

MM 591 Analytical Methods in Mechanical Engineering				MECHANICAL ENGINEERING DEPARTMENT					
Semester	Methods of Education							Credits	
	Lecture	Recit.	Lab.	Project/Field Study	Homework	Other	Total	Credit	ECTS credit
1,2	12	30				146	188	3	7.5
Language	Turkish								
Compulsory / Elective	Optional								
Prerequisites	-								
Course Contents	Non linear ordinary differential equations. Quasi linearization, Picards iteration, perturbation methods. Fourier series. Special fourotians (Bessel, Legendre, error etc.) Boundary value problems and Sturm Liouville problems. Partial differential equations. Variational calculus. Complex variables theory. Residues and definite integrals. Integral transform techniques (Laplace and Fourier transforms, Convolution theorem, Finite Fourier transforms etc. Fourier integrals) and its applications to partial differential equations. Green’s functions and its applications								
Course Objectives	Analitical methods of mathematical analysis are provided as basic tools for the understanding and formulation of general prinisples and solution of IBVP’s.								
Learning Outcomes and Competences	Students gain the ability to approach the scientific & engineering problems by means of proper tools of general and applied mathematics.								
Textbook and /or Reference	1. O’Neil, P.V., (2003). Advanced Engineering Mathematics, 5th ed.. Brooks/Cole. 2. Greenberg, M.D., (1978). Foundation of Applied Mathematics. Prentice Hall. 3. Glyn James and Others. Busley, Clemsib, Dyke, (1993). Advanced Modern Engineering Mathematics, 2nd ed.. Addison-Wesly.								
Assessment Criteria					If any, mark as (X)		Percentage (%)		
	Midterm Exams				X		30		
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam				X		70		
Instructors	Assist. Prof. Oguz TURGUT								
Week	Subject								
1	Fourier Series								
2	Fourier Series								
3	Special Functions								
4	Special Functions								
5	Method of Seperation Variable								
6	Method of Seperation Variable								
7	Midterm Exam 1								
8	Complex Numbers								
9	Complex Functions, Complex Integration								
10	Series Representations of Functions								
11	Residue Theorem								
12	Residue Theorem								
13	The Laplace Transform								
14	Midterm Exam 2								