School of Engineering and Natural Sciences / Electrical and Electronics Engineering (English) 2024 - 2025 Academic Year DIFFERNTIAL EQUATIONS Syllabus

Course L	Description							
Name	·	Co	ode	Semester	T+A Hour	Credit	ECTS	
DIFFEREN	NTIAL EQUATIONS	EE	E2114258	Fall Semester	2+0	2	4	
	isites Courses	MATEMATİK II						
	nended Elective Courses							
	ge of Instruction	English						
		First Cycle (Bachelor's Degree)						
Course Type Required								
Course Coordinator Assist.Prof. Özge BİÇER ÖDEMİŞ								
		Assist.Prof. Özge BİÇER ÖDEMİŞ						
Assistant(s)		MODISTRION OZYC DIYLK UDLINIŞ						
	11(3)	To provide the recognition of differential	equations and	to give solution techniques and	to give also its applica	ions for the	study of	
Aim		To provide the recognition of differential equations and to give solution techniques and to give also its applications for the study of Engineering. To provide supports on studies and researches in the area of Engineering.						
Course C	Content	This course contains; Preliminaries/Diffe Order Differential Equations: Separable exact Differential Equations to Exact,Sol Models ,Preliminaries: Higher Order Line Reduction of Order,Homogeneous Linear Annihilator Approaches, Variation of Para Transforms, Transforms of Derivatives an	Differential Equutions by Substear Differential I r Equations with meters and Cal	ations,Linear Differential Equatic itutions ,Differential Equations a: Equations,Methods of Solving Hig n Constant Coefficients,Undetern uchy-Euler Differential Equations	ons,Exact Differential E s Mathematical Models gher Order Linear Diffe nined Coefficients—Sup Definition of the Lapla	quations, Ma , Linear rential Equat perposition a ce Transforn	iking non- tions: nd	
Course Learning Outcomes					Teaching Methods		thods	
2.Apply the methods for solving first-order differential equations.				12, 14, 6, 9		Α		
 Recognize the classification of differential equations, solutions of differential equations, s initial value problems and apply Existence and Uniqueness Theorem for first-order different 					12, 14, 6, 9		Α	
Recognize and solve differential equations as mathematical models and higher-order lineapply Existence and Uniqueness Theorem for higher-order equations.			her-order linear	differential equations and	12, 14, 6, 9		Α	
 Recognize linearly dependent and independent solutions and Wronskian and apply the r linear differential equations. 			d apply the met	hods for solving higher-order	12, 14, 6, 9		Α	
5. Solve Cauchy-Euler differential equations and calculate initial value problems by Laplace t			ansforms.	12, 14, 6, 9		Α		
Teaching	g Methods	12: Problem Solving Method, 14: Self St	udy Method, 6:	Experiential Learning, 9: Lecture	e Method			
Assessm	nent Methods	A: Traditional Written Exam						
Lecture !	Schedule							
Sequenc e				Preliminary Preparation				
1	Preliminaries/Differential E	reliminaries/Differential Equations			Book Chapter 1.1			
2	Definitions and Terminolo	nd Terminology, Initial-Value Problems Book Chapters 1.1, 1.2						
3	Methods of Solving First Order Differential Equations: Separable Differential Equations			Book Chapter 2.2				
4	Linear Differential Equations			Book Chapter 2.3				
5	Exact Differential Equations, Making non-exact Differential Equations to Exact		ns to Exact	Book Chapter 2.4				
6	Solutions by Substitutions			Book Chapter 2.5				
	Differential Equations as Mathematical Models, Linear Models			Book Chapters 1.3, 3.1				
7	Preliminaries: Higher Order Linear Differential Equations							
7 8				Book Chapter 4.1				
	Preliminaries: Higher Orde Methods of Solving Higher		uction of	Book Chapter 4.1 Book Chapter 4.2				
8	Preliminaries: Higher Orde Methods of Solving Higher Order	er Linear Differential Equations	uction of	·				
8	Preliminaries: Higher Order Methods of Solving Higher Order Homogeneous Linear Equa	er Linear Differential Equations Order Linear Differential Equations: Red		Book Chapter 4.2				
8 9 10	Preliminaries: Higher Order Methods of Solving Higher Order Homogeneous Linear Equal Undetermined Coefficients	er Linear Differential Equations Order Linear Differential Equations: Red ations with Constant Coefficients —Superposition and Annihilator Approac		Book Chapter 4.2 Book Chapter 4.3				
8 9 10 11 12	Preliminaries: Higher Orde Methods of Solving Higher Order Homogeneous Linear Equa Undetermined Coefficients Variation of Parameters an	er Linear Differential Equations Order Linear Differential Equations: Red ations with Constant Coefficients		Book Chapter 4.2 Book Chapter 4.3 Book Chapters 4.4, 4.5 Book Chapters 4.6, 4.7				
8 9 10 11	Preliminaries: Higher Orde Methods of Solving Higher Order Homogeneous Linear Equa Undetermined Coefficients Variation of Parameters an Definition of the Laplace T Transforms of Derivatives	er Linear Differential Equations Order Linear Differential Equations: Red ations with Constant Coefficients —Superposition and Annihilator Approac nd Cauchy-Euler Differential Equations	hes	Book Chapter 4.2 Book Chapter 4.3 Book Chapters 4.4, 4.5				
8 9 10 11 12 13	Preliminaries: Higher Orde Methods of Solving Higher Order Homogeneous Linear Equal Undetermined Coefficients Variation of Parameters at Definition of the Laplace T Transforms of Derivatives Transform	er Linear Differential Equations Order Linear Differential Equations: Red ations with Constant Coefficients —Superposition and Annihilator Approac and Cauchy-Euler Differential Equations Fransform, Inverse Transforms	hes	Book Chapter 4.2 Book Chapter 4.3 Book Chapters 4.4, 4.5 Book Chapters 4.6, 4.7 Book Chapters 7.1, 7.2 Book Chapter 7.2				
8 9 10 11 12 13	Preliminaries: Higher Orde Methods of Solving Higher Order Homogeneous Linear Equi Undetermined Coefficients Variation of Parameters at Definition of the Laplace T Transforms of Derivatives Transform on Methods	er Linear Differential Equations Order Linear Differential Equations: Red ations with Constant Coefficients —Superposition and Annihilator Approac and Cauchy-Euler Differential Equations Fransform, Inverse Transforms	hes	Book Chapter 4.2 Book Chapter 4.3 Book Chapters 4.4, 4.5 Book Chapters 4.6, 4.7 Book Chapters 7.1, 7.2				

Resources
Dennis G. Zill - A First Course in Differential Equations with Modeling Applications 11th Edition.