

## Master Syllabus

### MAT 2310 - Elementary Differential Equations

**Division:** Science, Mathematics and Engineering

**Department:** Mathematics

**Credit Hour Total:** 4.0

**Lecture Hrs:** 4.0

**Prerequisite(s):** MAT 2280

**Other Prerequisite(s):** AND Other with a grade of C or better or satisfactory score on math placement test

**Date Revised:** March 2015

---

#### Course Description:

Solutions and applications of ordinary differential equations including separable, exact, homogeneous and non-homogeneous linear equations and others. Numerical approximation methods as well as substitutions, the total differential, separation of variables, integrating factors, undetermined coefficients, variation of parameters, Laplace Transforms and power series methods are covered.

#### General Education Outcomes:

- Critical Thinking/Problem Solving Competency

#### Course Outcomes:

##### Convolution and Laplace Transform

Evaluate the convolution of two functions and the Laplace Transform and Inverse Laplace Transform of functions.

**Assessment Method:** Locally developed exams

**Performance Criteria:** Score of 70% or better

##### Approximating Solutions to Differential Equations

Approximate solutions to differential equations and initial value problems using direction fields, Euler methods and the Runge-Kutta method.

**Assessment Method:** Locally developed exams

**Performance Criteria:** Score of 70% or better

##### Solve Differential Equations

Solve ordinary first order differential equations.

**Assessment Method:** Locally developed exams

**Performance Criteria:** Score of 70% or better

##### Applications of Differential Equations

Model real world applications of electrical circuits, population growth and Newton's Law of Cooling using differential equations.

**Assessment Method:** Locally developed exams

**Performance Criteria:** Score of 70% or better

#### Outline:

Solutions and applications of ordinary differential equations including separable, exact, homogeneous and nonhomogeneous linear equations and others. Numerical approximation methods as well as substitutions, the total differential, separation of variables, integrating factors, undetermined coefficients, variation of parameters, Laplace Transforms and power series methods are covered.