



Differential Equations

Course Number:	MTH 220	Term:	Summer, 2021
Instructor:	TBA	Email:	
Contact Hours:	60	Meeting Times:	TBA
Awarded Credits:	4.0		

Course Description:

This course is an introductory course to differential equations. The course covers techniques for solving many of the first and second order differential equations that arise in applications. This course will focus mainly on applications of differential equations and techniques of problem- solving. From time to time, I will mention the underlying theory, but the emphasis for this class is not proofs. The material for this course draws heavily from integral calculus. It will be imperative that you are comfortable working with integration techniques, in particular substitution, integration by parts, and partial fractions.

Learning Objectives:

Upon successful completion of this course, students will be prepared to:

1. Solve first order differential equations
2. Solve second order differential equations
3. Test solutions to differential equations
4. Visualize solutions to differential equations
5. Model real-world scenarios with differential equations

Required Textbook and Course Materials:

Text:	Elementary Differential Equations and Boundary Value Problems
Authors:	William E. Boyce and Richard C. DiPrima
Edition:	10th Edition
ISBN:	1118157389

Language of Instruction:

This course is taught entirely in English, including lectures, homework, assignments and examinations. Teaching assistants will be fluent in both English and Mandarin.

Course Prerequisites:

MTH 111 Calculus I and MTH 201 Introduction to Linear Algebra, or equivalent

University Policies**Class Format**

In Person. Course activities, discussions, assignments and resources will be made available at the start of and during the course.

Attendance, Participation and Deliverables

Courses are very intensive and in order to be successful, students need to attend every class. Attendance is required for all lectures and class activities. Class participation is expected from every student and form a significant portion of the final course grade.

All course deliverables (homework assignments and tests) are due on time as assigned. This course includes *no* make-ups, postponements or additional assignments, except for verified medical emergencies. If you miss an exam/assignment due to a non-sanctioned absence, your score on that exam/assignment will be zero.

Academic Dishonesty

All cases of academic dishonesty will be diligently pursued. Academic dishonesty includes representing the work of another as one's own work or cheating by any means. Academic dishonesty also includes aiding, abetting, concealing or attempting such activity. The penalty is automatic failure of the course and possible suspension from the university.

Grading Scale

Grading Scale (%)

97 - 100	A+	77 - 79	C+
93 - 96	A	73 - 76	C
90 - 92	A-	70 - 72	C-
87 - 89	B+	67 - 69	D+
83 - 86	B	63 - 66	D
80 - 82	B-	60 - 62	D-
		0 - 59	F

Professor- and Course-Specific Policies (*Tentative*)

Exams:

No make-ups will be given after the exam. The use of the textbook or any other written reference is not allowed during the exams. Calculators are allowed. The purpose of the exams is to test your understanding of key concepts from the course lectures and materials.

Quizzes:

There are no make-ups for quizzes; under any circumstance.

Homework:

Assignments will be listed at the beginning of the course. The purpose is to prepare you for the exams. The homework is a very important part of the course. No matter how well you think you understand the material presented in class, you won't really learn it until you do the problems.

Grade Components:

Quizz(es)	20%
Exam(s)	50%
Homework	20%
Attendance	10%
Total	100%

Course Schedule (Tentative)

Module	Topics
1	Integration Review and Partial Differentiation Definition and Terminologies Initial-value Problems Separable Equations, Linear Equations, and Exact Equations
2	Solution by Substitution Linear Models and Nonlinear Models Modeling with Systems of First-order Des Higher-Order Linear Differential Equations and Homogeneous Equations Reduction of Order
3	Homogeneous Linear Equations with Constant Coefficients Method of Undetermined Coefficients Variation of Parameters
4	Linear Models: Mass and Spring Systems Boundary-value problems Non-Linear Models Power Series Solutions about Ordinary and Singular Points Laplace Transforms and Inverse Laplace
5	Linear Systems of Differential Equations Homogeneous Linear System Non-Homogeneous Linear System Euler Methods Runge-Kutta Methods Final Exam