COURSE SYLLABUS (2 Page)

Course Number: MATH 2171
Course Name: Differential Equations

Credits and Contact Hours: 3

Instructor: Staff

Textbook: Fundamentals of Differential Equations, by Nagle, Saff, and Snider, 8th Edition (2012), Pearson. ISBN: 9780321747730.

Catalog Description: An introduction to ordinary differential equations including first order equations, general theory of linear equations, series solutions, special solutions, special equations such as Bessel's equation, and applications to physical and geometric problems.
Most Recently Offered (Day): Spring 2016, Fall 2015, Summer 2015
Most Recently Offered (Evening): Summer 2016, Summer 2015, Summer 2014

Pre-Requisites/Co-Requisites: MATH 1242 with a grade of C or above.

Course is: Required (R)

Goals:

Specific outcomes of instruction:
To develop student knowledge of ordinary differential equations, including first order equations, general theory of linear equations, series solutions, special solutions, special equations, and applications to physical and geometric problems.

Student Outcomes Addressed:
A. an ability to apply knowledge of mathematics, science, and engineering

Course Topics:

- Solutions and Initial Value Problems
- Direction Fields
- Euler's Method of Numerical Approximation
- Introduction to Frist Order Equations
- Separable Equations
- Linear Equations
- Exact Equations
- Substitutions and Transformations
- Mathematical Modeling / Compartmental Analysis / Newton's Law of Cooling
- Newtonian Mechanics

- Electrical Circuits
- Improved Euler Method
- Higher Order Numerical Methods
- Introduction to Second Order Equations
- Homogenous Linear Equations
- Auxiliary Equations with Complex Roots
- Undetermined Coefficients
- Superposition
- Variation of Parameters
- Free Mechanical Vibrations
- Forced Mechanical Vibrations
- RLC Circuits
- Introduction to Laplace Transform
- Solving Initial Value Problems Using the Laplace Transform
- Transforms of Discontinuous and Periodic Functions
- Impulses and the Dirac Delta Function