

Math 244: Differential Equations for Engineers
Summer 2003, Section C1
Course Calendar

This calendar is tentative and is subject to change. An updated version will be posted on the class website (http://www.math.rutgers.edu/~nweining/math244-s03/244_index.html) if and when changes are made.

T 5/27 Review syllabus. Set office hours. Introduction: basic definitions, classifying differential equations, analyzing solutions, basic solution techniques. (1.1-1.3)

W 5/28 Quiz 1. First order linear equations: integrating factors, separable equations, example models. (2.1-2.3)

Th 5/29 More on separable equations. Linear vs. nonlinear equations, existence and uniqueness theorem, autonomous equations and applications. (2.3-2.5)

M 6/2 Quiz 2. Assignment 1 due. Exact equations, more example models, Euler's approximation method. (2.6, 2.7)

T 6/3 Introduction to second-order linear equations. Homogeneous equations with constant coefficients, characteristic equation, fundamental solutions. (3.1, 3.2)

W 6/4 Quiz 3. Review of matrices and determinants. Linear independence and the Wronskian. Cases for roots of characteristic equations: real distinct roots, complex roots. (3.3, 3.4)

Th 6/5 More on complex roots. Repeated roots, reduction of order. Nonhomogeneous equations: method of undetermined coefficients. (3.4-3.6)

M 6/9 Quiz 4. Assignment 2 due. Nonhomogeneous equations: variation of parameters. Examples: mechanical and electrical vibrations, forced vibrations. (3.7-3.9)

T 6/10 General theory of higher-order equations. (4.1-4.2)

W 6/11 Quiz 5. More general theory of higher-order equations. Euler equations. (4.3, 5.5)

Th 6/12 Midterm 1, covering chapters 1, 2.1-2.7, and 3.

M 6/16 Quiz 6. Assignment 3 due. Return and review midterm 1. Introduction to systems of first-order linear equations. Solving higher-order equations by systems. (7.1)

T 6/17 Introductory concepts from linear algebra. (7.2, 7.3)

W 6/18 Quiz 7. More linear algebra. Existence and uniqueness of solutions to systems of first-order equations. Phase portraits, possible cases for eigenvalues. (7.3-7.5)

Th 6/19 Distinct real eigenvalues, phase portraits; fundamental matrices, diagonalization. (7.5, 7.7)

M 6/23 Quiz 8. Assignment 4 due. Complex eigenvalues, phase portraits; more on fundamental matrices and diagonalization. (7.6, 7.7)

T 6/24 Repeated eigenvalues; Jordan form. (7.8)

W 6/25 Quiz 9. Nonhomogeneous linear systems; diagonalization, method of undetermined coefficients, variation of parameters. (7.9)

Th 6/26 Laplace transforms, solution of initial value problems by Laplace transforms. (6.1, 6.2)

M 6/30 Quiz 10. Assignment 5 due. More on the Laplace transform: step functions, discontinuous forcing functions. (6.3, 6.4)

T 7/1 Midterm 2, covering chapters 4.1-4.3, 5.5, and 7.1-7.9.

W 7/2 Quiz 11. Review of power series. Series solutions near an ordinary point. (5.1, 5.2)

Th 7/3 Return and review midterm 2. More on series solutions near an ordinary point. (5.2, 5.3)

M 7/7 Quiz 12. Assignment 6 due. Regular singular points; solutions near regular singular points. (5.4, 5.6)

T 7/8 Basic approximation methods: Euler, improved Euler, Runge-Kutta. Basics of error estimation. (8.1-8.3)

W 7/9 Quiz 13. Introduction to nonlinear equations. Phase plane and characterization of second-order systems. (9.1)

Th 7/10 Autonomous systems, stability. Almost linear systems. (9.2, 9.3)

M 7/14 Quiz 14. Assignment 7 due. Examples of nonlinear systems: competing species, predator-prey equations. (9.4, 9.5)

T 7/15 Periodic solutions and limit cycles. Chaos and strange attractors. (9.7-9.8)

W 7/16 Quiz 15. Catch up and review for final exam.

Th 7/17 Final exam: 8:15-11:15 AM in class.