MATRICES, VECTORS, AND THEIR APPLICATION

MATH 2333, FALL 2016

Math 2333: Matrices, Vectors, and Their Application, Fall 2016

Instructor	Dr. Paul Stanford
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Office	FA 2.412
Office Hours	MW 1:15pm–2:00pm, TR 11:45am–12:30pm

Course Sections

Section	Class number	Days	Times	Room
001	84299	Mon & Wed	11:30am–12:45pm	JSOM 1.102
002	84298	Mon & Wed	2:30pm–3:45pm	JO 3.516
701	84443	Examinations	Varies	

Examinations

Exam	Date	Time	Locations
Exam I	Monday Oct 3	7:00pm–8:15pm	HH 2.402
Exam II	Monday Nov 7	7:00pm–8:15pm	HH 2.402
Final	Saturday Dec 10	2:00pm–4:45pm	HH 2.402

Teaching Assistants

Name	email	Office Hour	Office

Course Pre-requisites, Co-requisites, and/or Other Restrictions
Basic Facts from College Algebra: Math 1314 or equivalent.

Required Textbooks and Materials

Linear Algebra with Applications, 8th Edition, Gareth Williams

A WebAssign Account is optional, for access to the eBook. There will be no digital homework assignments, so you are free to select the cheapest or most convenient medium for the textbook. The Student Solutions Manual is recommended.

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 to solve 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 (if time allows).

Lastly, least square solutions (section 6.4) and linear programming problem and methods of solution are introduced (chapter eight), time permitting.

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.

Access to WebAssign

For those who wish to use the electronic version of the textbook you will need to gain access to WebAssign. Please note that this is not required for assignments: there will be no digital homework assignments in this course.

(1) Log into eLearning; select "(MERGED) MATH 2333.001–MATH 2333.002–F16".
(2) Click the link on the eLearning course homepage entitled "Access WebAssign / eBook."
(3) If you already have a WebAssign account, you will either see the WebAssign course "(MERGED) MATH 2333.001–MATH 2333.002–F16" at the left or you will see a pull-down menu with courses listed; choose "(MERGED) MATH 2333.001–MATH 2333.002–F16".
(4) (a) If you already have a WebAssign account with the text for this course, you should be taken to the WebAssign course "(MERGED) MATH 2333.001–MATH 2333.002–F16".
    (b) If you do not already have a WebAssign account with the text for this course, you will have three options to register.
        (i) "Purchase access online" if you do not already have an access code and you want to buy access to the ebook and homework problems without printed text.
        (ii) "Enter an access code" if you have already purchased an access code.
        (iii) "Continue my trial period" if you want to start using the system before purchasing. The deadline is given in red.
(5) Once you have registered, you should be taken to the WebAssign course "(MERGED) MATH 2333.001–MATH 2333.002–F16". On subsequent returns, you should only need to repeat the first three steps above.

Calculators: Students may use a simple scientific calculator. Graphing calculators are not permitted: no calculators with matrix and/or graphing features will be allowed during tests. A calculator such as the TI-30X, TI-30XA or similar is highly recommended.

Assignments: Exams, and Take Home Quizzes (THQ)

There will be threeexams (including the final exam).

Take Home Quizzes are mandatory and will be assigned weekly. These will take the form of quizzes posted on eLearning that you download, print, and staple. Due dates of Take Home Quizzes will are at the beginning of Wednesday's lecture. There will be penalties for late THQ, missing staples, or (the most severe penalty) for missing names! Be sure to staple and write your name on your take home quiz as soon as it is printed.

Practice Problems

Here are selected problems which all students should do. The answers to these problems are in the back of the text and examples of solutions are in the Solution Manual.

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
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
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
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
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
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
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
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
2.5	# 1, 2, 3, 4, 5, 6, 7
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
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
3.4	# 1, 2, 4, 6, 8, 9, 10, 13, 17, 19
4.1	# 18a, c, 19a, c, e, f, g, 20a, b, c, e, 21a, b, c, 22a, c, d
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
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
6.4	# 1, 3, 5, 9, 11, 13
7.1	# 1a, b, c, d, 2a, b, c, d, 3a, 5a
7.2	# 1, 3, 4, 6, 7a, b, c, d, 8a, b, c, d, 9, 11, 14, 18
8.1	# 1, 3, 5, 6, 8, 9, 11, 13
8.2	# 1, 2, 4, 6, 7, 10, 12, 15, 16

Course & Instructor Policies: The practice problems listed above are not collected. The examinations will contain problems comparable 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 well before the test date.

Attendance: Required.

Citizenship: Any action that disturbs your classmates or interrupts the lecture is unacceptable. Examples of such actions are:
(1) Entering the classroom late—be as punctual as possible.
(2) Leaving the classroom before the end of the lecture.
(3) Cell phones, ringers, buzzers, beepers, alarms, blackberries—turn them off.

An apology is expected from anyone creating such a disturbance. Student participation in class is desired. Please raise your hand to speak and avoid having side conversations with your classmates. We do not permit open carry in any classrooms, examination rooms, or during office visits.

Grading Policy

Quizzes (THQ)	25%
Exam I	25%
Exam II	25%
Final Exam	25%

There will be no extra credit. All letter grades will be assigned in accordance with the table of numeric to alphabetic conversions given below:

$[90, 93.33)$ A-	$[93.33, 96.66)$ A	$[96.66, 100)$ A+
$[80, 83.33)$ B-	$[83.33, 86.66)$ B	$[86.66, 90)$ B+
$[70, 73.33)$ C-	$[73.33, 76.66)$ C	$[77.66, 80)$ C+
$[60, 63.33)$ D-	$[63.33, 66.66)$ D	$[67.66, 70)$ D+
$[0, 60)$ F.		

Official UTD Policies http://go.utdallas.edu/syllabus-policies
These policies are considered to be a part of this syllabus.

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