearning website. Please see the course access and navigation section of the Getting Started with eLearning webpage for more information. To become familiar with the eLearning tool, please see the Student eLearning Tutorials webpage. UT Dallas provides eLearning technical support 24 hours a day, 7 days a week. The eLearning Support Center includes a toll-free telephone number for immediate assistance (1-866-588-3192), email request service, and an online chat service.

Communication: This course utilizes online tools for interaction and communication. Some other communication tools such as UTD email and a web conferencing tool may also be used during the semester. For more details, please visit the Student eLearning Tutorials webpage for video demonstrations on eLearning tools.

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 go to <http://go.utdallas.edu/syllabus-policies> for these policies.

These descriptions and timelines are subject to change at the discretion of the Professor.