Course Name: Differential Equations

Course Number: MAT*E285

Credits: 3

Catalog description:. This course demonstrates techniques for solving various types of differential equations. Topics include: ordinary differential equations of the first and higher order, operators, successive approximations, interpolation and numerical integration, infinite series and LaPlace transforms.

Prerequisite: MAT*256 with a grade of C or higher

General Education Competencies Satisfied:

HCC General Education Requirement Designated Competency Attribute Code(s):
None

Discipline-Specific Attribute Code(s):

☒ MATH **Mathematics elective**

Course objectives:

General Education Goals and Outcomes:

None

Course Specific Objectives:

1. Categorize any differential equation.
2. Describe the applications where differential equations are used.
3. Obtain the solutions of specific differential equations.

Course Content:

The Nature of Differential Equations

A. Introduction
B. General remarks on solutions
C. Families of curves: orthogonal trajectories
D. Growth, decay, and chemical reactions
E. Other applications of interest to the class

First-order Equations

A. Homogeneous equations
B. Exact equations
C. Integrating factors
D. Linear equations
E. Reduction of order
F. Applications: electric circuits

Second-order Equations

A. General solution of a homogeneous equation
B. The use of a known solution to find other solutions
C. The homogeneous equation with constant coefficients

D. The method of undetermined coefficients
E. The method of variation of parameters

Power Series Solutions

A. Series solutions of firs-order equations
B. Second-order equations: ordinary points
C. Regular singular points
D. Specific functions (optional)

LaPlace Transforms

A. The theory of LaPlace transforms
B. Applications to differential equations
C. The derivative and integral of LaPlace transforms

Other Topics (as time permits)

REV 1/2015
REV 02/27/2017