SCHOOL OF STEM SYLLABUS

TERM:

INSTRUCTOR:

COURSE CODE: MAT-212

OFFICE HOURS:

COURSE TITLE: Differential Equations

OFFICE LOCATION:

DAY(S) AND TIME(S):

EMAIL:

LOCATION:

PHONE:

COURSE PREREQUISITE: Complete MAT-211

CREDITS: 4

COURSE DESCRIPTION:
Methods for solving ordinary differential equations are studied, together with physical and geometrical applications. Laplace transforms and numerical and series solutions are included. Use of mathematical software in problem- solving is emphasized.

STUDENT LEARNING OUTCOMES:

- Upon completion of this course you should be able to:
- Classify differential equations by type, by order, and by linearity.
- The differential between initial value and boundary value problems
- Solve first-order differential equations by:
  - Separating variables
  - Integrating factors
  - Exact equation technique
- Solve higher-order equations by:
  - Reduction of order
  - Homogeneous linear equations with constant coefficients
  - Methods of undetermined coefficient & variation of parameters
  - Cauchy-Euler equation
  - Series solution Method of Frobenius
- Identify Bessel functions and solve Bessel Equations of first and second kind
- Define Laplace Transform
- Obtain transform and inverse of a transform for simple functions
- Apply Translation theorems related to Laplace Transform

TEXTBOOK AND SUPPLEMENTAL MATERIALS:
D. G. Zill, & M. R. Cullen "Differential Equations and Boundary-Value Problems" 9th Edition

GRADING POLICY:

Three one-hour-and-a-half exams	80%
Four WebAssign Homework Assignments	20%

Four exams will be given and the lowest grade will be dropped

SAMPLE COURSE SCHEDULE:

Date	**Topic**
Week 1	Introduction Chapter 1, Definitions & Terminology (classifications) Chapter 1 continued. Chapter 2, First-order differential equations (separable variables, and linear equations)
Week 2	Chapter 2 continued, exact equations, and solutions by Substitutions Review and question/answer time Chapter 3, applications
Week 3	***Exam I, chapters 1, & 2 6:30-8:00 pm*** Exam starts 30 minutes late to allow for late arrivals. No extra time will be given if you arrive late. **Use of phone during the test will be considered as cheating -** **WebAssign Homework 1 is due**
Week 4	Chapter 4, Higher order differential equations (fundamental set of Solutions, linear dependence & linear independence, Wronskian, homogeneous linear equations with constant coefficients, non-homogeneous equations, method of undetermined coefficients),
Week 5	Chapter 4 continued, method of variation of parameters Cauchy-Euler equation
Week 6	Review and question/answer. Work on WebAssign homework 2

Week 7	***Exam II, chapters 2 & 3 6:30-8:00 pm*** Exam starts 30 minutes late to allow for late arrivals. No extra time will be given if you arrive later **Use of phone during the test will be considered as cheating -** **WebAssign homework 2 is due**
Week 8	Spring break- no class meeting
Week 9	Laplace Transform, inverse of a transform Review of grades
Week 10	Laplace Transform Continued unit step function, translation theorems Derivative of a transform, Dirac delta function
Week 11	Easter break- no class
Week 12	Exam III chapters 4, & 7***- 6:30-8:00 pm*** Exam starts 30 minutes late to allow for late arrivals. No extra time will be given if you arrive later. **Use of phone during the test will be considered as cheating -** **WebAssign Homework 3 is due**
Week 13	Chapter 6, Series solutions of linear equations, ordinary and singular points, existence of a power series solution,
Week 14	**Review –** **WebAssign Homework 4 is due**
Week 15	**Exam IV, chapters 6, & 7 *6:30-8:00 pm***

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