Classroom and Schedule: Tuesday and Thursday, 9:30-10:50am; Room 402, Lee Drain Building

INSTRUCTOR: Dr. Emma Bullock
    Office: 439G
    Phone: (936) 294-3816
    Email: ebullock@shsu.edu
    FAX: (936) 294-1182
    Office Hours: M, W 11:00am-1:0pm
    T, R   12:30-1:30pm

1. Course Information

Course Description: An introduction to Linear Algebra and Matrices. Topics include: solving systems of linear equations, fundamental matrix theory (invertibility theorems, determinants), eigenvectors, and properties of linear transformations. Remaining topics are chosen from: Properties of general vector spaces, inner product spaces, and/or diagonalization of symmetric matrices. Prerequisite: Grade of C or better in MATH 1430

Course Objectives/Learning Outcomes: A successful student will attain mastery of the following topics. Other topics will also be covered.
- Solving systems of linear equations with matrices
- Invertible matrices
- The equivalence between matrices and linear transformations
- Vector: linear dependence and span
- Determinants: calculation and applications
- Change of basis
- Eigenvalues and eigenvectors
- Inner products and applications

Required Textbook

    Linear Algebra and Its Applications. (fifth Edition). Lay, D., Lay, S., and McDonald, J. (2016). New Yorl, NY: Pearson.

This text can be purchased in any format. A code will be given to allow students access to the MyMathLab course content which will include all homework assignments.

Required Materials

    Calculator: A calculator capable of doing matrix operations; TI-83 or better is recommended.

2. Grading Policy

Course Evaluation: Each student's grade will be based on

Homework	20%
Quizzes	10%
Mid Term Exam 1	20%
Mid Term Exam 2	20%
Final Exam	<u>30%</u>
Total:	100%

Grading Scale:

A	90%-100%
B	80-89%
C	70-79%
D	60-69%
F	<60%

Homework: I will assign homework on a regular basis via the MyMathLab online resource accompanying the text. Please see the Class Schedule below for a complete list of the sections assigned after each class and when they are due.

Late Homework Policy: Late homework will not be accepted. I recognize that emergencies sometimes arise during the semester, so in calculating your homework average, I will drop your (1) lowest homework score.

Random Daily Quizzes: Each day I will flip a coin at the beginning of class. If it is heads, there will be a 1-2 question quiz on the previously assigned homework or assigned reading from the text. If it is tails, there will be no quiz that day. Do your homework and reading prior to class and you should do very well. I will drop your (1) lowest quiz score.

Missed Quiz Policy: There will be absolutely no make-up quizzes allowed. If you are there, you get to take the quiz. If you are not, you do not.

Exams: Exam problems with be similar to homework problems or examples worked in class. The final exam will be cumulative. If you arrive late to an exam, you may still take the exam in the remaining time as long as nobody has finished the exam yet.

Missed Exam Policy: If you miss an exam, you will be expected to show appropriate cause in writing. If you   miss an exam, I expect you to contact me beforehand. If that is impossible, then you must contact me no later than 24 hours after the exam. If you miss an exam and have not contacted me within this timeframe, you forfeit your right to a make-up. An exam will only be allowed to be made up for emergency or documented medical reasons.

Academic Honesty Policy:
- Homework: You may work together when solving homework problems and you may consult whatever sources you deem necessary while doing so; however, be sure you understand the concepts entirely and can work the problems independently so you are prepared for the Exams.
- Exams: Exams are individual endeavors, where no help is to be given or received. Cheating on an exam includes, but is not limited to, sharing answers or using any form of cheat sheet (NOTE: notes programmed into a calculator count as a cheat sheet).

Cheating is punishable with a grade of F in the class. If you cheat, you may also be referred to the dean on academic dishonesty charges. (See General Academic Dishonesty Policy below for full details.)

Grade Dispute Policy: All grade issues need to be brought to my attention within one week of having your grade returned/posted.

Final Exam Schedule: Thursday, December 7th, 9:30-11:30am

Course Schedule: (I always reserve the right to take away from the schedule if I deem it necessary.)

Class Date	Concepts	Homework	Assignments DUE
R 8/24	Introduction/1.1 Systems of Linear Equations/1.2 Row Reduction and Echelon Forms	H1(1.1/1.2)	
T 9/5	1.3 Vector Equations/1.4 The Matrix Equations	HW2(1.3/1.4)	HW1
R 9/7	1.5 Solution Sets of Linear Solutions/1.7 Linear Independence	HW3(1.5/1.7)	HW2
T 9/12	1.8 Introduction to Linear Transformations/1.9 The Matrix of a Linear Transformation	HW4(1.8/1.9)	HW3
R 9/14	2.1 Matrix Operations/2.2 The Inverse of a Matrix	HW5(2.1/2.2)	HW4
T 9/19	2.3 Characterization of Invertible Matrices/2.4 Partitioned Matrices	HW6(2.3/2.4)	HW5
R 9/21	2.5 Matrix Factorizations/3.1 Introduction to Determinants	HW7(2.5/3.1)	HW6
T 9/26	3.2 Properties of Determinants/3.3. Cramer's Rule, Volume, and Linear Transformations	HW8(3.2/3.3)	HW7
R 9/28	Review for Exam 1 (built in extra time, if needed)		HW8
T 10/3	Exam 1 (Ch. 1-3; Linear systems, linear transformations, matrices, determinants)		
R 10/5	4.1 Vector Spaces and Subspaces/4.2 Null Spaces, Column Spaces, and Linear Transformations	HW9(4.1/4.2)	
T 10/10	4.3 Linearly Independent Sets; Bases/4.4 Coordinate Systems	HW10(4.3/4.4)	HW9
R 10/12	4.5 The Dimension of a Vector Space/4.6 Rank	HW11(4.5/4.6)	HW10
T 10/17	4.7 Change of Basis	HW12(4.7)	HW11
R 10/19	4.8 Applications to Difference Equations/4.9 Applications to Markov Chains	HW13(4.8/4.9)	HW12
T 10/24	5.1 Eigenvectors and Eigenvalues/5.2 The Characteristic Equation	HW14(5.1/5.2)	HW13
R 10/26	Review for Exam 2 (built in extra time, if needed)		HW14
T 10/31	Exam 2 (Ch. 4-5; Vector Spaces, Change of Basis, Eigenvectors and Eigenvalues)		
R 11/2	5.3 Diagonalization/5.4 Eigenvectors and Linear Transformations	HW15(5.3/5.4)	
T 11/7	5.5 Complex Eigenvalues	HW16(5.5/5.6)	HW15
R 11/9	6.1 Inner Product, Length, and Orthogonality/6.2 Orthogonal Sets	HW17(6.1/6.2)	HW16
T 11/14	6.3 Orthogonal Projections/6.4 The Gram-Schmidt Process	HW18(6.3/6.4)	HW17
R 11/16	6.5 Least-Squares Problems	HW19(6.5)	HW18
T 11/21	6.7 Inner Product Spaces/6.8 Applications of Inner Product Spaces (maybe)	HW20(6.7/6.8)	HW19

T 11/28	7.1 Diagonalization of Symmetric Matrices/ (built in extra time, if needed)	HW21(7.1)	HW20
R 11/30	Review for Final (Diagonalization, Inner Products, Gram-Schmidt, Further Topics)		HW21
R 12/7	Final Exam 9:30-11:30am		

3. Classroom Policies

Attendance Policy: I expect you to attend every class. If you miss a class, then I expect you to get notes from a classmate. I expect you to arrive to class on time and stay the entire class period.

CLASSROOM RULES OF CONDUCT
Students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. Cellular telephones and pagers must be turned off before class begins. Students are prohibited from eating in class, using tobacco products, making offensive remarks, reading newspapers, sleeping, talking at inappropriate times, wearing inappropriate clothing, or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in a directive to leave class. Students who are especially disruptive also may be reported to the Dean of Students for disciplinary action in accordance with university policy.

Use of Telephones and Text Messagers in Academic Classrooms and Facilities: The use by students of electronic devices that perform the function of a telephone or text messager during class-time may be prohibited if deemed disruptive by the instructor to the conduct of the class. Arrangements for handling potential emergency situations may be granted at the discretion of the instructor. Failure to comply with the instructor's policy could result in expulsion from the classroom or with multiple offenses, failure of the course. Any use of a telephone or text messager or any device that performs these functions during a test period is prohibited. These devices should not be present during a test or should be stored securely in such a way that they cannot be seen or used by the student. Even the visible presence of such a device during the test period will result in a zero for that test. Use of these devices during a test is considered de facto evidence of cheating and could result in a charge of academic dishonesty (see student code of conduct http://www.shsu.edu/students/guide/StudentGuidelines2010-2012.pdf#page=29).

VISITORS IN THE CLASSROOM
Unannounced visitors to class must present a current, official SHSU identification card to be permitted in the classroom. They must not present a disruption to the class by their attendance. If the visitor is not a registered student, it is at the instructor's discretion whether or not the visitor will be allowed to remain in the classroom.

STUDENT ABSENCES ON RELIGIOUS HOLY DAYS POLICY
Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence. University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). The instructor will provide the student with a written description of the deadline for the completion of missed assignments and/or tests.

STUDENTS WITH DISABILITIES POLICY:
It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be

denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail disability@shsu.edu). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities. For a complete listing of the university policy, see:
http://www.shsu.edu/dept/academic-affairs/documents/aps/students/811006.pdf

ACADEMIC DISHONESTY POLICY
1. GENERAL
The subject of academic honesty is addressed in paragraph 5.3, Chapter VI, of the Rules and Regulations, Board of Regents, The Texas State University System, and Sam Houston State University Student Guidelines published by the Office of Student Life.
5.3 Academic Honesty. The University expects all students to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action.
5.31 The University and its official representatives, acting in accordance with Subsection 5.32 may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating, plagiarism, collusion, and the abuse of resource materials.

"**Cheating**" includes the following and similar actions:
(1) Copying from another student's test paper, laboratory report, other report, or computer files, data listings, and/or programs.
(2) Using, during a test, materials not authorized by the person giving the test.
(3) Collaborating, without authorization, with another student during an examination or in preparing academic work.
(4) Knowingly, and without authorization, using, buying, selling, stealing, transporting, soliciting, copying, or possessing, in whole or in part, the contents of an unadministered test.
(5) Substituting for another student, permitting any other person, or otherwise assisting any other person to substitute for oneself or for another student in the taking of an examination or test or the preparation of academic work to be submitted for academic credit.
(6) Bribing another person to obtain an unadministered test or information about an unadministered test.
(7) Purchasing, or otherwise acquiring and submitting as one's own work any research paper or other writing assignment prepared by an individual or firm. This section does not apply to the typing of the rough and/or final versions of an assignment by a professional typist.
5.32 "Plagiarism" means the appropriation and the unacknowledged incorporation of another's work or idea into one's own work offered for credit.
5.33 "Collusion" means the unauthorized collaboration with another person in preparing work offered for credit.
5.34 "Abuse of resource materials" means the mutilation, destruction, concealment, theft or alteration of materials provided to assist students in the mastery of course materials.
5.35 "Academic work" means the preparation of an essay, dissertation, thesis, report, problem, assignment, or other project that the student submits as a course requirement or for a grade.

2. PROCEDURES IN CASES OF ALLEGED ACADEMIC DISHONESTY

2.01 Procedures for discipline due to academic dishonesty shall be the same as in disciplinary actions specified in The Texas State University System Rules and Regulations and Sam Houston State University Student Guidelines except that all academic dishonesty actions shall be first considered and reviewed by the faculty member teaching the class. The faculty member may impose failure or reduction of a grade in a test or the course, and/or performing additional academic work not required of other students in the course. If the faculty member believes that additional disciplinary action is necessary, as in the case of flagrant or repeated violations, the case may be referred to the Dean of Student Life or a designated appointee for further action. If the student involved does not accept the decision of the faculty member, the student may appeal to the chair of the appropriate academic department/school, seeking reversal of the faculty member's decision.

2.02 If the student does not accept the decision of the chair of the academic department/school, he/she may appeal to the appropriate academic dean. The chair of the academic department/school may also refer the case directly to the academic dean if the case so warrants.