

SYLLABUS FOR MATH 20D

Textbook: *Elementary Differential Equations*, 9th ed. by Boyce & DiPrima

Lecture	Section	Topic
1	1.1-1.3	Introduction: Mathematical modeling w/ ODE, Classification of ODE and PDE
2	2.1	Linear equations; Method of Integrating Factors
3	2.2	Separable Equations
4	2.3-2.4	Modeling w/ First Order Equations; Differences between Linear and Nonlinear Equations
5	2.5	Autonomous Equations and Population Dynamics
6	2.6	Exact Equations and Integrating Factors
7	3.1	Second Order Linear Equations: Fundamental Solutions of Linear Homogeneous Equations
8	3.2	Linear Independence and the Wronskian
9	3.3	Complex Roots of the Characteristic Equation
10	3.4	Repeated Roots; Reduction of Order
WEEK 4	Midterm 1	TOPICS COVERED: Sections 1.1-3.4
11	3.5	Nonhomogeneous Equations; Method of Undetermined Coefficients
12	3.6	Variation of Parameters
13	7.1-7.2	Systems of First Order Linear Equations: Introduction, Review of Matrices
14	7.3	Linear Algebraic Equations; Linear Independence, Eigenvalues, Eigenvectors
15	7.4	Basic Theory of Systems of First Order Linear Equations
16	7.5	Homogeneous Linear Systems with Constant Coefficients
17	7.6	Complex Eigenvalues
18	7.7-7.8	Fundamental Matrices, Repeated Eigenvalues
19	7.9	Nonhomogeneous Linear Systems
20	5.1	Review of Power Series; Using Power Series to Solve ODEs
WEEK 8	Midterm 2	TOPICS COVERED: Sections 3.5-3.7, 7.1-7.9
21	5.2-5.3	Series Solutions Near an Ordinary Point
22	6.1	The Laplace Transform: Definition of the Laplace Transform
23	6.2	Solution of Initial Value Problems
24	6.3-6.4	Step Function; Differential Equations with Discontinuous Forcing Functions
25	6.5	Impulse Functions
WEEK 10	Review	REVIEW for Final Exam
WEEK 11	Final Exam	TOPICS COVERED: Sections 1.1-7.9

Revised: Sept 2009