

**DIFFERENTIAL EQUATIONS  
MATH 2350**

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**1.0 Course Objectives**

**1.1 Overview of Content and Purpose:** (3 hours) Solutions of linear and first order nonlinear differential equations with applications. Also power series solutions, Fourier series, and Laplace transform.

**1.2 Prerequisite:** MATH 1960

**2.0 Objectives**

**2.1 Performance Objectives for the Students** 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. Many different techniques for solving differential equations are studied in this course.

**3.0 Content and Organization**

**3.1 Topics:**

1. First order nonlinear differential equations
2. Linear differential equations
  - a. Homogeneous equations with constant coefficients.
  - b. Nonhomogeneous equations
  - c. Applications- the vibrating spring
3. Power series solutions and Fourier Series
4. Laplace transform methods.

**4.0 Teaching Methodology**

**4.1 Methods To be Used:** This course will be presented by lecture, class discussion, and questions.

**5.0 Evaluation**

**5.1 Basis for Evaluating Student Performance:** Evaluation will be based on the results of written examinations. This will consist of three or four in-class tests during the semester, plus a comprehensive final examination.

**6.0 Resource Material**

**6.1 Textbook(s) Or other Required Readings:** Edwards, C. & Penny, D. (2007). *Elementary Differential Equations and Boundary Value Problems*, New York: Prentice Hall 6<sup>th</sup> Edition.

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**6.2**     **Current  
Bibliography  
Of resources:**

1. Buium, A. (2005). *Arithmetic differential equations*. Providence, RI: American Mathematical Society.
2. Chalkley, R. (2007). *Basic global relative invariants for nonlinear differential equations*. Providence, RI: American Mathematical Society.
3. Edwards, C. & Penny, D. (2007). *Elementary differential equations with boundary value problems*, New York: Prentice Hall 6<sup>th</sup> Edition.
4. Logan, J. (2004). *Applied partial differential equations*, New York: Springer, 2<sup>nd</sup> edition.
5. McOwen, R. (2003). *Partial differential equations: methods and applications*, Upper Saddle, NJ: Prentice Hall, 2<sup>nd</sup> edition.
6. Robinson, J. (2004). *An introduction to ordinary differential equations*. Cambridge: Cambridge University Press.
7. Sanchez, D. (2002). *Ordinary differential equations: a brief eclectic tour*. Washington, DC: Mathematical Association of America.