MATH 204 Probability and Statistics

MATH204 Probability and Statistics							
Course Name	**Course Code**	**Semester**	**h/w**	**Appl.**	**Lab. h/w**	**Credit**	**ECTS**
Probability and Statistics	MATH204	4	3	0	0	3	5

Prerequisites	No
Course Language	English
Course Type	Compulsory
Course Level	Undergraduate
Way of teaching	Online, face to face
Learning and teaching techniques	Expression, question answer, application

Course Objectives

To provide students with the ability to identify concepts such as random variables, probability density functions and to use them in problem solving. To ensure that they can calculate the expected value, variance and standard deviation. To gain students the ability to perform parameter estimation and hypothesis testing.

Course Educational / Learning Outcomes

Students who can successfully complete this course;

1.	Define random variables.
2	Define the concept of probability density function and uses it in problem solving.
3	Calculate the expected value, variance and standard deviation.
4	Make parameter estimation.
5	Make Hypothesis testing.
6	
7	
8	
9	
10	

Topics Covered

Basic concepts of probability and statistics. Random variables, functions of random variables. Multivariable distributions and densities. Independent random variables. Correlation, application of statistics to engineering systems.

Weekly Topics and Releated Preparation Studies

Week	Topics	Preparation
1	Definition of probability, sample space and event, geometric probability, basic axioms of probability, finite probability spaces.	
2	Conditional probability, axioms of conditional probability, multiplicative rule, some properties of conditional probability.	
3	Total probability formula, tree diagrams Independent events, complete independence, Bayes' Theorem,	
4	Definition of discrete random variables, probability distribution and probability function of discrete random variables.	
5	Definition of continuous random variables, probability distribution and probability density function of continuous random variables.	
6	Distribution functions of discrete and continuous random variables, properties of distribution function.	
7	Expected value, variance and standard deviation concepts, properties of expected value and variance.	
8	Midterm Exam I	
9	Discrete probability distributions: Uniform, Bernoulli, Binom, Hypergeometric.	
10	Discrete probability distributions: geometric, Pascal (negative binomial distribution), Poisson.	
11	Continuous probability distributions: Uniform, Exponential, Normal (Gaussian).	
12	Midterm Exam II	
13	Definition of statistic, basic concepts: Stack, parameter, sample, sampling, exact count, sampling types.	
14	Sampling distribution, central limit theorem.	
15	Point estimation, interval estimation (confidence interval).	
16	Hypothesis testing, strength of the test, independence test, compatibility test.	

Textbook
Introduction to Probability and Statistic for Engineers and Scientists-Shaldon M.Ross, Nobel.
A First Course in Probability, S.M. Ross

Assessment System		
Works	**Number**	**Contribution**
Attendance		
Laboratory		
Practice		
Field Study		
Course-Specific Internship (if applicable)		
Quizzes		
Homework		
Presentation		
Project		
Report		
Seminar		

Midterm Exams / Midterm Jury	2	% 60
Final Exam / Final Jury	1	% 40
	Total	**% 100**
Contribution to the success grade of semester studies		% 40
Contribution of the studies at the end of semester to the success grade		% 60
	Total	**% 100**

Course Category	
Basic Vocational Courses	X
Expertise / Field Courses	
Support Courses	
Communication and Management Skills Courses	
Transferable Skill Courses	

The Relationship between Course Learning Outcomes and Program Competencies

No	Program Competencies / Outcomes	Contribution Level				
		1	2	3	4	5
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						

ECTS/Workload Table

Activities	Number	Time (h)	Total Workload
Course hours (Including exam week: 16 x total weekly course hoursi)	16	3	48
Laboratory			
Application			
Course specific internship			
Field Study			
Out-of-class study time			
Presentation/Seminar Preparation			
Projects			
Reports			
Homeworks	3	4	12
Quizzes			
Preparation time for Midterm Exams / Midterm Jury	2	20	40
Preparation time for Final Exam / Final Jury	1	20	20
Total Workload	**(120/22 = 5.45)**		**120**