



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

COURSE INFORMATION FORM

SEMESTER	FALL
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COURSE CODE	151813558	COURSE NAME	DIFFERENTIAL EQUATIONS
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SEMESTER	WEEKLY COURSE PERIOD			COURSE OF			
	Theory	Practice	Laboratory	Credit	ECTS	TYPE	LANGUAGE
3	3	0	0	3	5	COMPULSORY (X) ELECTIVE ()	English

COURSE CATAGORY

Basic Science	Basic Engineering	Engineering Subjects [if it contains considerable design, mark with (√)]	Social Science
X			

ASSESSMENT CRITERIA

	Evaluation Type	Quantity	%
MID-TERM	Mid-Term	1	40
	Quiz		
	Homework		
	Project		
	Report		
	Others (.....)		
FINAL EXAM		1	60

PREREQUIEITE(S)	None
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COURSE DESCRIPTION	Differential equations and solutions, first-order differential equations and solution methods, applications of first-order differential equations, higher order differential equations and solution methods, linear differential equation systems
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COURSE OBJECTIVES	The main of the course is to introduce the basic terminology of differential equations and to examine, how differential equations are derived to formulate or describe physical phenomena in terms of mathematics.
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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
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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.
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TEXTBOOK	Richard Branson, Gabriel B. Costa, Differential Equations, Schaum's Outline Series, 3 rd edition, 2006.
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OTHER REFERENCES	William E. Boyce, Richard C. DiPrima, Elementary Differential Equations and Boundary Value Problems, 7 th edition, John Wiley & Sons Inc, 2001.
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TOOLS AND EQUIPMENTS REQUIRED	Computer and projection
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COURSE SYLLABUS	
WEEK	TOPICS
1	Definition and classification of differential equations
2	Separable equations and homogeneous equations
3	Exact differential equations and solution methods, integrating factors
4	Linear first order differential equations and solution methods
5	Bernoulli and Ricatti equations
6	Applications of first-order differential equations
7	Applications of first-order differential equations
8	Midterm
9	Linear differential equations, linearly independent solutions, Wronskian, non-homogenous equations
10	Second and higher order linear homogenous differential equations
11	Method of undetermined coefficients, method of variation of parameters
12	Linear differential equation systems
13	Linear differential equation systems
14	Cauchy-Euler and Lagrange equations
15,16	Final Exam

NO	PROGRAM OUTCOMES	3	2	1
1	Sufficient knowledge of engineering subjects related with mathematics, science and own branch; an ability to apply theoretical and practical knowledge on solving and modeling of engineering problems.	[]	[]	[X]
2	Ability to determine, define, formulate and solve complex 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 constraints 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 engineering applications; ability to effective use of information technologies.	[]	[X]	[]
5	In order to investigate 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: Asst. Prof. Bahadır DOĞAN

Date: 02.11.2021

Signature(s):