

FACULTY OF ENGINEERING
1st Year 1st Semester

MAT 101 Mathematics I					FACULTY OF ENGINEERING				
Semester	Methods of Education							Credits	
	Lecture	Recit.	Lab.	Project / Field Study	Homework	Other	Total	Credit	ECTS Credit
1	56	-	-	-	56	84	196	4	7.0
Language	Turkish / English								
Compulsory / Elective	Compulsory								
Prerequisites	None								
Course Contents	Number Sentences. Absolute value, inequalities involving absolute value function, induction. Coordinates. Complex numbers. Functions. Function composition. Trigonometric functions. Limit of functions. Continuity. Properties of continuous functions. Differentiation. Derivative, mean value theorem and its applications. Determination of maximum, minimum and their applications. The graphs of functions, differential and its applications. Integral, fundamental theorem. Functions identified integrals. Integration formulas, methods of integration. Calculations of area, volume and length of an arc.								
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 to use the acquisitions in vocational courses and researches is gained by investigating the basic topics of mathematics such as functions, limit, differentiation and integral and then theaching solution approaches to the problems about these basic topics.								
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	INTRODUCTION : Sets, numbers (real ve copmlex), intervals, inequalities, neighbourhoods, coordinates								
2	FONCTIONS : Definition and image of sets, injections, surjections and inverse functions, combinations of functions and function composition, some special functions								
3	ALGEBRAIC AND TRANSCENDENTAL FUNCTIONS : Investigation of properties of rational, irrational, trigonometric, inverse trigonometric, exponenetial, logarithmic, hyperbolic and inverse hyperbolic functions								
4	LIMIT OF FUNCTION : Definition of limit, right and left-hand limit, fundamental theorems about limits, some special and trigonometric limits								
5	CONTINUITY AND DISCONTINUITY OF FUNCTIONS : Definition of continuity, fundamental properties of continuous funcitons, discontinuities and its types								
6	CONCEPT OF DIFFERENTIATION : Definition and presence, rules of differentiation, differentiation of composite and inverse functions, differentiation of algebraic, trigonometric ve inverse trigonometric functions								
7	Differentiation of exponenetial, logarithmic, hyperbolic and inverse hyperbolic functions, differentiation of closed and parametric functions, higher order derivatives								
8	APPLICATION OF DIFFERENTIATION : Geometrical interpretation of differentiaition and its application, absolute and local extremums, maxima and minima problems, physical aplications of differentiation, concavity								
9	Rolle's theorem and mean value theorems, uncertainties , elimination of uncertainties by using l` Hospital rule, asymptotes of an arc								
10	GRAPHIC DRAWING : Graphs of rational, irrational, exponenetial, logarithmic, trigonometric, hyperbolic and parametric functions								
11	INDEFINITE INTEGRAL : Differentiation of a function, definition of indefinite integral, propereties, basic integration formulas								
12	METHODS OF COMPUTING INTEGRAL : Integration by substitution, parts, partial fractions, integral of trigonometric and hyperbolic functions, integration by some special substitution								
13	DEFINITE INTEGRAL AND ITS APPLICATIONS : Definition, properties, fundamental theorem of integral computation, calculations of area and volume (cross section, disc and shell methods)								
14	Calculation of length of an arc and surface area of revolution, generalized integrals ve rules of convergence								