



SCHOOL OF STEM SYLLABUS



TERM:

COURSE CODE: MAT-212

COURSE TITLE: Differential Equations

DAY(S) AND TIME(S):

LOCATION:

INSTRUCTOR:

OFFICE HOURS:

OFFICE LOCATION:

EMAIL:

PHONE:

COURSE PREREQUISITE: Complete MAT-211

CREDITS: 4

COURSE DESCRIPTION:

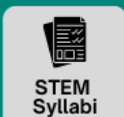
Methods for solving ordinary differential equations are studied, together with physical and geometrical applications. Laplace transforms and numerical and series solutions are included. Use of mathematical software in problem-solving is emphasized.

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

STEM STUDENT HUB

Information & Resources tailored towards students taking any STEM courses



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
<i>Week 3</i>	<i>Exam I, chapters 1, & 2 6:30-8:00 pm</i> 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

<i>Week 7</i>	<p>Exam II, chapters 2 & 3 6:30-8:00 pm</p> <p>Exam starts 30 minutes late to allow for late arrivals. No extra time will be given if you arrive later</p> <p>Use of phone during the test will be considered as cheating -</p> <p>WebAssign homework 2 is due</p>
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
<i>Week 12</i>	<p>Exam III chapters 4, & 7- 6:30-8:00 pm</p> <p>Exam starts 30 minutes late to allow for late arrivals. No extra time will be given if you arrive later.</p> <p>Use of phone during the test will be considered as cheating -</p> <p>WebAssign Homework 3 is due</p>
Week 13	Chapter 6, Series solutions of linear equations, ordinary and singular points, existence of a power series solution,
Week 14	<p>Review –</p> <p>WebAssign Homework 4 is due</p>
<i>Week 15</i>	Exam IV, chapters 6, & 7 6:30-8:00 pm

HCCC POLICIES, STATEMENTS, AND SERVICES:

<https://www.hccc.edu/administration/academic-affairs/syllabus-addendum.html>



