Phil 370: Theoretical Logic
Syllabus

Course Information:

Instructor: Dr. Audrey Yap (ayap@uvic.ca)
O ce: CLE B307
Class times: TWF 12:30pm{1:20pm.
In Person Tutorial Sessions: W 1:20pm{2:20pm (location TBA)
Zoom Tutorial Sessions: Th 10:30am-11:30am on Zoom (no sign up required)
One on one O ce Hours: T/Th 9:30am{10:20am on Zoom (sign up required)

Course Website: Through Brightspace (https://bright.uvic.ca/d2l/home)
Textbook: Abridged Version of http://forallx.openlogicproject.org/ PDF copy available through the course website.
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. I would also encourage any students who might bene t from their services to register with the Centre for Accessible Learning (https://www.uvic.ca/services/cal/).

Course Description:

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 fol-

- knowing when and how to apply intermediate proof techniques in the metatheory of first-order logic, including proofs using cases, contradictions, conditionals, and induction.
- understanding and applying the syntax and semantics of first-order logic, including a natural deduction system. This includes being able to correctly apply concepts like satisfaction, validity, provability, and consistency.
- understanding and being able to do proofs using basic model theory, including substructures, isomorphisms, and non-standard models.

Course Logistics:

The textbook is available on the course website as a downloadable PDF file. All assignments will be posted online, and all of your work | problem sets and your final exam | will be turned in through Brightspace. You don't have to type up your problem sets | you can write them out on paper and use any number of free scanning apps, or even just take photos with your phone. All that matters is that I am able to read them.

Tutorials: Most students who take this class find it beneficial to attend tutorial sessions on a regular basis. These will be drop-in times when you can work on your own or with others, and I'll be available to help out with questions. Wednesday tutorials will be held on campus, and Thursday tutorials will be held online over Zoom.

Communication: 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

Gradeable Items

Below is the list of things on which you will be evaluated in the course, as well as their percentage value. For each week you successfully earn engagement credit, you will earn one point up to a maximum of 10.

Gradable Item	Description	Value
Engagement	Posting on the course discussion boards	1% 10 weeks = 10%
Problem Sets	Weekly problems on the week's material	5% 11 = 55%
Final Exam	Cumulative take home nal exam.	35%
		Total = 100%

Engagement: There will be a shared class discussion board to be used for discussion of weekly topics. In order to receive full marks for participation, you will be responsible for posting in 10 out of the 13 weeks of class. Speci c guidelines for each week's participation assignment will be given in the forums where the posts are to be made. But the typical format will ask you to explain one thing from the week's material that you found clear, and pose one question about something that you found less clear. You are highly encouraged to learn from each other and discuss your forum responses. Often you will nd that explanations from your peers will be helpful in ways that explanations from your instructors are not, as they will be learning the concepts along with you and may better understand where you're at. Since these forum posts are intended to be ways to engage with the material at the same time as your peers, you will have to post them during the week the material is covered in order to receive credit. Any post that satis es the weekly guidelines will be given full credit.

Problem Sets: There will be 11 short problem sets, each worth 5% of your nal grade, one on each of the topics or formal systems we are covering. Each problem set will be due at the start of the week following that topic and will be handed in online through Brightspace. All due dates are listed on the course schedule below, and you can always assume the due time is 11:59pm.

I also know that sometimes things do not go as planned. You are welcome to two day's worth of extensions on assignments. This means you can take two extra days to complete a single assignment, or have one extra day on two di erent assignments. Please let me know

sets throughout the semester. This will also be handed in online, just like your problem sets.

All exam and homework questions will be graded out of 10, where numerical scores correspond to the following rubric:

- E (8{10): The work demonstrates a thorough understanding of the concepts, meets the expectations outlined in the assignment, is complete and well documented. This answer could be used as an example for teaching purposes.
- M (6.5{7.5): Correct proof, example, or answer to the homework problem. Some revision or expansion is needed, but no signi cant gaps or errors are present.
- R (4{6): Some understanding of the concepts is evident, but signi cant gaps remain. Needs further work, more review, or improved explanations.
- N (3.5): The work is fragmentary, contains signi cant errors or omissions, or there are too many issues to justify correcting each one. Not enough evidence provided to assess whether there is understanding of the concepts.

Academic Integrity: You are welcome and encouraged to discuss course material with others in your class, and work through material and ideas together. However, you are not allowed to provide the solutions for someone else's problem sets or exams, or vice versa. If you are ever unsure about what constitutes a violation of academic integrity, more information is provided on the University Calendar: `http://web.uvic.ca/calendar/undergrad/info/`

- Week Three: Sep 20{26

  Topic: Set Theory: The Size of Sets (4.1{4.3, 4.6{4.10)
  Problem Set Two completed by Sep 21

- Week Four: Sep 27{Oct 3

  Topic: Proofs: Induction and First-Order Logic: Syntax (5.1{5.8, Appendix B)
  Problem Set Three completed by Sep 28

- Week Five: Oct 4{10

  Topic: First-Order Logic: Semantics (5.9{5.14)
  Problem Set Four completed by Oct 5

- Week Six: Oct 11{17 (Oct 11 is a holiday)

  Topic: First-Order Logic: Natural Deduction (7.1, 7.3, 8.1{8.6)
  Problem Set Five completed by Oct 12

- Week Seven: Oct 18{24

  Topic: First-Order Logic: Derivability and Soundness (8.7{8.11)
  Problem Set Six completed by Oct 19

- Week Eight: Oct 25{31

  Topic: First-Order Logic: Proving Completeness (9.1{9.6)
  Problem Set Seven completed by Oct 26

- Week Nine: Nov 1{7

  Topic: First-Order Logic: Completeness and Compactness (9.8{9.11)
  Problem Set Eight completed by Nov 2

- Week Ten: Nov 8-14 (Reading Break is Nov 10-12)

  Topic: Model Theory: Introduction (6.1{6.4)

- Week Eleven: Nov 15{21

  Topic: Model Theory: Substructures and Isomorphisms (10.1{10.4, 10.6)
  Problem Set Nine completed by Nov 16

- Week Twelve: Nov 22{28

  Topic: Model Theory: Models of Arithmetic (11.1{11.3)
  Problem Set Ten completed by Nov 23

- Week Thirteen: Nov 29{Dec 5

  Topic: Review
  Problem Set Eleven completed by Nov 30
  Take home exam distributed Dec 6, completed by Dec 8