MATH 4377/6308 – Advanced Linear Algebra I – Fall 2011
Syllabus

Instructor: Dr. Gordon Heier
Contact Information:
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Lecture: MWF 9am-10am in SEC 206

Exams: Midterm Exam: October 19, 2011 (in-class)
  Final Exam: December 12, 2011, 8am-11am


Homework will be assigned every Wednesday on my web site (see above) and will be
due the following Wednesday. Late homework will not be accepted.

Quizzes: Several unannounced in-class pop-quizzes will be given throughout the
semester.

Attendance: Attending classes and exams is mandatory for all students. Missing class
makes a student liable to missing important information, pop-quizzes etc. Substantial
documentation is necessary to receive any kind of excuse or make-up privilege.

Grades: The homework and the midterm exam will each account for 25 percent of your
grade. The pop-quizzes will account for 20 percent, and the final exam will account for
30 percent. Your two lowest homework scores and your two lowest pop-quiz scores will
be dropped.

4377 vs. 6308: All students will be treated the same, regardless of their seniority. When
very challenging problems are to be solved by students, then it will usually be for extra
credit only. For simplicity, I will refer to this course usually as “Math 4377” only.

Disability: If you think or know that you have a disability that needs special
accommodation, please see me at the beginning of the semester so that the proper steps
can be taken.

Academic Dishonesty will not be tolerated and dealt with appropriately.

Course Content: On the next page you will find a tentative list of the sections from the
textbook that I intend to cover.
1.1 Introduction (with excerpts from Appendices A (Sets), B (Functions), C (Fields), D (Complex Numbers))
1.2 Vector Spaces
1.3 Subspaces
1.4 Linear Combinations and Systems of Linear Equations
1.5 Linear Dependence and Linear Independence
1.6 Bases and Dimension
1.7* Maximal Linearly Independent Subsets

2.1 Linear Transformations, Null Spaces, and Ranges
2.2 The Matrix Representation of a Linear Transformation
2.3 Composition of Linear Transformations and Matrix Multiplication
2.4 Invertibility and Isomorphisms
2.5 The Change of Coordinate Matrix
2.6 Dual Spaces
2.7* Homogeneous Linear Differential Equations with Constant Coefficients

3.1 Elementary Matrix Operations and Elementary Matrices
3.2 The Rank of a Matrix and Matrix Inverses
3.3 Systems of Linear Equations—Theoretical Aspects
3.4 Systems of Linear Equations—Computational Aspects

4.1 Determinants of Order 2
4.2 Determinants of Order $n$
4.3 Properties of Determinants
4.4 Summary—Important Facts about Determinants
4.5* A Characterization of the Determinant

5.1 Eigenvalues and Eigenvectors (and Appendix E (Polynomials))
5.2 Diagonalizability

Sections marked with a * will be included if time permits.