



Dror Bar-Natan: Wiki

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14-240

Algebra I

Department of Mathematics, University of Toronto, Fall 2014

Agenda: Understand linear algebra, the simplest algebra there is, and come to appreciate that simplest is also the most fundamental.

Hidden Agenda: Learn (by example) how "real" math is done: abstraction and generalization, definitions, theorems and proofs, the basic language of mathematics.

Instructor: Dror Bar-Natan, drorbn@math.toronto.edu, Bahen 6178, 416-946-5438. Office hours: Wednesdays 2:30-3:30 or by appointment (v).

Classes: Mondays 9-10 at SS 2102 and Wednesdays 9-11 at ES 1050.

Teaching Assistants: Mikhail Gudim (no email) and Nikita Nikolaev (nikolaev@math.utoronto.ca).



Tutorials: Tuesday 1-3 at ?? with Mikhail Gudim if your student number is even, and at ?? with Nikita Nikolaev if it is odd. No tutorials on the first week of classes.

Text

Our main text book will be *Linear Algebra* (fourth edition) by Friedberg, Insel and Spence, ISBN 0-13-008451-4; it is a required reading.

Further Resources

- Undergraduate Information [at the UofT Math Department](#)
- Undergraduate Course Descriptions [.](#)
- My 2012 Math 240 web site.
- Marco Gualtieri's 2011 Math 240 web site [.](#)
- Marco Gualtieri's 2010 Math 240 web site [.](#)
- My 2009 Math 240 web site.
- The 2008 MAT240 site [.](#)
- My 2006 Math 240 web site.
- My 14-240 notebook.

Dror's notes above / Students' notes below

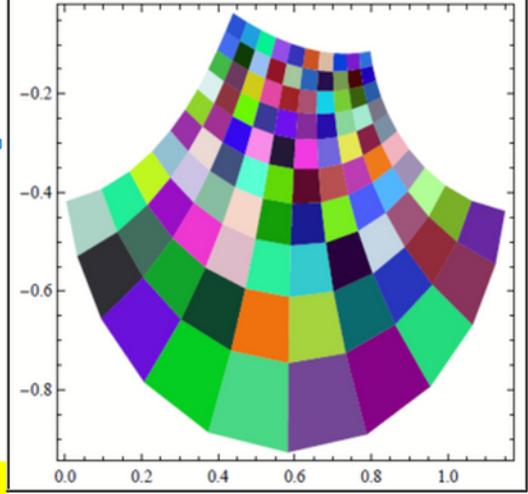
Category: [Pages with broken file links](#)

DBN: Classes: 2014-15: 14-240 / Navigation

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1	Sep 8	About This Class , Monday
2	Sep 15	HW1
3	Sep 22	HW2 , Class Photo
4	Sep 29	HW3
5	Oct 6	HW4
6	Oct 13	No Monday class (Thanksgiving)
7	Oct 20	HW5 , Term Test at tutorials on Tuesday
8	Oct 27	HW6
9	Nov 3	Monday is the last day to drop this class, HW7
10	Nov 10	HW8
11	Nov 17	Monday-Tuesday is UofT November break, HW9
12	Nov 24	HW10
13	Dec 1	Wednesday is a "makeup Monday"!
F	Dec 8	The Final Exam?
F	Dec 15	The Final Exam?

Register of Good Deeds

310px
Add your name / see who's in!



14-240/About This Class

From Drorbn

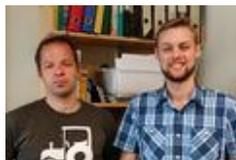
Crucial Information

Agenda: Understand linear algebra, the simplest algebra there is, and come to appreciate that simplest is also the most fundamental.

Hidden Agenda: Learn (by example) how "real" math is done: abstraction and generalization, definitions, theorems and proofs, the basic language of mathematics.

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URL: <http://drorbn.net/drorbn/index.php?title=14-240>.

Abstract

Taken from the Faculty of Arts and Science Calendar (http://www.artsandscience.utoronto.ca/ofr/calendar/crs_mat.htm) :

A theoretical approach to: vector spaces over arbitrary fields including \mathbb{C} , \mathbb{Z}_p . Subspaces, bases and dimension. Linear transformations, matrices, change of basis, similarity, determinants. Polynomials over a field (including unique factorization, resultants). Eigenvalues, eigenvectors, characteristic polynomial, diagonalization. Minimal polynomial, Cayley-Hamilton theorem.

- Prerequisite: high school level calculus.
- Co-requisite: MAT157Y1
- Distribution Requirement Status: This is a Science course
- Breadth Requirement: The Physical and Mathematical Universes (5)

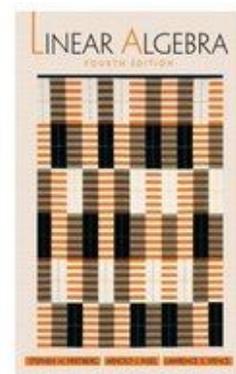
Text Book(s)

Our main text book will be *Linear Algebra* (fourth edition) by Friedberg, Insel and Spence, ISBN 0-13-008451-4; it is a required reading.

Wiki

The class web site is a wiki, as in Wikipedia (<http://www.wikipedia.org>) - meaning that anyone can and is welcome to edit almost anything and in particular, students can post notes, comments, pictures, whatever. Some rules, though -

- This wiki is a part of my (Dror's) academic web page. All postings on it must be class-related (or related to one of the other projects I'm involved with).
- You must login to edit. To get an account, email me the class you are taking (14-240), your preferred login name, your real name and your email address if different from the address you are writing from.
- Criticism is fine, but no insults or foul language, please.
- I (Dror) will allow myself to exercise editorial control, when necessary.



- The titles of all pages related to this class should begin with "14-240/" or with "14-240-", just like the title of this page.
- For most 14-240 pages, it is a good idea to put a line containing only the string `{{14-240/Navigation}}` at the top of the page. This template inserts the class' "navigation panel" on the top right of the page.
- To edit the navigation panel itself, click on the word "Navigation" on the upper right of the panel. **Use caution!** Such edits affect many other pages! Note that due to page-caching, such edits take some time to propagate to the pages that include the navigation panel. To force immediate propagation to a given page, reload that page with the string `&action=purge` (meaning: "purge cached version") appended to the page's URL.
- Neatness matters! Material that is posted in an appealing manner will be read more, and thus will be more useful.
- Some further editing help is available at Help:Contents.

Marking Scheme

There will be one term test (25% of the total grade) and a final exam (50%), as well as about 10 homework assignments (25%).

The Term Test

The term test will take place at tutorials on Tuesday October 21th, 1-3PM. A student who misses the term test without providing a valid reason (for example, a doctor's note) within one week of the test will receive a mark of 0 on the term test. There will be no make-up term test. If a student misses the term test for a valid reason, the weight of the problem sets will increase to 35% and the weight of the final exam to 65%.

Homework

About 10 assignments will be posted on the course web page and distributed in class (usually on Mondays) approximately on the weeks shown in the class timeline. They will usually be due a week later at the tutorials (on Tuesdays) and they will be (at least partially) marked by the TAs. All students (including those who join the course late) will receive a mark of 0 on each assignment not handed in; though in computing the homework grade, your worst two assignments will not count. I encourage you to discuss the assignments with other students or browse the web, so long as you do at least some of the thinking on your own and you write up your own solutions. Remember that cheating is always possible and may increase your homework grade a bit. But it will hurt your appreciation of yourself, your knowledge and your exam grades a lot more.

Good Deeds

Students will be able to earn up to 25 "good deeds" points throughout the year for doing services to the class as a whole. There is no pre-set system for awarding these points, but the following will definitely count:

- Drawing a beautiful picture to illustrate a point discussed in class and posting it on this site.
- Taking class notes in nice handwriting, scanning them and posting them here.
- Typing up or formatting somebody else's class notes, correcting them or expanding them in any way.
- Writing an essay on expanding on anything mentioned in class and posting it here; correcting or expanding somebody else's article.
- Setup *useful* external resources: A web-based discussion forum? A Q/A site?
- Doing anything on our 14-240/To do list.
- Any other service to the class as a whole.

Good deed points will count towards your final grade! If you got n of those, they are solidly yours and the above formula for the final grade will only be applied to the remaining $100 - n$ points. So if you got 25 good deed points (say) and your final grade is 80, I will report your grade as $25 + 80(100 - 25)/100 = 85$. Yet you can get an overall 100 even without doing a single good deed.

Important. For your good deeds to count, you **must** do them under your own name. So you must set up an account for yourself on this wiki and you must use it whenever you edit something. I will periodically check Recent changes to assign good deeds credits. Those credits will be made public (good deeds are public as a whole) towards the end of the course, at 14-240/Register of Good Deeds.

Important. The good deed points are an extra, a bonus, a treat. Very few will get many, and you should not count of them as a substitute for doing class work.

Class Photo

To help me learn your names, I will take a class photo on Wednesday of the third week of classes. I will post the picture on the class' web site and you will be *required* to send me an email and identify yourself in the picture or to identify yourself on the Class Photo page of this wiki.

Accessibility Needs

The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact Accessibility Services as soon as possible: disability.services@utoronto.ca (<mailto:disability.services@utoronto.ca>) or <http://studentlife.utoronto.ca/accessibility>.

Academic Integrity

I have been asked to include with the course syllabus a link to the Office of Academic Integrity. Here it is: <http://www.artsci.utoronto.ca/osai/students>.

How to Succeed in this Class

- **Keep up!** Don't fall behind on reading, listening, and doing assignments! University goes at a different pace than high school. New material is covered once and just once. There will be no going over the same thing again and again - if you fall behind, you stay behind. Unless you are an Einstein, there is *no way* to do well in this class merely by attending lectures - you **must** think about the material more than 3 or 5 hours a week if you want it to sink in. And if you are planning on not attending lectures, well, think again. Most people find it very hard to pace their own studies without a human contact; if you'll try, you are likely to discover the hard way that you belong to the majority.
- If in high school you were the best in your class in math, now remember that everybody around you was the same. You may find that what was enough then simply doesn't cut it any more. Try to catch that early in the year!
- Math is about **understanding**, not about memorizing. To understand is to internalize; it is to come to the point where whatever the professor does on the blackboard or whatever is printed in the books becomes **yours**; it is to come to the point where you appreciate why everything is done the way it is done, what does it mean, what are the reasons and motivations and what is it all good for. Don't settle for less!
- Keep asking yourself questions; many of them will be answered in class, but not all. Remember the old Chinese proverb:

"Teachers open the door, but you must enter by yourself"
"师傅领进门,修行靠个人!"

Retrieved from "http://drorbn.net/index.php?title=14-240/About_This_Class&oldid=13206"