

Math 0290: Differential Equations, Fall 2017
Departmental Syllabus - M. Lewicka section - MWF 11:00am, G31 Benedum Hall

Schedule and practice problems: The following is an approximate schedule for lectures and a full list of practice problems from the course textbook.

Week 1:

Introduction to differential equations, numerical methods and computer tools including Matlab for DEs

- 1.1 Number 1-11.
- 2.1 Number 3-6, 10-15, 21-28.
- 6.1 Number 1-9, 11.

Week 2:

Numerics (cont.), separation of variables.

- 6.2 Number 1-9.
- 6.3 Number 1-6, 11-13.
- 2.2 Number 1-22, 23-29, 33-35.

Week 3:

Modeling, linear first-order equations.

- 2.3 Number 1-10.
- 2.4 Number 1-21, 29.
- 2.5 Number 1-7, 9-10.

Week 4:

Modeling (cont.), second order equations.

- 3.4 Number 1-19.
- 4.1 Number 1-20, 26-30.
- 4.3 Number 1-36.

Week 5:

Second order equations (cont.), harmonic motion.

- 4.3 (cont.) Number 1-36.
- 4.4 Number 1-12, 14-16, 18.
- 4.5 Number 1-29.

Week 6:

Inhomogeneous second order equations.

- 4.5 (cont.) Number 1-29.
- 4.6 Number 1-10.
- 4.7 Number 3-11.

Week 7:

Laplace Transform.

- 5.1 Number 1-29.
- 5.2 Number 1-41.
- 5.3 Number 1-36.

Week 8:

Laplace Transform (cont.)

- 5.4 Number 1-26.
- 5.5 Number 1-25.
- 5.6 Number 1-9.

Week 9:

Laplace Transform (cont.), systems of differential equations

- 5.7 Number 4-24.
- 8.1 Number 1-16.
- 8.2 Number 1-6, 13-16.

Week 10:

Systems of differential equations, constant coefficient homogeneous systems.

- 8.3 Number 1-6.
- 9.1 Number 1-8, 16-23.
- 9.2 Number 1-27, 58-61.
- 9.3 Number 20-23.

Week 11:

MIDTERM, *Constant coefficients homogeneous 2×2 systems*

- 9.4 Number 1-12.

Week 12:

Nonlinear systems, Fourier series.

- 10.1 Number 1-16.
- 12.1 Number 1-22.

Weeks 13-14:

Fourier series, separation of variables for heat equation.

- 12.3 Number 1-32.
- 12.4 Number 1-11.
- 13.2 Number 1-18.

Week 15:

Review.