TED UNIVERSITY

MATH 240
INTRODUCTION TO PROBABILITY & STATISTICS FOR ENGINEERS

SYLLABUS – Spring 2021

Course Information

Required or Elective	☑ Required ☐ Elective	**Date**	February 2021
Semester	Spring 2021	**Class Hours and Classrooms**	Section 01 Tue. 15:00-15:50 Wed. 11:00 – 12:50 Section 02 Tue. 15:00-15:50 Wed. 11:00 – 12:50 Section 03 Tue. 13:00 – 14:50, Thurs. 11:00 – 11:50 https://moodle2.tedu.edu.tr/
Course/ECTS Credit Hours	(3+0+0) 3 / 6	**Pre-requisite / Co-requisite**	MATH 101 – Calculus of One Variable
Level of Course	Sophomore	**Language of Instruction**	☑ English ☐ Turkish
Instructors and Office Hours	Dr. Can B. Aktaş (can.aktas@tedu.edu.tr) (Office D311) Dr. Aslı Numanoğlu Genç (asli.genc@tedu.edu.tr) (Office D301) You can contact us through e-mail or ZOOM meetings if you have any questions or comments.		
Teaching Assistant(s)	None		
Textbook	1) ***Probability and Statistics for Engineers and Scientists*** – 9th Ed. (2018) by Walpole, R. E., Myers, R. H., Myers S. L., Ye, K. – Pearson 2) Additional hand-outs will be posted as deemed necessary.		
Supplementary Textbooks (not in order)	Applied Statistics and Probability for Engineers by D. C. Montgomery and G. C. Runger Statistics for engineers and scientists by W. Navidi Introduction to Probability Models by S. M. Ross		

Course Description

Basic concepts of probability, Discrete and continuous random variables, their probability distributions, expected value, variance. Discrete probability distributions, Jointly distributed and independent Random Variables. Covariance and correlation. Sampling, estimation. Hypothesis Testing, Regression and ANOVA.

Course Learning Outcomes

On successful completion of this course students will be able to:

1. Compute probabilities by modeling sample spaces
2. Construct the probability distribution of discrete and continuous random variables
3. Calculate expected values and variances of random variables

4. Apply statistical descriptors to a sample
5. Apply hypothesis testing to form engineering judgement
6. Interpret regression results

Relationship to Program Outcomes

This course contributes to fulfillment of the following program outcomes (2 count / 2 weights):
PO1: Comprehend science and advanced mathematics subjects fundamental to engineering (1)
PO6: Design and conduct experiments; analyze and interpret data (1)

Course Assignments

A. ***Homework (15%):*** There will be multiple homework (tentatively 7) given during the semester administered through Pearson MyStatLab that will be graded. Individual homework topics will mostly be limited to a single chapter of the textbook. Students will have a limited number of attempts to complete the homework.
B. ***Quizzes (25%):*** There will be multiple quizzes (tentatively 3-4) given during the semester administered through Pearson MyStatLab that will be graded. Quiz topics may span multiple chapters. There will be a time restriction for quizzes, and students will have one attempt only.
C. ***Mid-Term (20%):*** There will be one Mid-Term exam given during the semester.
D. ***Application Projects (20%):*** There will be several application projects as part of course assessment. The intent of such projects is for students to apply what they learn in class to their life/surroundings. Skills that will be sought and enhanced will include: statistical experiment setup; data collection and recording; statistical analysis; and formally reporting conclusions as a brief (2-3 page, about 1000 words) report.
E. ***Final Exam (20%):*** There will be a comprehensive final during the final exam weeks. Exact date of the final will be announced by the University towards the end of the semester.

Course Assessments & Learning Outcomes Matrix

Assessment Methods	Course Learning Outcomes
Homework	All
Quizzes	All
Application Projects	All
Final Exam	All

Teaching Methods & Learning Activities

☑ Telling/Explaining
☐ Discussions/Debates
☑ Questioning
☑ Reading
☐ Peer Teaching
☐ Scaffolding/Coaching
☐ Demonstrating
☑ Problem Solving
☐ Inquiry
☑ Collaborating
☐ Think-Pair-Share
☐ Predict-Observe-Explain
☐ Microteaching
☑ Case Study/Scenario Analysis
☐ Simulations & Games
☐ Video Presentations
☐ Oral Presentations/Reports
☐ Concept Mapping
☐ Brainstorming
☐ Drama/Role Playing
☐ Seminars
☐ Field Trips
☐ Guest Speakers
☑ Hands-on Activities
☐ Service Learning
☐ Web Searching
☑ Experiments
☐ Other(s):

Student Workload

☑ Lectures .....**42** .. hrs
☑ Course Readings .....**14**... hrs
☐ Workshop .... hrs
☐ Online Discussion .... hrs
☐ Debate .... hrs
☐ Work Placement..... ..... hrs
☐ Field Trips/Visits..... ..... hrs
☐ Observation..... ..... hrs
☐ Lab Applications..... ..... hrs
☐ Hands-on Work..... ..... hrs
☑ Quizzes .....**42** .. hrs
☐ Resource Review..... ..... hrs
☐ Research Review .... hrs
☐ Report on a Topic .... hrs
☐ Case Study Analysis .... hrs
☐ Oral Presentation .... hrs
☐ Poster Presentation .... hrs
☐ Demonstration .... hrs
☐ Web Designs .... hrs
☐ Mock Designs .... hrs
☐ Team Meetings..... ..... hrs
☑ Other: Homework/Term Projects . **54**... hrs
TOTAL..... **152**... hrs

Assessment Methods

☐ Test/Exam
☑ Quiz
☐ Oral Questioning
☐ Performance Project
☐ Written ☐Oral
☐ Observation
☐ Self-evaluation
☐ Peer Evaluation
☐ Portfolio
☐ Presentation (Oral, Poster)
☑ Other(s): Homework and term projects

Tentative Course Outline

A tentative course outline for the lectures and exam dates is given below. Any changes and updates will be announced on the Moodle web page for the course.

Week	Topic
1	Interpreting Probabilities, Sample Spaces and Events, Permutations and Combinations
2	Axioms of Probability, Conditional Probability
3	Independence, Bayes' Theorem
4	Random Variables, Discrete and Continuous Probability Distributions, Expectation and Variance – **Quiz 1**
5	Binomial Distribution, Poisson Distribution
6	Uniform, Exponential Distributions, Applications in Component and System Reliability
7	Normal Distribution
8	Applications of Normal Distributions – **Mid-Term**
9	Sample Statistics
10	Central Limit Theorem – **Quiz 2**
11	Hypothesis Testing
12	Hypothesis Testing, p-value
13	Hypothesis testing, confidence interval – **Quiz 3**
14	Simple Linear Regression

Course Policies and Some Remarks

Attendance

Classes start on time. Please be respectful of your fellow students and your instructor by arriving punctually to class hours.

Cell phones should be turned off and kept out of sight. Please do not use your computers during class time.

Calculator Policy

You may use a simple, non-programmable engineering calculator during exams.

Plagiarism

We are encouraging you to collaborate on non-collected/non-graded homework and to study as a group with other friends; however, the work you hand-in as part of your grading must be solely your own regardless of the extend you have collaborated. Sharing written work before it is turned in to be graded is academic dishonesty. For more information on TEDU policy on intellectual integrity see the link below:

https://ds.tedu.edu.tr/sites/default/files/content_files/tedu_ogrenci-el-kitabi.pdf

Disability Support

If you have a disabling condition which may interfere with your ability to successfully complete this module, please Dr. Onur Özmen (email: onur.ozmen@tedu.edu.tr). For more information, please see TEDU Handbook for Registered Students.

Make Up Exams

In general, make-up exams for exams during the semester will NOT be offered. If you have a legitimate reason for missing an exam, then you must arrange to make up the exam BEFORE the scheduled time of the exam. The only exceptions may be illness or emergency (e.g., death in family, a traffic accident, etc.). In case of an illness or emergency you need to supply a documentation that supports your claim. You may read the documents given in the links below:

https://www.tedu.edu.tr/tr/main/yonetmelikler-ve-yonergeler

https://www.tedu.edu.tr/sites/default/files/content_files/docs/Yonergeler/lisans_egitim-ogretim_yonetmeligi_ogrenci_isleri.pdf

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