Mathematics 1350H – Linear Algebra I: Matrix Algebra

TRENT UNIVERSITY, Summer 2017 *[In Peterborough!]*

Instructor

Stefan Bilaniuk (pronounced Стефан Біланюк)
office: GCS 337
Office hours: Monday & Wednesday 12:00-13:00
or by appointment, or just drop by!
phone: 705 748-1011 x7474
home: 705 742-7862 [Do *not* call 21:00-08:00 unless it's an emergency.]
e-mail: `sbilaniuk@trentu.ca` [If it's important, please call or drop by.]
web: `euclid.trentu.ca/math/sb/`

Department of Mathematics

Gina Collins
office: GCS 343
hours: TuTh 09:00-12:00
& MWF 13:00-16:00
phone: 705 748-1011 x7614
e-mail: `math@trentu.ca`

Prerequisite

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

Text

Linear Algebra: A Modern Introduction (Fourth Edition), by David Poole
Cengage, 2015, ISBN-13: 1-285-46324-7

Meetings

Mondays and Wednesdays 09:00-12:00 in GCS 108. We will usually employ the first 30–40 minutes for tutorial time and to write the quizzes, and the remainder of the time for lectures.

Marking Scheme

There will be at least nine quizzes, at least five assignments, a test, and a final examination. (Please see the schedule for the dates.) 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%

Please note that work worth at least 25% of the course should be completed, marked, and returned by the final date (Tuesday, 30 May) to withdraw from the course without academic penalty. 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.

Content and Learning Outcomes

MATH 1350H is an introductory course on linear algebra, with an emphasis on the geometrical and computational aspects of the subject. We will cover the core material from Chapters 1–4 of the text. At the completion of Math 1350H, the successful student should be able to:

1. do vector calculations and perform vector algebra;
2. use vector methods to describe and answer questions about lines and planes;
3. solve a system of linear equations using Gaussian and Gauss-Jordan elimination;
4. do matrix calculations and perform matrix algebra;
5. compute eigenvalues and eigenvectors;
6. explain the key concepts of the course and write proofs;
7. use the key concepts of the course in selected applications.

Schedule

Week 1. *(8-12 May)* Chapter 1: Vectors and operations on vectors, lines, and planes. Quiz #1 on Wednesday, 10 May.
Week 2. *(15-19 May)* Chapters 2 & 3: Systems of linear equations and methods for solving them, matrix representation and row operations. Quiz #2 written and Assignment #1 due on Monday, 15 May; Quiz #3 written on Wednesday, 17 May.
Week 3. *(22-26 May) University closed on Monday, 22 May: Victoria Day.* Chapter 3: Matrices and operations on matrices, matrix algebra. Quiz #4 written and Assignment #2 due on Wednesday, 24 May.
Week 4. *(29 May - 2 June)* Chapter 3: Bases, subspaces, and dimension. Test written on Monday, 29 May; Quiz #5 written and Assignment #3 due on Wednesday, 31 May. *The last date to drop this course without academic penalty is Tuesday, 30 May.*
Week 5. *(5-9 June)* Chapters 3 & 4: Linear transformations, eigenvalues. Quiz #6 written on Monday, 5 June; Quiz #7 written and Assignment #4 due on Wednesday, 7 June.
Week 6. *(12-14 June)* Chapter 4: Eigenvalues and determinants. Quiz #8 written on Monday, 12 June; Quiz #9 written and Assignment #5 due on Wednesday, 14 June.
Examination Period. *(15-18 June)* Exam schedule to be announced.

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.*

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.