MATH 3301 Linear Algebra – Fall 2021

Instructor Information
Instructor: Dr. Susan Abernathy-Taylor
Office: MCS 220i
Phone: 325.486.5442
Office Hours: MW 10am-1pm; TR 12:15-2:15pm;
          or by appointment.

Email: All of the following addresses work.
      They all go to the same inbox; you need only send an email to one of them.
      susan.abernathy@angelo.edu
      susan.taylor@angelo.edu
      staylor28@angelo.edu

Class Time/Location
MWF 8:00-8:50am in MCS 210

Textbook
Linear Algebra & Its Applications (5th edition), by Lay, Lay, and McDonald
ISBN: 9780321982384

Grading System
Grades will be determined as follows:
  Tests: 60% (best two 22% each, lowest 16%)
  Homework: 10%
  Quizzes/In-Class Work: 5%
  Final Exam: 25%
Final grades will be based on the following grading scale: A is 89.5+, B is 79.5-89.49, C is 69.5-79.49, D is 59.5-69.49, F is below 59.5.

Test grades and periodic overall averages will be posted in Blackboard.

Disclaimer
This syllabus is current and accurate as of its posting date, but will not be updated. For the most complete and up-to-date course information, email the instructor.

Attendance
Students are expected to attend class as long as they are not experiencing symptoms of illness. If you are under the weather, or have known exposure to someone who has COVID-19, please do not come to class. Attendance will be taken daily, and excessive absences will be reported to the appropriate university authorities.

Homework
Homework sets will be assigned at least once a week. They will be posted on Blackboard and you will submit homework online. Late homework is not accepted, but your lowest three
homework grades will be dropped. If you know you will miss class, you may turn in your homework early. To receive credit for a problem, you must show your work and write legibly.

Quizzes and In-Class Work
We will have short quizzes throughout the semester. Quizzes will always be announced in class ahead of time. There will also periodically be in-class assignments which count toward this grading category. These assignments will not be announced ahead of time. Except under extenuating circumstances, Quizzes and In-Class Work may not be made up if missed. If you know you will miss a quiz, you may request to take it ahead of time.

Tests
There will be three in-class exams. Your best two test grades will each count for 22% of your overall grade; your worst test grade will count for 16% of your overall grade. There will also be a cumulative final exam at the end of the semester which is 20% of your overall grade. Exam dates are listed below. In general, calculators will not be allowed during exams.

- Test 1: Wednesday, September 22
- Test 2: Friday, October 22
- Test 3: Monday, November 22
- Final Exam: Monday, December 6th, 8-10am

Make-up Policy
If you have a conflict with an exam, you must talk to me about it beforehand if possible. If you miss a test, your final exam grade will replace it. You will receive a grade of zero on any subsequent missed tests. Make-up tests will be given (or not) at the discretion of the instructor.

Student Responsibilities
The student is solely responsible for:

- Staying home and completing the Wellness Screening in Ramport if you are experiencing any symptoms of COVID-19 or have known exposure to a person who has tested positive.
- Maintaining academic honesty.
- Completing each assignment by the specified due date.
- Obtaining assignments (graded or newly assigned) and other materials for classes missed.
- Positively contributing to the classroom environment. Be courteous; don’t use your phone in class; be on time; don’t disrupt your fellow classmates.
- Being proactive about their grade in this course. You are not given a grade in a college course; you EARN your grade. You may want or need a particular grade to graduate, maintain a scholarship, or stay in athletics, for instance. It is your responsibility to put in as much effort as it takes to earn this grade. This includes utilizing (as needed) all available study aid options (going to office hours and/or Math Lab, reading outside textbooks, meeting with the instructor, etc.) to resolve any questions or concerns you might have about any aspect of the course.
General Policies Related to This Course
All students are required to follow the policies and procedures presented in these documents:

- Angelo State University Student Handbook\(^i\)
- Angelo State University Catalog\(^ii\)

Information About COVID-19
Please refer to ASU’s COVID-19 (Coronavirus) Updates\(^iii\) web page for current information about campus guidelines and safety standards as they relate to the COVID-19 pandemic.

Academic Integrity
Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU.

The College of Science and Engineering adheres to the university’s Statement of Academic Integrity\(^iv\).

Accommodations for Students with Disabilities
ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA) and subsequent legislation.

Student Disability Services is located in the Office of Student Affairs, and is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability. It is the student’s responsibility to initiate such a request by contacting an employee of the Office of Student Affairs, in the Houston Harte University Center, Room 112, or contacting the department via email at ADA@angelo.edu. For more information about the application process and requirements, visit the Student Disability Services website.\(^v\) The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dr. Dallas Swafford
Director of Student Disability Services
Office of Student Affairs
325-942-2047
dallas.swafford@angelo.edu
Houston Harte University Center, Room 112
Incomplete Grade Policy
It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 Grading Procedures for more information.

Plagiarism
Plagiarism is a serious topic covered in ASU’s Academic Integrity policy in the Student Handbook. Plagiarism is the action or practice of taking someone else’s work, idea, etc., and passing it off as one’s own. Plagiarism is literary theft.

In your discussions and/or your papers, it is unacceptable to copy word-for-word without quotation marks and the source of the quotation. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list.

Papers are subject to be evaluated for originality. Resources to help you understand this policy better are available at the ASU Writing Center.

Student Absence for Observance of Religious Holy Days
A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 Student Absence for Observance of Religious Holy Day for more information.

Title IX at Angelo State University
Angelo State University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from sex discrimination of any kind. In accordance with Title VII, Title IX, the Violence Against Women Act (VAWA), the Campus Sexual Violence Elimination Act (SaVE), and other federal and state laws, the University prohibits discrimination based on sex, which includes pregnancy, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination and unwelcome behavior of a sexual nature. The term includes sexual harassment, nonconsensual sexual contact, nonconsensual sexual intercourse, sexual assault, sexual exploitation, stalking, public indecency, interpersonal violence (domestic violence or dating violence), sexual violence, and any other misconduct based on sex.

You are encouraged to report any incidents involving sexual misconduct to the Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator, Michelle Miller, J.D. You may submit reports in the following manner:

Online: Incident Reporting Form
Face to Face: Mayer Administration Building, Room 210
Note, as a faculty member at Angelo State, I am a mandatory reporter and must report incidents involving sexual misconduct to the Title IX Coordinator. Should you wish to speak to someone in confidence about an issue, you may contact the University Counseling Center (325-942-2371), the 24-Hour Crisis Helpline (325-486-6345), or the University Health Clinic (325-942-2171).

For more information about resources related to sexual misconduct, Title IX, or Angelo State’s policy please visit the [Title IX website](#).

**Topics by Week**
This subject matter listed below is tentative and subject to change. For current information about course topics, please contact the instructor.

1. 1.1-1.2
2. 1.3-1.4
3. 1.6-1.8
4. 1.9-2.1
5. Test 1, 2.2
6. 2.3, 3.1
7. 3.2, 4.1
8. 4.2, 4.3
9. 4.3, Test 2
10. 4.5, 4.6
11. 5.1, 5.2
12. 5.3, 6.1
13. 6.2, 6.3
14. Test 3
15. Special Topics, Review
16. Final Exam

**Student Learning Outcomes – Math 3301**

1. **Students will demonstrate factual knowledge including the mathematical notation and terminology used in this course.** Students will learn the vocabulary, symbolism and basic definitions used in linear algebra, including vectors, matrices, vector spaces, subspaces, linear independence, span, basis, dimension, linear transformation, inner product, eigenvalue and eigenvector.

2. **Students will describe the fundamental principles including the laws and theorems arising from concepts covered in this course.** Students will become familiar with the theorems about and the characteristics of linear spaces and linear transformations. Students will determine bases,
compute dimensions, evaluate linear transformations, solve systems of linear equations and find determinants.

3. **Students will apply course material along with procedures and techniques covered in this course to solve problems.** Students will apply properties and theorems about linear spaces to specific mathematical structures that satisfy the linear space axioms.

4. **Students will develop specific skills, competencies, and thought processes sufficient to support further study or work in this field or related fields.** Students will acquire a level of proficiency in the fundamental concepts and applications necessary for further study in academic areas requiring linear algebra as a prerequisite or for work in occupational fields requiring a background in linear algebra. These fields might include the physical sciences and engineering as well as mathematics.

**Course Content**

**Textbook:** *Linear Algebra and Its Applications*, Fifth Edition, by David Lay, Steven Lay, Judi McDonald. The following chapters including the particular sections listed are covered. (See textbook “Contents”)

1. **Linear Equations in Linear Algebra:** Systems of Linear Equations; Row Reduction and Echelon Forms; Vector Equations; The Matrix Equation $Ax = b$; Solution Sets of Linear Systems; Linear Independence; Introduction to Linear Transformations; The Matrix of a Linear Transformation.
2. **Matrix Algebra:** Matrix Operations; The Inverse of a Matrix; Characterizations of Invertible Matrices.
3. **Determinants:** Introduction to Determinants.
4. **Vector Spaces:** Vector Spaces and Subspaces; Null Spaces, Column Spaces, and Linear Transformations; Linearly Independent Sets, Bases; Coordinate Systems; The Dimension of a Vector Space; Rank.
5. **Eigenvalues and Eigenvectors:** Eigenvectors and Eigenvalues; The Characteristic Equation; Diagonalization.

Additional topics will be chosen from among the following: more on determinants, partitioned matrices, matrix factorizations, change of basis, topics from Chapter 6 (Orthogonality and Least Squares), topics from Chapter 7 (Symmetric Matrices and Quadratic Forms), and applications.

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i [https://www.angelo.edu/current-students/student-handbook/](https://www.angelo.edu/current-students/student-handbook/)
ii [https://www.angelo.edu/academics/catalog/](https://www.angelo.edu/academics/catalog/)
iii [https://www.angelo.edu/covid-19/](https://www.angelo.edu/covid-19/)
v [https://www.angelo.edu/current-students/disability-services/](https://www.angelo.edu/current-students/disability-services/)
vi [https://www.angelo.edu/content/files/14197-op-1011-grading-procedures](https://www.angelo.edu/content/files/14197-op-1011-grading-procedures)
vii [https://www.angelo.edu/current-students/writing-center/academic_honesty.php](https://www.angelo.edu/current-students/writing-center/academic_honesty.php)
viii [https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of](https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of)
ix [https://www.angelo.edu/incident-form](https://www.angelo.edu/incident-form)
x [https://www.angelo.edu/title-ix](https://www.angelo.edu/title-ix)