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# Math 1750 - Shameless Mathematica

Toronto, Spring Term, Academic Year of 2015-2016

## Preliminary Page

**Instructor.** [Dror Bar-Natan](#), [drorbn@math.toronto.edu](mailto:drorbn@math.toronto.edu) (for administrative matters only; math on email is slow and prone to misunderstandings, so I generally avoid it). Office: Bahen 6178, 416-946-5438. Office hours: [here](#).

**Classes.** Mondays 1:30-3:00 and Wednesdays 1:00-2:30 at Bahen 6183.

**Course Description.** Yes, we all dream of the day we will prove that powerful theorem, whose beauty and sophistication will leave our colleagues breathless. It will, of course, be a product or pure thought, affirming that our intellect rises far, oh so far, beyond everybody else's. Obviously, no computers will be used. We are artists and philosophers, not technicians.

As a temporary measure I have learned to work with computers, and I plan to share what I have learned with you. For me, computer-assisted mathematics is a powered exoskeleton (seen Avatar? Iron Man?) for the brain. It's still my inner powers that everybody should admire, yet they reach much farther now that I've learned how to integrate them so tightly with the machine. Learn that too and reach far! I often use the platform "Mathematica" (though not only), and hence that's what I'll teach (though perhaps not only).



About one third of the course will be a systematic overview of Mathematica following that or another textbook. The other two thirds will be divided into chapters, each about some (mathematical) real life problem that I have at some point encountered and solved with computers. The typical chapter will start with a mathematical introduction (sometimes deep and meaningful in itself). I will then pose a computational problem, and challenge you to solve it better than the solution that I found and will present a week or two later. Many (though not all) of the problems will involve algebraic computations in knot theory, as this is what I know best. There will also be graphics, and some interaction with the web and with  $T_E X$ .

### Further resources.

- [Undergraduate Information](#) at the [UofT Math Department](#).
- My [Math 1750 Notebook](#).

1 Comment

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**Dror Bar-Natan** · Professor at University of Toronto

From an email I got recently: ... your "Shameless Mathematica" course sounds really cool. To quote a friend: "He's basically saying that he can give us superpowers!"

So here are the reasons you should NOT take this class:

- There are places where exoskeleta simply don't work. Try swimming with one...
- It's a huge pain to learn exoskeleta. You think "I'll just wear it and start punching". Oh no, the balance is completely different; at first you'll simply fall over.
- Exoskeleta are bulky, rough and unpleasant. There are sharp ends, even, no, especially on the inside. Air conditioning? Don't make me laugh.
- Try showing up to the conference dinner wearing your exoskeleton. Nobody will want to sit next to you. Deep inside, everybody will think that you no longer belong.
- If ever you get too used to wearing your exoskeleton, you'll find that you are pink and vulnerable when you are not wearing it. If you want to remain tough, face the elements wearing only your sword.

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