

Course Description					
Name	Code	Semester	T+A Hour	Credit	ECTS
PROBABILITY and RANDOM VARIABLES	COE2249080	Spring Semester	3+0	3	6
Prerequisites Courses	MATEMATİK II				
Recommended Elective Courses					
Language of Instruction	English				
Course Level	First Cycle (Bachelor's Degree)				
Course Type	Required				
Course Coordinator	Prof.Dr. Afgan ASLAN				
Name of Lecturer(s)	Prof.Dr. Afgan ASLAN				
Assistant(s)					
Aim	This is a second year undergraduate course (third year for CoE) on introduction to probability and random variables. The course introduces fundamental differences between statistics and probability and then introduces basic topics of probability. Probability axioms, probability density functions, joint pdfs, and random variables with related topics are covered throughout the course.				
Course Content	This course contains; Class Info, Introduction to Statistics and Probability,Basic probability,Conditional probability,Discrete random variables,Discrete distributions and their statistics. ,Continuous Random Variables and their statistics,Continuous Random Variables (Cont.),Midterm overview,Continuous Distributions,Multiple Discrete Random Variables,Multiple Continuous Random Variables,Conditional Probability Mass Functions,Conditional Probability Density Functions,Conditional Probability Density Functions.				
Course Learning Outcomes			Teaching Methods	Assessment Methods	
Model simple probabilistic phenomena mathematically.			12, 16, 21, 9	A, E	
Calculate probabilities of events in a known event space, expected values, variances of random variables, and conditional probability.			12, 16, 21, 9	A, E	
Develops mathematical tools for discrete and continuous random variables			12, 16, 21, 9	A, E	
Determines the common probability distributions and the understanding of where to use them.			12, 16, 21, 9	A, E	
Work with multiple random variables, their joint distributions, their conditional distributions, and their one and two dimensional transformations.			12, 16, 21, 9	A, E	
Teaching Methods	12: Problem Solving Method, 16: Question - Answer Technique, 21: Simulation Technique, 9: Lecture Method				
Assessment Methods	A: Traditional Written Exam, E: Homework				
Lecture Schedule					
Sequence	Topics	Preliminary Preparation			
1	Class Info, Introduction to Statistics and Probability	Syllabus, Text 1-Chap. 1, Text 2-Chap. 1 &2			
2	Basic probability	Text 1-Chap. 2, Text 2-Chap 3			
3	Conditional probability	Text 1-Chap. 2, Text 2-Chap 4			
4	Discrete random variables	Text 1-Chap. 3, Text 2-Chap 5			
5	Discrete distributions and their statistics.	Text 1-Chap. 3, Text 2-Chap 6			
6	Continuous Random Variables and their statistics	Text 1-Chap. 4, Text 2-Chap 10			
7	Continuous Random Variables (Cont.)	Text 1-Chap. 4, Text 2-Chap 10			
8	Midterm overview	All Lectures till Week 8			
9	Continuous Distributions	Text 1-Chap. 4, Text 2-Chap 11			
10	Multiple Discrete Random Variables	Text 1-Chap. 5, Text 2-Chap 7			
11	Multiple Continuous Random Variables	Text 1-Chap. 5, Text 2-Chap 12			
12	Conditional Probability Mass Functions	Text 1-Chap. 5, Text 2-Chap 8			
13	Conditional Probability Density Functions	Text 1-Chap. 5, Text 2-Chap 13			
14	Conditional Probability Density Functions	Text 1-Chap. 5, Text 2-Chap 13			
Evaluation Methods		Weight(%)			
Midterm Exam		30			
General Exam		70			

Resources
1. Applied Statistics and Probability for Engineers, Sixth Edition, Douglas C. Montgomery and George C. Runger, ISBN : 13 9781118539712
2. Intuitive Probability and Random Processes Using MatLab - Steven M. Kay, 2016, ISBN-13: 978-0-387-24157-91) A. Papoulis, Probability, Random Variables, and Stochastic Processes, Mc Graw Hill, 1984.
2) Alberto Leon-Garcia, Probability, Statistics, and Random Processes For Electrical Engineering, Prentice Hall, Third Edition, 2008.
3) A. Papoulis, Probability, Random Variables and Stochastic Processes, McGraw-Hill , Third Edition,1991