PHIL170: Introduction to Logic

University of Maryland, College Park

Summer 2020

Logistics

Meeting place & time	Instructor	Contact	Office hours	Prerequisites	Website
Online, asynchronous	Aleks Knoks, PhD Philosophy, MSc Logic	`aknoks@umd.edu`	Online, by appointment	None	ELMS **OLI**

Course description

Logic is the study of consequence, or, roughly, the question of when does one statement follow from a set of other statements. This course is an introduction to modern symbolic logic—which is called *symbolic* because of its heavy reliance on symbols or formal notation. We'll look at two logical systems: propositional and predicate logic. Propositional logic is concerned with consequence that obtains in virtue of such sentence-connecting expressions as *and*, *or*, and *not*. (Does not-Y follow from the statements "either X or not Y" and X?) Predicate logic extends propositional logic to study consequences that obtain in virtue of sub-sentential structural features. (Does "There's a mortal philosopher" follow from "Socrates is a philosopher" and "All philosophers are mortal"?) Although modern symbolic logic was developed by mathematicians and philosophers for their own special purposes—which we'll discuss—logical concepts and techniques have found applications in a variety of disciplines, including computer science, economics, law, linguistics, and psychology.

Course goals and learning outcomes

Students will:

- develop formal reasoning skills and get familiar with the workings of formal systems;

- develop skills in translating between ordinary language and logical notation;

- develop skills in establishing validity (or invalidity) of arguments using a variety of logical methods, including truth tables, truth trees, natural deductions, and countermodels;

- learn the basic logical concepts;

- gain a comprehensive overview of classical propositional and predicate logic.

Workload

In terms of content, this course is no different from a standard PHIL170 taught during the fall and spring semesters. We cover a fair amount of material. You should be prepared to spend as many as **36 hours per week** on this course.

Course text

We'll be using an online textbook/tutorial/course called *Logic & Proofs*, which is a part the *Open Learning Initiative* at Carnegie Mellon University. Unfortunately, the textbook costs $80. On the upside, it's the best tool for learning logic online there is. In order to access the textbook:

1. Go to `https://oli.cmu.edu/students/` and click on *Register with a Course Key*.

2. Follow the instructions to register and pay for the textbook/course, using the key **umd-m20**.

The textbook comes with a software called *LogicLab*. You'll have to set up your system before using it. It's not difficult to do, and there will be instructions that'll guide you through the process. (You can always contact me if you have any problems with the textbook or software.)

Grading policy

- **Quizzes** (20%): Quizzes are based on the daily readings. They'll help you (and me) see whether you've grasped the theory. There are 8 quizzes scheduled. These are to be taken online. You'll have two opportunities to take each quiz, with the higher score counting towards your final grade. Due dates for the quizzes are listed in the schedule.
- **Exercises** (10%): Exercises are interactive tutorials available from the course website. They are meant to help you learn to apply theory in practice, as well as prepare you for the more challenging problem sets. The number of exercises you'll need to do will change from week to week.
- **Problem Sets** (or "labs"; 20%): These are similar to the exercises. However, you'll receive less (automated) guidance as you are working through them. 8 problem sets are scheduled throughout the term. Late problem sets will not be accepted. Note that you won't have access to a given chapter's problem set before you've completed all the exercises in that chapter.
- **Forum participation** (5%): Discussion is an excellent way to learn. A small fraction of your grade will depend on how actively you participate in the discussion forum of the class. You can participate by asking questions about the daily readings, as well as answering questions your peers have asked. From time to time I'll formulate prompt questions too. Discussions will take place on the ELMS website. It's your responsibility to check the forum regularly.
- **Exams** (45%): There will be 3 online exams. The course is divided into three blocks, with an exam at the end of each. The exams will consist of two components: a quiz and a comprehensive problem set. Notice that you will have only one attempt to get the quiz right and there will be next to no guidance on the problem set. Each exam be made available 72 hours before it is due.

Assessment	Points
Quizzes	20
Exercises	10
Problem Sets	20
Participation	5
Discussion	45

Your grade will be the weighed average of all the above grade components. I'll grade on a curve—this means that a final average of 90% might turn out to be an A rather than an A-. See the undergraduate catalog for the official description of grades. There might also be an extra credit assignment.

I am happy to discuss your grades with you, and if I have made a mistake I'll correct it. Formal grade disputes must be submitted in writing and within 1 week of receiving the grade. You should be aware of the University of Maryland's policy on *arbitrary and capricious grading* and understand the process of appealing a final grade.

Accommodation

Students who require special accommodations should inform me at the beginning of the course, and must provide the appropriate documentation from the DSS office (see `http://www.counseling.umd.edu/DSS/`).

Course procedures and policies

Consult the following webpage for the official procedures and policies for this course:

`www.ugst.umd.edu/courserelatedpolicies.html`

Schedule

Below is a rough schedule for the term. A more detailed schedule is available on the course website (OLI).

Block 1: Propositional (or sentential) logic, 22 June – 26 June

date	unit/topic	reading	assignments due
June 22 (Mon)	Statements & Arguments	Ch. 1	Ch. 1 quiz and lab
June 23 (Tue)	Syntax & Symbolization	Ch. 2	Ch. 2 quiz and lab
June 24 (Wed)	Semantics A: Truth-value assignments, truth-functions, truth-definition, logical notions	Ch. 3	Ch. 3 quiz
June 25 (Thu)	Semantics B: Truth-trees	Ch. 3 c'd	Ch. 3 lab
June 26 (Fri)	Exam #1	Review Chs. 1–3	
June 27 (Sat)		-	
June 28 (Sun)		-	Exam 1 DUE at 11:59pm

Block 2: Derivations in logic, June 29 – July 3

date	unit/topic	reading	assignments due
June 29 (Mon)	Derivations A	Ch. 4	Ch. 4 quiz
June 30 (Tue)	Derivations B	Ch. 4 c'd	Ch. 4 lab
July 1 (Wed)	Indirect Rules	Ch. 5	Ch. 5 quiz and lab
July 2 (Thu)	Elementary Metamathematics	Ch. 7	Ch. 7 quiz and lab
July 3 (Fri)	Exam #2	Review Chs. 4, 5 & 7	
July 4 (Sat)		-	
July 5 (Sun)		-	Exam 2 DUE at 11:59pm

Block 3: Predicate logic, July 6 – July 10

date	unit/topic	reading	assignments due
July 6 (Mon)	Syntax & Semantics I A	Ch. 8	Ch. 8 quiz
July 7 (Tue)	Syntax & Semantics I B	Ch. 8 c'd	Ch. 8 lab
July 8 (Wed)	Syntax & Semantics II A	Ch. 9	Ch. 9 quiz
July 9 (Thu)	Syntax & Semantics II B	Ch. 9 c'd	Ch. 9 lab
July 10 (Fri)	Exam #3	Review Chs. 8–9	
July 11 (Sat)		-	
July 12 (Sun)		-	Exam 3 DUE at 11:59pm

Changes to the syllabus

This syllabus is subject to change. You will be notified in advance of important changes that could affect, for instance, grading.