MATH 2243
Differential Equations and Linear Algebra

Fall 2015 — Lecture 020

Lecture: Mo, We, Fr   11:15 – 12:05,   Anderson Hall 310

Lecturer: Matthias Maier
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Office hours: Mo, We, Fr 1:30 – 2:30

Website: `http://www.math.umn.edu/~msmaier/math2243`

Textbook: Edwards & Penney, Differential Equations and Linear Algebra, 3$^{\text{rd}}$ Edition.
We will cover most of chapters 1 – 7 and 10.

Teaching Assistants:

023, 025:   Brittany Baker, `bake0573@umn.edu`, 557 Vincent Hall
Office hours: Mo, Tu 2:00 – 3:20 and Fr 9:05 – 9:55

021:   William Grodzicki, `grodz007@umn.edu`, 454 Vincent Hall
Office hours: Tu, Th 9:05 – 9:55

022, 024:   Amit Sharma, `sharm121@umn.edu`, 526 Vincent Hall
Office hours: Tu, 1:00 – 2:00 and Th 12:30 – 2:00

TAs' office hours are open to all students from any section of Math 2243 Lecture 020.

Prerequisites: Grade of at least C- in Math 1272, 1282, 1372, or 1572.

Overview: The course is divided into two topics, *Linear Algebra* and *Ordinary Differential Equations*. In detail, we will cover the following topics. Ordinary Differential Equations (ODE): Separable and first-order ODEs, 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. Linear Algebra: Matrices and matrix operation, Gaussian elimination, matrix inverses, determinants, vector spaces and subspaces, linear dependence, Wronskian, dimension of a vector space, eigenvalues, eigenvectors, diagonalization of a matrix.

Course assessment:

– There will be three 50-minute mid-term exams during discussion sessions, to be held on **Thursday October 8, Thursday November 5, Thursday December 03.**

- The final exam is scheduled for **Thursday December 17**, 1:30pm – 4:30pm, room TBA.

- There will be a short quiz at most of the Thursday recitation periods on the topics covered in the homework the preceding week. The first quiz will be in the second week on Thursday Sep 17. Quizzes will continue each Thursday unless there is an exam, or unless it is Thanksgiving.

- There will be weekly homework assignments, announced a week in advance (together with suggested exercises) and due on Tuesdays.

Homework and quizzes: TAs will be entirely in charge of policies and arrangements for homework and quizzes. This means, for example, that the TA determines their own policy for things like what happens if homework is late or what happens if a student miss a quiz.

Grading: The final grade will be made up of homework and quizzes 23 %, mid-term exams 15 % each, and the final exam 32 %. The final grade distribution for each discussion in all lectures of Math 2243 will be determined by its students' performance on the common final exam. An individual student's final grade within that distribution depends on all of the work of the course, including the work graded individually by that discussion's TA.

By University policy, a grade of A represents achievement that is outstanding relative to the level necessary to meet course requirements. A grade of B represents achievement that is significantly above the level necessary to meet course requirements. A grade of C represents achievement that meets the course requirements in every respect. A grade of D represents achievement that is worthy of credit even though it fails to meet fully the course requirements. Earning 90 %, 80 %, and 70 % of the total points will result in final grades in the A, B, and C, ranges, respectively, though, the boundaries between grades may be relaxed at the lecturer's discretion.

Missing an exam and make-ups: Exam absences, due to recognized University-related activities, religious holidays, verifiable illness, and family/medical emergencies will be dealt with on an individual basis. Students must make arrangements *in advance* (the sooner the better) if they will miss an exam (except for emergencies that prevent prior arrangements).

Students missing a mid-term exam unexcused will be rewarded a 0; students missing the final exam unexcused will fail the course. Ignorance of the time and place of an exam will not be accepted as an excuse for absence.

Calculator policy, crib sheet: No calculators or other electronic devices are allowed on exams, nor will they be needed for the course. A small (roughly half letter page, both sides) "crib sheet" (in handwriting or printed) can be brought to each exam.

Tutoring resources: Aside from the lecturer's and TAs' office hours, students might take advantage of tutoring that is offered through Smart Learning Commons and the Multicultural Center for Academic Excellence. The Undergraduate Office in the School of Mathematics maintains a list of private tutors available for hire.

Academic dishonesty: See the Students Conduct Code, a link to which is posted on the course website, for general information. Academic dishonesty, including use of an unapproved electronic device, will result in a report to the Office for Student Conduct and Academic Integrity. Penalties can include a grade of zero on the task in question and/or a failing grade in the course.

Other policies: A link to other general policy statements—including statements about equal opportunity, disability accommodations, and mental health resources—appears on the course website above.