MTH 251 - DIFFERENTIAL EQUATIONS

Course Description

This course introduces the concepts of differential equations. Topics include: solving first and second order differential equations, and systems of linear differential equations. Solutions are found using analytical, numerical, or graphical techniques relating to quantitative modeling. Laplace transforms and solving non-linear differential equations are introduced. Complex numbers and their usefulness in solving differential equations is identified. Linear algebra is introduced including the topics of; vector spaces, subspaces, spanning sets, linear dependence and independence, basis and dimensions, eigenvalues, eigenvectors, and linear transformations. Group 1 course.

Credit Hours

4

Contact Hours

4

Lecture Hours

4

Required Prerequisites

A grade of 2.0 or better in MTH 142 or equivalent

Recommended Prerequisites or Skills Competencies

Placement into ENG 111

General Education Outcomes supported by this course

Quantitative Reasoning

Course Learning Outcomes

Knowledge:

- Solve differential equations and differential systems (of 2 variables) with initial conditions analytically, numerically, graphically and qualitatively.
- Utilize technology and theory and explain the limitations of each.

Application:

- Determine the appropriate method for solving various first and second order equations.
- Solve and describe the nature of the solutions to various first order systems of equations.

Integration:

- Represent a physical phenomenon in the form of a differential equation.
- Interpret the solution in the context of the problem and justify the results.

Human Dimension:

- Strive to improve areas of mathematical weakness based on feedback.
- Collaborate with peers during group work.

Caring - Civic Learning:

- Recognize the impact mathematics plays in civic situations such as politics, education and income.

Learning How to Learn:

- Relate mathematical skills to real-life situations.