

University of Regina
Department of Mathematics and Statistics

MATH 122-001 Linear Algebra I
Course Syllabus, Winter 2006
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Section numbers refer to David C. Lay, Linear Algebra and its Applications, third edition, Addison-Wesley, 2003; S section numbers refer to James Stewart, Calculus, fifth edition, Thomson Brooks/Cole, 2003. We will be covering material from chapters 1, 2, 3, and 5 of Lay and S13.3 and S13.4 of Stewart. Within each chapter we will be covering a selection of sections as indicated below.

This course syllabus is the final version, reflecting the material which was actually covered in the course and which may appear on the final exam.

| Lecture | Date | Topic | Sections |
|---------|--------|--|-------------------------------|
| 1 | Jan 6 | Introduction | |
| 2 | Jan 9 | Systems of Linear Equations in Two Variables | 1.1 |
| 3 | Jan 11 | Systems of Linear Equations in Three Variables | 1.1 |
| 4 | Jan 13 | Row Reduction and Echelon Forms | 1.2 |
| 5 | Jan 16 | Vector Equations | 1.3 |
| 6 | Jan 18 | The Matrix Equation $A\mathbf{x}=\mathbf{b}$ | 1.4 |
| 7 | Jan 20 | Solution Sets of Linear Systems | 1.5 |
| 8 | Jan 23 | Applications of Linear Systems | 1.6 (just chemical equations) |
| 9 | Jan 25 | Quiz 1 (sections 1.1-1.3) | Review (1.1-1.3) |
| 10 | Jan 27 | Linear Independence | 1.7 |
| 11 | Jan 30 | Introduction to Linear Transformations | 1.8 |
| 12 | Feb 1 | Quiz 2 (sections 1.4-1.6) | Review (1.4-1.6) |
| 13 | Feb 3 | The Matrix of a Linear Transformation | 1.9 |
| 14 | Feb 6 | Matrix Operations | 2.1 |
| 15 | Feb 8 | The Inverse of a Matrix | 2.2 |
| 16 | Feb 10 | Review | Review (1.1-1.5) |
| 17 | Feb 12 | Review | Review (1.6-1.9) |
| 18 | Feb 15 | Midterm 1 (chapter 1) | |
| 19 | Feb 17 | Characterizations of Invertible Matrices | 2.3 |
| 20 | Feb 27 | Subspaces of \mathbf{R}^n | 2.8 |
| 21 | Mar 1 | Quiz 3 (sections 2.1-2.3) | Review (2.1-2.3) |
| 22 | Mar 3 | Subspaces of \mathbf{R}^n , continued | 2.8, ctd |
| 23 | Mar 6 | Dimension and Rank | 2.9 |
| 24 | Mar 8 | Introduction to Determinants | 3.1 |

| Lecture | Date | Topic | Sections |
|----------------|-------------|--|--------------------|
| 25 | Mar 10 | Review | Review (2.1-2.3) |
| 26 | Mar 12 | Review | Review (2.8-2.9) |
| 27 | Mar 15 | Midterm 2 (chapters 1 and 2) | |
| 28 | Mar 17 | Properties of Determinants | 3.2 |
| 29 | Mar 20 | Cramer's Rule | 3.3 (pp. 201-204) |
| 30 | Mar 22 | Volume and Linear Transformations | 3.3 (pp. 205-207) |
| 31 | Mar 24 | The Dot Product (not Work) | S13.3 |
| 32 | Mar 27 | The Dot Product (not Work) | S13.3 |
| 33 | Mar 29 | Quiz 4 (chapter 3) | Review (3.1-3.3) |
| 34 | Mar 31 | The Cross Product (not Torque) | S13.4 |
| 35 | Apr 3 | The Cross Product (not Torque) | S13.4 |
| 36 | Apr 5 | Eigenvectors and Eigenvalues | 5.1 |
| 37 | Apr 7 | The Characteristic Equation (not Similarity, not Application to Dynamical Systems) | 5.2 (pp. 310-314) |
| 38 | Apr 10 | Review | Review (chapter 5) |
| 39 | Apr 12 | Review | Review (chapter 6) |