

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

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January 7, 2020



UNIVERSITY OF
WATERLOO

FACULTY OF
ENGINEERING

Organization (I)

Instructor

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GitHub <https://github.com/astoeckel>

Course website

- ▶ <http://compneuro.uwaterloo.ca/courses/syde-750.html>
- ▶ <https://github.com/astoeckel/syde556-w20>

Organization (II)

Course times and location

- ▶ **Tuesday:**
11:30-12:50 in **E5-4106** (SYDE 556/750)
- ▶ **Thursday:**
9:00-10:20 in **E5-6004** (SYDE 556/750)
- ▶ **Thursday:**
10:30-11:20 in **E5-6127** (SYDE 750, optional for 556)

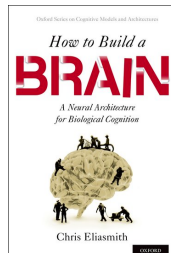
Office hours

- ▶ Office hours are generally in E7-6323.
- ▶ Potential times:
Tue 13:00-14:00, Tue 15:00-16:00, Thu 11:30-12:30, Fri 10:30-11:30
- ▶ Alternatively, if that time doesn't work for you, by appointment.

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

Four Assignments (60% of the mark)

- ▶ 20%, 20%, 10%, 10%, respectively
- ▶ Roughly two weeks for each assignment
- ▶ Everyone must write their own code, generate their own graphs, and write their own answers.

Final Project (40% of the mark)

- ▶ 5% presentation, 35% report
- ▶ Build a model of some neural system.
- ▶ For 556 students: extension of something seen in class
- ▶ For 750 students: research project with more novelty
- ▶ Have your project approved via email before Reading Week!

Schedule (I)

Date	Reading	Topic	Assignments
WEEK 1			
Jan 7	Chapter 1	Introduction	
Jan 9	Chapter 2	Neurons	
WEEK 2			
Jan 14	Chapter 2	Population Representation (I)	#1 posted
Jan 16	Chapter 2	Population Representation (II)	
WEEK 3			
Jan 21	Chapter 4	Temporal Representation (I)	
Jan 23	Chapter 4	Temporal Representation (II)	
WEEK 4			
Jan 28	Chapters 5, 6	Feedforward Transformations (I)	#1 due*, #2 posted
Jan 30	Chapters 5, 6	Feedforward Transformations (II)	
WEEK 5			
Feb 4	Chapter 8	Dynamics (I)	
Feb 6	Chapter 8	Dynamics (II)	

Schedule (II)

Date	Reading	Topic	Assignments
WEEK 6			
Feb 11	Chapter 7 <i>provided</i>	Analysis of Representation	#2 due*, #3 posted
Feb 13		Temporal Basis Functions	
Feb 14			Project proposal due
WEEK 7			
— Reading week, no lectures —			
WEEK 8			
Feb 25	<i>provided</i>	Symbols (I)	
Feb 27	<i>provided</i>	Symbols (II)	
WEEK 9			
Mar 3	Chapter 8 <i>provided</i>	Memory	#3 due*, #4 posted
Mar 5		Action Selection	
WEEK 10			
Mar 10	Chaper 9	Learning (I)	
Mar 12	Chaper 9	Learning (II)	

Schedule (III)

Date	Reading	Topic	Assignments
WEEK 11			
Mar 17	<i>provided</i>	Spatial Semantic Pointers	#4 due*
Mar 19	<i>provided</i>	Biological Details	
WEEK 12			
Mar 24	<i>provided</i>	Other modelling frameworks	
Apr 2		Conclusion	
WEEK 13			
Mar 31, Apr 2		Project presentations	
WEEK 15			
Apr 15			Projects due*

* The project and all assignments are due at midnight (\approx 11:59p EST) of that day.

Homework

- ▶ **Get the textbook**
("Neural Engineering", Chris Eliasmith and Charles Anderson, 2003)
- ▶ **Be able to run jupyter lab or (jupyter notebook) with Python 3**
Install numpy, scipy, and matplotlib. You may want to use Anaconda, which ships with these packets preinstalled.
- ▶ Have a look at the **course website** and the **lecture notes**.
- ▶ Start thinking about a **project** ... already.