Wayne County Community College District

COURSE SYLLABUS

MAT 273   Differential Equations

CREDIT HOURS: 4.00

CONTACT HOURS: 60.00

COURSE DESCRIPTION:
This course covers the following topics: the study of first order equations, higher order equations, linear systems of differential equations, power series solutions, and the Laplace transform. The use of a computer algebra system is required.

PREREQUISITE*: MAT 272*

EXPECTED COMPETENCIES:
Upon completion of this course, the student will be familiar with:
- Solutions and Initial-Value Problems; and Direction Fields.
- First-Order Differential Equations, which includes: motion of a falling body, separable equations, linear equations, exact equations, special integrating factors, and substitutions and transformations.
- Mathematical Models and Numerical Methods Involving First-Order Equations, which includes: compartmental analysis, heating and cooling of buildings, Newtonian mechanics, and electrical circuits.
- Linear Second-Order Equations, which includes: the mass spring oscillator, homogeneous linear equations, auxiliary equations with complex roots, non-homogeneous equations, superposition principal, and variation of parameters.
- System and Phase Plane Analysis, which includes: interconnected fluid tanks, elimination method for systems, solving systems and higher-order equations numerically, and introduction to the phase plane.
- Theory of Higher-Order Linear Differential Equations, which includes: basic theory of linear differential equations, homogeneous linear equations with constant coefficients, undetermined coefficients and the annihilator method, and method of variation of parameters.
- Laplace Transforms, which includes: definition and properties of the Laplace transform, inverse Laplace transform, solving initial-value problems, transforms of discontinuous and periodic functions, and convolution.
- Series Solutions of Differential Equations, which includes: the Taylor polynomial approximation, power series and analytic functions, power series solutions to linear differential equations, and equations with analytic coefficients.

ASSESSMENT METHODS:
Student performance may be assessed by examination, quizzes, case studies, oral conversation, group discussion, oral presentations. The instructor reserves the option to employ one or more of these assessment methods during the course.

GRADING SCALE:
90%-100% = A
80%-89.9%= B
70%-79.9%= C
60%-69.9%= D
<60% = E