

Fall 2024. MATH3351. Section 001.

Higher Mathematics for Engineers and Scientists II

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Classroom and Time: MWF 12:00 PM-12:50 PM in MA 016 (Mathematics Building)

Office hours: MWF 10:30am-11:30am

Course website: <http://www.math.ttu.edu/~lhoang/2024Fall-M3351/>

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

Prerequisite: MATH 3350 or MATH 3354.

Text: *Elementary Differential Equations & Boundary Value Problems*, 12th Edition, Boyce, DiPrima, and Meade, Wiley and Sons, Inc. (2022)

Course Description: This course covers topics in linear algebra, systems of ordinary differential equations, Fourier series and solution of boundary value problems for partial differential equations. Topics to be covered include: Linear Algebra and Matrix Theory; Systems of linear first-order differential equations; Orthogonal Functions and Fourier Series; Boundary-Value Problems in Rectangular Coordinates; Boundary-Value Problems in Other Coordinate Systems.

Course Outline:

- Chapter 7 – Systems of First-Order Linear Equations
- Chapter 8 – Numerical Methods
- Chapter 9 – Nonlinear Differential Equations and Stability
- Chapter 10 – Partial Differential Equations and Fourier Series
- Chapter 11 – Boundary Value Problems and Sturm-Liouville Theory

Student Learning Outcomes: The students will extend their knowledge of differential equations and their solutions acquired in MATH 3350 by developing new methods to solve differential equations and by studying the concept of partial differential equations and their solutions and applications. In particular, the students learn:

- about the fundamental properties of linear systems, and their solutions
- how to solve partial differential equations by separation of variables or Fourier series
- to apply these techniques to the three classical equations: the heat, wave, and Laplace's equation
- many examples of boundary value problems that appear in physical sciences 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/f24lhoangm3351s001/>

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, September 20, in class (date has been changed to avoid the Engineering Job Fair on Wednesday)
- Midterm 2: Wednesday, October 16, in class
- Midterm 3: Wednesday, November 20, in class
- FINAL EXAM: Thursday, December 5, 1:30 p.m. - 4:00 p.m. Room MA 016

Critical Dates:

- Aug. 22: Classes begin.
- Aug. 27: Last day for student-initiated addition of a course on MyTech.
- Sep. 2: Labor Day. University Holiday.
- Sep. 9: Last day for student-initiated drop on MyTech without academic penalty (drop does not count against drop limit).
- Sep. 10: Student-initiated drop made on or after this date counts against drop limit.
- Nov. 18: Last day for student-initiated drop on MyTech with academic penalty (counts against drop limit).
- Nov. 25 - Dec. 4: No exams.
- Nov. 27 - Dec. 1: Thanksgiving holiday. No classes.
- Dec. 3: 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](#)

Links:

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