Math 0280 - Introduction to Matrices and Linear Algebra
Student Guidelines and Syllabus

About the course: The principal topics of the course include vectors, matrices, determinants, linear transformations, eigenvalues and eigenvectors, and selected applications.

Prerequisite: Math 0220 or equivalent, with a grade of C or better.

Text: The text for this course is Linear Algebra, A Modern Introduction, Third Edition by David Poole.

Course Objectives: Students who complete Math 0280 are expected to have mastered the fundamental ideas of linear algebra and to be able to apply these ideas to a variety of practical problems. More specifically, in Math 0280 you will be expected to:

- explore and learn the core concepts associated with systems of linear equations, manipulation of matrices, linear transformations, orthogonality, and eigenvalues/eigenvectors;
- begin to think abstractly about certain of these topics;
- understand how these ideas can be used to solve problems and compute things.

Homework/quizzes/written assignments: Each week, you will be assigned some problems to write up and hand in. These assignments will be graded and returned. In addition, you will be provided with a list of practice problems to do, even though they will not be handed in and graded. At the instructor's discretion there may be quizzes or written assignments.

Grades - Your course grade will be determined as follows:

- Two midterm exams: 40% (20 % each)
- Final exam: 40%
- Written assignments/quizzes/homework assignments: 20%

Some sections may deviate slightly from this formula. Any variations will be announced by your instructor at the beginning of the term.

Calculators Policy: Calculators are NOT allowed on the quizzes, midterm examinations and the final exam.

Final Exam Policy: All sections will take a departmental final exam at a time and place to be scheduled by the registrar. You MUST attend the final exam.

Final Grade Policy: Your course grade will not exceed your final exam grade by more than one letter grade.

Exam Dates: See the class schedule for the dates of the two midterm exams and the final. The room of the final exam will be announced by your instructor.

Getting Help
Tutoring: Walk in tutoring is available in the Math Assistance Center (MAC) in Room 215 of the O'Hara Student Center. See http://www.mathematics.pitt.edu/about/math-assistance-center
Office Hours: Your instructor will announce the office hours.
Disability Resource Services: If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of Disability Resources and Services, 216 William Pitt Union (412) 624-7890 as early as possible in the term. See http://www.studentaffairs.pitt.edu/drsabout

Academic Integrity: Cheating/plagiarism will not be tolerated. Students suspected of violating the University of Pittsburgh Policy on Academic Integrity will incur a minimum sanction of a zero score for the quiz, exam or paper in question. Additional sanctions may be imposed, depending on the severity of the infraction.
On homework, you may work with other students or use library resources, but each student must write up his or her solutions independently. Copying solutions from other students will be considered cheating, and handled accordingly.

Math 0280 Schedule and Practice Problems

August 26:
Introduction.
1.1. The Geometry and Algebra of Vectors.
1.1 Problems 1--28
August 28:
1.1.(cont.) The Geometry and Algebra of Vectors
1.1 Problems 1--28
August 30:
1.2. Length and Angle. The Dot Product.
1.2 Problems 1--52.
September 4:
1.2.(cont.) Length and Angle. The Dot Product.
1.3. Lines and Planes.
1.2 Problems 61--67.
1.3 Problems 1--15.
September 6: (Fall term add/drop period ends)
1.3. Lines and Planes.
1.3 Problems 18--24.
September 9:
2.1. Introduction to Systems of Linear Equations.
2.1 Problems 1--38.
September 11:
2.2. Direct Methods for Solving Linear Systems.
2.2 Problems 1--18.
September 13:
2.2.(cont.) Direct Methods for Solving Linear Systems.
2.2 Problems 23--46.
September 16:
2.3. Spanning Sets and Linear Independence.
2.3 Problems 1--42.
September 18:
2.3.(cont.) Spanning Sets and Linear Independence.
2.3 Problems 1--42.
September 20:
Chapters 1 and 2 Review. Applications.
September 23:
3.1. Matrix Operations.
3.1 Problems 1--22.
September 25:
3.1.(cont.) Matrix Operations.
3.2. Matrix Algebra.
3.1 Problems 1--22.
3.2 Problems 1--28.
September 27:
3.2.(cont.) Matrix Algebra.
3.2 Problems 1--28.
September 30:
3.3. The Inverse of a Matrix
3.3 Problems 1--40.
October 2:
3.3.(cont.) The Inverse of a Matrix
3.3 Problems 47--59.
October 4:
Review.
October 7:
Midterm Exam 1
October 9:
3.5. Subspaces, Basis, Dimension, and Rank.
3.5 Problems 1--48.
October 11:
3.5.(cont.) Subspaces, Basis, Dimension, and Rank.
3.5 Problems 1--48.
October 14:
Fall Break (no classes)
October 15: (Monday classes)
3.5.(cont.) Subspaces, Basis, Dimension, and Rank.
3.5 Problems 1--48.
October 16:
3.6. Introduction to Linear Transformations.
3.6 Problems 1--45.
October 18:
3.6.(cont.) Introduction to Linear Transformations.
3.6 Problems 1--45.
October 21:
Chapter 3 Review. Applications.
October 23:
4.1. Introduction to Eigenvalues and Eigenvectors.
4.1 Problems 1--18.
October 25:
4.2. Determinants.
4.2 Problems 1--52.
October 28:
4.2.(cont.) Determinants.
4.2 Problems 57--65.
October 30:
4.3. Eigenvalues and Eigenvectors of n x n Matrices
4.3 Problems 1--18.
November 4:
4.3. (cont.) Eigenvalues and Eigenvectors of n x n Matrices
4.3 Problems 1--18.
November 6:
Review.
November 8:
Midterm Exam 2.
November 11:
4.4. Similarity and Diagonalization.
4.4 Problems 1--45.
November 13:
4.4. (cont.) Similarity and Diagonalization.
4.4 Problems 1--45.
November 15:
4.4.(cont.) Similarity and Diagonalization.
4.4 Problems 1--45.
November 18:
5.1. Orthogonality.
5.1 Problems 1--21.
November 20:
5.1.(cont.) Orthogonality.
5.2. Orthogonal complements and Orthogonal Projections.
5.1 Problems 1--21.
5.2 Problems 1--22.
November 22:
5.2.(cont.) Orthogonal complements and Orthogonal Projections.
5.2 Problems 1--22.
November 25:
5.3. The Gram-Schmidt Process.
5.3 Problems 1--14.
November 27-December: 1
Thanksgiving break (no classes)
December 2:
5.4. Orthogonal Diagonalization of Symmetric Matrices.
5.4 Problems 1--24.
December 4:
Chapters 4 and 5 Review. Applications.
December 6:
Review
December 9--14, Finals week
Final exam for all sections