

Math 3203 – Matrix Methods in Science and Engineering

Fall 2007

Professor: Dr. Deborah Koslover

Office: RBN 4010

Office Hours: Monday 3-5 PM, Wednesday 9:30-10:30 AM and Wednesday 4-5 PM. I will be holding my office hours in the Math Learning Lab RBN 4021. These times will be set aside for your exclusive use. Additionally, any other time, if my office door is open, you are welcome to come in for help. If my door is closed, I am probably busy and you should come back later. I will rarely be available on Tuesdays and Thursdays as they are my research days. If you cannot come by during office hours, you can call or email to make an appointment.

Telephone Number: 903-566-7143

Email: dkoslover@uttyler.edu

AIM screen name: debpi3141. Add my name to your buddy list. If I am on AIM, you are welcome to ask me questions. This is a good time to anonymously ask questions, if you are too shy to ask them in class. I will hold scheduled AIM office hours in the late afternoon or early evening on the day before tests, so that you can ask any last minute questions.

Class Meeting Time: 6:00-6:50 MWF

Room: RBN 4025

Required Texts: *Matrix Methods An Introduction*, 2nd Edition, Richard Bronson, Academic Press, Inc. 1991, ISBN # 0-12-135251-X

Prerequisites: Math 2414 or Concurrent Enrollment

Course Description: Matrices and matrix algebra, determinants, systems of linear equations, Gaussian elimination, eigenvalues and eigenvectors, linear transformation, applications in science and engineering.

Learning Outcomes: At the conclusion of the course, the student should be able to:

1. Perform basic matrix operations including row reduction, transpose, finding the inverse and finding the determinant.
2. Solve systems of linear equations using substitution, Gaussian elimination, Cramer's rule and inverse matrices.
3. Find eigenvalues and eigenvectors and use them to diagonalize matrices and solve problems of matrix calculus.
4. Understand the basic properties of Euclidean space including linear independence, dimension, rank, orthogonality, norm and projection.

5. Apply the principles of linear algebra by modeling data using the method of least squares and by performing image manipulation.

6. Apply the Gram-Schmidt process to find an orthonormal set of vectors within a subspace of a n-dimensional vector space.

Attendance Policy: Attendance is mandatory and attendance records will be kept. Notify the professor in advance if you must miss a class, be late for a class or leave early. (Official University Policy: Class attendance is the responsibility of the student. When a student has a legitimate absence, the instructor may permit the student to complete missed assignments. In many cases class participation is a significant measure of performance, and non-attendance may adversely affect a student's grade. When a student's absences become excessive, the instructor may recommend that the student initiate a withdrawal.)

Homework: Homework will be assigned daily. Homework assigned during the week will be due in class on Wednesday of the following week. Assignments will appear on Blackboard. Selected problems will be graded for accuracy, completeness and legibility. Late assignments will be accepted for one week and will receive $\frac{1}{2}$ credit. Solutions to homework problems will appear on Blackboard after the final due dates. Homework must be stapled before you come to class. Homework will be worth 20% of your grade.

Extra credit: Each homework assignment in which every problem is seriously attempted, although not necessarily correctly solved will be worth $\frac{1}{2}$ pt or 1pt added to your test scores. (Short easy assignments will be worth $\frac{1}{2}$, longer harder assignments will be worth 1). You may earn these points even if your homework is late. There will be a total of 10 points. If you earn every point, this will raise your grade on one midterm by a full letter grade.

Quizzes, in-class assignments and participation: Unannounced quizzes will be given. These will generally be short, easy quizzes to test for basic understanding. In-class assignments will be given regularly. Participation will be graded based on taking part in classroom discussions and asking questions. These areas will count toward 10% of your grade.

Tests and Final Exams: There will be two tests (20% each) and a final exam (30%). These exams will test your knowledge of the theory and application of discrete math. The dates and times of these exams are as follows:

- **Test 1:** Monday, September 24 (Review Fri, Sept 21 – Time and place TBA)
- **Test 2:** Wednesday, October 24 (Review Tues, Oct 23 – Time and place TBA)
- **Final Exam:** Wednesday, December 12, from 6-8 PM

You must take the final exam on the date given. Do not plan your winter vacation to start early.

Make-ups: Make-ups for **documented** absences that are **required** as part of a UT Tyler obligation (e.g. athletes participating in an event, participating in a debate contest, etc.) or for religious observation will be granted. For all make-ups of this type, prior notification of at least one week and documentation are required. Other make-ups are granted only in extreme cases and at the sole discretion of the instructor.

Blackboard: You MUST register for this class on Blackboard 6. To do so go to <http://ccs.uttyler.edu/blackboard/>. Follow the instructions at the website to login.

The Blackboard server does not know courses you are taking. At the beginning of each semester you may have to search for, and "Enroll", in any Blackboard courses that are available to you.

After you Log In, click on the "Courses" tab at the top of the Blackboard window Search for Matrix Methods in the Course Catalog When you find your course name, DO NOT CLICK ON THE COURSE NAME. Look for and click on the "Enroll" button to the right of the course name. Follow the instructions for enrolling in that Blackboard course. The password is – **firefly**.

Be sure to update your email address - the default is your patriot email address. I will use Blackboard to contact you, post assignments and grades. If you have a homework question and cannot get to my office, you may post it on the discussion board. Then, email me and let me know that you made a post. I will answer your question and if I feel it is of general interest, email the class that a post has been made.

Calculator Policy: No calculators will be allowed on quizzes and tests.

Cell phones, IPODs and other electronic devices: Please set your cell phones and pagers to silent mode. If you are expecting an emergency call, please notify the professor in advance, sit near the door, and answer the phone outside. You will not be allowed to wear an IPOD or other electronic devices during an exam.

Important Dates:

September 3 – Labor Day Holiday – No class

September 5 – 12th day

September 24 – Test 1

October 24 – Test 2

October 29 – Last day to withdraw from classes

November 21-23 – Thanksgiving Holiday – No class

December 12 – Final Exam 6-8 PM

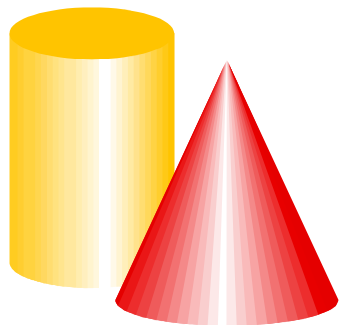
Disability Statement: If you have a disability, including a learning disability, for which you request disability support services/accommodation(s), please contact Ida MacDonald in the Disability Support Services office so that the appropriate arrangements may be made. In accordance with federal law, a student requesting disability support services/accommodation(s) must provide appropriate documentation of his/her disability to the Disability Support Services counselor. For more information, call or visit the Student Services Center located in the University Center, Room 282. The telephone

number is 566-7079 (TDD 565-5579)." Additional information may also be obtained at the following UT Tyler Web address: <http://www.uttyler.edu/disabilityservices>.

Social Security Statement: It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have identification numbers.

Note Regarding Student Absence due to Religious Observance: Students who anticipate being absent from class due to religious observance are requested to inform the instructor by the second class meeting of such absences.

Grade Replacement: If you are repeating this course for a grade replacement, you must file an intent to receive grade forgiveness with the registrar by the 12th day of class (September 5). Failure to file an intent to use grade forgiveness will result in both the original and repeated grade being used to calculate your overall grade point average. A student will receive grade forgiveness (grade replacement) for only three (undergraduate student) or two (graduate student) course repeats during his/her career at UT Tyler. (2006-08 Catalog, p. 35)



Add a Math Minor!



For many majors, it only takes one additional class and a lab!

| If your major is | Requirements for your major | Courses to add a math minor |
|--|---|--|
| Chemistry | MATH 2413, MATH 2414, MATH 3203, MATH 3404 | MATH 2113 Calculus I Lab* MATH 3425 Foundations of Mathematics |
| Education 4-8 Math/Science Certification | MATH 2113, MATH 2114, MATH 2413, MATH 2414, MATH 3203 | MATH 3425 Foundations of Mathematics (In place of MATH 2330) One more upper level course** |
| Computer Science | MATH 2413, MATH 2414, MATH 3203 | MATH 2113 Calculus I Lab* MATH 3425 Foundations of Mathematics (In place of MATH 2330) One more upper level course** |
| Civil Engineering | MATH 2413, MATH 2414, MATH 3305, MATH 3404 | MATH 2113 Calculus I Lab* MATH 3425 Foundations of Mathematics |
| Electrical Engineering | MATH 2413, MATH 2414, MATH 3202, MATH 3305, MATH 3404 | MATH 2113 Calculus I Lab* MATH 3425 Foundations of Mathematics |
| Mechanical Engineering | MATH 2413, MATH 2414, MATH 3305, MATH 3404 | MATH 2113 Calculus I Lab* MATH 3425 Foundations of Mathematics |

*Waived, if Calc I was taken at UTT before Fall 2007

** Must have a total of 18 credits for minor

In general, to get a math minor, you must complete 18 credits in math, 9 of these in upper level courses. You must take MATH 2113, MATH 2413, MATH 2414, and MATH 3425. You may pick the remaining courses from among MATH 3404, MATH 3203, MATH 3305, MATH 4160, MATH 3336, MATH 3345, MATH 4350, MATH 3380, MATH 4336, MATH 4341, MATH 4351, MATH 4380, MATH 4342

Contact a math advisor for more information.