	Course name: MATH 321 Introduction to Probability Theory	**Department:** Mathematics		Semester
				5
	Methods of Education			Credit (ECTS)
	Lecture	Recitation/ (Etud)	Lab	Project/Field Study	Homework	Other	Total	
	42	0	0	0	42	84	168	6

Language	English
Compulsory/Elective	Elective
Prerequisites	MATH 111 Calculus I and MATH 112 Calculus II

	Week	Subjects
Course Contents	1	- The Basic Principle of Counting - Permutations and Combinations - Sample Space and Events
	2	- Axioms of Probability - Sample Spaces Having Equally Likely Outcomes - Conditional Probabilities - Bayes's Formula
	3	- Independent Events - Random Variables - Discrete Random Variables - Expected Value
	4	- Expectation of a Function of a Random Variable - Variance
	5	The Bernoulli and Binomial Random Variables
	6	- Quiz 1 - The Poisson Random Variable - Expected Value of Sums of Random Variables
	7	- Continuous Random Variables - Expectation and Variance of Continuous Random Variables
	8	The Uniform Random Variable
	9	Exam Week (No classes)
	10	- Normal Random Variables - The Normal Approximation to the Binomial Distribution
	11	- Exponential Random Variables - The Distribution of a Function of a Random Variable
	12	- Quiz 2 - Joint Distribution Functions
	13	- Independent Random Variables - Sums of Independent Random Variables
	14	- Chebyshev's Inequality and the Weak Law of Large Numbers - The Central Limit Theorem
	15	- The Strong Law of Large Numbers - Review

Course Objectives	The purpose of this course is - to give fundamental concepts in probability theory, - to teach basic properties of random variables and convergence of random variables, - to give theoretical background on convergence theorems such as law of large numbers and central limit theorem.
Learning Outcomes and Competences	Upon completion of this course students will be able to model a probabilistic event in terms of random variables,

	• learn how to apply convergence theorems on random variables and able to make probabilistic deductions.			
Textbook and /or References	1) Ross, S., A First course in Probability, Pearson 2) Jacod J. and Protter, P., *Probability Essentials*, 2nd edition, Springer. 3) Karr, A. F., *Probability*, Springer.			
			If any, mark as (X)	Percentage (%)
	Midterm Exams		X	30
	Quizzes		X	20
	Homework			
Assessment Criteria	Projects			
	Term Paper			
	Laboratory work			
	Other			
	Final Exam		X	50
Instructors				