



Applied Mathematics 311

Differential Equations I

(see Course Descriptions for the applicable academic year: (<http://www.ucalgary.ca/pubs/calendar/>))

Syllabus

Topics

**Number
of hours**

Classification of differential equations, definition of solutions, explanation of existence and uniqueness theorems (without proofs)

2

Solutions of first-order equations with applications

9

Solutions of second-order equations with applications

8

Series solutions including singular points, and special functions

8

Laplace transforms

6

Systems of equations

3

TOTAL

36

Course Outcomes

Upon Successful Completion of the Course, Students will be able to:

1. Construct a logical argument and draw conclusions about problems of theoretical nature (e.g. Existence & Uniqueness, Wronskain & Linear independence, convergence, etc.)
2. Predict Specific strategies or techniques for solving Linear or variety of non-Linear first order Ordinary Differential Equation.
3. Employ variety of the techniques (outlined in the syllabus) of obtaining solutions to higher order linear or (appropriate) non-linear homogeneous and non-homogeneous Differential Equations.
4. Model and solve practical applications in interdisciplinary fields including but not limited to Particle Dynamics , Mechanical and Electrical Vibration , Chemical Reactions , Mixtures, Biology , Epidemiology , etc.)

5. Apply Laplace Transforms to obtain solutions to initial value problems.
6. Use power series to obtain or approximate solutions to linear, second order differential equation or initial value problems in the vicinity of an ordinary or a regular-singular point.
7. Solve a system of first order differential equations using differential operators.

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2016:08:10
Prerequisite change made 03:07:02
Prerequisite change made 08:07:01
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