

## Spring 2025. MATH3354. Section 001.

### Differential Equations I

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**Classroom and Time:** MWF 13:00 PM-13:50 PM in MA 016 (Mathematics Building)

**Office hours:** MWF 9:30am-10:45am

**Course website:** <http://www.math.ttu.edu/~lhoang/2025Spr-M3354/>

Updates about the course and other related announcements will be posted on this webpage.

**Prerequisite:** MATH 2350 or 2450 and MATH 2360.

**Text:** *Differential Equations with Boundary-Value Problems*, 10th edition, by D.G. Zill, published by Cengage.

**Course Description:** This course covers topics in ordinary differential equations: First-order differential equations; Modeling with first-order differential equations; Higher-order differential equations; Modeling with higher-order differential equations; Laplace transform; Series solutions of Linear Equations.

#### Course Outline:

- Chapter 1 – (1.1, 1.2) Introduction
- Chapter 2 – (2.1-2.6) First-Order Differential Equations
- Chapter 3 – (3.1-3.2) Modeling with First-Order Differential Equations
- Chapter 4 – (4.1-4.4, 4.6, 4.7) Higher-Order Differential Equations
- Chapter 5 – (5.1) Modeling with Higher-Order Differential Equations
- Chapter 6 – (6.1, 6.3) Series Solutions of Linear Equations
- Chapter 7 – (7.1-7.5) Laplace Transform

**Expected Learning Outcomes:** Students will obtain a thorough knowledge of solution techniques for first-order and for second- and higher-order constant coefficient linear homogeneous and nonhomogeneous initial value problems using standard methods of undetermined coefficients and variation of parameters. In addition, the students will acquire a general understanding of how to apply the Laplace transform in solving initial value problems and convolution integral equations. Students will gain an appreciation for some of the applications of ordinary differential equations in biology and engineering.

**Methods of Assessment of Learning Outcomes:** Assessment of the learning outcomes will be achieved through homework assignments, three midterm exams, and a final exam.

**Grading policy:** Homework will be assigned weekly and will count for 25% of the grade. **However, your overall grade in the Homework at the end of the semester must be at least 50%, otherwise you automatically fail the course.** The lowest homework score will be dropped. There will be three midterm exams in class, each will count for 15% of the grade. The final exam will count for 30% of the grade. All in-class exams are closed-book. No make-up exams are given unless legitimate documents for excuses are presented to the instructor at least a week in advance.

Grading Scale: A: 90%-100%, B: 80%-89%, C: 70%-79%, D: 60%-69%, F: below 60%

**Homework assignments:** Online homework will be assigned through Webwork. Students will receive the instructor's message for login information. Due dates are indicated on each assignment. Students should spend very first week to get familiar with the system.

**Webwork Link:** <https://webwork.math.ttu.edu/webwork2/spr25lhoangm3354s001>

**Attendance Policy:** Students must go to lectures and attendance will be taken. If you miss no more than four lectures, a bonus of three points will be added to your final grade.

**Calculators:** Only scientific calculators are allowed in exams. These calculators can calculate the values of the standard algebraic, trigonometric, exponential and logarithmic functions. Graphing calculators and calculators that can do symbolic manipulations are not allowed.

### **Examination Schedule:**

- Midterm 1: \*\*\* Friday, February 14, \*\*\* in class. (The date was changed from Wednesday to avoid the Engineering Job Fair.)
- Midterm 2: Wednesday, March 12, in class
- Midterm 3: Wednesday, April 16, in class
- FINAL EXAM: Monday, May 12, 1:30 p.m. - 4:00 p.m. Room MA 016 (our classroom)

### **Critical Dates:**

- Jan. 15: Classes begin.
- Jan. 20: MLK Day. University holiday.
- Jan. 21: Last day for student-initiated addition of a course on MyTech.
- Jan. 31: Last day for student-initiated drop on MyTech without academic penalty (drop does not count against drop limit).
- Feb. 1: Student-initiated drop made on or after this date counts against drop limit.
- Mar. 15 - 23: Spring Break. No classes.
- Apr. 21: No classes.
- Apr. 22: Last day for student-initiated drop on MyTech with academic penalty (counts against drop limit).
- May 1 - 7: No exams.
- May 6: Last day of classes.

**TTU Policies.** Texas Tech Policies Concerning Academic Honesty, Special Accommodations for Students with Disabilities, Student Absences for Observance of Religious Holy Days, and Statement of Accommodation for Pregnant Students may be found on Blackboard. Relevant Texas Tech policies can be found here:

- <https://www.depts.ttu.edu/tlpdc/RequiredSyllabusStatements.php>
- <https://www.depts.ttu.edu/tlpdc/RecommendedSyllabusStatements.php>

Some of the policies are below.

ADA accommodations. Any student who, because of a disability, may require some special arrangements in order to meet course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services, during the

instructor's office hours. Please note instructors are not allowed to provide classroom accommodations to student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office at 335 West Hall or (806) 742-2405.

Religious holy day. "Religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Texas Tax Code 11.20. A student who intends to observe a religious holy day should make that intention known to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence. A student who is excused under Section 2 may not be penalized for the absence; however, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily.

Academic Integrity. Academic integrity is taking responsibility for one's own class and/or course work, being individually accountable, and demonstrating intellectual honesty and ethical behavior. Academic integrity is a personal choice to abide by the standards of intellectual honesty and responsibility. Because education is a shared effort to achieve learning through the exchange of ideas, students, faculty, and staff have the collective responsibility to build mutual trust and respect. Ethical behavior and independent thought are essential for the highest level of academic achievement, which then must be measured. Academic achievement includes scholarship, teaching, and learning, all of which are shared endeavors. Grades are a device used to quantify the successful accumulation of knowledge through learning. Adhering to the standards of academic integrity ensures grades are earned honestly. Academic integrity is the foundation upon which students, faculty, and staff build their educational and professional careers.

**Civility in the Classroom:** Students are expected to assist in maintaining a classroom environment that is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor, students are prohibited from engaging in any other form of distraction. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class.

**Advice:** Come to class regularly, work on homework problems. Ask questions in class and get help from the instructor during the office hours. Master the material quickly and *do not* wait too late until the midterms or the final exam. Students are encouraged to give feedbacks to the instructor during the semester.

**NOTE:** When needed, the instructor will communicate with the students using their TTU email addresses. At the beginning of the semester, the instructor will send out two messages, one to confirm the students' email addresses, and another to inform about Webwork. If a student does not receive these messages by the time of the second class, he/she must contact the instructor immediately.

#### **Handouts:**

- [Syllabus](#)
- [Summary of Chapter 3 \(Prof. D. Gilliam\)](#)
- [Formula sheet: Method of undetermined coefficients \(Prof. D. Gilliam\)](#)
- [Formula sheet: Partial fractions \(Prof. D. Gilliam\)](#)

#### **Links:**

- [WeBWork](#)
- [How to Enter Answers in WeBWorK \(Prof. D. Gilliam\)](#)