Math 253 • Linear Algebra • Spring 2005

Class Meetings

MTW-F, 11:00 - 11:50 AM, Lovejoy 212

Instructor

Otto Bretscher, Olin 342 E-mail: obretsch@colby.edu Office Phone: 859-5848, Home Phone: 872-7370 Office Hours (tentative): MWF, 10 - 11 AM; MTWF, Noon - 1 PM; Tuesday, 2 - 4 PM; and by appointment.

Web Page

www.colby.edu/~obretsch

Check this site for homework assignments, review problems, and the *Student's Solutions Manual* accompanying our text.

Grading

Course grades will be based upon two exams (20% each), the final exam (30%), problem sets (15%), and quizzes (15%). Active class participation will earn you a few extra points.

Problem Sets

Problem Sets will be due on Wednesdays, starting February 9, to be submitted in class. The grader, Demeke Wondmagegn (dawondma), will announce policies regarding late homework and other relevant matters.

Tests and Quizzes

There will be a number of short in-class quizzes testing your command of basic techniques and concepts. The hour exams will be given in class as well. There will be at least a week's notice for the hour exams, but no advance notice for the quizzes. You will be allowed one double-sided, hand-written reference sheet for all quizzes and exams. There will be no make-ups for missed quizzes.

Class Attendance

Students are expected to attend all of their classes and are responsible for any work missed. Failure to attend can lead to a warning, grading penalties, and dismissal from the course with a failing grade.

If you anticipate missing a class, for whatever reason, your absence is excused as long as you send me an e-mail in advance.

Without advance notice, students are excused only in the case of a critical emergency (verified by the Dean of Students Office) or illness (verified by the Health Center).

Text

Linear Algebra with Applications, Third Edition, 2005, Prentice Hall.

There is no need to buy this expensive text; come and see me in office hours to get a copy (to be returned at the end of the semester).

Calculators

A calculator with good linear algebra capabilities (such as a TI-83) can be useful, although it isn't required. Calculators will not be allowed in quizzes and exams.

Syllabus

Chapter 1: Linear Equations

- 1.1 Introduction to Linear Systems
- 1.2 Matrices and Gauss-Jordan Elimination
- 1.3 On the Solutions of Linear Systems

Chapter 2: Linear Transformations

- 2.1 Introduction to Linear Transformations and Their Inverses
- 2.2 Linear Transformations in Geometry
- 2.3 The Inverse of a Linear Transformation
- 2.4 Matrix Products

Chapter 3: Subspaces of i ⁿ and Their Dimension

- 3.1 Image and Kernel of a Linear Transformation
- 3.2 Subspaces of i ^{*n*}; Bases and Linear Independence
- 3.3 The Dimension of a Subspace of i^{n}
- 3.4 Coordinates

Chapter 4: Linear Spaces

- 4.1 Introduction to Linear Spaces
- 4.2 Linear Transformations and Isomorphisms
- 4.3 Coordinates in a Linear Space

Chapter 5: Orthogonality and Least Squares (to be discussed briefly)

- 5.1 Orthonormal Bases and Orthogonal Projections
- 5.3 Orthogonal Transformations and Orthogonal Matrices

Chapter 6: Determinants (to be discussed briefly)

- 6.1 Introduction to Determinants
- 6.2 Properties of the Determinant

Chapter 7: Eigenvectors and Eigenvalues

- 7.1 Dynamical Systems and Eigenvectors : An Introductory Example
- 7.2 Finding the Eigenvalues of a Matrix
- 7.3 Finding the Eigenvectors of a Matrix
- 7.4 Diagonalization