DIFFERENTIAL EQUATIONS

MATH 2350

Course Description:

Topics include solutions of linear and first-order nonlinear differential equations with applications, higher-order linear differential equations with applications, power series solutions, and Laplace transform methods. **3 credits**

Prerequisites:

MATH 1960 with a grade of C- or better

Overview of Content and Purpose of the Course:

The laws of nature are often described with differential equations. It is important for students in science, engineering, and mathematics to be familiar with these equations.

Anticipated Audience/Demand:

This course is designed to meet the needs of Science, Engineering, and Mathematics students.

Major Topics:

1) First-order Linear and Nonlinear Differential Equations with Applications
- **a.** Solution Curves and Direction Fields
- **b.** Separable, Linear, Exact Equations
- **c.** Solutions by Substitution
- **d.** Euler's Method

2) Higher-Order Linear Differential Equations with Applications
- **a.** Homogeneous Equations with Constant Coefficients
- **b.** Nonhomogeneous Equations
- **c.** Applications- the Vibrating Spring

3) Power Series Solutions

4) Laplace Transform Methods

Methods:

This course will be presented by lecture, class discussion, and questions.

Student Role:

Students must attend and participate in class in addition to completing the course requirements.

Textbook:

Zill, Dennis G. *A First Course in Differential Equations with Modeling Applications, 10th ed*. Boston: Brooks/Cole, 2013.