

Mathematics 1350H – Linear algebra I: Matrix algebra

TRENT UNIVERSITY, Summer 2015

[In Peterborough!]

MATH 1350H is an introductory linear algebra course, with an emphasis on the geometrical and computational aspects of the subject.

Instructor

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Department of Mathematics

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Prerequisite

Any Grade 12U mathematics course with at least 60%, or equivalent.

Text

Linear Algebra: A Modern Introduction (Fourth Edition), by David Poole,
CENGAGE Learning, 2015, ISBN-10: 1-285-46324-2, ISBN-13: 978-1-285-46324-7.

Meetings

The course will run during the first six-week summer session (S61: 11 May – 18 June), 09:00-11:50 on Mondays and Wednesdays in ~~FPHL-117~~ GCS 103. Normally, the first half-hour or so of each three-hour period will be used as a seminar, followed by a quiz on the material in the previous lecture, and the rest will be used as lecture time.

Marking Scheme

There will be at least nine quizzes, at least five assignments, a test, and a final examination. Quizzes will normally be written in the lectures and last between ten and twenty minutes apiece. The assignments will usually be handed out and collected on Tuesdays. The test will last fifty minutes and will probably be written during the lecture period on Monday, 1 June. The final examination will last three hours and will be written during the examination period (19–20 June). These will weigh as follows in the final mark:

| | |
|------------------------------|-----|
| Best 8 quizzes (4% each) | 32% |
| Best 4 assignments (5% each) | 20% |
| Test | 15% |
| Final Examination | 33% |

Students who miss the test or more than one quiz for reasons beyond their control should contact the instructor as soon as possible to arrange to write a make-up. Assignments will not normally be accepted after the due date; students unable to hand in the assignments in time for reasons beyond their control should contact the instructor as soon as possible. Note that there is no attendance requirement *per se*, but the consequences of missing classes are ultimately the students' responsibility to deal with.

This scheme may be modified for individual students in *exceptional* circumstances, such as a lengthy absence due to illness. Any such modification will require the agreement of both the student and the instructor.

Web page

This course will make at most minimal use Blackboard, and perhaps none at all. A web page at euclid.trentu.ca/math/sb/1350H/ will have hopefully-up-to-date information and all handouts.

Content, Learning Outcomes, & Schedule

MATH 1350H is an introduction to linear algebra, covering the basics of vectors and matrices, systems of linear equations, linear transformations, determinants, eigenvalues, and eigenvectors. By the end of the course, the successful student should be able to do vector calculations and perform vector algebra, use vector methods to describe and answer questions about lines and planes, solve a system of linear equations using Gauss-Jordan elimination, do matrix calculations and perform matrix algebra, compute eigenvalues and eigenvectors, explain the key concepts of the course and write simple proofs, and apply the key concepts of the course to various problems.

- Week 1.* [11-15 May] Chapter 1: Vectors and operations on vectors, lines, and planes. Quiz #1 on Wednesday, 13 May.
- Week 2.* [18-22 May] Chapter 2: Systems of linear equations and methods for solving them. Quiz #2 written and Assignment #1 due on Monday, 18 May; Quiz #3 written on Wednesday, 20 May.
- Week 3.* [25-29 May] Chapters 2 & 3: Matrix representation and row operations, matrices and operations on matrices, matrix algebra. Quiz #4 written and Assignment #2 due on Monday, 25 May; Quiz #5 written on Wednesday, 27 May.
- Week 4.* [1-5 June] Chapter 3: Bases, subspaces, and dimension. Test written on Monday, 1 June; Quiz #6 written and Assignment #3 due on Wednesday, 3 June. *The last date to drop this course without academic penalty is Thursday, 4 June.*
- Week 5.* [8-12 June] Chapters 3 & 4: Linear transformations, eigenvalues. Quiz #7 and Assignment #4 due written on Monday, 8 June; Quiz #8 written on Wednesday, 10 June.
- Week 6.* [15-19 June] Chapter 4: Eigenvalues and determinants. Quiz #9 written and Assignment #5 due on Monday, 15 June; possible Quiz #10 written on Wednesday, 17 June. The exam will be written on Friday, 19 June, or Saturday, 20 June.

Please note that where the material covered is concerned this schedule is a polite fiction: no lesson plan survives contact with actual students unchanged! Some additional material, including material not in the text, may be covered on assignments and in class, and other sources may be used to augment the text in a couple of places.

Academic integrity

Academic dishonesty, which includes plagiarism and cheating, is an extremely serious academic offence and carries penalties varying from a 0 grade on an assignment to expulsion from the University. Definitions, penalties, and procedures for dealing with plagiarism and cheating are set out in Trent University's Academic Integrity Policy. You have a responsibility to educate yourself – unfamiliarity with the policy is not an excuse. You are strongly encouraged to visit Trent's Academic Integrity website to learn more – www.trentu.ca/academicintegrity

For clarity, the following guidelines will apply in MATH 1350H:

You are permitted and encouraged to work with others and ask anyone willing (especially the instructor!) for explanations, hints, and suggestions on the assignments, and to consult whatever sources you wish. However, **all work submitted for credit must be written up entirely by yourself, giving due credit to all relevant sources of help and information. For the quizzes, test, and final exam, you may not give or receive any help,** nor use any aids except for a calculator (any that you like) and one letter- or A4-sized aid sheet with whatever you want on (all sides!) of it, except with the instructor's express permission.

Access to instruction

It is Trent University's intent to create an inclusive learning environment. If a student has a disability and/or health consideration and feels that he/she may need accommodations to succeed in this course, the student should contact the Student Accessibility Services Office (SAS), Blackburn Hall Suite 132, 705 748-1281, sas@trentu.ca. For Trent University in Oshawa Student Accessibility Services Office contact 905 435-5102, ext. 5024. Complete text can be found under Access to Instruction in the Academic Calendar.