MATH 53: ORDINARY DIFFERENTIAL EQUATIONS WITH LINEAR ALGEBRA

SYLLABUS - WINTER, 2007

Text:

- Polking, Boggess, and Arnold, **Differential equations,** 2nd edition

Exams:

- **Midterm I : Thursday, February 1, 7:00 - 8:30 pm**
- **Midterm II: Thursday, March 1, 7:00 - 8:30 pm**
- **Final Exam: Monday, March 19 , 7:00 - 10:00 pm**

Week of January 8

Tues., January 9: NO SECTION MEETING

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

Th.: Applications 2.5, 3.3, 3.4

F: Separable ODE's 2.2, 2.3

Week of January 15

Mon., January 15, HOLIDAY, no classes

Tues: Examples, and problems, 2.2, 2.3

Wed: ODE's and exact differentials, 2.6

Thurs: . Applications, 3.1, 3.2

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

Week of January 22

Mon.: Second order equations: definitions and examples, 4.1

Tues: Autonomous equations 2.9

Wed: Second order equations and systems 4.2

Thurs.: examples and problems, 4.1, 4.2

Fri.: Linear homogeneous equations with constant coefficients, 4.3

Week of January 29

Mon.: Harmonic motion 4.4

Tues. examples and problems

Wed: more on harmonic motion, method of undetermined coefficients, 4.4, 4.5

Th.: review

Thursday evening, February 1, 7:00 pm : Midterm I: room TBA

Fri.: Variations of Parameters: 4.6,

Week of February 5

Mon.: forced harmonic motion 4.7

Tues. examples and problems

Wed: Laplace transform, 5.1, 5.2

Thurs.: inverse Laplace transform, 5.3

Fri.: ODE's and Laplace Transform 5.4, 5.5

Week of February 12

Mon.: The Delta function 5.6

Tues. examples and problems

Wed.: Convolutions, 5.7

Thurs.: Review of Laplace Transform review of linear algebra I 5.8, 7.1

Fri.: Review of linear algebra II , 7.2 , 7.3

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Week of February 19

Mon. HOLIDAY, no lecture

Tues.: Review of linear algebra III 7.4 - 7.6

Wed.: Systems of ODE's, 8.1, 9.1

Thurs.: Planar linear systems with constant coefficients, 9.2

Fri:. phase-plane portraits 8.2, 9.3

Week of February 26

Mon.: Higher dimensional systems I, 9.4

Tues.: examples and problems

Wed.: the exponential of a matrix, 9.5

Th. review

Thursday evening, March 1, 7:00 pm : Midterm II: room TBA

Fri.: Inhomogeneous linear systems 9.8

Week of March 5

Mon.: Qualitative properties of systems of ODE's, 8.3, 8.4, 9.6,

Tues. examples and problems

Wed.: Higher order linear equations, 9.7

Thurs.: examples and problems

Fri.: Runge Kutte methods 6.2

Week of March 12

Mon.: numerical methods 6.3, 6.4

Tues: examples, problems

Wed.: Linearization at equilibrium 10.1

Thurs.: long term behavior of solutions 10.2

Fri.: More on Long term behavior, 10.3, 10.4

Final Exam: Monday, March 19, 7:00 - 10:00pm