

Fall 2006

Math 2243: Linear Algebra and Differential Equations

Four credits; three lectures MWF and two recitation meetings TTh per week

TEXTBOOK: *Differential Equations and Linear Algebra*,
by Farlow, Hall, McDill and West. Prentice Hall, 2002.

Overview: This course is divided into two somewhat related topics. The major emphasis will be on techniques and concepts, with less emphasis on the theory. **Linear Algebra:** matrices and matrix operations, Gaussian elimination, matrix inverses, determinants, vector spaces and subspaces, linear dependence, Wronskian, dimension of a vector space, eigenvalues, eigenvectors, diagonalization of a matrix. **Ordinary Differential Equations:** Separable and first-order equations, applications, second-order linear ODEs with constant coefficients, method of undetermined coefficients, the harmonic oscillator, 2×2 and 3×3 linear systems of ODEs with constant coefficients, solution by eigenvalues and eigenvectors, nonhomogeneous linear systems, phase-plane analysis of 2×2 nonlinear systems near equilibrium.

Homework: The homework sheet shows suggested homework problems, with the number of the first page of Farlow on which the homework appears; and a much smaller number of problems you are expected to write up, to be handed in each Tuesday in recitation.

Quizzes: There will be a 10-minute quiz each Thursday (except Sept. 7, exam dates and Thanksgiving) in recitation. The typical quiz will be one or two of the homework problems you did not have to hand in.

Exams: There will be three 50-minute midterm exams, during recitation on Thursday, September 28; Tuesday, October 24; and Thursday, November 30. The final exam will be Thursday, December 14 from 1:30 to 4:30 PM, room TBA. Calculators will not be allowed, nor needed, on the three hour exams and the final exam. Students may bring a small "crib sheet" in his/her own handwriting to each exam.

Make-ups: Students must make arrangements in advance (the sooner the better) if they will not be handing in homework on time or will miss an exam. Exam absences, due to recognized University-related activities, religious holidays, verifiable illness, and family/medical emergencies will be dealt with on an individual basis. In case you must take a make up exam you must make arrangements for taking the make up exam with your teaching assistant before the time of the regular exam. Ignorance of the time and place of an exam will not be accepted as an excuse for absence.

Incompletes: We will consider giving you an incomplete if you have successfully completed all but a small portion of the work for the course and some severe, unexpected event prevents you from completing the course. This means that you must have taken at least 2 midterms and must be doing work at the C- level or better. We cannot give you an incomplete simply because you are behind in your work. You may drop any course without permission from your college up through the 8th week of the semester.

Grading Distribution:

Homework: 84 points total

Best nine of ten Quizzes: 12 points each

Three midterms: 100 points each

Final Exam: 300 points

Semester Total: 792 points.

Lectures are MWF 2:30–3:20 in Physics 131.

Lecturer: Robert Gulliver, 452 Vincent Hall, 625-1560.

gulliver@math.umn.edu

Recitation section 31 meets TTh 2:30–3:20 in Rapson Hall 47.

Teaching Assistant, section 31: Antoine Choffrut, 360 Vincent Hall, 625-4392.

choffrut@math.umn.edu

Recitation section 32 meets TTh 2:30–3:20 in Rapson Hall 43;

Recitation section 33 meets TTh 3:35–4:25 in Vincent Hall 2.

Teaching Assistant, sections 32 & 33: Varunyu Khamviwath, 456 Vincent Hall, 625-0356.

khamv001@math.umn.edu

Course web page, currently under construction, will be found at

www.math.umn.edu/~gulliver/2243

University Grading Standards:

A = achievement that is outstanding relative to the level necessary to meet course requirements.

B = achievement that is significantly above the level necessary to meet course requirements.

C = achievement that meets the course requirements in every respect.

D = achievement that is worthy of credit even though it fails to meet fully the course requirements.

S = achievement equivalent to C- or better.

F = N = failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an I.

I = assigned at the discretion of the instructor when, due to *extraordinary* circumstances, e.g., hospitalization, a student is prevented from completing the work of the course on time. Requires a written agreement between instructor and student.

Academic Dishonesty:

Academic dishonesty in any portion of the academic work for a course shall be grounds for awarding a grade of F or N for the entire course.

Credits and Workload Expectations:

For undergraduate courses, one credit is defined as equivalent to an average of three hours of learning effort per week (over a full semester) necessary for an average student to achieve an average grade in the course. For example, a student taking a three-credit course that meets for three hours a week should expect to spend an additional six hours a week on coursework outside the classroom.