SYDE 556/750
Simulating Neurobiological Systems
Lecture 0: Administrative Remarks

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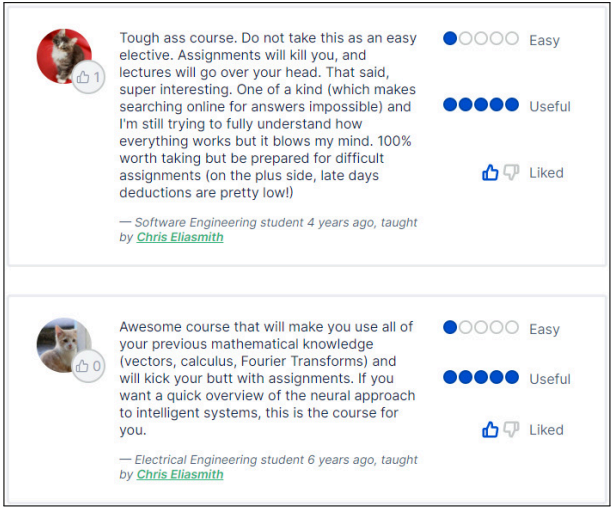
UNIVERSITY OF WATERLOO | FACULTY OF ENGINEERING

Warning



Tough ass course. Do not take this as an easy elective. Assignments will kill you, and lectures will go over your head. That said, super interesting. One of a kind (which makes searching online for answers impossible) and I'm still trying to fully understand how everything works but it blows my mind. 100% worth taking but be prepared for difficult assignments (on the plus side, late days deductions are pretty low!)

— *Software Engineering student 4 years ago, taught by Chris Eliasmith*

Easy

Useful

Liked

Awesome course that will make you use all of your previous mathematical knowledge (vectors, calculus, Fourier Transforms) and will kick your butt with assignments. If you want a quick overview of the neural approach to intelligent systems, this is the course for you.

— *Electrical Engineering student 6 years ago, taught by Chris Eliasmith*

Easy

Useful

Liked

- The UWFlow reviews are accurate.
- This can be a challenging course.
- Be prepared to spend a lot of time on the assignments.
- We'll be making use of pretty much everything in undergrad engineering, and applying it to cognitive science and neuroscience.

Organization (I)

Instructor

Chris Eliasmith

Email `celiasmith@uwaterloo.ca`
Website `compneuro.uwaterloo.ca`

Course website

- Syllabus, project description, due dates:
  `http://compneuro.uwaterloo.ca/courses/syde-750.html`
- Assignments, slides, lecture notes:
  `https://github.com/celiasmith/syde556-f23`

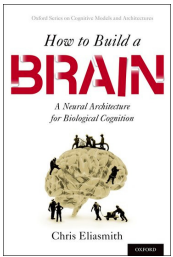
Organization (II)

Course times and logistics - All meetings in E7-4433 (nothing Friday)

- **Monday:**
  10:30-12:20 Lecture
- **Wednesday:**
  10:30-11:20 Lecture
- **Wednesday:**
  11:30-12:20 In person discussion (SYDE 750, optional for 556)

Textbooks and Readings

Main text:
Chris Eliasmith and Charles H. Anderson *Neural Engineering: Computation, Representation, and Dynamics in Neurobiological Systems*, MIT Press, 2003.



Optional:
Chris Eliasmith *How to Build a Brain*, Oxford University Press, 2013.

Coursework (SYDE 556 & SYDE 750)

Five Assignments

- 20%, 20%, 15%, 15%, 30%, respectively
- Roughly two weeks for each assignment
- Everyone must write their own code, generate their own graphs, and write their own answers.

Final Project (SYDE 750 only)

- Build a model of some neural system.
- Replicable science: report everything needed to recreate your model and analysis
- 20% of grade (assignments are rescaled to 80%)
- Have your project proposal approved via email by Oct 23rd (see template)

Coursework (SYDE 750 only)

Class Participation in the Seminar (SYDE 750 only; optional for SYDE 556)

- General discussion about Neuroscience, cognitive science, AI, etc.
- Each student is asked to submit questions or interesting observations pertaining to this week's reading, lecture notes, or the material referenced in the lecture (this should be about 100 words).
- Questions must be submitted via email to the instructor (`celiasmith@uwaterloo.ca`) by midnight (23:59 EST) on the Tuesday before.
- This is to ensure a lively discussion in the seminar — there are no marks for this part of the course.

Schedule

- See here: `http://compneuro.uwaterloo.ca/courses/syde-750/syde-556-course-outline.html`

To get started

- Get the textbook ("Neural Engineering", Chris Eliasmith and Charles Anderson, 2003)
- Be able to run `jupyter lab` or `jupyter notebook` with a Python 3 kernel. Install `numpy`, `scipy`, and `matplotlib`. Anaconda is a Python distribution that ships with these packets preinstalled, so (depending on your platform) this might be the easiest to use.
- Start thinking about a project... already.