Course Description

The aim of this course is to provide students with a background in various concepts, methods, and results from mathematical logic that are of philosophical importance. Topics that we will cover include basic set theory, topics in the model- and proof-theory of propositional logic, first-order logic, and modal logic, and applications of formal techniques to the study of meaning in natural language.

This course is open to both undergraduate and graduate students, and will move at a fairly rapid pace. Undergraduates must have taken PHI 251 or an equivalent introductory logic course; additional background in logic, mathematics, or relevant areas of philosophy is beneficial.

Texts

The primary textbook for this course will be Ted Sider’s *Logic for Philosophy* (OUP, 2010). We will also draw on material from the following:

- *The Open Logic Project*, http://openlogicproject.org

I will provide pdfs of this material and other supplementary readings.

Course Requirements

(i) Problem Sets (UG: 50%, G: 30%)
(ii) Quizzes (UG: 40%, G: 30%)
(iii) Attendance and participation (UG: 10%, G: 10%)
(iv) Cumulative Final Exam (G: 30%)

‘UG’ indicates the percentage weight for undergraduate students, ‘G’ for graduate students. The cumulative final exam is required of graduate students only.

Tentative Schedule

This schedule is subject to change as the course proceeds. Changes will be announced in class. It is your responsibility to ensure that you know what the reading and homework is for each class meeting.

Part 1: Logic!

Week 1 — 8.29, 8.31
- Review of natural deduction and informal proof strategies. [Handout]
- Basic set theory. [Devlin Ch. 1]

**Week 2 — 9.5, 9.7**
- Basic set theory. [Devlin Ch. 1, Sider §1.8]

**Week 3 — 9.12, 9.14**
- Basic set theory. [Sider §1.8]
- Semantics of Propositional Logic. [Sider §2.1 – 2.4]

**Week 4 — 9.19, 9.21**
- Formal proof systems for Propositional Logic. [Sider §2.5–2.6]
- Proof by induction. [‘Induction’ from the Open Logic Project]

**Week 5 — 9.26, 9.28**
- Metatheory of Propositional Logic. [Sider §2.7 – 2.9]

**Week 6 — 10.3, 10.5**
- Truth functions and expressive completeness. [Sider §3.1]
- A Non-Classical Logic: Priest’s Logic of Paradox. [Sider §3.4]

**Week 7 — 10.10, 10.12**
- Predicate Logic. [Sider Ch. 4]

**Week 8 — 10.17, 10.19**
- Predicate Logic with identity. [Sider §5.1, 5.3]

**Week 9 — 10.24, 10.26**
- Modal Propositional Logic. [Sider §6.1–6.4]

**Week 10 — 10.31, 11.2**
- Metatheory of Modal Propositional Logic. [Sider §6.5–6.6]

**Part 2: Language!**

**Week 11 — 11.7, 11.9**
- Kaplan (1989), *Demonstratives*

**Week 12 — 11.14, 11.16**
- The lambda calculus in natural language semantics. [Heim and Kratzer Ch. 1–3]
Week 13 — 11.21, 11.23

- *Thanksgiving Recess, no classes!*

Week 14 — 11.28, 11.30

- Generalized quantifiers in natural language. [Heim and Kratzer, Ch. 6–7]

Week 15 — 12.5, 12.7

- To be determined. Likely one of the following:
  
  - Kolodny and MacFarlane (2010), ‘Ifs and Oughts’ (on deontic modals and modus ponens)
  - Yalcin (2015), ‘Epistemic Modality *De Re*’ (on epistemic modals and dynamic semantics)
  - Goodman (2017), ‘Reality is not Structured’ (on second-order logic)

Course Policies

Academic Integrity

Syracuse University’s Academic Integrity Policy holds students accountable for the integrity of the work they submit. For details visit:


Working on problem sets collaboratively with others is fine, and indeed encouraged. However, any work that you submit must have been written up by you individually. Directly copying someone else’s work or relying on detailed notes produced in collaboration with others is considered a violation of academic integrity. You may not work with others on take-home exams.

Accommodations for Students with Disabilities

If you believe that you need accommodations for a disability, please contact the Office of Disability Services (ODS) [http://disabilityservices.syr.edu](http://disabilityservices.syr.edu) for an appointment to discuss your needs. *Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible.*

Extensions and Absences

To request an extension on an assignment you need to contact me least **twenty four hours** before the due date. Unexcused late work will not be accepted.

If you expect to miss a class meeting due to a religious observance, please inform me of the dates on which you will be absent within the first two weeks of the semester.

You can have two unexcused absences without it affecting the participation portion of your grade. Any additional absences should come with an official excuse (e.g. a doctor’s note).

Electronic Devices

Please do not use electronic devices in class. Phones, tablets, computers etc. should be put away and the volume muted. If you think you need to use an electronic device during class meetings in order to succeed in this course, please come speak to me personally.