



Hunan University

MATH 41: Differential Equations

Professor: To be announced
Total contact hours: 54 hours
Credit: 4

Course Description

The main purpose of this course is to provide students an understanding of the theory and applications of differential equations, while both computational and conceptual skills will be developed. This course will introduce methods of solving first-order differential equations with and without initial conditions, second-order differential equations with and without initial conditions, higher-order differential equations, Laplace transforms, Fourier series, second-order partial differential equations, numerical solutions, computer-aided study of differential equations, graphics phase planes, systems of differential equations, and applications. Applications may include mixing problems, motion with resistance, springs, thermal conductions, as well as others appropriate for science and engineering.

Textbook

Textbook: *Fundamentals of Differential Equations*
 Author: R. Kent Nagle, Edward B. Saff, Arthur David Snider
 Edition: 8th Edition
 Publication Date: March 31, 2011
 Publisher: Pearson
 ISBN-10: 0321747739
 ISBN-13: 978-0321747730

Grading

- 3 Quizzes 30%
- Participation 10%
- Midterm 20%
- Final Exam 40%

A+ 96-100	A 90-95	A- 85-89
B+ 82-84	B 78-81	B- 75-77
C+ 71-74	C 66-70	C- 62-65
D 60-61	F < 60	



Course Schedule

The course has 24 class sessions in total. All sessions are 2 hours and 15 minutes in length.
Note: the course outline and required readings are subject to change.

Class 1:

Brief introduction of the course

Go through the syllabus

Chapter 1: Introduction

Class 2:

Chapter 2: First-Order Differential Equations

Class 3:

Chapter 2: First-Order Differential Equations (Cont.)

Class 4:

Chapter 3: Mathematical Models and Numerical Methods Involving First-Order Equations

Class 5:

Chapter 3: Mathematical Models and Numerical Methods Involving First-Order Equations (Cont.)

Class 6:

Overview of Chapter 1 to Chapter 3

Quiz 1

Class 7:

Chapter 4: Linear Second-Order Equations

Class 8:

Chapter 4: Linear Second-Order Equations (Cont.)

Class 9:

Chapter 5: Introduction to Systems and Phase Plane Analysis

Class 10:

Chapter 5: Introduction to Systems and Phase Plane Analysis (Cont.)

Quiz 2

Class 11:

Chapter 6: Theory of Higher-Order Linear Differential Equations

Class 12:



Overview of Chapter 1 to Chapter 6
Midterm

Class 13:
Chapter 7: Laplace Transforms

Class 14:
Chapter 7: Laplace Transforms (Cont.)

Class 15:
Chapter 8: Series Solutions of Differential Equations

Class 16:
Chapter 8: Series Solutions of Differential Equations (Cont.)

Class 17:
Overview of Chapter 7 to Chapter 8
Participation

Class 18:
Chapter 9: Matrix Methods for Linear Systems

Class 19:
Chapter 9: Matrix Methods for Linear Systems (Cont.)

Class 20:
Chapter 10: Partial Differential Equations

Class 21:
Chapter 10: Partial Differential Equations (Cont.)

Class 22:
Overview of Chapter 9 to Chapter 10
Quiz 3

Class 23:
Overview for Final Exam

Class 24:
Final Exam



Attending Policy

Regular and prompt attendance is required. Under ordinary circumstances, you may miss two times without penalty. Each absence over this number will lower your course grade by a third of a letter and missing more than five classes may lead to a failing grade in the course. Arriving late and/or leaving before the end of the class period are equivalent to absences.

Policy on “Late Withdrawals”

In accordance with university policy, appeals for late withdrawal will be approved ONLY in case of medical emergency and similar crises.

Academic Honesty

Hunan University expects all students to do their own work. Instructors will fail assignments that show evidence of plagiarism or other forms of cheating, and will also report the student's name to the University administration. A student reported to the University for cheating is placed on disciplinary probation; a student reported twice is suspended or expelled.

General Expectations:

Students are expected to:

- Attend all classes and be responsible for all materials covered in class and otherwise assigned;
- Complete the day's required reading and assignments before class;
- Review the previous day's notes before class and make notes about questions you have about the previous class or the day's reading;
- Participate in class discussions and complete required written work on time;
- Refrain from texting, phoning or engaging in computer activities unrelated to class during the class period;
- While class participation is welcome, even required, you are expected to refrain from private conversations during the class period.

Special Needs or Assistance

Please contact the Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material. Our goal is to help you learn, not to penalize you for issues which mask your learning.