Math 3323 **MATRIX ALGEBRA** Fall 2007
TuTh 1:30–2:50 **Syllabus**
LART 323

Instructor: **Dr. Art Duval**

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`http://www.math.utep.edu/Faculty/duval/home.html`

Office hours: **Mon, 3:00–4:00; Wed, 11:00–12:00; Fri, 10:00–12:00.** Please feel free to come by my office any time during scheduled office hours. You are welcome to come at other times, but in that case you might want to make an appointment, just to make sure that I will be there then. You can make an appointment simply by talking to me before or after class, by calling me at my office or at home, or by sending e-mail.

You may also ask any questions directly via phone or e-mail. If I'm not in when you call, please leave a message on the voice-mail or answering machine with your name, number, and a good time for me to call you back. I will try to repond to your phone or e-mail message as soon as possible.

Website: `http://www.math.utep.edu/Faculty/duval/class/3323/074/home.html`
Here you will find this syllabus with relevant links, including homework and reading assignments for the whole semester, as they are announced. Other resources may become available.

COURSE OBJECTIVES: This course is concerned with matrices and vectors. In one setting, matrices and vectors merely serve as efficient devices for storing the coefficients and solutions of systems of linear equations. The solutions of many such systems, though, are hard to even describe without the right language. This is the language of vector spaces, where matrices serve as functions turning vectors into other vectors. We will then spend most of our time examining vector spaces, and especially various vector spaces we can naturally assign to a matrix. In this setting, eigenvalues and eigenvectors of a matrix arise naturally, and we end the course examining these.

Upon successful completion of this course, you will be able to solve and analyze systems of linear equations. You will be able to find and describe the various vector spaces associated to a matrix, and you will be prepared to study more abstract vector spaces. You will be able to compute eigenvalues and eigenvectors of a matrix, and know what they are good for. You will be able to do all of this equally well with the symbolic/numerical description of matrices and vectors as arrays of numbers, and with the geometrical description of matrices and vectors, using the powerful organizing concept of dimension, even in dimensions higher than 3.

You will improve your skills of investigating and describing mathematical phenomena.

Textbook: **Introduction to Linear Algebra, 5th ed., Johnson, Riess, Arnold, Chs. 1–4.** We will skip some sections, as announced in class. The textbook is required at all class meetings.

Required Reading: Read each section that we cover in class, both before and after class. Skim the section before class, even if you don't understand it fully, to have some idea of what we'll be doing in class. Read it more carefully after class to clarify and fill in details you missed in class.

Warning: Sometimes, we will not "cover" all the material from a section in class, but instead focus on a particular aspect of the section. In such cases, I will point out in class (and on the course's website) which other parts of the section I expect you to read on your own.

GRADES:

Quizzes (10%) Suggested homework problems will be assigned most class days and will generally be discussed at the next class. There will be approximately biweekly quizzes, with problems taken from the homework. Quizzes are closed-book, closed-notes. Missed quizzes **cannot** be made up, but your lowest quiz score will be dropped.

It is very important that you do your homework before it is discussed in class. You will only learn the material by doing it yourself, not by watching others do it for you.

Investigations (10%) There will be a series of investigations available on the course website where you will get to explore concepts a little more in depth, using WebMathemtica. Each investigation will have guiding questions to help you with the computer experiments. Afterwards, you will write a short report describing your findings. You will have about 1–2 weeks for each investigation. You are allowed to work together on investigations (in fact, I encourage you to do so), but the report you turn in you must write yourself.

Exams (15% each) There will be three in-class exams on the following days:

Ch. 1	Thu.	27	Sep.
Chs. 2, 3	Thu.	8	Nov.
Ch. 4	Tue.	4	Dec.

Makeup exams can be given only in extraordinary and unavoidable circumstances, and with advance notice. (See also "Exception" below.)

Final (35%) comprehensive

Thu. 13 Dec., 4:00 p.m.–6:45 p.m.

Exception Your final exam score will be used in place of your lowest in-class exam score, if this increases your overall class average. In particular, if you miss an exam, your final exam score will replace it.

Attendance policy: I strongly encourage you to attend every class, though there is no particular grade penalty for absences. My goal is for class meetings and activities to complement, rather than echo, the textbook, and thus for every class to be worth attending.

Drop date: The deadline for student-initiated drops with a W is Fri., 2 Nov. After this date, you can only drop with the Dean's approval, which is granted only under extenuating circumstances.

I hope everyone will complete the course successfully, but if you are having doubts about your progress, I will be happy to discuss your standing in the course to help you decide whether or not to drop. You are only allowed three enrollments in this course, and new freshmen are only allowed six withdrawals in their entire academic career, so please exercise the drop option judiciously.