Math 314/814–002: Matrix Theory
Fall 2008

Instructor: Dr. Susan Cooper

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Office Hours: Mondays 2:00 p.m. – 3:00 p.m.; Tuesdays & Thursdays 11:00 a.m. – 12:00 p.m.
Appointments: I am happy to make appointments when you are unable to attend office hours.
Correspondence: The most reliable way to reach me is via email.

Class Times and Location: TR 12:30 p.m. – 1:45 p.m., Avery Hall – Room 110.

Prerequisites: Math 106-107-208 (106H-107H); closed to MA/MS students in math or statistics.

Course Web Page: `www.math.unl.edu/~scooper4/courses_fall08` & Blackboard.

Text: D. Poole, *Linear Algebra: A Modern Introduction (2nd ed.)*, Thomson Brooks/Cole, 2006.

Calculators: Computations with matrices can involve tedious arithmetic. You may find it helpful to own a calculator that is capable of working with (e.g., row-reducing) matrices, such as a TI-85 or better. Calculators will be allowed on most exams and quizzes.

Mathematics Computer Lab: Computer algebra systems, such as *Maple*, *Mathematica* and *MATLAB*, are powerful tools for working with matrices. You will most likely find such tools helpful for the Application Mini-Projects (see below). Students registered for this course will have access to the Math Computer Lab (Avery Hall, Room 18). Your WAM account will enable you to login to the computers in the Math Lab which will provide you access to *Maple*.

Course Description: We will begin by discussing large systems of equations which involve many variables. This will lead us to study fundamental concepts of linear algebra from the point of view of matrix manipulation with an emphasis on concepts that are most important in applications. Topics include solving systems of linear equations, vector spaces, determinants, eigenvalues, and similarity of matrices. We will mainly cover Chapters 1 - 6 in the text.

Homework: Homework exercises will be assigned each lecture. These will not be collected. However, it is imperative that you complete and understand these exercises. There will not be enough class time to cover all the material so you should read each section of the text carefully as part of your daily homework. Learning mathematics is not a spectator sport – you learn by regularly completing exercises and paying close attention to definitions and the theory underlying many applications. We will review homework exercises at the beginning of each class (with student participation!).

Quizzes: A quiz will be given once a week (except for weeks in which an in-class exam is scheduled). The quizzes will be used to gauge your understanding of the material. Some of the quizzes will be given in-class and some will be take-home exercise sets. For the take-home quizzes, you will be allowed to use your class notes and textbook, but you must not seek help from any other source (this includes other books, the internet, and other people). These evaluations will test routine computations, definitions, and the theory learned in class. The quiz dates are as follows:

Month	Dates
August:	26
September:	2, 9, 16, 23, 30
October:	16, 23, 28
November:	4, 11, 18, 25
December:	9

Application Mini-Projects: There will be four Application Mini-Projects over the course of the semester. The *approximate* schedule for these is as follows:

	Assigned	Due
Application Mini-Project #1	August 28	September 11
Application Mini-Project #2	September 25	October 16
Application Mini-Project #3	October 23	November 6
Application Mini-Project #4	November 13	December 9

It is highly recommended that Application Mini-Projects be done in groups of two or three students, but you may work alone if you prefer. (Groups of size four or more are not allowed.) Each group will turn in one solution, and each member of the group will receive the same grade. Under certain circumstances, late submissions may be accepted, but they will be penalized.

In-Class Exams: There will be two in-class exams given during the semester. Tentative dates and content for the in-class exams are as follows:

	Date	Material Covered
Exam #1	Thursday, October 9	Chapters 1–3 & Section 4.1
Exam #2	Thursday, December 4	Chapters 4–5, Section 7.3 & Sections 6.1–6.5

Missed In-Class Quizzes and Exams: Make-up quizzes will only be given in extreme cases. In most cases, if you have to miss an in-class quiz then a grade of zero will be given. A missed in-class exam will count as zero unless compelling reasons are presented, in which case arrangements must be made *prior* to the exam, or official documentation (such as a doctor's notes) is presented.

Final Exam Date and Policy: There will be a cumulative final exam. The final exam will be given in Avery Hall, Room 110 during our assigned Final Exam Period: 7:30 a.m.–9:30 a.m. on Friday, December 19. Students are expected to arrange their personal and work schedules to allow them to take the final exam at the scheduled time. Students who have conflicting exam schedules may be allowed to take an alternate final which is always given after the regularly scheduled final. No student will be allowed to take the final exam early.

Course Grades: Grades for the course will be computed as follows:

Quizzes (Best 12 out of 14)	14%
Application Mini-Projects (4% each)	16%
In-Class Exams (20% each)	40%
Final Exam	30%
Total	100%

Letter grades will be assigned based on your course total. The following table will be used as an initial guide when determining your letter grade.

Letter Grade	Percentage Needed	GPA Value
A+	96%	4.00
A	92%	4.00
A-	89%	3.67
B+	86%	3.33
B	82%	3.00
B-	79%	2.67
C+	76%	2.33
C	72%	2.00
C-	69%	1.67
D+	66%	1.33
D	62%	1.00
D-	59%	0.67

Mathematics Department Grading Policy: Students who believe their academic evaluation has been prejudiced or capricious have recourse for appeals to (in order) the instructor, the department chair, the departmental appeals committee, and the college appeals committee.

Special Dates to Remember:

Date(s)	Importance
September 1	No Classes (Labor Day)
September 5	Last day to file a drop to remove a course from student's transcript
October 17	Last day to change a course registration to or from "Pass/No Pass"
October 20 – 21	No Classes (Fall Semester Break)
November 14	Last day to drop a course and receive a grade of "W"
November 26 – 28	No Classes (Thanksgiving Break)

Expectations and Tips on How to be Successful in Math 314:
• An essential part of the learning process occurs during class. You are expected to attend classes.
• Starting with the first class, study in-depth and regularly.
• Class will be much more enjoyable if you come prepared. Try to read the scheduled material *before* each lecture and attempt the assigned homework exercises *before* the next class period.
• Matrix Theory is a language in its own right: it is very important that you learn the definitions as they are introduced!
• Be an active participant and considerate of others during classroom discussions.
• Do not reply on solution manuals! These are readily available and it is tempting to just copy the solutions. Although sometimes frustrating, struggling through the homework exercises is an important phase of the learning process.
• Give justification for your answers. It will be expected that you write legibly, use full sentences and proper grammar.
• Be academically honest! Although it is encouraged that you discuss homework exercises with fellow students, you are expected to hand in work that is only yours. This will help us gauge your understanding, progress, and abilities for the course material.
• Get help as soon as you need it: ask questions in class and office hours, form a study group, consider getting a tutor, etc.
• For exam preparation, practice exercises that have not been assigned.
• Everyone wants you to succeed. Please speak with me regarding any concerns you may have.
• Relax and have fun with the course!

Students with Disabilities: Students with disabilities are encouraged to contact me for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska - Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 402-472-3787 voice or TTY.