

# Syllabus

(as of May 19, 2020)

Class time & location: M/W 2-3:30 DRL A-5

Instructor:	Florian Schwarz	Graduate TA:	Alexandros Kalomoiros
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Office hours: Thursday 3-5 (Alex), Thursday 11:30-12:30, Friday 3-4 (Florian) See Canvas Syllabus Page for details

Course site on Canvas: <https://canvas.upenn.edu/courses/1493624>

(Please use Canvas for all class-related messages!)

## 1 Course Description

In this course, we study formal mathematical tools for the analysis of language that help us understand and classify the complex structures and rules that constitute language and grammar. These tools include set theory, formal language and automata theory, as well as aspects of logic, and will be applied to the syntax and semantics of natural language. In addition to learning something about formal tools for analyzing language, this will also enhance your general skills in analytical reasoning.

## 2 Logistics & Requirements

There is no textbook. Video lectures and notes (as well as some readings) will be made available throughout the course on Canvas. Class time will largely be devoted to group work and exercises.

To do well in this class, it is crucial that you attend class and actively participate in the group activities, and also do all of the quizzes and homework on Canvas in time. Both group work and homework assignments are designed to make sure that you are able to work with the new material. As much of what comes later builds on earlier parts of the course, it is difficult to catch up once you fall behind. Therefore, the **short video quizzes & homework assignments** together make up a large part of your grade (**50%**). These assignments will be completed online through Canvas, though sometimes you will likely want to submit hand-written/drawn work, so be prepared to provide scans in those cases. There generally will be short quizzes for each video lecture (counting for **20%** of the course grade), as well as about one more general weekly homework assignment (**30%**). There will be a **mid-term** and a **final (15% each)**. In addition, the group work in class will also need to be submitted each time, and be worth another **20%** of your grade (only group members that are present in class get credit for group work on a given day).

There is quite a lot of work throughout the semester. The upside of that is that if you're on top of the homework and the daily quizzes, the mid-term and the final should be relatively straightforward.

### 2.1 Attendance

Since much of the in-class time will be dedicated to group activities, and parts of that work count towards your grade, it is paramount that you are present in class. If you are excused for an absence prior to a given class, you may get the opportunity to submit the relevant class-work individually, but barring exceptional circumstances, this is only possible two times. Also, you have to let me know that you're missing class by noon the day of at the very latest, so I can make the relevant logistical changes on Canvas. Please let me know about any foreseeable absences as much ahead of time as possible.

### 2.2 Homework assignments, and how to do well on them

Homework has to be submitted by the beginning of class on the day it is due through Canvas.

Getting the answers right is not everything - what's important is that we can see that you thought the problems through and are able to identify the steps of your reasoning. Be explicit about these steps, so that even if the end-result is wrong, we can see what you did and where you went wrong. Also, if you feel like your answer is going wrong at some point or you can't figure something out, try to describe what you're having trouble with. You can submit any such comments with your assignment on Canvas directly, or upload a file with your comments separately.

### 2.3 Late Work

Late work will not be accepted (barring truly exceptional circumstances which you generally need to tell us about before the due date if at all possible).

### 2.4 Academic Honesty

If you find it helpful to talk to other students about general issues on homework assignments, you are encouraged to do so. However, **you have to write up and turn in your individual answers**. Otherwise, neither you nor we can reliably gauge your understanding of the material. If you do work with other students, please indicate in submission comments on Canvas who you worked with. DO NOT simply copy each others work - if we suspect that this is happening, we will first talk to you and, if necessary, inform the Office of Student Conduct.

On the exams, you should work entirely independently in accordance with Penn's Code of Academic Integrity. If I have reason to believe that your behavior is violating this code, I will contact the Office of Student Conduct to initiate an investigation. See the following links for further information:

- University's Code of Academic Integrity: <http://www.vpul.upenn.edu/osl/acadint.html>
- The Office of Student Conduct's Frequently Asked Questions page:  
<http://www.upenn.edu/osc/faq.html>

## 3 List of Topics

Check Canvas Calendar for an up-to-date schedule. Homework due dates will also be posted there.

- Introduction / Set Theory (Reading: Partee, ter Meulen and Wall, Chap. 1)
- Relations and Functions (Reading: PtMW, Chap. 2)
- Properties of Relations (Reading: PtMW, Chap. 3)
- The Lexicon & Parts of Speech
- Syntax & Finite State Automata
- Finite State Automata & Regular Languages
- The Pumping Lemma
- Right-Linear Grammars
- Context Free Grammars
- English as a CFG
- CFG's & the Chomsky Hierarchy
- Syntax & Semantics: Structural Ambiguities
- Modeling Sentence Meanings
- Meaning Composition
- Structural Ambiguities Formalized
- Quantifiers