South Plains College
Common Course Syllabus: Linear Algebra (MATH 2318)
Spring 2021

Department: Mathematics, Engineering, and Computer Science

Discipline: Mathematics

Course Number: MATH 2318

Section: 001 (Tuesdays and Thursdays, 11:00am-12:15pm, Math and Engineering building, room 108)

Course Title: Linear Algebra

Available Formats: conventional/flex

Campuses: Levelland, and Reese. This class meets on the Levelland campus.

Course Description: Introduces and provides models for application of the concepts of vector algebra. Topics include finite dimensional vector spaces and their geometric significance; representing and solving systems of linear equations using multiple methods, including Gaussian elimination and matrix inversion; matrices; determinants; linear transformations; quadratic forms; eigenvalues and eigenvector; and applications in science and engineering.

Prerequisite: Successful completion with a grade of 'C' or better in MATH 2414.

Credit: 3 **Lecture:** 3 **Lab:** 0

Instructor: Jay Driver
Telephone: (806) 716-2780
Office: Math and Engineering building, office 114
Email: The instructor may be emailed through Blackboard or at jdriver@southplainscollege.edu.

Email Policy: All students at South Plains College are assigned a standardized SPC e-mail account. Although personal email addresses will continue to be collected, the assigned SPC e-mail account will be used as the official channel of communication for South Plains College. The Student Correspondence Policy can be found at www.southplainscollege.edu. To access the SPC student e-mail account, log in to portal.office.com. (Copied from SPC Student Guide) Since all students have an assigned SPC email, the instructor will only acknowledge, respond, and send emails to your assigned SPC email. This ensures all correspondence from the instructor is received by the intended recipient.

Virtual/Face-to-Face Office Hours:
- Mondays, 11:00-12:00pm, 1:30-2:30pm.
- Tuesdays, 2:30-3:30pm.
- Wednesdays, 11:00-12:00pm, 1:30-2:30pm.
- Thursdays (*virtual office hours only) 2:30-3:30pm.
- Fridays (*virtual office hours only) 9:00am-12:00pm.
- And by appointment (scheduled in Blackboard).
Virtual office hours may be scheduled in Blackboard.

Textbook: Textbook references for this course may be any of the following:
- Larson, R. (2017). Elementary Linear Algebra, Eighth ed. Boston, MA: Cengage Learning. ISBN 978-1-305-65800-4.
- Larson, R. (2013). Elementary Linear Algebra, Seventh ed. Boston, MA: Brooks/Cole. ISBN 978-1-133-11087-3.

- Larson, R. & Falvo, D. C. (2009). <u>Elementary Linear Algebra, Sixth ed.</u> Boston, MA: Houghton Mifflin Company. ISBN 0-618-78376-8.
- Larson, R., Edwards, B. H. & Falvo, D. C. (2004). <u>Elementary Linear Algebra, Fifth ed.</u> Boston, MA: Houghton Mifflin Company. ISBN 0-618-33567-6.

Supplies: You will need a calculator capable of matrix algebra (a TI-graphing calculator such as the TI-84 works well) and a minimal supply of graph paper. A TI-89 calculator is acceptable. Calculators on cell phones or other electronic devices are strongly discouraged and will <u>not</u> be allowed during testing without permission. Make certain you have access to a scanner or scanning app such as CamScanner, Scannable, OneDrive, etc. in order to scan your assignments/quizzes and submit them through Blackboard.

Blackboard: Blackboard is the online course management system that will be utilized for this course. This course is supplemented online, so all access to course information and your instructor is through the Internet. This course syllabus, as well as <u>all</u> course materials can be accessed through Blackboard. Login at https://southplainscollege.blackboard.com/. The user name and password should be the same as the MySPC and SPC email.

       User name: first initial, last name, and last 4 digits of the Student ID
       Password: Original CampusConnect Pin No. (found on SPC acceptance letter)

Questions regarding Blackboard support may be emailed to blackboard@southplainscollege.edu or by telephone to 806-716-2180.

This course partially satisfies a Core Curriculum Requirement: None

Core Curriculum Objectives addressed:
- **Communications skills**—to include effective written, oral and visual communication
- **Critical thinking skills**—to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- **Empirical and quantitative competency skills**—to manipulate and analyze numerical data or observable facts resulting in informed conclusions

Student Learning Outcomes: Upon completion of this course and receiving a passing grade, the student will be able to:

1. Be able to solve systems of linear equations using multiple methods, including Gaussian elimination and matrix inversion.
2. Be able to carry out matrix operations, including inverses and determinants.
3. Demonstrate understanding of the concepts of vector space and subspace.
4. Demonstrate understanding of linear independence, span, and basis.
5. Be able to determine eigenvalues and eigenvectors and solve problems involving eigenvalues.
6. Apply principles of matrix algebra to linear transformations.
7. Demonstrate application of inner products and associated norms.

Student Learning Outcomes Assessment: Pre- and post-test questions will be used to determine the extent of improvement that the students have gained during the semester.

Course Evaluation: There will be departmental final exam questions given by all instructors. Assignments will count for 20% of the final grade, while exams count for 80% of the final grade. Expect 19 assignments and 4 scheduled exams throughout the course. Your final average in the course will determine the letter grade posted on your transcript. This grade is determined by the following scale: A (90-100%), B (80-89%), C (70-79%), D (60-69%), F (0-59%).

Grading Policy: Assignments/Quizzes (19 assignments, 10 quizzes, Matlab assignments) = 20%
                    Exam 1 (covering Assignments 1-4) = 15%
                    Exam 2 (covering Assignments 5-8) = 20%
                    Exam 3 (covering Assignments 9-14) = 20%

Exam 4 (covering Assignments 15-19) = 25%.

To maximize your potential for successfully completing this course:
- login to Blackboard daily;
- watch the lecture videos and take notes on them;
- thoroughly complete and submit the assignments on time;
- practice the exercises repeatedly until you have full mastery of them.

Attendance/Student Engagement Policy: Attendance and effort are the most important activities for success in this course. The instructor maintains records of the student's engagement throughout the semester. The student will be allowed to miss twenty percent (20%) of class assignments for the semester, *for any reason*. Should this number be exceeded, the instructor has the right to drop the student with a grade of F or an X, depending on the instructor's discretion.

Before arriving for the class meeting, make certain you have
1. worked through the notes and videos for that week's lessons;
2. completed a majority of the assigned exercises.

Upon arriving at the class meeting, we will
1. answer questions over exercises;
2. work through exercises;
3. submit assignments and quizzes.

Major exams will be at specified Thursday face-to-face meetings in the Math and Engineering building, room 108 from 11:00am-12:15pm.

Assignments and Exams List: The following is a sequential list of the assignments and exams.
1. Linear Systems
2. Gauss-Jordan Elimination
3. Applications of Linear Systems
4. Summations
   Matlab Assignment #1

Exam 1 (15%)
5. Matrix Operations
6. Special Matrices
7. Determinants
8. Applications of Determinants

Exam 2 (20%)
9. Vector Spaces
10. Linear Independence
11. Basis & Dimension
12. Rank
13. Change of Basis
14. Vectors

Exam 3 (20%)
15. Linear Transformations
16. Transition Matrices & Similarity
17. Eigenvalues and eigenvectors
18. Diagonalization
19. Applications of Eigenvalues
    Matlab Assignment #2

Exam 4 (25%)

Assignment Format and Policy: Assignments are given after each lesson and are collected according to the calendar below. For each question on each assignment:

- Write the question number.
- In solving the problem, show all necessary work.
- Clearly mark your answer.
- Check your answers in the textbook and occasionally through Blackboard to make certain you are practicing the exercises correctly.
- Write your name at the top of each page of your work.
- Submit the assignment in Blackboard as a single pdf file. (Pdf files can be generated easily using a scanner or many freely available phone apps, like CamScanner, Scannable, or OneDrive.)

Late assignments will be accepted with a 10% deduction. No late quizzes will be accepted. Make certain to complete and submit assignments on time (or early). Early submissions are welcomed! Again, expect a quiz to be administered with each assignment collection. All lessons for each unit are due no later than the close of the unit exam.

Exam Format and Policy: There are four (4) units of study in this course. At the conclusion of each unit is a face-to-face examination on specified Thursdays, 11:00am – 12:15pm except for the final exam, which is on a Tuesday, 11:00am-12:15pm. If there becomes a quarantine issue or movement of this class to an online setting, then adequate internet supplies will be needed, such as a webcam, microphone, and access to online collaborative tools like Blackboard Collaborate or Zoom.

Tentative Course Calendar: Below is a calendar view of assignment and exam due dates and times.

Date	Topics (assignment is included with each lesson)	Due Date
Wk1: Jan 19-22	Course Introduction Lsn1: Linear Systems Lsn2: Gauss-Jordan Elimination	Thur, Jan 21: Qz1 due by 12:15pm. Lsns 1&2 due by noon Fri, Jan 22.
Wk2: Jan 25-29	Lsn3: Applications of Linear Systems Lsn4: Summations	Thur, Jan 28: Qz2 due by 12:15pm. Lsns 3&4 due by noon Fri, Jan 29.
Wk3: Feb 1-5	Matlab Assignment #1	Thur, Feb 4: Qz3 due by 12:15pm. Matlab Assignment #1 due by noon Fri, Feb 5.
Wk4: Feb 8-12	Exam 1 (Thur, Feb 11) The exam will begin at 11:00am and be due by 12:15pm.	Thur, Feb 11, 12:15pm.
Wk5: Feb 15-19	Lsn5: Matrix Operations Lsn6: Special Matrices	Thur, Feb 18: Qz4 due by 12:15pm. Lsns 5&6 due by noon Fri, Feb 19.
Wk6: Feb 22-26	Lsn7: Determinants Lsn8: Applications of Determinants	Thur, Feb 25: Qz5 due by 12:15pm. Lsns 7&8 due by noon Fri, Feb 26.
Wk7: Mar 1-5	Exam 2 (Thur, Mar 4) The exam will begin at 11:00am and be due by 12:15pm.	Thur, Mar 4, 12:15pm.
Wk8: Mar 8-12	Lsn9: Vector Spaces	Thur, Mar 11: Qz6 due by 12:15pm. Lsn9 due by noon Fri, Mar 12.
Wk9: Mar 22-26	Lsn10: Linear Independence Lsn11: Basis & Dimension	Thur, Mar 25: Qz7 due by 12:15pm.

		Lsns 10&11 due by noon Fri, Mar 26.
Wk10: Mar 29 – Apr 1 (Fri, Apr 2 is Easter Holiday)	Lsn12: Rank Lsn13: Change of Basis	Thur, Apr 1: Qz8 due by 12:15pm. Lsns 12&13 due by noon Fri, Apr 2.
Wk11: Apr 5-9	Lsn14: Vectors	Thur, Apr 8: Qz9 due by 12:15pm. Lsn14 due by noon Fri, Apr 9.
Wk12: Apr 12-16	Exam 3 (Thur, Apr 15) The exam will begin at 11:00am and be due by 12:15pm.	Thur, Apr 15, 12:15pm.
Wk13: Apr 19-23	Lsn15: Linear Transformations Lsn16: Transition Matrices & Similarity	Thur, Apr 22: Qz10 due by 12:15pm. Lsns 15&16 due by noon Fri, Apr 23.
Wk14: Apr 26-30	Lsn17: Eigenvalues and Eigenvectors Lsn18: Diagonalization	Tue, Apr 29: Lsns 17&18 due by noon Fri, Apr 30.
Wk15: May 3-7	Lsn19: Applications of Eigenvalues Matlab Assignment #2	Thur, May 6: Lsn19 and Matlab Assignment #2 due by noon Fri, May 7.
Wk16: May 10-13 (Semester ends Thur, May 13.)	Exam 4 (Tuesday, May 11) This exam is the cumulative final exam that will be from 10:15am-12:15pm in room 108.	Tue, May 11, 12:15pm.

Academic Integrity (Plagiarism and Cheating Policy): "Complete honesty is required of the student in the presentation of any and all phases of course work. This idea applies to quizzes of whatever length as well to final examinations, to daily reports, and to term papers" *(SPC General Catalog)*.

Plagiarism violations include, but are not limited to, the following:
1. Turning in a paper that has been purchased, borrowed, or downloaded from another student, an online term paper site, or a mail order term paper mill;
2. Cutting and pasting together information from books, articles, other papers, or online sites without providing proper documentation;
3. Using direct quotations (three or more words) from a source without showing them to be direct quotations and citing them; or
4. Missing in-text citations.

Cheating violations include, but are not limited to, the following:
1. Obtaining an examination by stealing or collusion;
2. Discovering the content of an examination before it is given;
3. Using an unauthorized source of information (notes, textbook, text messaging, internet, apps) during an examination, quiz, or homework assignment;
4. Entering an office or building to obtain an unfair advantage;
5. Taking an examination for another;
6. Altering grade records;
7. Copying another's work during an examination or on a homework assignment;
8. Rewriting another student's work in Peer Editing so that the writing is no longer the original student's;
9. Taking pictures of a test, test answers, or someone else's paper.

COVID: It is the policy of South Plains College for the Spring 2021 semester that as a condition of on-campus enrollment, all students are required to engage in safe behaviors to avoid the spread of COVID-19 in the SPC

community. Such behaviors specifically include the requirement that all students properly wear CDC-compliant face coverings while in SPC buildings including in classrooms, labs, hallways, and restrooms. Failure to comply with this policy may result in dismissal from the current class session. If the student refuses to leave the classroom or lab after being dismissed, the student may be referred to the Dean of Students on the Levelland campus or the Dean/Director of external centers for Student Code of Conduct Violation. Students who believe they have been exposed or may be COVID-19 positive, must contact Health Services, DeEtte Edens, BSN, RN at (806) 716-2376 or dedens@southplainscollege.edu.

Student Code of Conduct Policy: Any successful learning experience requires mutual respect on the part of the student and the instructor. Neither instructor nor student should be subject to others' behavior that is rude, disruptive, intimidating, aggressive, or demeaning**.** Student conduct that disrupts the learning process or is deemed disrespectful or threatening shall not be tolerated and may lead to disciplinary action and/or removal from class.

Diversity Statement: In this class, the teacher will establish and support an environment that values and nurtures individual and group differences and encourages engagement and interaction. Understanding and respecting multiple experiences and perspectives will serve to challenge and stimulate all of us to learn about others, about the larger world and about ourselves. By promoting diversity and intellectual exchange, we will not only mirror society as it is, but also model society as it should and can be.

Disability Statement: Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should notify the Disability Services Office early in the semester so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability to the Disability Services Office. For more information, call or visit the Disability Services Office at Levelland (Student Health & Wellness Office) 806-716-2577, Reese Center (Building 8) 806-716-4675, or Plainview Center (Main Office) 806-716-4302 or 806-296-9611.

Nondiscrimination Policy: South Plains College does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities. The following person has been designated to handle inquiries regarding the non-discrimination policies: Vice President for Student Affairs, South Plains College, 1401 College Avenue, Box 5, Levelland, TX 79336. Phone number 806-716-2360.

Title IX Pregnancy Accommodations Statement: If you are pregnant, or have given birth within six months, Under Title IX you have a right to reasonable accommodations to help continue your education. To activate accommodations you must submit a Title IX pregnancy accommodations request, along with specific medical documentation, to the Director of Health and Wellness. Once approved, notification will be sent to the student and instructors. It is the student's responsibility to work with the instructor to arrange accommodations. Contact the Director of Health and Wellness at 806-716-2362 or email cgilster@southplainscollege.edu for assistance.

Campus Concealed Carry: Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in South Plains College buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and South Plains College policy, license holders may not carry a concealed handgun in restricted locations. For a list of locations and Frequently Asked Questions, please refer to the Campus Carry page at: http://www.southplainscollege.edu/campuscarry.php
Pursuant to PC 46.035, the open carrying of handguns is prohibited on all South Plains College campuses. Report violations to the College Police Department at 806-716-2396 or 9-1-1.

SPC Bookstore Price Match Guarantee Policy: If you find a lower price on a textbook, the South Plains College bookstore will match that price. The difference will be given to the student on a bookstore gift certificate! The gift certificate can be spent on anything in the store.

If students have already purchased textbooks and then find a better price later, the South Plains College bookstore will price match through the first week of the semester.   The student must have a copy of the receipt and the book has to be in stock at the competition at the time of the price match.

The South Plains College bookstore will happily price match BN.com & books on Amazon noted as *ships from and sold by Amazon.com*. Online marketplaces such as *Other Sellers* on Amazon, Amazon's Warehouse Deals, *fulfilled by* Amazon, BN.com Marketplace, and peer-to-peer pricing are not eligible. They will price match the exact textbook, in the same edition and format, including all accompanying materials, like workbooks and CDs.

A textbook is only eligible for price match if it is in stock on a competitor's website at time of the price match request. Additional membership discounts and offers cannot be applied to the student's refund.

Price matching is only available on in-store purchases.   Digital books, access codes sold via publisher sites, rentals and special orders are not eligible. Only one price match per title per customer is allowed.

Note: The instructor reserves the right to modify the course syllabus and policies, as well as notify students of any changes, at any point during the semester.