TED UNIVERSITY

MATH 240
INTRODUCTION TO PROBABILITY & STATISTICS FOR ENGINEERS

SYLLABUS – Spring 2020

REVISED FOR THE SPRING 2020 EMERGENCY REMOTE TEACHING

Course Information

Required or Elective	☑ Required ☐ Elective	Date	February 2020 (updated April 2020)
Semester	Spring 2020	Class Hours and Classrooms	Section 01 & 03 Tue. 13:00 – 14:00, Wed. 14:00 – 16:00 https://moo-dle2.tedu.edu.tr/mod/lti/view.php?id=78988 Section 02 & 04 Tue. 09:00 – 11:00 Thu. 12:00 – 13:00 https://moo-dle2.tedu.edu.tr/mod/lti/view.php?id=78989
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) (Home Office) Dr. Aslı Numanoğlu Genç (asli.genc@tedu.edu.tr) (Home Office) Dr. Cem Akgüner (cem.akguner@tedu.edu.tr) (Home Office) Please feel free to contact us through e-mail if you have any questions or comments. We will do our best to respond as soon as possible.		
Teaching Assistant(s)	None		
Textbook (Available through TEDU Bookstore)	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)	Probability and Statistics for Engineering & the Sciences by J. L. Devore Introduction to Probability Models by S. M. Ross Applied Statistics and Probability for Engineers by D. C. Montgomery and G. C. Runger		

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 (35%):* 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 (40%):* 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. *Application Projects (25%):* 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 (1-2 page, maximum 1000 words) report.

Course Assessments & Learning Outcomes Matrix

Assessment Methods	Course Learning Outcomes
Weekly Homework	All
In-class Activities	All
Midterm Exams	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 - **Quiz 2**
9	Sample Statistics - **Quiz 3**
10	Central Limit Theorem
11	Hypothesis Testing
12	Hypothesis Testing, p-value
13	Hypothesis testing, confidence interval - **Quiz 4**
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.

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 Policy

In general, make-up exams for exams during the semester will NOT be offered.

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

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