Linear Algebra and its Applications (MATH 289)
Winter Quarter, 2003

Time/Place: MWF 8:00-8:50 a.m. KRH 205
Instructor: Jonathan Duncan (duncjo@wwc.edu)
Office: Kretchmar Hall 330, phone: 527-2097
Office Hours: 10:00 MWTF, 4:00 MTT, or by appointment

Text: Linear Algebra and its Applications, 3rd Edition,
Webpage: http://math.wwc.edu/courses/289/

This course examines matrices and determinants, vector spaces, linear transformations, eigenvalues and eigenvectors, with applications. We will cover selected sections from chapters 1-3 and 5-7 of your text, in order. The deadline for withdrawing from the course is Tuesday, 18 February and the final will be given on Wednesday, 19 March.

Topics

1. Linear Equations and Matrices (chapter 1):
   Systems of linear equations, row reduction and echelon forms, vector equations, matrix equations, solution sets, linear independence, linear transformations, matrix of a linear transformation.

2. Matrix Algebra and Determinants (chapters 2,3):
   Basic operations, inverses characterizations of invertible matrices, subspaces of $\mathbb{R}^n$, dimension and rank, definition and properties of determinants, applications of determinants.

3. Eigenvalues and Eigenvectors (chapter 5):
   Definitions, computations, the characteristic equation, diagonalization.

4. Orthogonality (chapter 6):
   Inner product, length, orthogonal sets, Gram-Schmidt process.

5. Symmetric Matrices and Quadratic Forms (chapter 7):
   Diagonalization of symmetric matrices, quadratic forms.

Objectives

Upon completion of this course, students will have

1. developed demonstrable understanding of the topics outlined above.
2. successfully engaged in mathematical thinking, reasoning, and problem solving.
3. become proficient in expressing clear and accurate solutions to mathematical problems in written form.

The following requirements encourage and measure the successful completion of these objectives.

Homework

Daily 10 point assignments will be give, each due at the beginning of the next class period. Homework which is more than one class period overdue will be discounted at a rate of 2 points per day late. Please see your instructor about homework which is late due to illness or other appropriate and verifiable reasons. Your lowest homework score will be dropped at the end of the quarter.

Please observe the following guidelines when preparing your homework. You may be asked to redo assignments which do not meet these criteria. In such cases, normal late homework discounts will apply.
1. Use letter (8.5 × 11) sized paper with clean edges (not torn out of a notebook).
2. Multi-page assignments must be stapled or paper-clipped together.
3. Fold the assignment lengthwise like a book and write your name, the course number, and assignment number(s) on the front cover.
4. Handwritten assignments should be done in pencil and written legibly. All assignments must be organized and present solutions in a logical manner.
5. Show all essential steps in solving the problem, include figures, and notes when appropriate. A reader must be able to easily verify that you not only have the correct answer, but have also expressed the correct solution to the problem.

Exams
There will be three exams during the course of the quarter, including the two-hour comprehensive final. You **must** attend the final exam at the scheduled time. The first two exams will be taken during the normal class meeting time. Make-ups will only be given for written, **verifiable** excuses, with notification given to your instructor in advance.

<table>
<thead>
<tr>
<th>Exam</th>
<th>Chapter(s)</th>
<th>Date</th>
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<tbody>
<tr>
<td>Exam I</td>
<td>Chapter 1</td>
<td>27 January</td>
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<tr>
<td>Exam II</td>
<td>Chapters 2, 3, and 5</td>
<td>26 February</td>
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<tr>
<td>Final</td>
<td>Comprehensive, emphasis on 6 and 7</td>
<td>Wed, 19 Mar 8:00 a.m.</td>
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Grades
Your final letter grade will be assigned as shown below based on your quarter average. Your quarter average is made up of three averages: your homework average, hour-exam average, and your final exam score. Weights for each of these are shown below. Appropriate (to your instructor) modifications of the final letter grades may be made in individual cases for progress, unusual circumstances, etc.

<table>
<thead>
<tr>
<th>Average Weights</th>
<th>Letter Grades (lowest percent)</th>
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<tbody>
<tr>
<td>Final 30%</td>
<td>A+ 98%  B+ 88%  C+ 76%  D+ 63%</td>
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<tr>
<td>Exams I, II 50%</td>
<td>A 92%  B 82%  C 67%  D 57%  F 0%</td>
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<tr>
<td>Homework 20%</td>
<td>A- 90%  B- 80%  C- 65%  D- 55%</td>
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Disabilities
Students with a physical and/or learning disability who require accommodations should contact the instructor or Disability Support Services at 527-2366. This syllabus is available in alternative print formats upon request.