



T.C. ESKİŞEHİR OSMANGAZI UNIVERSITY
ENGINEERING AND ARCHITECTURE FACULTY
MECHANICAL ENGINEERING DEPARTMENT

COURSE INFORMATION FORM

SEMESTER	Fall
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COURSE CODE	151813553	COURSE NAME	DIFFERENTIAL EQUATIONS
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SEMESTER	WEEKLY COURSE PERIOD			COURSE OF			
	Theory	Practice	Laboratory	Credit	ECTS	TYPE	LANGUAGE
3	2	2	0	3	5	COMPULSORY (X) ELECTIVE ()	English
COURSE CATAGORY							
Basic Science		Basic Engineering		Mechanical Engineering [if it contains considerable design, mark with (√)]			Social Science
X				()			
ASSESSMENT CRITERIA							
MID-TERM				Evaluation Type		Quantity	%
				1 st Mid-Term		1	40
				2 nd Mid-Term			
				Quiz			
				Homework			
				Project			
				Report			
				Others (.....)			
FINAL EXAM						1	60
PREREQUIEITE(S)				NONE			
COURSE DESCRIPTION				Differential equations and solutions, first-order differential equations and solution methods, applications of first-order differential equations, higherorder differential equations and solution methods, Laplace transform and applications, linear differential equation systems			
COURSE OBJECTIVES				The main of the course is to introduce the basic terminology of differential equations and to examine, how differential equations are derived in an attempt to formulate, or describe, physical phenomena in terms of mathematics.			
ADDITIVE OF COURSE TO APPLY PROFESSIONAL EDUATION				To apply theoretical and practical knowledge on solving and modeling of engineering problems by using sufficient knowledge of engineering subjects related with mathematics			
COURSE OUTCOMES				Ability to determine, define, formulate and solve complex engineering problems; for that purpose an ability to select and use convenient analytical and experimental methods.			
TEXTBOOK				Özer, N. ve, Eser, D. “Diferensiyel Denklemler”, Eskişehir 2010.			
OTHER REFERENCES							
TOOLS AND EQUIPMENTS REQUIRED				Computer and projection			

COURSE SYLLABUS	
WEEK	TOPICS
1	Definition and classification of differential equations, first-order differential equations, separable equations, homogeneous equations and solution methods
2	Exact differential equations and solution methods, integrating factors
3	Linear and nonlinear differential equation and solution methods
4	Higher-degree differential equations, substitutions.
5	Applications of first-order differential equations
6	Higher-order differential equations and solution methods, differential equations with the dependent and in dependent variables,
7	Linear differential equations, linear dependence and linear independence, homogeneous linear equations and solution methods
8	Mid-Term Examination
9	Mid-Term Examination
10	Solutions of non- homogeneous linear equations and linear differential equations with constant coefficients, Cauchy-Euler and Lagrange equations and solution methods
11	Laplace transform and applications
12	Inverse Laplace transform and applications
13	Linear differential equation systems
14	Solution methods of the linear differential equation systems
15,16	Final Exam

NO	PROGRAM OUTCOMES	3	2	1
1	Sufficient knowledge of engineering subjects related with mathematics, science and Mechanical Engineering; an ability to apply theoretical and practical knowledge on solving and modeling of Mechanical Engineering problems.			x
2	Ability to determine, define, formulate and solve complex Mechanical Engineering problems; for that purpose an ability to select and use convenient analytical and experimental methods.			x
3	Ability to design a complex system, a component and/or an engineering process under real life constrains or conditions, defined by environmental, economical and political problems; for that purpose an ability to apply modern design methods.		x	
4	Ability to develop, select and use modern methods and tools required for ... Mechanical Engineering applications; ability to effective use of information technologies.		x	
5	In order to investigate Mechanical Engineering problems; ability to set up and conduct experiments and ability to analyze and interpretation of experimental results.			x
6	Ability to work effectively in inner or multi-disciplinary teams; proficiency of interdependence.			x
7	Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language.			x
8	Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement.	x		
9	Understanding of professional and ethical issues and taking responsibility	x		
10	Awareness of project, risk and change management; awareness of entrepreneurship, innovativeness and sustainable development.		x	
11	Knowledge of actual problems and effects of engineering applications on health, environment and security in global and social scale; an awareness of juridical results of engineering solutions.	x		
1:None. 2:Partially contribution. 3: Completely contribution.				

Prepared by:

Date:

Signature(s):