

MAT223H1 S: Linear Algebra I

Summer Session 2 — 2026

1 Instructor and TA Information

1.1 Course Instructor

Name: Alex Kroitor

Email: alex.kroitor@mail.utoronto.ca

Office Hours: Thursday 13:00 - 15:00, Friday 11:00 - 13:00

1.2 Teaching Assistants

Name: [REDACTED]

Email: [REDACTED]

Name: [REDACTED]

Email: [REDACTED]

Name: [REDACTED]

Email: [REDACTED]

1.3 Email Policy

When you write an email make sure your **subject line is just 'MAT223H1S'**, and that you are using your **UofT email**. If you don't do this, there's a reasonable chance your email will be missed! Please also **be polite!** There's a human being on the other end of your email.

If you find yourself needing help or accommodations **PLEASE ASK ME** – I cannot help you if I don't know. The number one reason students struggle is that they don't ask for help when they need it.

1.4 Axioms

In this course (as one should in life) we accept [Federico Ardila-Mantilla's axioms](#):

Axiom 1. *Mathematical talent is distributed equally among different groups, irrespective of geographic, demographic, and economic boundaries.*

Axiom 2. *Everyone can have joyful, meaningful, and empowering mathematical experiences.*

Axiom 3. *Mathematics is a powerful, malleable tool that can be shaped and used differently by various communities to serve their needs.*

Axiom 4. *Every student deserves to be treated with dignity and respect.*

Please keep these in mind when you interact with your fellow students and the TAs of the course.

2 Course Overview

This is a first course on *linear algebra* - the study of linear equations and spaces. We study principally solutions of systems of linear equations, the geometry of vector space and the transformations between them, and matrices and their interpretations.

2.1 Textbooks

For this class we will be using the set of notes *Linear Algebra in Euclidean Space* by Bellah (kindly provided to us by Prof. Bellah). Some other sources are listed in these notes; it's suggested students read them for different perspectives. I will also put some additional (much harder) sources on Quercus.

3 Evaluation/Grading Scheme

The grading scheme is as follows.

- Review sheet – 5%
- Tutorial worksheets – 30%
- Term tests – 30%
- Final exam – 35%

Review sheet

There will be a review sheet handed out, with basic proof techniques. This will be due on July 11th.

Tutorial worksheets

There will be one worksheet per tutorial (and an extra worksheet the week of August 3rd), for a total of eleven worksheets. You will be given these worksheets at the beginning of each tutorial and must submit them at the end of the tutorial. The lowest 2 of these 11 worksheets will be dropped, and each of the 9 non-dropped worksheets will be worth 3.33%.

Term tests

There will be two 2-hour term tests.

- Test 1 will be on **July 21st** from **6pm to 8pm**.
- Test 2 will be on **August 4th** from **6pm to 8pm**.

TT2 will be cumulative with a heavy emphasis on post-TT1 material. Your term test grade will be

$$\text{TTgrade} = 2/3 \cdot \max\{\text{TT1grade}, \text{TT2grade}\} + 1/3 \cdot \min\{\text{TT1grade}, \text{TT2grade}\}.$$

This means that your grade will be weighted more heavily towards your *better* term test.

Final exam

This will be a 3-hour exam in the exam period for S and Y exams, eg **August 15-22**.

3.1 Course Organization

This is a short 6-week offering of MAT223. Class and tutorial times are as follows:

Lecture	Time	Room
Monday	9:00am-11:00am	BA 1180
Wednesday	9:00am-11:00am	BA 1180
Thursday	9:00am-11:00am	BA 1190

TUT0101	Time	Room
Monday	1:00pm-2:00pm	OI 8214
Wednesday	1:00pm-2:00pm	OI 5160

TUT0102	Time	Room
Monday	1:00pm-2:00pm	OI 8220
Wednesday	1:00pm-2:00pm	OI 8220

TUT0201	Time	Room
Wednesday	11:00am-12:00pm	BA B024
Thursday	11:00am-12:00pm	BA B024

Figure 1: Class schedule

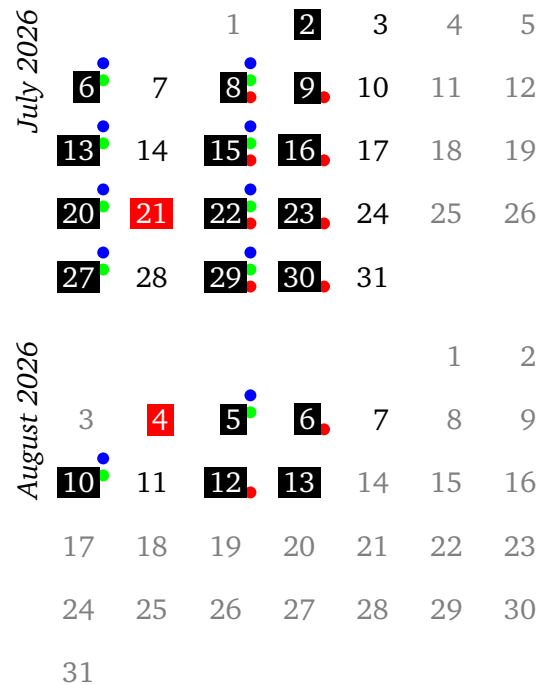


Figure 2: A calendar for the course.

In Figure 2 we have the following legend.

- **Black boxed dates** indicate days where there is class.
- **Red boxed dates** indicate term test dates.
- **Blue dots** indicate days that have TUT0101 sessions
- **Green dots** indicate days that have TUT0102 sessions.
- **Red dots** indicate days that have TUT0201 session.

3.2 Tutorials

There will be eleven tutorials per section, starting the week of July 6:

- TUT0101 - starts July 6, runs until August 10. Run by [REDACTED].
- TUT0102 - starts July 6, runs until August 10. Run by [REDACTED].
- TUT0201 - starts July 8, runs until August 12. Run by [REDACTED].

Each tutorial will have a graded worksheet that must be completed during (and handed in at the end of) the tutorial. You are strongly encouraged to work in groups and talk to the TA – they are there to help you!

4 Schedule of Lectures

This schedule is tentative. The cutoffs of material for the term tests is accurate, but we may go through material quicker than below.

Lecture	Date	Sections covered
1	July 2	1.1 - 1.4
2	July 6	1.5 - 1.7 , 2.1 - 2.3
3	July 8	2.3 - 2.4
4	July 9	3.1 - 3.2
5	July 13	3.3 - 3.4 , 4.1 - 4.2
6	July 15	4.2 - 4.4
CUTOFF	FOR	TT1
7	July 16	5.1 - 5.2
8	July 20	5.3 - 5.4 , 6.1 - 6.2
9	July 22	6.3 - 6.4
10	July 23	7.1 - 7.2
11	July 27	7.2 - 7.3 , 8.1 - 8.2
12	July 29	9.1 - 9.2
CUTOFF	FOR	TT2
13	July 30	10.1 - 10.2
14	August 5	10.3 - 10.4
15	August 6	11.1 - 11.3
16	August 10	11.4 , 12.1
17	August 12	12.2 - 12.3
18	August 13	REVIEW
END	OF	COURSE

5 Course Policies

5.1 Policy on Missed Term Work

Students who are absent from class for prolonged periods and who require consideration for missed academic work should contact the instructor and verify their absence(s) through either the Absence Declaration tool, Verification of Illness or Injury (VOI) form, College Registrar Letter, or Letter of Academic Accommodation from Accessibility Services, as appropriate to their situation.

<https://www.artsci.utoronto.ca/current/academics/student-absences>

The absence declaration can be used once per term. Outside of the one time absence declaration use, students must adhere to the alternate processes for absences listed above, as well as the missed work policy as set out in each course's syllabus.

If you miss a term test, then you must inform your course Instructor within 72 hours of the test. No exceptions. If your request is approved, you may receive an accommodation. The accommodation to be used will be decided by your instructor. Some examples of accommodations may include: an oral exam, written make-up test, or a re-weighting of your assessments.

5.2 Re-marking Policy

A student who believes an individual item of work has been incorrectly or unfairly marked may ask the person who marked it for a re-evaluation. With evidence to back their appeal, students should make such requests as soon as reasonably possible after receiving the work back, but no later than 2 weeks after it was returned.

6 Institutional Policies and Support

6.1 Academic Integrity

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters (<https://governingcouncil.utoronto.ca/secretariat/policies/codebehaviour-academic-matters-july-1-2019>). If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, please reach out to your Course Instructor. Note that you are expected to seek out additional information on academic integrity from me or from other institutional resources (for example, the University of Toronto website on Academic Integrity <http://academicintegrity.utoronto.ca/>).

6.2 Accessibility

The University provides academic accommodations for students with disabilities in accordance with the terms of the Ontario Human Rights Code. This occurs through a collaborative process that acknowledges a collective obligation to develop an accessible learning environment that both meets the needs of students and preserves the essential academic requirements of the University's courses and programs. Students with diverse learning styles and needs are welcome in this course. If you have a disability that may require accommodations, please feel free to approach your Course Instructor and/or the Accessibility Services office as soon as possible. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

Link to Accessibility Services website: <https://studentlife.utoronto.ca/departments/accessibility-services/>