

MATH 53: ORDINARY DIFFERENTIAL EQUATIONS WITH LINEAR ALGEBRA

SYLLABUS - SPRING, 2004

Week of March 29

Tues., March 30: NO SECTION MEETING

Wed, March 31: Introduction and First order ODE's : 1.1- 1.3, 2.1, 2.4

Th., Apr. 1: Applications 2.5, 3.3, 3.4

F, Apr. 2 Separable ODE's 2.2, 2.3

Week of April 5

Mon. Apr. 5: ODE's and exact differentials, 2.6

Tues. Applications, 3.1, 3.2

Wed. Qualitative properties of first order ODE's 2.7, 2.8

Th: Autonomous equations 2.9

F: Second order equations: definitions and examples, 4.1

Week of April 12

Mon. April 12: Second order equations and systems 4.2

Tues. examples and problems, 4.1, 4.2

Wed. Linear homogeneous equations with constant coefficients, 4.3

Th. examples and problems, 4.3

F. Harmonic motion 4.4

Week of April 19

Mon. Apr. 19: more on harmonic motion, method of undetermined coefficients, 4.4, 4.5

Tues. examples and problems

Wed. Variations of Parameters: 4.6,

Th. review

F. forced harmonic motion 4.7

Week of April 26

Mon. Apr. 26 Laplace transform, 5.1, 5.2

Monday evening, April 26 7:00-8:30 pm : Midterm I: room TBA

Tues. examples and problems

Wed. inverse Laplace transform, 5.3

Th. ODE's and Laplace Transform 5.4, 5.5

F. The Delta function 5.6

Week of May 3

Mon. May 3 Convolutions, 5.7 Tues. examples and problems

Wed. Review of Laplace Transform review of linear algebra I 5.8, 7.1, 7.2

Thurs. Review of linear algebra II , 7.3

F. Review of linear algebra III 7.4 - 7.6

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Week of May 10

- Mon. May 10 Systems of ODE's, 8.1, 9.1
- Tues. Planar linear systems with constant coefficients, 9.2
- Wed. phase-plane portraits 8.2, 9.3
- Th. more on phase-plane portraits, examples, problems, 9.3
- F. Higher dimensional systems I, 9.4

Week of May 17

- Mon. May 17 the exponential of a matrix, 9.5
- Tues. examples and problems
- Wed. More on the exponential matrix
- Th. review
- Thursday evening, May 19 7:00 pm : Midterm II:** room TBA
- F. Inhomogeneous linear systems 9.8

Week of May 24

- Mon. May 24 Qualitative properties of systems of ODE's, 8.3, 8.4, 9.6,
- Tues. examples and problems
- Wed. Higher order linear equations, 9.7
- Th. Examples
- F. Runge-Kutta methods 6.2

Week of May 31

- Mon. May 31 **Memorial Day**, no classes
- Tues. numerical methods 6.3, 6.4
- Wed. Linearization of a Nonlinear System, 10.1

Final Exam: Friday, June 4, 7:00 - 10:00pm