

Phil 370: Theoretical Logic

Syllabus

Instructor: Dr. Audrey Yap (ayap@uvic.ca)

Office: CLE B307

Office Hours: TWF 10:30-11:20 and by appointment

Class Information: TWF 1:30-2:20 in CLE A203

Drop-in Hours: Th 2:30-3:20 in CLE D131

Course Website: Through CourseSpaces <http://coursespaces.uvic.ca>

Textbook: Open Logic Textbook, downloadable from the course website. For more information on this textbook, see <http://openlogicproject.org>

Prerequisites: Phil 203, Math 122, or permission of the instructor.

If you notice any accessibility issues with respect to this class, please let me know and I will do my best to solve them. If you require any formal accommodation, you are encouraged to register with the Centre for Accessible Learning. <https://www.uvic.ca/services/cal/>

Course Objectives: Techniques of formal symbolic logic are used in modeling deductive arguments. We use them most often to model the validity of arguments, and to prove that a conclusion follows from the premises. We have criteria for determining when one sentence is a logical consequence of others, and when one sentence is deducible from others. The *metatheory* of formal logic is the study of these rules and criteria. For instance, we want to make sure that our rules for deduction will always lead us to correct conclusions, and that we have enough rules to ensure that everything that logically follows can also be deduced. The goal of this course is to introduce you to the main ideas and metatheorems of formal symbolic logic, as well as teach you how to write mathematically rigorous proofs. It is important to know how to prove theorems, but such proofs also need to be clear and readable. Proof-writing skills will also be emphasised in this course.

Communication: Office hours are held on a drop-in basis. You do not need to make an appointment to see me during those times, although the amount of time I can spend talking to any one person during office hours can depend on how many people are waiting. If you do want to schedule an appointment outside my office hours, try emailing me with a few suggestions for times that would work for you. I'm also happy to try and answer short questions either before or after class, time permitting. In general, email is my preferred method of communication, especially for any official requests. If you ask me a question over email, you can expect a reply within about 1 working day. If you don't hear back from me after that time frame, feel free to try again in case your message went astray. When you do address me (over email or otherwise), please do so as either Audrey, Professor (Prof.) Yap, or Dr. Yap. Please don't use any of Mrs/Miss/Ms/Mr, for a variety of reasons. If you are ever nervous about sending me an email, or asking a question, feel free to include a picture of a puppy with your request. This will not affect whether or not I will be able to help you

with your request, but will give you an excuse to look for pictures of puppies. Finally, my pronouns are she/hers. If you think I am unlikely to know the name you would prefer to be called, or the pronouns I ought to use for you, through the entry that I will see for you through CourseSpaces/UVic registration, please don't hesitate to make me aware.

Course Logistics: This course typically requires regular attendance, and almost all students find it useful to attend at least some of the designated drop-in sessions. These are held every week in which an assignment is due and will give you the chance to work on the assignments in groups with instructor feedback. The material is not easy, and I don't expect you to try to get through it all on your own! I highly encourage you to come to drop-in sessions, office hours, or just get support from other students in the class.

There will be 9 homework assignments which must be turned in by class time on the due date unless otherwise specified. I will generally expect you to bring them to class, but they can also be handed in to my mailbox outside the philosophy department office. Assignments will generally be due on Fridays, but any one assignment can be turned in late (the following Monday) without penalty, so long as you email me and ask for an extension before the class when it is due. Further extensions may be granted in cases of illness or other extenuating circumstances. Assignments that have not been granted an extension will lose 2 points per working day until they are turned in, to a maximum of 5 days. Note that while I encourage you to work on your assignments in groups, you must write up your answers independently. Plagiarised work will not receive credit. For more information on plagiarism, see the University Calendar.

Homework is worth 25% of the final grade. There will also be two non-cumulative tests (20% each) and a cumulative final to be held during the final examination period to be scheduled by the Registrar (35%). You will be allowed to bring a 1 letter-sized page (2 pages for the final) formula sheet to each test. In keeping with my encouraging you to work collaboratively, during the first 10 minutes (20 for the final) of each test, you will have the option of discussing the questions and your approach to them with other students in the class. You may not write any of your answers on the test paper while you are engaging in collaborative discussion, but you can choose to start writing your test answers individually at any time, or forgo group discussion altogether. If you write your exams through CAL, you will have the option to do this in my office before the exam start time. Test rewrites will only be scheduled in cases of illness or other extenuating circumstances. Documentation must be received within a week of the exam date.

Numerical and Letter Grades: Grades will be given as percentile marks. The percentile mark for the course will be converted to a letter grade in the following manner: A+ = 90 - 100, A = 85 - 89, A- = 80 - 84, B+ = 77 - 79, B = 73 - 76, B- = 70 - 72, C+ = 65 - 69, C = 60 - 64, D = 50 - 59, F = 0 - 49. The A range means exceptional, outstanding and excellent performance. A grade in the B range means a very good, good and solid

performance. A grade in the C+ or C range means satisfactory, or minimally satisfactory, performance. A grade of D or D- indicates merely passable or marginal performance. An F indicates unsatisfactory performance.

Schedule:

All of the topics covered are discussed in the Open Logic Textbook, available through the course website. I may occasionally post supplementary notes, but you are expected to come to class and take your own notes. If you miss any classes, I encourage you to get notes from one of your classmates, since I will sometimes end up answering in class questions and coming up with examples on the fly that will not be included in the posted material.

- Week One: Jan 7, 8, 10
Topic: Sets and Relations.
- Week Two: Jan 14, 15, 17
Topic: Functions. Introduction to Propositional Logic.
HW1 due Jan 17
- Week Three: Jan 21, 22, 24
Induction. Semantics and Validity.
HW12 due Jan 24
- Week Four: Jan 28, 29, 31
Topic: Sentential Connectives.
HW3 due Jan 31
- Week Five: Feb 4, 5, 7
Topic: First-Order Languages.
HW4 due Feb 7
Test One Feb 5
- Week Six: Feb 11, 12, 14
Topic: Structures.
- Week Seven: Feb 25, 26, 28
Topic: Semantics.
HW5 due Feb 28
- Week Eight: Mar 3, 4, 6
Topic: Natural Deduction.
Test Two Mar 6

- Week Nine: Mar 10, 11, 13
Topic: Soundness and Completeness.
HW6 due Mar 13
- Week Ten: Mar 17, 18, 20
Topic: Completeness.
HW7 due Mar 20
- Week Eleven: Mar 24, 25, 27
Topic: Model Theory.
HW8 due Mar 27
- Week Twelve: Mar 31, Apr 1, 3
Topic: Model Theory. Review.
HW9 due Apr 3

Note: This syllabus is provisional, and should only be used to give a rough guide to the course schedule. Dates may be changed if necessary.