Recent Announcements

Rescheduled Office Hours

(https://q.utoronto.ca/courses/297154/discussion_topics/2192147)

Hi Everyone,Everything is fine now, but due to a medical issue this morning, I was unable to hold my office hour. According to the Zoom log, there were quite a few people! So instead of having only one hour per week, I have added a few extra days, so I can speak to each of you.If you had intended to speak to me today, please do attend one of these office hours:Friday May 12 from 10-11 amMonday May 15 from 10-11 amTuesday May 16 from 10-11 amThursdays 10-11 am for the duration of May and June, 2023All of these hours will be held at: https://utoronto.zoom.us/j/86747202827Thank you for your understanding!Best wishes,Lindsey

Posted on:

May 11, 2023, 4:13 p.m.

Grades, Requests, Office Hours

(https://q.utoronto.ca/courses/297154/discussion_topics/2186324)

Hi Everyone,Your grades should be visible on ACORN before noon today.We have looked at all of the re-grade requests, but have not finished responding to each one by email. If you have a request pending, you should expect a response in the next week or so.If you have any questions about the course material or your grade, you are welcome to visit:Lindsey Shorser's Summer Office HoursWhen: Thursdays 10-11 am for the duration of May and June, 2023Where: https://utoronto.zoom.us/j/86747202827 Have a great summer!!Cheers,The MAT224 Instructional Team

Posted on:

May 5, 2023, 10:30 a.m.

Some final notes

(https://q.utoronto.ca/courses/297154/discussion_topics/2179669)

Dear students,Congratulations on going all the way through MAT 224! We (the instructors) are currently finishing grading the final exams, and, in the meantime, I wanted to send some additional info for you. This announcement is mostly addressed to students who attended the 0501 lecture session, but most of the info can be of interest to all of you.First of all, I really enjoyed teaching the course, and I wanted to thank you for your participation. I greatly enjoyed the discussions we had through the office hours, and the interactions we established during and after lectures.Second, starting this Friday, April 28th, I will be organizing something I would like to call "Student hours". The intention is to address and discuss mathematical (or close to mathematical) questions that are not necessarily related to a course you are currently taking. Those can range from "I vaguely heard about this area/problem/idea in mathematics, and I understood nothing/something, could we discuss that/how to approach this?" to "Here is a specific question I am stuck on, how could we solve this?" or even meta-questions like "Why would you even need pure mathematics?". The format is intended to be similar to office hours for now, and it will depend on the number of interested students. These student hours will be held weekly on Fridays from 11 am to 2 pm in my office, HSB 374 (155 College street). I created a shared calendar to reflect any reschedules/cancellations Google calendar link: feel free to subscribe if you are interested.Third, if you did strongly like my lectures, the department of Mathematics announced Teaching Awards for this year, and students can nominate their instructors if they wish. This would require filling the following Google form: https://forms.office.com/r/FhidA3w9eW. The deadline is May 12th. The same is applicable to the other lecturers and TAs in our course with some restrictions to their status: the available awards are given to undergraduate and graduate students, and to postdoctoral fellows.Last but not least, I wanted to share a student drawing from one of the exam copies (credit to Ale Malusà for finding it). There were several wonderful drawings :)Good luck,Denis Gorodkov

Posted on:

Apr 27, 2023, 9:40 p.m.

Welcome to MAT224! In part 2 of Linear Algebra, we will learn about vector spaces, linear transformations, spectral theorem, and more! **Each week you are expected to attend lecture, take notes, attend tutorial, work on the bi-weekly homework. There will also be two tests and an exam.** See below for more details.

In this document, you will find:

- **Section-specific websites:**
  - LEC0101 -- Sebastián (https://q.utoronto.ca/courses/297154/pages/lecture-materials-for-lec0101-sebastian)
  - LEC0201 -- Li Yu (https://q.utoronto.ca/courses/297154/pages/lecture-materials-for-lec0201-yu)
  - LEC0301 -- Lindsey (https://q.utoronto.ca/courses/297154/pages/lecture-materials-for-lec0301-lindsey)
  - LEC0401 -- Caleb (https://q.utoronto.ca/courses/297154/pages/lecture-materials-for-lec0401-caleb)
  - LEC0501 -- Denis (https://q.utoronto.ca/courses/297154/pages/lecture-materials-for-lec0501-denis)
  - LEC5101 -- Alessandro (https://q.utoronto.ca/courses/297154/pages/lecture-materials-for-lec5101-alessandro)
- **Instructions for Tutorials** (see the Homework Pages for instructions) Tutorials start on 26-27 January.
- Textbook Information
- Office Hours, Piazza(message board), and Contact Info
- Marking Scheme
- Important Dates
- Course Policies

Course Summary

Week	Unit Number	Lecture Notes	Tutorial Handout	Homew
Jan 9-13	1	• Unit-1a.pdf (https://q.utoronto.ca/courses/297154/files/24237950?wrap=1) (https://q.utoronto.ca/courses/297154/files/24237950/download?download_frd=1) • Unit-1a.tex (https://q.utoronto.ca/courses/297154/files/24237951?wrap=1) (https://q.utoronto.ca/courses/297154/files/24237951/download?download_frd=1) • (https://q.utoronto.ca/courses/297154/files/24237951?wrap=1) Detexify (http://detexify.kirelabs.org/classify.html) For finding LaTeX symbols	• no tutorials	Unit 1 I homew
Jan 16-20	1	• Unit-1b.pdf (https://q.utoronto.ca/courses/297154/files/24330652?wrap=1) (https://q.utoronto.ca/courses/297154/files/24330652/download?download_frd=1) • Unit-1b.tex (https://q.utoronto.ca/courses/297154/files/24330653?wrap=1) (https://q.utoronto.ca/courses/297154/files/24330653/download?download_frd=1)	• no tutorials	Unit 1 I
Jan 23-27	2	• Unit-2a.pdf (https://q.utoronto.ca/courses/297154/files/24431363?wrap=1) (https://q.utoronto.ca/courses/297154/files/24431363/download?download_frd=1) • Unit-2a.tex (https://q.utoronto.ca/courses/297154/files/24431367?wrap=1) (https://q.utoronto.ca/courses/297154/files/24431367/download?download_frd=1)	• tutorial1.pdf (https://q.utoronto.ca/courses/297154/files/24384079?wrap=1) (https://q.utoronto.ca/courses/297154/files/24384079/download?download_frd=1) • tut1 solutions (https://q.utoronto.ca/courses/297154/files/24384083?wrap=1) (https://q.utoronto.ca/courses/297154/files/24384083/download?download_frd=1)	Unit 2 I homew HW 2 S (https:// (https:// downlo
Jan 30-Feb 3	2	• Unit-2b.pdf (https://q.utoronto.ca/courses/297154/files/24604215?wrap=1) (https://q.utoronto.ca/courses/297154/files/24604215/download?download_frd=1) • Unit-2b.tex (https://q.utoronto.ca/courses/297154/files/24604217?wrap=1)	• tutorial2.pdf (https://q.utoronto.ca/courses/297154/files/24384239?wrap=1) (https://q.utoronto.ca/courses/297154/files/24384239/download?download_frd=1) • tut2 solutions (https://q.utoronto.ca/courses/297154/files/24384236?wrap=1)	Unit 2 I

		(https://q.utoronto.ca/courses/297154/files/24604217/download?download_frd=1)	(https://q.utoronto.ca/courses/297154/files/24384236/download?download_frd=1) • Practice_Test_1.pdf (https://q.utoronto.ca/courses/297154/files/24574419?wrap=1) (https://q.utoronto.ca/courses/297154/files/24574419/download?download_frd=1)	
Feb 6-10	3	• Unit-3a.pdf (https://q.utoronto.ca/courses/297154/files/24929498?wrap=1) (https://q.utoronto.ca/courses/297154/files/24929498/download?download_frd=1) • Unit-3a.tex (https://q.utoronto.ca/courses/297154/files/24929499?wrap=1) (https://q.utoronto.ca/courses/297154/files/24929499/download?download_frd=1)	• tutorial3.pdf (https://q.utoronto.ca/courses/297154/files/24384350?wrap=1) (https://q.utoronto.ca/courses/297154/files/24384350/download?download_frd=1) • tut3 solutions (https://q.utoronto.ca/courses/297154/files/24384351?wrap=1) (https://q.utoronto.ca/courses/297154/files/24384351/download?download_frd=1)	Unit 3 I homew Test 1 I (https:// Test 1 S (https:// (https:// downlo Re-gra (https:// PMt8gU usp=sf_
Feb 13-17	3	• Unit-3b.pdf (https://q.utoronto.ca/courses/297154/files/24920444?wrap=1) (https://q.utoronto.ca/courses/297154/files/24920444/download?download_frd=1) • Unit-3b.tex (https://q.utoronto.ca/courses/297154/files/24920445?wrap=1) (https://q.utoronto.ca/courses/297154/files/24920445/download?download_frd=1)	• tutorial4.pdf (https://q.utoronto.ca/courses/297154/files/24384389?wrap=1) (https://q.utoronto.ca/courses/297154/files/24384389/download?download_frd=1) • tut4 solutions (https://q.utoronto.ca/courses/297154/files/24384385?wrap=1) (https://q.utoronto.ca/courses/297154/files/24384385/download?download_frd=1)	**Unit 3 I EXTEN**
Feb 20-24	--	Reading Week	--	
Feb 27-Mar 3	4	• Unit-4a.pdf (https://q.utoronto.ca/courses/297154/files/25110583?wrap=1) (https://q.utoronto.ca/courses/297154/files/25110583/download?download_frd=1) • Unit-4a.tex (https://q.utoronto.ca/courses/297154/files/25110586?wrap=1) (https://q.utoronto.ca/courses/297154/files/25110586/download?download_frd=1)	• tutorial5.pdf (https://q.utoronto.ca/courses/297154/files/25089322?wrap=1) (https://q.utoronto.ca/courses/297154/files/25089322/download?download_frd=1) • tut5 solutions (https://q.utoronto.ca/courses/297154/files/25089223?wrap=1) (https://q.utoronto.ca/courses/297154/files/25089223/download?download_frd=1)	Unit 4 I homew
March 6-10	4	• Unit-4b.pdf (https://q.utoronto.ca/courses/297154/files/25291431?wrap=1) (https://q.utoronto.ca/courses/297154/files/25291431/download?download_frd=1) • Unit-4b.tex (https://q.utoronto.ca/courses/297154/files/25291428?wrap=1) (https://q.utoronto.ca/courses/297154/files/25291428/download?download_frd=1)	• tutorial6.pdf (https://q.utoronto.ca/courses/297154/files/25089323?wrap=1) (https://q.utoronto.ca/courses/297154/files/25089323/download?download_frd=1) • tut6 solutions (https://q.utoronto.ca/courses/297154/files/25089224?wrap=1) (https://q.utoronto.ca/courses/297154/files/25089224/download?download_frd=1) • Practice Test 2 (https://q.utoronto.ca/courses/297154/files/25342136?wrap=1) (https://q.utoronto.ca/courses/297154/files/25342136/download?download_frd=1)	**Unit 4 I** **EXTEN**

March 13-17	5	• Unit-5a.pdf (https://q.utoronto.ca/courses/297154/files/25813805?wrap=1) (https://q.utoronto.ca/courses/297154/files/25813805/download?download_frd=1) • Unit-5a.tex (https://q.utoronto.ca/courses/297154/files/25923191?wrap=1) (https://q.utoronto.ca/courses/297154/files/25923191/download?download_frd=1)	• tutorial7.pdf (https://q.utoronto.ca/courses/297154/files/25089324?wrap=1) (https://q.utoronto.ca/courses/297154/files/25089324/download?download_frd=1) • tut7 solutions (https://q.utoronto.ca/courses/297154/files/25089225?wrap=1) (https://q.utoronto.ca/courses/297154/files/25089225/download?download_frd=1)	Unit 5 I homew
March 20-24	5	• Unit-5b.pdf (https://q.utoronto.ca/courses/297154/files/25923177?wrap=1) (https://q.utoronto.ca/courses/297154/files/25923177/download?download_frd=1) • Unit-5b.tex (https://q.utoronto.ca/courses/297154/files/25923190?wrap=1) (https://q.utoronto.ca/courses/297154/files/25923190/download?download_frd=1)	• tutorial8.pdf (https://q.utoronto.ca/courses/297154/files/25089326?wrap=1) (https://q.utoronto.ca/courses/297154/files/25089326/download?download_frd=1) • Definitions for tut8 (https://q.utoronto.ca/courses/297154/pages/definitions-for-tutorial-on-thursday-march-23-24) • tut8 solutions (https://q.utoronto.ca/courses/297154/files/25089227?wrap=1) (https://q.utoronto.ca/courses/297154/files/25089227/download?download_frd=1)	**Unit 5 I** **EXTEN** Test 2 I (https:// Test 2 S with up (https:// (https:// downlo
March 27-31	6	• Unit-6a.pdf (https://q.utoronto.ca/courses/297154/files/25923176?wrap=1) (https://q.utoronto.ca/courses/297154/files/25923176/download?download_frd=1) • Unit-6a.tex (https://q.utoronto.ca/courses/297154/files/25923189?wrap=1) (https://q.utoronto.ca/courses/297154/files/25923189/download?download_frd=1)	• tutorial9.pdf (https://q.utoronto.ca/courses/297154/files/25089330?wrap=1) (https://q.utoronto.ca/courses/297154/files/25089330/download?download_frd=1) • tut9 solutions (https://q.utoronto.ca/courses/297154/files/25089228?wrap=1) (https://q.utoronto.ca/courses/297154/files/25089228/download?download_frd=1)	Unit 6 I homew
April 3-7	6	• Unit-6b.pdf (https://q.utoronto.ca/courses/297154/files/25906768?wrap=1) (https://q.utoronto.ca/courses/297154/files/25906768/download?download_frd=1) • Unit-6b.tex (https://q.utoronto.ca/courses/297154/files/25923192?wrap=1) (https://q.utoronto.ca/courses/297154/files/25923192/download?download_frd=1)	• tutorial10.pdf (https://q.utoronto.ca/courses/297154/files/25089331?wrap=1) (https://q.utoronto.ca/courses/297154/files/25089331/download?download_frd=1) • tut10 solutions (https://q.utoronto.ca/courses/297154/files/25089229?wrap=1) (https://q.utoronto.ca/courses/297154/files/25089229/download?download_frd=1)	**Unit 6 I**
April 11-28	--	Exam Period	• Exam Information (https://q.utoronto.ca/courses/297154/pages/final-exam-information) • Practice Exam (https://q.utoronto.ca/courses/297154/files/25768283?wrap=1) (https://q.utoronto.ca/courses/297154/files/25768283/download?download_frd=1)	--

Lectures Details

You are expected to attend all of the lectures and fill in the "Lecture Notes" (see table above). You can take notes directly on the "Lecture Notes" or use your own notes to fill them out at the end of the semester.

Section	Instructor	Times	Location(s)	Contact	Office Hours

LEC 0101	Sebastián Olano Espinosa	TWR 9 am	LM 162 (https://map.utoronto.ca/?id=1809#!m/494502?s/)	sebastian.olano@utoronto.ca (mailto:sebastian.olano@utoronto.ca)	• TBA
LEC 0201	Li Yu	TWR 10 am	MP 103 (https://map.utoronto.ca/?id=1809#!m/494490?s/)	liyu@math.toronto.edu (mailto:liyu@math.toronto.edu)	• TBA
LEC 0301	Lindsey Shorser	TWR 11 am	LM 162 (https://map.utoronto.ca/?id=1809#!m/494502?s/)	admin224@math.toronto.edu (mailto:admin224@math.toronto.edu)	• Mondays 8-9 pm in RW 140 and online (link) • immediately after lectures (TWR 12) in the LM hallway, 1st floor • Friday noon online (link)
LEC 0401	Caleb Jonker	TWR 1 pm	RW 117 (https://map.utoronto.ca/?id=1809#!m/494515?s/)	cjonker@math.utoronto.ca (mailto:cjonker@math.utoronto.ca)	• TBA
LEC 0501	Denis Gorodkov	TWR 2 pm	RW 117 (https://map.utoronto.ca/?id=1809#!m/494515?s/)	denis.gorodkov+mat224@utoronto.ca (mailto:denis.gorodkov+mat224@utoronto.ca)	• Tuesdays 3.30-4.30 pm in SS 623 (to the left from the MLC, door with Office Hours written) • Thursdays 3.30-4.30 pm in SS 623 (to the left from the MLC, door with Office Hours written)
LEC 5101	Alessandro Malusà	TWR 6 pm	LM 162 (https://map.utoronto.ca/?id=1809#!m/494502?s/)	amalusa@math.utoronto.ca (mailto:amalusa@math.utoronto.ca)	• Tuesdays, 7-8pm and Thursdays, 5-6pm at LM162.

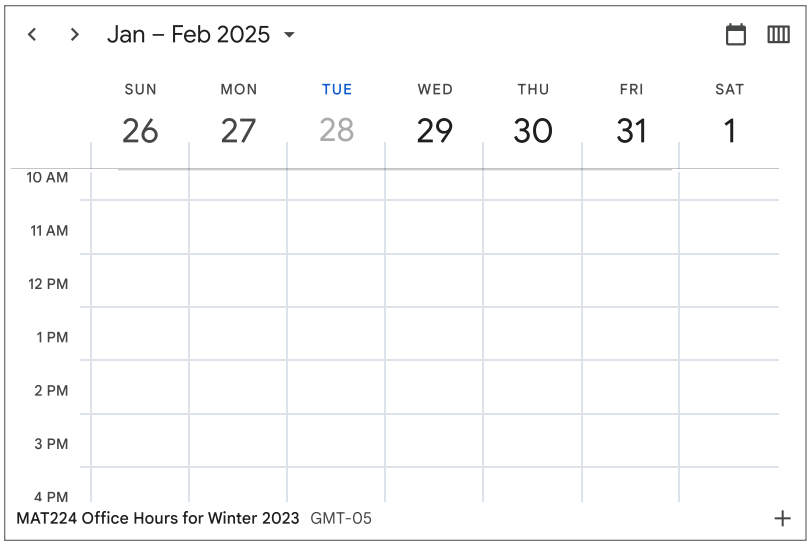
Textbook Information

Primary Textbook: A Course in Linear Algebra, David B. Damiano and John B. Little -- available through the U of T bookstore (https://www.uoftbookstore.com/) for purchase.

Complementary Textbook: Linear Algebra Done Right, Sheldon Axler -- available electronically through the UofT library (https://library.utoronto.ca/) .

Office Hours, Piazza (message board), and Contact Info

Office Hours Calendar



If you have questions, concerns, or want to join the discussion, post to our message board! It is hosted on **https://piazza.com/utoronto.ca/winter2023/mat224 (https://piazza.com/utoronto.ca/winter2023/mat224)** .

Our course email address is **admin224@math.toronto.edu (mailto:admin224@math.toronto.edu)** Alternatively, you can post a "private" message on Piazza which will only be seen by instructors.

Marking Scheme

% of Final Grade	Assignment	Description
25%	Homework	• Each of your top 5 Homework assignments are worth 5% each • due on the Friday at the end of each unit)
30%	Tests	• Your highest test is worth 20% and your other test is worth 10% • Feb 6 at 6-8 pm and March 20 at 6-8 pm)
5%	Lecture Notes	• 0.5% for each week's lecture notes, up to a maximum of 5% • due at the end of the semester
40%	Exam	• To be scheduled during the April exam period

Important Dates

Date(s)	Description
Jan 10	First Lecture
Jan 26-27	First tutorials
Jan 22	Last day to enrol in an S course
Feb 6	**Test 1 Information (https://q.utoronto.ca/courses/297154/pages/test-1-information)**
Feb 20-24	Reading Week
March 19	Last day to drop an S course
March 20	**Test 2 Information (https://q.utoronto.ca/courses/297154/pages/test-2-information)**
April 6	Last day of tutorials and lectures
April 11-28	**Exam period (https://q.utoronto.ca/courses/297154/pages/final-exam-information)**

Course Policies

1. Extensions and Absence Declaration information:

Please try to keep up with the course. If you are unable to submit a homework assignment on time, cannot write a test, or miss a tutorial due to something outside of your control (example: being ill), please email the course address (**admin224@math.toronto.edu (mailto:admin224@math.toronto.edu)**) so we can discuss an appropriate accommodation.

You should also attend an office hour or create a private post on **Piazza (https://piazza.com/utoronto.ca/winter2023/mat224/home)** to discuss how you can catch up with the course material.

2. Late Policy

If you do not contact your instructor as outlined above, there will be a 0% deduction for submissions that are submitted up to 1 hour late and 20% deduction for anything that is 1 to 23 hours late. Any submission received more than 24 hours after the deadline will receive a mark of 0.

3. Tutorials

Tutorials will begin on January 26 and 27. The purpose of tutorials is to give you a chance to try out the concepts learned during lecture. You are expected to attend all of them as part of the learning process and also to prepare for the tests and exam. Some of the activities you do during tutorial will count towards a homework assignment. Check the homework assignments for more details.

4. Remark Requests

All remark requests should be submitted through Crowdmark (**https://app.crowdmark.com** (https://app.crowdmark.com)) or through the course email address (**admin224@math.toronto.edu** (mailto:admin224@math.toronto.edu)). Requests will be considered before final course grades are submitted. If you would like a faster response, feel free to bring your request to an office hour.

5. Accessibility

Students with diverse learning styles and needs are welcome in this course. If you have an acute or ongoing disability issue or accommodation need, you should register with Accessibility Services (AS) at the beginning of the academic year by visiting **http://www.studentlife.utoronto.ca/as/new-registration** (http://www.studentlife.utoronto.ca/as/new-registration) . Without registration, you will not be able to verify your situation with your instructors, and instructors will not be advised about your accommodation needs. AS will assess your situation, develop an accommodation plan with you, and support you in requesting accommodation for your course work. Remember that the process of accommodation is private: AS will not share details of your needs or condition with any instructor, and your instructors will not reveal that you are registered with AS.

6. Religious Accommodation

As a student at the University of Toronto, you are part of a diverse community that welcomes and includes students and faculty from a wide range of cultural and religious traditions. For my part, I will make every reasonable effort to avoid scheduling tests, examinations, or other compulsory activities on religious holy days not captured by statutory holidays. Further to University Policy, if you anticipate being absent from class or missing a major course activity (such as a test or in-class assignment) due to a religious observance, please let me know as early in the course as possible, and with sufficient notice (at least two to three weeks), so that we can work together to make alternate arrangements.

7. Academic Integrity

All students, faculty and staff are expected to follow the University's guidelines and policies on academic integrity. For students, this means following the standards of academic honesty when writing assignments, collaborating with fellow students, and writing tests and exams. Ensure that the work you submit for grading represents your own honest efforts. Plagiarism—representing someone else's work as your own or submitting work that you have previously submitted for marks in another class or program—is a serious offence that can result in sanctions. Speak to me or your TA for advice on anything that you find unclear. To learn more about how to cite and use source material appropriately and for other writing support, see the U of T writing support website at **http://www.writing.utoronto.ca** (http://www.writing.utoronto.ca) . Consult the Code of Behaviour on Academic Matters for a complete outline of the University's policy and expectations. For more information, please see **https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity** (https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity) and **http://academicintegrity.utoronto.ca** (http://academicintegrity.utoronto.ca)

Assignment Submission Method

Details for submitting assignments will be included in each Homework Assignment. All parts of the Homework Assignments will be submitted either to Quercus or to Crowdmark (**https://app.crowdmark.com/sign-in/utoronto** (https://app.crowdmark.com/sign-in/utoronto)). Please see the actual Homework Assignments (linked at the top of this page) for details.

For your Homework Assignments, typing is optional. However, if you want to learn LaTeX for typing mathematical notation, here is a resource for getting started on **overleaf.com** (https://www.overleaf.com/) :

https://www.overleaf.com/learn/how-to/How_do_I_use_Overleaf%3F (https://www.overleaf.com/learn/how-to/How_do_I_use_Overleaf%3F)

Alternatively, you can take a high quality scan of your handwritten work, using something like **https://scanbot.io/** (https://scanbot.io/) or **https://www.camscanner.com/user/download** (https://www.camscanner.com/user/download) .