



TED UNIVERSITY

**Syllabus for
EE 304 Probability and Random Processes
Spring 2018-2019**

Instructor:	Asst. Prof. Dr. H. Ugur Yildiz
Office:	351
Phone:	(0312) 585-02-21
E-mail:	hugur.yildiz@tedu.edu.tr

	Section 01	Section 02
Time Schedule:	Wednesday (10.00 – 11.50) @G212 Friday (13.00 – 13.50) @ G212	Wednesday (13.00 – 13.50) @ G212 Friday (10.00 – 11.50) @ G212
Office Hours:	Wednesday (16.00 –18.00) (or by appointment)	

Course Code & Number	EE 304	Course Title	Probability and Random Processes
Type of Course	<input checked="" type="checkbox"/> Compulsory <input type="checkbox"/> Elective	Semester	<input type="checkbox"/> Fall <input checked="" type="checkbox"/> Spring <input type="checkbox"/> Summer
Level of Course	BSc	Year of Study	Junior
Course Credit Hours / ECTS	(3+0+0) 3 / 5 ECTS	Pre-requisite / Co-requisite	Pre-requisite: MATH 101 Co-requisite:
Mode of Delivery	<input checked="" type="checkbox"/> Face-to-face <input type="checkbox"/> Distance learning	Language of Instruction	<input checked="" type="checkbox"/> English <input type="checkbox"/> Turkish
Course Coordinator	Asst. Prof. Huseyin Ugur Yildiz Phone: 0312-585-0221 E-mail: hugur.yildiz@tedu.edu.tr		
Computer Usage	MATLAB with Communications System Toolbox https://www.mathworks.com/products/communications.html		
Textbooks	R. D. Yates and D. J. Goodman, "Probability and Stochastic Processes: A Friendly Introduction for Electrical and Computer Engineers", 3 rd Edition International Student Version, Wiley, 2014.		
Supplementary Reading	<ul style="list-style-type: none"> • A. Leon-Garcia, "Probability, Statistics, and Random Processes For Electrical Engineering", Prentice Hall, 3rd Edition, 2008. • D. P. Bertsekas and J. N. Tsitsiklis, "Introduction to Probability", 2nd Edition, Athena Scientific, 2002. 		
Module and Instructor Evaluation Date	Evaluation will be held on the last day of the class		
Course Catalog Description	Basic Concepts of Probability Theory, Discrete Random Variables, One Random Variables, Pairs of Random Variables, Long-Term Averages, Bernoulli and Poisson Random Processes, Analysis and Processing of Random Signals, Markov Chains.		
Course Objectives	This course aims to improve the knowledge of students on probability and random processes by providing tools for solving of the engineering problems in communications, signal processing, computer science, and other disciplines.		
Course Learning Outcomes (LO)	<p>Having successfully completed this course, students will be able to:</p> <p>LO-1: Learn the basic concepts of probability theory (e.g., random experiments, axioms of probability, conditional probability, and statistical independence).</p> <p>LO-2: Express discrete random variables by using CDFs, PMFs; calculate expected value of random variables. Students also learn Markov and Chebyshev inequalities.</p> <p>LO-3: Identify continuous random variables, expected values, their joint PDFs, conditional probabilities, conditional expectations, correlation, and covariance.</p> <p>LO-4: Understand multiple random variables including joint CDFs, PMFs, PDFs; marginal PMFs, PDFs; independent random variables, derived distributions, and conditional probability models.</p> <p>LO-5: Identify iid sequences, Poisson processes, stationary processes, and cross-correlation.</p> <p>LO-6: Understand Markov chains and their transient behavior.</p>		

TENTATIVE COURSE OUTLINE					
	Week	Topics	Learning Outcome (LO)	Textbook Reading	Assignments / Exams
	1	Basic Concepts of Probability Theory	1	Ch. 1, 2	
	2	Basic Concepts of Probability Theory	1	Ch.1, 2	
	3	Discrete Random Variables	2	Ch.3	ALE#1
	4	Discrete Random Variables	2	Ch.3	
	5	Continuous Random Variables	3	Ch.4	ALE#2 Midterm#1
	6	Continuous Random Variables	3	Ch.4	
	7	Multiple Random Variables	4	Ch.5	ALE#3
	8	Multiple Random Variables	4	Ch.5	
	9	Derived Random Variables	4	Ch.6	ALE#4 Midterm#2
	10	Derived Random Variables	4	Ch. 6	
	11	No Lecture (Conference)			
	12	Conditional Probability Models No Lecture on Wednesday, May 01, 2019	4	Ch. 7	
	13	Conditional Probability Models	4	Ch. 7	ALE#5
	14	Conditional Probability Models Stochastic Processes	4, 5, 6	Ch. 7, Ch. 13	
	FINAL EXAMS WEEK (date and time to be announced later).				
COURSE ASSIGNMENTS					
A. Midterm Exams [50%]					
There will be two <u>closed-book & closed-note</u> midterm exams, 25% for each exam. Exam 1 and 2 will be on the 5 th and 9 th weeks, respectively. Date and time of the midterm exams will be announced later.					
B. Final [40%]					
There will be a cumulative <u>closed-book & closed-note</u> final exam covering all topics. Date and time of the final exam will be announced at the end of the semester.					
C. Active Learning Exercises [10%]					
There will be 5 <u>closed-book</u> Active Learning Exercises (ALEs) which will be performed as collaborative quizzes (2% for each quiz). In the first lecture of the ALE week, a group of 2 students gets a 2-question practice quiz to complete <u>as a team</u> . Each group needs to answer <u>only one of the given questions</u> . In the second lecture of the ALE week, a similar 2-question is divided into 2-separate slips paper with one question each. Each group member completes one slip <u>individually</u> . The two ALE scores are combined with the individual score counting for 60% and the group quiz counting for 40% of the grade.					

COURSE ASSESSMENTS & LEARNING OUTCOMES MATRIX	
Assessment Methods	Course Learning Outcomes
Active Learning Exercises	LO # 1...6
1 st Midterm Exam	LO # 1, 2
2 nd Midterm Exam	LO # 3, 4
Final Exam	LO # 1...6

Teaching Methods & Learning Activities	<input checked="" type="checkbox"/> Telling/Explaining <input checked="" type="checkbox"/> Questioning <input checked="" type="checkbox"/> Reading	<input checked="" type="checkbox"/> Collaborating <input checked="" type="checkbox"/> Web Searching <input checked="" type="checkbox"/> Problem Solving
Assessment Methods (Formal & Informal)	<input checked="" type="checkbox"/> Test/Exam	<input checked="" type="checkbox"/> Quizzes
Student Workload (Total 133 Hrs)	<input checked="" type="checkbox"/> Lectures 42 hrs <input checked="" type="checkbox"/> Course Readings..... 28 hrs <input checked="" type="checkbox"/> Quizzes 21 hrs	<input checked="" type="checkbox"/> Midterm Exam 1 14 hrs <input checked="" type="checkbox"/> Midterm Exam 2 14 hrs <input checked="" type="checkbox"/> Final Exam 14 hrs

COURSE POLICIES
I. Attendance <ul style="list-style-type: none"> Regular class attendance is expected for all students at the University. <u>You are not required but advised to attend all classes.</u> Please send your professor a brief e-mail to explain your absence in advance. Your absence will not reduce your attendance rate <i>if and only if</i> you have a legitimate reason for missing a class (such as illness, death in family, a traffic accident, etc.). In case of an illness or emergency, you must supply a formal documentation that supports your claim. Classes start on the hour. Please be respectful of your classmates by being on time. All electronic equipment should be turned off and kept out of sight before lecture starts.
II. Make-up Exams <p>There will be a <u>single make-up exam</u> for Midterm Exam 1 and 2 which will be available <i>if and only if</i> you have a legitimate reason for missing the exam (such as illness, death in family, a traffic accident, etc.). In case of an illness or emergency, you must supply a formal documentation that supports your claim. <u>The topics for the make-up exam are from everything that is covered in class at the time of the exam.</u></p>
III. Late Submission Policy <p>Late submissions will not be graded. Missed quizzes without any clarification will result in a grade of zero (0).</p>
IV. Participation <p>In their book, <i>The Adult Student's Guide to Survival & Success</i>, Al Siebert and Mary Karr suggest that the most effective learning technique of all is to study by <i>asking and answering questions</i>. Develop the habit of reading textbooks, taking lecture notes, and studying by asking and answering questions. When you do this, you save many hours of studying and have time to spend with your family or friends.</p>

There are several ways to go about asking and answering questions.

- When studying on your own, write questions that occur to you while you're reading and then go back and find the answers.
- If you're part of a study group, make a list of questions to ask the group.
- In the classroom, participate fully by asking questions and answering the ones posed by your instructor.

Curiosity is one of the cornerstones of learning. Be curious. Ask questions. Learn faster.

V. Cheating & Plagiarism

Collaboration is strongly encouraged; however, the work you hand in must be solely your own. Cheating and plagiarism are very serious offenses and will be penalized accordingly by the university disciplinary committee.

Cheating has a very broad description which can be summarized as "acting dishonestly". Some of the things that can be considered as cheating are the following:

- Copying answers on exams, home works and lab works,
- Using prohibited material on exams,
- Lying to gain any type of advantage in class,
- Providing false, modified or forged data in a report,
- Plagiarizing (see below),
- Modifying graded material to be re-graded,
- Causing harm to colleagues by distributing false information about an exam, homework or lab.

All of the following are considered plagiarism:

- Turning in someone else's work as your own,
- Copying words or ideas from someone else without giving credit,
- Failing to put a quotation in quotation marks,
- Giving incorrect information about the source of a quotation,
- Changing words but copying the sentence structure of a source without giving credit,
- Copying so many words or ideas from a source that it makes up the majority of your work, whether you give credit or not.

(www.plagiarism.org)

VI. Disability Support

If you have a disabling condition which may interfere with your ability to successfully complete this course, please contact Dr. Asli Bugay (email: asli.bugay@tedu.edu.tr) or Dr. Huseyin Ugur Yildiz (email: hugur.yildiz@tedu.edu.tr). For more information please see Handbook for Registered Students.

*** GOOD LUCK ***