

**PRACTICAL INFORMATION**

Class time: MWF 3:00–3:50 pm  
Class room: MATH 016  
Instructor: Lars Winther Christensen  
Office: Weeks Hall 347  
Office hours: W 12.00–1.30 pm, R 3.30–5 pm, or by appointment  
E-mail: lars.w.christensen@ttu.edu  
Homepage: [www.math.ttu.edu/~lchriste/teaching.html](http://www.math.ttu.edu/~lchriste/teaching.html)  
WebAssign Class Key id: ttu 5596 8839 (enrollment optional)

**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*, 8<sup>th</sup> 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 is also a Communication Literacy course. 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

Of the 43 class periods, 39 will be spent on lectures and in-class activities and 4 on exams and feedback. The plan is to cover sections 1.1–1.2 (3 class periods), 2.1–2.4 (6 c.p.), 3.1–3.4 (5 c.p.), 4.1–4.7 (8 c.p.), 6.1–6.4 (5 c.p.), 7.1–7.2 (4 c.p.), 5.1–5.4 (6 c.p.), and 7.3 (2 c.p.) with examples drawn from sections 1.3, 2.5–2.6, 4.8, 6.5, and 7.4. Exact reading assignments are posted on Blackboard, which is updated after every class.

**Exams:** In-term exams take place on Monday 21 February and Monday 4 April, 3:00–3:50 pm. The final exam is on Saturday 7 May, 4:30–7:00 pm.

### Other important dates:

Martin Luther King Jr. Day	17 January
Last day to drop a course without penalty	28 January
Spring Break	12–20 March
No classes	18 April
Last day to drop a course	27 April
Last day to withdraw	27 April

Two exams are given during the semester. Homework will be assigned 14 times during the semester. Each assignment has an online part in WeBWorK due by Midnight on Thursdays, and a written part due in class on Fridays. Students are encouraged to work together on the homework problems. Results and grades are posted at [www.blackboard.ttu.edu](http://www.blackboard.ttu.edu).

**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 (12 of 14 assignments) and exams (3) count towards the final grade with weights as follows: Online homework 30% (2.5% ea.), written homework 10% (5/6% ea.), in-term exams 30% (15% ea.), and final exam 30%.

## 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 is 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](http://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](http://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](http://www.depts.ttu.edu/opmanual/OP34.19.pdf). Note that prior notice must be given to the instructor in writing.