

Revised: Fall 2015

MTH 291

Differential Equations

COURSE OUTLINE

Prerequisites:

MTH 277 or equivalent.

Course Description:

Introduces first and second order differential equations, systems of differential equations, series solutions, Laplace Transforms and applications. Designed for mathematical, physical, and engineering science programs.

Semester Credits: 3 Lecture Hours: 3 Lab/Recitation Hours: 0

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Course Outcomes

At the completion of this course, the student should be able to:

1. Have a general understanding of the role of differential equations as a tool for solving many practical problems of engineering and science as well as a wide range of purely mathematical problems.
2. Solve first order and second order nonhomogeneous differential equations.
3. Solve systems of differential equations using eigenvalues and eigenvectors.
4. Use Laplace Transforms to solve Initial Value Problems.
5. Derive a series solution about an ordinary point.

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Required Materials:

Textbook, Software

Textbook:

Elementary Differential Equations and Boundry Value Problems, Boyce and DePrima, Tenth Edition,
John Wiley and Sons Incorporated. ISBN 9780470458310

The following supplementary materials are available:

- 1.
- 2.
- 3.

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Topical Description: (Outline chapters and sections to be covered in the book – may include timeline)

<u>Topics</u>	<u>Chapter</u>	<u>Section</u>
1. Definitions and examples of Differential Equations	1	1.1-1.4
2. Equations of First Order (Linear, Nonlinear, Applications)	2	2.1-2.7
3. Equations of Second Order	3	3.1-3.8
4. Higher Order	4	4.1-4.2
5. Systems of Differential Equations	7	7.1-7.9
6. Laplace Transforms	6	6.1-6.4
7. Series Solutions to Differential Equations	5	5.1-5.3

The software Maple 9 will be included in the course. The Maple Labs include:

1. Direction Fields
2. Symbolic Solutions
3. Laplace Transforms

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Notes to Instructors

(List information about optional topics, departmental exams, etc)

- 1.
- 2.
- 3.
- 4.

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