

Math 3323 (3 credits)
MWF 11:30–12:20
PSYC 306

MATRIX ALGEBRA
Syllabus

Fall 2009

Instructor: **Dr. Art Duval**

office: **Bell Hall 303**

phone: **747-6846**/office (24hrs./day; if I'm not in, please leave a message)

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

Office hours: **Mon, 9:00–10:00; Tue, Wed, 1:00–2:00; Thu, 10:00–11:00**. 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 respond to your phone or e-mail message as soon as possible.

Website: <http://www.math.utep.edu/Faculty/duval/class/3323/094/home.html>

Here you will find this syllabus, and relevant links, including homework and reading assignments for the whole semester, as they are announced. Other resources may become available.

Prerequisites: Calculus II (Math 1312). This is entirely a mathematical maturity requirement, as we will use no calculus in this course.

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 computer-based investigations where you will get to explore concepts a little more in depth, using WebMathematica. Each investigation will have guiding questions to help you with the computer experiments. Afterwards, you will write a very brief report describing your findings. You will have about 1 week 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, closed-book exams on the following days:

Ch. 1	Fri.	25 Sep.
Chs. 2, 3	Fri.	6 Nov.
Ch. 4	Mon.	30 Nov.

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

Final (35%) The final exam will be comprehensive over all material we discuss in class.

Wed. 9 Dec., 1:00 p.m.–3:45 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.

POLICIES:

Academic dishonesty: It is UTEP's policy, and mine, for all suspected cases or acts of alleged scholastic dishonesty to be referred to the Dean of Students for investigation and appropriate disposition. See Section 1.3.1 of the Handbook for Operating Procedures.

Attendance: 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 Friday, October 30. 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 students enrolled after Fall 2007 are only allowed six withdrawals in their entire academic career, so please exercise the drop option judiciously.

Courtesy: We all have to show courtesy to each other, and the class as a whole, during class time. Please arrive to class on time (or let me know when you have to be late, and why); do not engage in side conversations when one person (me, or another student) is talking to the whole class; turn off your cell phone (or at least set it to not ring out loud), and do not engage in phone, email, or text conversations during class.

Disabilities: If you have, or suspect you have, a disability and need an accommodation, you should contact the Disabled Student Services Office (DSSO) at 747-5148, dss@utep.edu, or Union East room 106. You are responsible for presenting to me any DSS accommodation letters and instructions.

Exceptional circumstances: If you anticipate the possibility of missing large portions of class time, due to exceptional circumstances such as military service and/or training, or childbirth, please let me know as soon as possible.