

MAT 2700: Introduction to Differential Equations

**Text: *Differential Equations and Boundary Value Problems:
Computing and Modeling*
by C. H. Edwards and David E. Penney**

Semester Syllabus: First 3 chapters (except sections 2.6, 3.7, and 3.8) and parts of Chapter 7. The instructor should spend plenty of class time working problems and stimulate students to use appropriate computer software packages (*Mathematica; MATLAB, MAPLE*) to investigate differential equations and interpret their solutions. The following is a schedule for covering the syllabus material.

Week	Sections	Topics	Hour Test Dates
1	1.1, 1.2, 1.3	Introduction; Solutions; Slope Fields	
2	1.4	Separable Equations	
3	1.5, 1.6	Linear First-Order Equations; Substitution Methods	Test 1
4	2.1, 2.2	Population Models; Stability	
5	2.3, 2.4	Acceleration-Velocity Models; Euler's Method	
6	2.5	Improved Euler Method; Review and Applications	Test 2
7	1.3, 3.1, 3.2	Existence Theorem; Second Order Linear Equations	
8	3.3	Homogeneous Equations with Constant Coefficients	
9	3.4	Vibrations	Test 3
10	3.5	Undetermined Coefficients; Variation of Parameters	
11	3.6	Forced Oscillations and Resonance	
12		Problems; Review	Test 4
13	7.1, 7.2	Laplace Transforms; Initial Value Problems	
14	7.3, 7.4	Translation and Partial Fractions; Transform Calculation	
15	7.6	Impulses and Delta Functions; Review	

Note: The instructor may choose to use Boyce and DiPrima: *Elementary Differential Equations and Boundary Value Problems*. Chapters 2, 3, 6, and 8 of Boyce and DiPrima's sixth edition cover this syllabus.