

PRACTICAL INFORMATION

Class time: Asynchronous
Q&A sessions TF 1–2 pm
Instructor: Lars Winther Christensen
Class room/office: Blackboard Collaborate
Office hours: MR 1:30–3:00 pm or by appointment
E-mail: lars.w.christensen@ttu.edu
Course homepage: www.math.ttu.edu/~lchrste/teaching.html
WebAssign Class Key id: ttu 4866 7034

COURSE DESCRIPTION

Linear algebra is the study of systems of linear equations and the related concept of vector spaces. The class is focused on solution of concrete problems.

Required text: *Elementary Linear Algebra*, 8th edition by Ron Larson, Cengage.

Prerequisites: Math 1452 or consent of the department.

Student learning outcomes: Math 2360 satisfies the university's core curriculum requirement in mathematics: *Students graduating from Texas Tech University should be able to demonstrate the ability to apply quantitative and logical skills to solve problems.* It meets the following TTU general education student learning outcomes for mathematics, that students will:

- Apply arithmetic, algebraic, geometric, statistical, and logical reasoning to solve problems.
- Represent and evaluate basic mathematical and/or logical information numerically, graphically, and symbolically.
- Interpret mathematical and/or logical models such as formulas, graphs, tables, and schematics, and draw inference from them.

In the class, the students will develop skills in manipulating matrices and understand their connections to linear systems of equations. The students will develop an understanding of the concept of vector spaces including bases, linear transformations, eigenvectors, and eigenspaces.

In particular the students will learn to

- Solve systems of linear equations
- Perform matrix arithmetic and compute the determinant of a matrix
- Perform the Gram-Schmidt orthogonalization process
- Compute eigenvalues and eigenvectors
- Recognize vector spaces and determine their bases
- Express a linear transformation as a matrix

LEARNING ASSESSMENT

Graded assessment is done through homework and exams. Other assessment techniques will also be used; these include discussions during office hours and Q&A sessions. Additionally, problems will be assigned for student self-assessment. The homework problems will be assigned out of the textbook and an online test bank; they will be chosen such that they facilitate the students' development of skills in manipulating matrices, solving systems of linear equations, and determining bases for vector spaces. Exam problems will be constructed such as to test if the students have acquired the skills and understanding necessary to perform the five types of operations listed (●) above.

COURSE ORGANIZATION

The 14 weeks of classes are spent on sections 1.1–1.2 (1 week), 2.1–2.4 (2 w), 3.1–3.4 (2 w), 4.1–4.7 (4 w), 6.1–6.4 (2 w), 7.1–7.3 (1.5 w), and 5.1–5.4 (1.5 w), with examples drawn from sections 1.3, 2.5–2.6, 4.8, 6.5, and 7.4. Exact reading assignments are posted in weekly study guides..

Term exams: Delivered via WeBWorK on 8 October and 16 November; 1 hour each.

Final exam: Delivered via WeBWorK on Friday 4 December, 2.5 hour.

Other important dates:

Labor Day Holiday	7 September
Last day to drop a course without penalty	9 September
Last day to drop a course	24 November
Thanksgiving Vacation	25–29 November
Last day to withdraw	24 November

ASSIGNMENTS, PARTICIPATION, GRADES, AND GRADING

Two exams are given during the semester. Homework will be assigned 24 times during the semester. These are all done in WeBWorK and due by Midnight on Mondays and Thursdays. Students are encouraged to work together on the homework problems; not on exams. Results and grades are posted at www.blackboard.ttu.edu.

Participation: The semester spans 15 calendar weeks. In each week one percent credit can be gained, either by coming to office hours on Blackboard Collaborate, or by posting a relevant and serious question or answer on the Linear Algebra Discussion Forum in Blackboard. Students must request credit for posts on the discussion forum by emailing the instructor.

Grading policy: On exams and written homework, partial credit for correct steps will be awarded even if the final answer is wrong. Full credit will be given only if the final answer and all intermediate steps are correct. A correct final answer does not *per se* guarantee any credit.

Deadlines and make ups: Homework is not accepted after the deadline. The final exam is cumulative and can serve as make-up for term exams that were missed for legitimate reasons.

Final grade: Homework (24 assignments), exams (3), and participation counts towards the final grade with weights as follows: Online homework 60% (2.5% ea.), attendance 15% (1% per week), term exams 10% (5% ea.), and final exam 15%.

GENERAL POLICIES

Academic integrity: It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. The attempt of students to present as their own any work not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offenders liable to serious consequences, possibly suspension. “Scholastic dishonesty” includes, but it not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student or the attempt to commit such an act. See www.depts.ttu.edu/opmanual/OP34.12.pdf.

Students with disabilities: Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services (SDS) during the instructor’s office hours. Please note: instructors are not allowed to provide classroom accommodations to a student until appropriate verification from SDS has been provided. For additional information, please contact SDS in West Hall or call 806-742-2405. Please see more on-line at www.depts.ttu.edu/opmanual/OP34.22.pdf

Religious holy days: Students are allowed to take time to travel and observe a religious holy day as detailed in www.depts.ttu.edu/opmanual/OP34.19.pdf. Note that prior notice must be given to the instructor in writing.

COVID-19 RELATED POLICIES

The University's COVID-19 related policies primarily concern face-to-face classes, but to the extent that they are relevant they apply equally to this online class.

Illness-based absence policy: If at any time during this semester you feel ill, in the interest of your own health and safety as well as the health and safety of your instructors and classmates, you are encouraged not to attend face-to-face class meetings or events. Please review the steps outlined below that you should follow to ensure your absence for illness will be excused. These steps also apply to not participating in synchronous online class meetings if you feel too ill to do so and missing specified assignment due dates in asynchronous online classes because of illness.

1. If you are ill and think the symptoms might be COVID-19-related:
 - (a) Call Student Health Services at 806.743.2848 or your health care provider. After hours and on weekends contact TTU COVID-19 Helpline at 806.742.5929.
 - (b) Self-report as soon as possible using the Dean of Students COVID-19 webpage. This website has specific directions about how to upload documentation from a medical provider and what will happen if your illness renders you unable to participate in classes for more than one week.
 - (c) If your illness is determined to be COVID-19-related, all remaining documentation and communication will be handled through the Office of the Dean of Students, including notification of your instructors of the period of time you may be absent from and may return to classes.
 - (d) If your illness is determined not to be COVID-19-related, please follow steps 2.(a)–(d) below.
2. If you are ill and can attribute your symptoms to something other than COVID-19:
 - (a) If your illness renders you unable to attend face-to-face classes, participate in synchronous online classes, or miss specified assignment due dates in asynchronous online classes, you are encouraged to visit with either Student Health Services at 806.743.2848 or your health care provider. Note that Student Health Services and your own and other health care providers may arrange virtual visits.
 - (b) During the health provider visit, request a “return to school” note;
 - (c) E-mail the instructor a picture of that note;
 - (d) Return to class by the next class period after the date indicated on your note.

Following the steps outlined above helps to keep your instructors informed about your absences and ensures your absence or missing an assignment due date because of illness will be marked excused. You will still be responsible to complete within a week of returning to class any assignments, quizzes, or exams you miss because of illness.