Welcome to PHIL 2200, Deductive Logic! In this class we will learn a system of symbols that turns out to be useful for understanding the concept of validity. Validity is the notion of some information following from some given information. The symbolic system will help us to understand what this means. At the end of the course, you will be better at assessing arguments that are meant to establish a conclusion.

**Catalog description:** This course is a study of deductive arguments and techniques for evaluating their validity, including construction of proofs. Students learn to recognize formal fallacies in reasoning and symbolize English sentences and arguments to make their meanings precise. Topics also include propositional logic and a study of quantifiers and relations.

**IMPORTANT ADVICE!** Logic is one of those classes which require you to keep up with the material. Work steadily each day, and make sure you understand what you are doing when we are covering it. Students who intend to catch-up on everything later will crash and burn. You have been warned.

I will record our classes and post any Slides presentations I offer, so if you miss a class, you can catch up on the material. Still, it is probably most effective to attend class and participate.

**Text:** The text we will be using is *forall x: Calgary*. (Weird title, I know.) It is an Open Source Logic textbook, and is available here in multiple formats: [multiple links]. You should download the version that will work best for you. You need not print it out unless that makes things easier for you.

**Work:** We will steadily be working through exercises and techniques as the course progresses. Each class will be more like a workshop than a one-way lecture. This means you will have to be able to read, watch, write and do work while attending class; you can't be driving around eating cheeseburgers, for crying out loud. There will be three exams, at week 5, week 10, and at the end of the course. The exams will be online, and governed by Proctorio software (which you will need to add to your internet browser; instructions can be found here: [link]). Your final grade will be the average of your scores on these three exams.

**Doing homework.** I will not assign homework. There are exercises at the end of most chapters in the text, and there is a file above under "Text" you may download with solutions to the exercises. I recommend doing exercises and checking your work to make sure you are understanding the material. If you have questions about the exercises, please raise them with me one-on-one or in class.

**What I mean by "Assignments":** I understand "Assignments" on Canvas to include stuff to turn in but also reading assignments or even just topics that will be discussed in class. So for each
day, there will be an "assignment", but that does not mean there is something you should turn in or submit. If there is something you should turn in, I'll make that obvious.

**Instructor information**: Charlie Huenemann, office hours 1-2 on Wednesdays, but I’m also generally available by appointment, email charlie.huenemann@usu.edu. Office hours will be held over our recurring class Zoom link. I’m always happy to meet with you - really, I’m a friendly and encouraging fellow who enjoys talking with students - so please feel welcome to schedule a meeting with me. I have a blog if you are interested: [link]. Also, on the subject of blogs, you may wish to check out [link] to keep up with local philosophical happenings.

Topics to be covered:

I Key notions of logic
   - Arguments
   - The scope of logic
   - Other logical notions

II Truth-functional logic (TFL)
   - First steps to symbolization
   - Connectives
   - Sentences of TFL
   - Ambiguity

III Truth tables
   - Characteristic truth tables
   - Truth-functional connectives
   - Complete truth tables
   - Semantic concepts
   - Truth table shortcuts
   - Partial truth tables
   - Truth trees

IV Natural deduction for TFL
   - The very idea of natural deduction
   - Basic rules for TFL
   - Constructing proofs
   - Additional rules for TFL

V First-order logic (FOL)
   - Building blocks of FOL
   - Sentences with one quantifier
   - Multiple generality
   - Identity
   - Sentences of FOL
   - Ambiguity

VI Interpretations
   - Extensionality
   - Truth in FOL
   - Semantic concepts
Using interpretations
Reasoning about interpretations

VII Natural deduction for FOL
Basic rules for FOL
Proofs with quantifiers
Conversion of quantifiers
Rules for identity
Derived rules
Proofs and semantics