Course Syllabus

Course Information

Math 2333 Matrices, Vectors, and Their Application Fall 2013

Professor Contact Information

Instructor: William Scott
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Office Hours: TR 1:30-2:30, or by appointment

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Math 1314 or equivalent

Course Description

Students will learn concepts and elementary techniques of linear algebra related to systems of linear equations, matrices, determinants and vectors. They will use those techniques in solving appropriate applied problems.

Topics from chapter one will include matrices and their connection with systems of simultaneous linear equations, Gauss-Jordan elimination, Euclidean vector spaces, subspaces of $\mathbb{R}^n$, basis and dimension, some applications of the inner product for $\mathbb{R}^n$, curve fitting. Chapter two will cover the arithmetic and algebra of matrices and computing the multiplicative inverse of a matrix. Chapter three will include determinants and their computation, the application of determinants to matrix inverse and the solution of systems of linear equations, eigenvalues and eigenvectors. Chapter four covers subspaces, spanning sets and linear independence, properties of bases, and rank. Gaussian elimination and LU decomposition are covered in chapter seven. Lastly, linear programming problems and methods of solution are introduced in chapter eight.

Student Learning Objectives/Outcomes

1). Students will apply Gauss-Jordan method to solve a system of linear equations or to determine such that a solution does not exist.
2). Students will compute the determinant, inverse, and rank of a matrix, eigenvalues and eigenvectors as appropriate.
3). Students will demonstrate their understanding of the properties of operations on vectors. In particular, given a set of vectors in a space, they will be able to determine if the set forms a basis for that space.
4). Given a narrative description of a real-life problem, students will analyze the problem and relate it to relevant concepts from linear algebra and then use appropriate techniques to solve the original application problem.

Required Textbooks and Materials

*Linear Algebra with Applications, 8*th Edition, Gareth Williams, and an access code to WebAssign.
You can either buy the textbook bundled with the WebAssign access code, or you could buy each separately.

Suggested Course Materials

Student Solutions Manual is recommended.

Assignments & Academic Calendar

There will be two midterm examinations and a comprehensive final examination.

Midterm I	Tuesday, October 1, in class
Midterm II	Tuesday, November 5, in class
Final Exam	Monday, December 16, 8:00pm−10:00pm, HH 2.402, SLC 1.102

Here is the schedule for selected problems which all students should do. The answers to these problems are in the book and solutions are in the Solution Manual.

Week of 8/26	1.1: #1a, c, e, 2, 5a, c, e, 6a, d, f, h, 7a, c, e, 8a, c, 9a, c, 10a, c, e, 11a, c, d, 12a, b, d
Week of 9/2	1.2: #1a, b, c, d, e, f, g, h, i, 2a, b, c, d, e, f, g, h, i, 3a, c, e, 4a, c, 5a, c, e, 6a, c, e, 7a
Week of 9/9	1.3: #5a, c, d, g, 6a, b, d, 7a, b, d, 8a, b, 9a, c, 10a, c, 11a, c, f,
	1.4: #1a, c, 2a, c, 3a, b, c, 4, 6, 8, 9
Week of 9/16	1.5: #1, 3a, c, 4a, c, 5a, c, 6a, b, c, d, e, f, 7a, b, c, d, e, f, 12, 13, 14, 15, 16, 17, 18
Week of 9/23	1.6: #1a, c, 2a, c, 3a, c, e, 5a, c, e, 6a, c, e, 7a, c, e, 8a, c, e, 9a, c, d, 10a, c, d, 11a, c, e, 12a, b, 13a, b, d, 14a, c, 15a, 16a, c, 17a, c, 18a, c, 19a, c, e, 20
	Review for the first midterm
Week of 9/30	Midterm 1
	1.7: #1, 2, 3
	2.1: #1a, c, g, 2a, d, f, 3a, d, e, g, 4a, d, f, h, 5a, c, e, g, 8a, c, e, g, 9a, b, d, e, g, 10a, c, 11a, c, 25a, c
Week of 10/7	2.2: #1a, c, 2, 4a, c, 5a, c, 6a, c, 7a, c, 12a, c, 13a, c, 15, 31a, 32a, b, 36, 38
	2.3: #1a, c, d, f, h, 2a, b, c, 3a, c, e, 9
Week of 10/14	2.4: #1a, c, 2a, c, 3a, c, e, 4a, c, 5a, c, *very important is 7a, c*, 8a, c, e, 9a, c, e, 13, 17, 19
	3.1: #1a, c, 2a, c, 3a, c, 4a, c, 5a, c, 6a, c, 7a, c(just use the cofactor expansion method with #7), 8a, c, 9a, c, 10a, c, 11a, c, 12, 14, 16
Week of 10/21	3.2: #1a, c, 2a, c, 3a, c, 4a, c, 5, 6a, c, 7a, c, 8a, b, c, d, e, f, 9a, b, c, d, e, f, 10a, c, 12a, b, 13a, c
	3.3: #1a, c, 2a, c, 3a, c, 4a, c, 5a, c, 6a, c, 7a, c, 8a, c, 9a, b, 10a, c, 13a, c, 14a, c, 15
Week of 10/28	3.4: #1, 2, 4, 6, 8, 9, 10, 13, 17, 19
	Review for the second midterm
Week of 11/4	Midterm 2
	4.1: #18a, c, 19a, c, e, f, g, 20a, b, c, e, 21a, b, c, 22a, c, d
Week of 11/11	4.2: #1a, c, 2a, c, 3a, 4a, c, 5a, 6a
	4.3: #1a, c, e, 2a, c, 3a, c, 4a, b, 6a, b, c, d, 7a, c, 16a, b, c, d, 17a, b, c, d, e
Week of 11/18	4.4: #1a, c, 2a, c, 3a, b, c, d, 4a, c, 5a, b, c, d, 6a, b, c, d, e, f, g, 7, 8, 10, 12, 13, 15a, b, c, d, e, 16a, b, c, d, 32, 33
	4.5: #1a, c, 2a, c, e, 3a, c, 4a, c, 5a, b, 6a, c, 7a, 10a, b, c, d, 11a, b, c, d, e, f, 12a, 14a, 19
Week of 11/25	7.2: #1, 3, 4, 6, 7a, b, c, d, 8a, b, c, d, 9, 11, 14, 18
Week of 12/1	8.1: #1, 3, 5, 6, 8, 9, 11, 13
	8.2: #1, 2, 4, 6, 7, 10, 12, 15, 16
Week of 12/8	Review for the final examination

Grading Policy

Homework	10%
Midterm with lower grade	20%
Midterm with higher grade	30%
Comprehensive Final	40%

Course & Instructor Policies

The practice problems listed above are not collected. However, there will be graded computer based homework assignments on WebAssign. The examinations will contain problems entirely comparable in their essentials to these practice homework problems. Therefore when grading tests, it will be apparent who has done these problems and who has not. Makeup examinations will not be given except in extraordinary circumstances. If you know you will be missing an exam, notify your instructor *before* the test date.

All letter grades will be assigned in accordance with the table of numeric to alphabetic conversions given below.

[90; 92) A-, [92; 97) A, [97; 100] A+,
[80; 82) B-, [82; 87) B, [87; 90) B+,
[70; 72) C-, [72; 77) C, [77; 80) C+,
[60; 62) D-, [62; 67) D, [67; 70) D+, [0; 60) F

Calculators: Students may use a scientific or arithmetic calculator but are not required to have a graphing calculator. No calculators with matrix and/or graphing features will be allowed during tests.

Field Trip Policies
Off-campus Instruction and Course Activities

Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at the website address http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm. Additional information is available from the office of the school dean. Below is a description of any travel and/or risk related activity associated with this course.

Student Conduct & Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, A to Z Guide, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the Rules and Regulations, Board of Regents, The University of Texas System, Part 1, Chapter VI, Section 3, and in Title V, Rules on Student Services and Activities of the university's Handbook of Operating Procedures. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883- 6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

Withdrawal from Class

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

Student Grievance Procedures

Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's Handbook of Operating Procedures.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the deal will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.
Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

Incomplete Grade Policy

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of F .

Office of Student AccessAbility

The goal of the Office of Student AccessAbility is to provide students with learning differences educational opportunities equal to those of their peers. Student AccessAbility is located in room 3.200 in the Student Services Building. Office hours are Monday-Thursday, 8:30 a.m. to 6:00 p.m.; Friday, 8:00 a.m. to 5:00 p.m.; and evenings by appointment.

The contact information for Student AccessAbility is:
UT Dallas Student AccessAbility
800 W. Campbell Rd., SSB32
Richardson, Texas 75083- 0688
(972) 883-2098 (voice or TTY)

Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance.
It is the student's responsibility to notify his or her professors of the need for such an accommodation. Student AccessAbiliity provides students with letters to present to faculty members to verify that the student needs accommodation(s). Individuals requiring special accommodation should contact the professor after class or during office hours.

Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

These descriptions and timelines are subject to change at the discretion of the professor.