OSTIM TECHNICAL UNIVERSITY INSTITUTE OF SCIENCES ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE SCHEDULE FORM 2023-2024 FALL/SPRING

Course CODE Course NAME									
Course Unit Name	Course Unit Code	Semester	Lecture Hr	Practice Hr	Lab Hr	Credit	ECTS		
Differential Equations	Math 202	Fall	4	0	0	4	5		

Course Details	
Language of Instruction	English
Level of Course Unit	Bachelor's Degree
Program	Industrial Engineering Material Science and Engineering Software Engineering
Mode of Delivery	Face to Face
Type of Course Unit	Compulsory
Objectives of the Course	The laws of nature are expressed as differential equations. The scientists and engineers must know how to model the real-world problems in terms of differential equations, and how to solve those equations and interpret the solutions. This course focuses on differential equations, solution discussions and applications in engineering.
Course Content	Equations, Series Solutions of Differential Equations, Laplace Transforms, Linear Systems of Ordinary Differential Equations, Fourier Series
Course Method and Techniques	 Primarily to give the basic idea of topics and help the students to see the big picture. To support the issues with a variety of examples. Reinforcing learning through regular homework research and team activities. Holding midterm exam and final exam.
Prerequisites and Corequisities	
Course Coordinator	
Name of Lecturer(s)	
Assistants	
Work Placement(s)	

Recommended or Required Reading

Resources: Textbook(s):

1. Lectures on Differential Equations, E. Akyıldız, Y. Akyıldız, Ş.Alpay, A. Erkip and A.Yazıcı,, Matematik Vakfı Yayın No:1

2. Differential Equations, 2nd Edition, Shepley L. Ross, John Wiley and Sons, 1984

3. Advanced Engineering Mathematics, 8th • Edition, Erwin Kreyszig, John Wiley and Sons, 1998.

- 4. Diferansiyel Denklemler, Hüseyin Bereketoğlu 2021, Nobel Akademik Yayıncılık
- 5. Diferansiyel Denklemler Schaum Serisi, Nobel Akademik Yayıncılık
- 6. Advanced Engineering Mathematics , Erwin Kreyszig 2009.

Course Category			
Mathematics and Basic Sc	iences : % 100	Education	: %
Engineering	: %0	Science	: %
Engineering Design	: %0	Health	: %
Social Sciences	: %	Profession	: %

Weekly	Detailed Course Contents	
Week No	Topics	Pre-study & Materials
1	Preliminaries, Solutions	
2	First Order Ordinary Differential Equations Seperable Equations	
3	Linear Equations	
4	Homogeneous Equations	
5	Bernoulli Equations	
6	Midterm Exam	
7	Exact Equations	
8	Substitutions and Applications	
9	Higher Order Linear Ordinary Differential Equations	
10	Homogeneous Constant Coefficient Equations and Undetermined Coefficients Method	
11	Variation of Parameters Method	

	Cauchy-Euler Equations	
12	Basic Properties of the Laplace Transforms Solution of Differential Equations by the Laplace Transforms. Convolution	
13	Boundary Value Problems. Trigonometric Series, Fourier Series.	
14	Final Exam	

Course	Learning Outcomes
No	Learning Outcomes
C1	Understand the differential equation concept.
C2	Learning the types of differential equation
C3	Be able to determine the particular and general solutions of the first and second-order
	differential equations
C4	Be able to solve the differential equations with Laplace transform

Progra	mme Outcomes
No	Outcomes
P01	Reaches the knowledge broadly and in depth by doing scientific research in the field, evaluates, interprets and applies the knowledge.
P02	Has comprehensive knowledge about current techniques and methods applied in engineering and their constraints.
P03	Complements and applies knowledge with scientific methods, using uncertain, limited or incomplete data; can use information from different disciplines together.
P04	He is aware of the new and developing applications of his profession, examines and learns them when needed.
P05	Defines and formulates problems related to the field, develops methods to solve and applies innovative methods in solutions.
P06	Develops new and/or original ideas and methods; designs complex systems or processes and develops innovative/alternative solutions in their designs.
P07	Designs and implements theoretical, experimental and modeling research; examines and solves complex problems encountered in this process.
P08	Can work effectively in disciplinary and multi-disciplinary teams, lead such teams and develop solutions in complex situations; can work independently and take responsibility.
P09	Communicates verbally and in writing by using a foreign language at least at the B2 General Level of the European Language Portfolio.
P10	He/she conveys results of his/her studies systematically and clearly in written or verbal form in national and international environments in that field or outside the field.
P11	Knows the social, environmental, health, safety, legal aspects of engineering applications, project management and business life applications and is aware of the constraints they impose on engineering applications.
P12	Observes social, scientific and ethical values in the stages of data collection, interpretation, announcement and in all professional activities.

Assessment Methods and Criteria

In-term studies	Quantity	Percentage
Attendance		
Lab		
Practice		
Fieldwork		
Course-specific internship (if any)		
Quiz/Studio/Criticize	1	%10
Homework		
Presentation		
Project		
Report		
Seminar		
Midterm Exam	1	%40
Final Exam	1	%50
	Total	%100
Contribution of Midterm Studies to Success Grade		
Contribution of End of Semester Studies to Success Grade		
	Total	% 100

ECTS Allocated Based on Student Workload									
Activities	Quantity	Duration (Hr)	Total Work Load						
Weekly Theoretical Course Hrs (Including the exam	14	4	56						
week: 14 x total course hours)									
Lab									
Practice									
Course-specific internship (if any)									
Fieldwork									
Out-of-class study time	14	2	28						
Presentation/Seminar Preperation									
Project									
Report									
Homework	1	5	5						
Quiz/Studio/Criticize	1	5	5						
Midterm Exam and Preperation for Midterm	1	10	10						
Final Exam and Preperation for Final Exam	1 20		20						
Total Workload			119						
ECTS Credit	(11	9/25) =	4,76						

Contri	Contribution of Course Learning Outcomes to Programme Outcomes											
Contri	Contribution: 1: Very Slight 2:Slight 3:Moderate 4:Significant 5:Very Significant											
	P01 P02 P03 P04 P05 P06 P07 P08 P09 P10 P11 P12										P12	
C1	4	4	4		3							
C2	4	4	4		3							
C3	4	4	4		3							
C4	4	4	4		3							
C5	4	4	4		3							