

Tentative Course Outline:

The weekly coverage might change as it depends on the progress of the class. However, you must keep up with the reading assignments.

Week	Content
Week 1 1/26	<ul style="list-style-type: none"> • §1,2.1: Introduction and Separable Equations. • Turn in: §1.3 for Physics, Mathematics and Engineering • Solutions
Week 2 2/2	<ul style="list-style-type: none"> • §2.2,2.3,2.4: Graphical Solutions, Linear 1st Order ODEs, E& U • Turn in: §2.3 #15,16 and §2.4 #3,4 Solutions.
Week 3 2/9	<ul style="list-style-type: none"> • §2.5-2.7: Analytical Methods, Numerical Methods and Autonomous Equations • Choose Project & Teams • Project: Noonburg, P76, <i>Single Neuron Equation</i>. Hints.
Week 4 2/17	<ul style="list-style-type: none"> • §3: Second Order ODEs • Project
Week 5 2/23	<ul style="list-style-type: none"> • §3: Forced Spring/Mass Equations • To turn in: 3.3: #6,10,11 (Solns) & 3.4: #6,12,18 (Solns)
Week 6 3/2	<ul style="list-style-type: none"> • §3.7: Autonomous 2nd-order ODEs • §4.1: Introduction to systems • Midterm 1 and Solutions
Week 7 3/9	<ul style="list-style-type: none"> • §4.2,3: Matrix Algebra, Eigenvalues and Eigenvectors. • Choose Project & Team
Week 8 3/16	<ul style="list-style-type: none"> • §4.4: Analytic Solutions of $\dot{x}' = Ax$ • Interacting Species Project and solutions
Week 9 3/23	<ul style="list-style-type: none"> • 4.5: Eigensystems and Analytic Solutions
Week 10 4/6	<ul style="list-style-type: none"> • §5.1,5.2: Phase Plane and Geometric Analysis of Autonomous Solutions. • Noonburg 5.1
Week 11 4/13	<ul style="list-style-type: none"> • §5.1,5.2: Phase Plane and Geometric Analysis of Autonomous Solutions. • Noonburg 5.2
Week 12	<ul style="list-style-type: none"> • Choose Projects and Teams • 5.3 Geometric Behavior of Nonlinear Autonomous Systems • Bifurcations of Systems • 5.3 problems • Here's that paper on equal roots.
Week 13	<ul style="list-style-type: none"> • Bifurcations of Systems • Midterm 2 (Part 1) and (Part 2)
Week 14	<ul style="list-style-type: none"> • §6.1,2 Laplace Transforms: Definitions and Solving Equations • §Extending the Table and the Unit Stem Function. • Projects
Week 15	<ul style="list-style-type: none"> • The Convolution Integral • Review for final exam.
Week 16	<ul style="list-style-type: none"> • Final Exam - (solutions).