

FACULTY OF ENGINEERING
1st Year 2nd Semester

MAT 102 Mathematics II				FACULTY OF ENGINEERING					
Semester	Methods of Education							Credits	
	Lecture	Recit.	Lab.	Project / Field Study	Homework	Other	Total	Credit	ECTS Credit
2	56	-	-	-	42	62	160	4	6.0
Language	Turkish / English								
Compulsory / Elective	Compulsory								
Prerequisites	None								
Course Contents	Sequences, series, power series. Polar coordinates, vectors in R3, curves, lines and planes. Limit and continuity of multivariable functions, partial differentiation, gradient, tangential plane, directional derivatives, unconditional and conditional maximum/minimum, Lagrange multipliers. Multiple integrals, line integrals and path independence, surface integral.								
Course Objectives	Mathematics is the science of thinking based on intelligence and logic. Therefore anyone working as professional oriented towards mathematics. Mathematics is an indispensable tool especially for engineering sciences. The purpose of this course is to increase the capability of thinking and to implement mathematical methods and topics taught in this course to the technology.								
Learning Outcomes and Competences	The ability both to make analysis and synthesis by examining different aspects of cases and looking multi-dimensionally at events is gained and to use the topics of the mathematics such as series, vectors, multivariable functions, multiple and line integrals, which are used usually in applications of mathematics, in engineering courses and researches is gained.								
Textbook and /or Reference	1-Matematik Analiz ve Analitik Geometri, Edwards& Penney, Çeviri Editörü Prof.Dr. Ömer Akın 2-Genel Matematik, Prof. Dr. Mustafa Balcı 3- Calculus,Robert Ellis-Denny Gulick								
Assessment Criteria					If any, mark as (x)		Percentage (%)		
	Midterm Exams				X		60		
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam				X		40		
Week	Subject								
1	POLAR COORDINATES : Definition, drawing of an arc, calculation of area, length of an arc and surface area of revolution								
2	SEQUENCES : Definition, types, monotone and finite sequences, subsequence, convergence and divergence of sequences								
3	SERIES : Definition, convergence and divergence, posite series and convergence tests, alterne seriler, absolute and conditional convergence, power series, radius and interval of convergence								
4	SERIES EXPANSIONS : Taylor , Maclaurin and Binomial series, differentiation and integral of power series, calculations with the help of series								
5	VECTORS : Vector spaces, investigation of vectors in two and three-dimensional spaces,vector operations, linear independence and basis, lines and planes in R3								
6	MULTIVARIABLE FUNCTIONS : Definition, domain of definition, graphs, limit and continuity of functions of two variables, partial differentiation								
7	Higher order partial derivatives, chain rule, implicit function derivatives, exact differentiation								
8	APPLICATIONS OF PARTIAL DIFFERENTIATIONS : Gradient, divergens ve rotasyon, directional derivatives, geometrical interpretation of partial derivatives, tangent plane and normal line equation								
9	Taylor expansions of of functions of two variables, maxima and minima, conditional maxima and minima,maximum and minimum problems,bölge dönüşümleri ve jacobians								
10	DOUBLE INTEGRALS : Definition, properties, computation, bölge dönüşümleri								
11	APPLICATIONS OF DOUBLE INTEGRALS : Calculation of area, volume, mass and moment, finding of center of masses and calculation of moment of inertia								
12	TRIPLE INTEGRALS : Definition, properties, computation methods, bölge dönüşümleri								
13	APPLICATIONS OF TRIPLE INTEGRALS : Calculation of volume, mass and moment of inertia, finding of center of gravities								
14	LINE INTEGRALS : Definition, properties, fundamentals theorems and path independence, Green's theorem and calculation of area, length of an arc, work, mass, center of gravity and moments of inertia								