COURSE: Probability and Statistics				
CODE: MATH331	**SEMESTER:** FALL			
LANGUAGE: ENGLISH	**TYPE:** COMPULSORY			
PRE-REQUISITES:- **CO-REQUISITES:**-	**THEORY**	**PRACTICAL**	**CREDIT**	**ECTS**
WEEKLY HOURS:	3	0	3	5

CONTENT OF THE COURSE:
Introduction to probability, permutation, combination, relative frequency concept, axioms of probability, set theory, conditional probability, Bayes theorem, independence, mutually exclusive events, discrete random variables, probability mass and distribution functions, expected value, variance, Bernoulli, Binomial, and Poisson random variables, continuous random variables, their probability density and distribution functions, expected value and variance of continuous random variables, uniform, Gauss (normal), and exponential random variables, density function of a function of a random variable, jointly distributed random variables, density function of functions of independent random variables, introduction to random processes.

OBJECTIVE OF THE COURSE:
Objective of this course is to cover basic principles of the theory of probability, and its applications. This course aims to give the basic principles and infrastructure of probability theory needed in applications such as signal analysis, analog and digital communications, speech processing and data modeling. A student is expected to solve basic probabilistic problems and systems analytically after taking the course.

WEEKLY SCHEDULE	
Week	**Topics**
1	Introduction to Statistical and Descriptive Statistics
2	Axioms of probability, set theory
3	Conditional probability, Bayes theorem
4	Statistical independency, mutually exclusive events
5	Discrete random variables, their probability mass and distribution functions
6	Expected value and variance of discrete random variables
7	Bernoulli, Binomial and Poisson random variables and their applications
8	MIDTERM
9	Introduction to continuous random variables
10	Uniform, exponential random variables, density function of a random variable
11	Gauss (normal) random variables and applications.
12	Distributions of Sampling Statistic
13	Parameter Estimation
14	Hypothesis Testing

TEXTBOOK:
Probability and Statistics for Engineers&Scientists, Walpole, Myers,Myers,Ye, 9th Edition, Pearson

REFERENCE BOOKS:
Introduction to Probability and Statistics for Engineers and Scientists, 4th Edition, Sheldon M. Ross, Academic Press.

EVALUATION SYSTEM:

IN-TERM STUDIES	QUANTITY	PERCENTAGE (%)
Midterm Exam	1	30
Homework	4	5
Labworks	0	0
Quiz	4	5
Final Exam	1	60
TOTAL		
CONTRIBUTION OF INTERM STUDIES TO OVERALL GRADE	9	40
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE	1	60
TOTAL		100

COURSE CATEGORY:	PERCENTAGE (%)
Mathematics and Basic Sciences	%80
Engineering	%20
Engineering Design	%0
Social Sciences	%0

TABLE OF ECTS / WORKLOAD:

Activities	QUANTITY	Duration (Hour)	Total Workload
Course Duration	13	3	39
Hours for off-the-classroom study (Pre-study, practice)	14	6	84
Mid-term	1	2	2
Final examination	1	2	2
Homwork	4	2	8
Quiz	4	2	8
Total Work Load			**143**
Total Work Load / 30			**4,77**
ECTS Credit of the Course			**5**

INSTRUCTOR(S):	Asst. Prof. Dr. Kadir Sercan Bayram
FORM PREPARATION DATE:	25.11.2019

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
LO1	3	1	0	0	0	0	0	0	0	0	0
LO2	3	2	0	0	0	0	0	0	0	0	0
LO3	3	2	0	0	0	0	0	0	0	0	0
LO4	3	1	0	0	0	0	0	0	0	0	0
LO5	3	1	0	0	0	0	0	0	0	0	0
	PO: Program Outcomes | LO: Learning Outcomes Values: 0: None | 1: Low | 2: Medium | 3: High										

LEARNING OUTCOMES OF THE COURSE:	PROGRAM OUTCOMES:
LO1:Students shall learn the basic techniques and principles of the probability theory LO2: be able to theoretically analyze and solve probability problems LO3: Students will understand and solve basic probabilistic problems, which are encountered in engineering applications LO4: Students will use probability models for some random experiments LO5: Students will understand the basic principles of probability calculus.	**PO1:** Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied knowledge in these areas in complex engineering problems. **PO2:** Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose. **PO3:** Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose. **PO4:** Ability to devise, select, and use modern techniques and tools needed for analyzing and solving complex problems encountered in engineering practice; ability to employ information technologies effectively. **PO5:** Ability to design and conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems or discipline specific research questions. **PO6:** Ability to work efficiently in intra-disciplinary and multi-disciplinary teams; ability to work individually. **PO7:** Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign language; ability to write effective reports and comprehend written reports, prepare design and production reports, make effective presentations, and give and receive clear and intelligible instructions. **PO8:** Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself. **PO9:** Consciousness to behave according to

	ethical principles and professional and ethical responsibility; knowledge on standards used in engineering practice. **PO10:** Knowledge about business life practices such as project management, risk management, and change management; awareness in entrepreneurship, innovation; knowledge about sustainable development. **PO11:** Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering; awareness of the legal consequences of engineering solutions.