	Course name: MATH 114 Discrete Mathematics			Department: Mathematics			Semester
							2
	Methods of Education						Credit (ECTS)
	Lecture	Recitation/ (Etud)	Lab	Exams	Homework / Quiz	Other	Total	
	42	0	0	35	15	88	180	6

Language	English
Compulsory/Elective	Compulsory
Prerequisites	None

	Week	Subjects
Course Contents	1	▪ Basics of counting, permutations, combinations. ▪ Distribution problems.
	2	▪ Generalized permutations and combinations. ▪ Binomial coefficients and identities.
	3	▪ The principle of inclusion-exclusion. ▪ The pigeonhole principle.
	4	▪ Mathematical induction. ▪ Strong induction.
	5	▪ Discrete probability, conditional probability. ▪ Independence, binomial distribution.
	6	▪ Bayes' theorem. ▪ Discrete random variables, expectation and variance.
	7	▪ Divisibility, modular arithmetic. ▪ Primes, greatest common divisor.
	8	▪ Fermat's theorem, Euler function, Euler's theorem.
	9	▪ Solving congruences.
	10	▪ Recurrence relations. ▪ Solving linear recurrence relations.
	11	▪ Fibonacci sequence. ▪ Generating functions.
	12	▪ Graph terminology, degrees, paths, cycles. ▪ Complete graphs, bipartite graphs.
	13	▪ Isomorphism of graphs. ▪ Connectivity.
	14	▪ Planar graphs, Euler's formula. ▪ Trees.

Course Objectives	The purpose of this course is • to teach fundamental techniques and methods in counting, • to give a basic background in probability, • to provide an introduction to graph theory, • to reinforce proof techniques.
Learning Outcomes and Competences	Upon completion of this course students will • learn how to approach basic combinatorial problems, • strengthen their mathematical thinking skills, • have the basic knowledge on discrete structures.

Textbook and /or References	Main texbooks : 1. Kenneth H. Rosen, Discrete Matematics and Its Applications **References:** 1. Steven G. Krantz, Discrete Matematics 2009 2. Ralph P. Grimaldi, Discrete Mathematics and Combinatorial Mathematics 5th Edition 3. Gallian, Contemporary Abstract Algebra, 7 ed 2010. 4. David S. Dummit, Richard M. Foote, Abstract Algebra, 3rd Edition,Wiley (2003). Fraleigh Victor, J. Katz, A first course in abstract algebra, AddisonWesley (2003).		
		If any, mark as (X)	Percentage (%)
	Midterm Exams	X	40
	Quizzes		
	Homework		
Assessment Criteria	Projects		
	Term Paper		
	Laboratory work		
	Other		
	Final Exam	X	60
Instructors			