**Philosophy 310: Introduction to Symbolic Logic**
Spring 2019

*Updated 25 January 2019*


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| Instructor: | Ben Caplan |
| Time: | T Th 1:00 PM – 2:15 PM |
| Location: | 4033 Wescoe |
| Office: | 3079 Wescoe |
| Office hours: | T Th 10:45 AM – 11:45 AM |
| | T 2:15 PM – 3:15 PM |
| | Or by appointment |
| Email: | caplan@ku.edu |


## Course description

We will study sentential and predicate logic. We will learn three skills: (*i*) how to symbolize natural-language sentences (e.g. 'Elizabeth has dorgis and Meghan has a beagle', 'Someone who has dorgis is the grandmother-in-law of someone who has a beagle') in various formal languages; (*ii*) how to interpret those formal languages; and (*iii*) how to do proofs in those formal languages. These skills are learned, and we will learn them by working through many examples.

## Required text and software

Terence Parsons's *An Exposition of Symbolic Logic: With Kalish–Montague Derivations* (August 2013)—otherwise known as *TerryText*—is available on Blackboard (under 'TerryText').

We will use Logic 2010. The software can be downloaded (for free) from logiclx.humnet.ucla.edu. You will need to use the software to submit homework assignments.

Further information about how to install and use Logic 2010 is on Blackboard (under 'Logic 2010').

## Course requirements

The grading scheme for the course is as follows.

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| Homework assignments | 10% |
| Two in-class mini-tests | 20% (10% each) |
| Two take-home group assignments | 20% (10% each) |
| Midterm exam | 25% |
| Final exam | 25% |

**More information**

*Numbers and letters*

Numerical grades will be converted to letter grades using the following scheme.[1]

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|---|---|
| 93.50–100.00 | A |
| 90.00–93.49 | A– |
| 86.50–89.99 | B+ |
| 83.50–86.49 | B |
| 80.00–83.49 | B– |
| 76.50–79.99 | C+ |
| 73.50–76.49 | C |
| 70.00–73.49 | C– |
| 66.50–69.99 | D+ |
| 63.50–66.49 | D |
| 60.00–63.49 | D– |
| 00.00–59.99 | F |

*Assignments, tests, and exams*

The mini-tests and group assignments are intended mainly as diagnostics, to provide you with feedback about how well you're learning the relevant skills (and to provide me with feedback about how well I'm helping you learn those skills). The group assignments are also learning and teaching opportunities: they are opportunities for you to learn some skills from, or teach some skills to, your peers.

*Dates and due dates*

You will typically (but perhaps not invariably) have at least five days (e.g. Thursday to Tuesday) to complete each homework assignment. Due dates for the homework assignments will be posted on Blackboard (under 'Schedule').

The mini-tests and the midterm exam will be held in class. The midterm will take up an entire class period; the mini-tests will not. The dates for the mini-tests and the midterm exam will be announced at least one week ahead of time, as will the due dates for the take-home group assignments. This information will be posted on Blackboard (under 'Schedule').

When the mini-tests and the midterm exam are held, and when the group assignments are due, will depend on when we cover the relevant material in class. One mini-test will be held, and one group assignment will be due, before the midterm; another mini-test will be held, and another group assignment will be due, after the midterm. The

[1] See Ben Eggleston, "Plus/Minus Grading," available at benegg.net/plus-minus_grading.pdf.

final exam will be on **Thursday, 16 May 2019 from 1:30 PM to 4:00 PM** in 4033 Wescoe Hall.

*Material to be covered*

The first mini-test will cover symbolization in sentential logic, and the first group assignment will cover truth-tables. The midterm exam will be cumulative: it will cover symbolization in sentential logic, truth-tables, and derivations in sentential logic. This material can be found in Chapters 1 and 2.

The second mini-test will cover symbolization in predicate logic, and the second group assignment will cover counter-models. The final exam will be cumulative: it will cover symbolization in sentential and predicate logic; truth-tables and counter-models; and derivations in sentential and predicate logic. This material can be found in Chapters 1–4.

If time permits, at the end of the semester we will also cover symbolization, counter-models, and derivations in predicate logic with identity. This material can be found in Chapter 5. If we cover this material in class, it will be on the final exam.

*Lateness policies*

My policy on late homework assignments and late group assignments is straightforward and draconian: I won't accept late homework assignments under any circumstances; and, unless you contact me beforehand, I won't accept any late group assignments either. My policy on missed mini-tests and exams (including the final exam) is similarly straightforward and draconian: unless you contact me beforehand, you won't be able to take the midterm or the final exam for credit. This is in part to allow me to discuss the homework assignments, the group assignments, the mini-tests, and the midterm in class as soon as possible.

I also have some less draconian policies. First, one or two homework assignments (specifically, the ones on which you score the lowest) will be dropped when calculating your overall grade on the homework assignments. I will count ten homework assignments towards your overall grade. I expect there to be eleven or twelve homework assignments in all.

Second, to give you feedback, I will be happy to correct (but not grade) late group assignments and to administer and correct (but not grade) make-up mini-tests and midterm exams.

And, finally, given the cumulative nature of the course, there is a mechanism in place to weight later exams more heavily to make up for earlier lower grades (see immediately below).

*Additional policies*

I reserve the right to revise your grade *upward* to reflect my sense of what skills you have learned by the end of the course. For example, if you score higher on the midterm exam than on the first mini-test and the first group assignment, or if you score higher on the final exam than on the midterm exam, the mini-tests, and the group assignments, then I reserve the right to weight the midterm exam or the final exam more heavily.

You do not need to take the final exam if your average on the mini-tests, the group assignments, the midterm, and the homework assignments is 100% (or above). If you don't need to take the final exam, I will let you know beforehand.

Due to the slightly complicated nature of the grading scheme, I won't be using Blackboard to calculate your grades; rather, I'll be using my own spreadsheet. If you're curious about your grade at any point, just ask or email me.

**A note about grading**

On some standardized tests, there is a penalty for being wrong: you earn points for a correct answer, lose points for an incorrect answer, and neither earn nor lose points for no answer. The tests, assignments, and exams in this course are not graded in that way. There is no penalty for being wrong: you earn points for a correct answer, and *at worst* an incorrect answer is treated like no answer (that is, you neither earn nor lose points for it). So it is pretty much never to your advantage to skip a question. Even if you don't feel 100% confident about your answer, you might be right, in which case you will earn full points. And, even if you haven't completely figured out how to solve a problem, if you show your work you can still earn partial credit.

It turns out that there is a significant difference between men and women: men are much more likely to guess when they don't know the answer. There is empirical evidence to suggest that this accounts for much of the reported gender differences in standardized test scores.[2]

**A note about stereotype threat**

Anxiety can hinder academic performance. And negative stereotypes can contribute to anxiety. In particular, negative stereotypes about a certain group can lead members of that group to be more anxious. If one negative stereotype is that members of that group don't perform as well academically, the negative stereotypes can become self-fulfilling. The process whereby negative stereotypes can hinder academic performance is known as *stereotype threat*.

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[2] See Katherine Baldiga, "Gender Differences in Willingness to Guess," *Management Science* 60.2 (Feb. 2014): 434–448.

Unfortunately, it turns out that it's disturbingly easy to elicit stereotype threat. For example, it makes a huge difference whether students are told "This is a math test" or "This is a problem-solving task."[3] (By the way, this is not a course in math. It's a course in problem-solving.)

Fortunately, it also turns out that talking about stereotype threat it is a good way to combat it. For example, if students are put in a situation that elicits stereotype threat (e.g. by being told "This is a math test") but are *also* told about stereotype threat, that can make the effects of stereotype threat go away.[4] The words used in one study were "it's important to keep in mind that if you are feeling anxious while taking this test, this anxiety could be the result of these negative stereotypes that are widely known in society and have nothing to do with your actual ability to do well on the test."[5]

So it's important to keep in mind that, if you are feeling anxious while taking tests or exams or while completing assignments in this course, the anxiety could be the result of negative stereotypes that are widely known in society and that have nothing to do with your actual ability to do well on the tests, exams, or assignments.

**Accessibility**

I'm committed to making this class as accessible as possible. If you have any particular accommodation requests, please speak to me as soon as possible.

**Electronic devices**

You are permitted to use laptops and other electronic devices in class. Some students prefer taking notes, or reading texts, on such devices; and we'll be using software for the homework assignments.

However, students report that they find laptop use in class distracting. This includes laptop use by their peers.[6] (If you're browsing social media during class, you might find it interesting. So, apparently, might those around you.) More importantly, "the level of laptop use was negatively related to several measures of student learning, including … overall course performance," which is to say that (generally speaking) the more students used laptops in class, the worse their final grades were.[7]

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[3] For a survey of the literature, see Steve Stroessner and Catherine Good, "Stereotype Threat: An Overview," available at diversity.arizona.edu/sites/diversity/files/stereotype_threat_overview.pdf.

[4] Michael Johns, Toni Schmader, and Andy Martens, "Knowing Is Half the Battle: Teaching Stereotype Threat as a Means of Improving Women's Math Performance," *Psychological Science* 16.3 (March 2005): 175–179.

[5] Johns, Schmader, and Martens, "Knowing Is Half the Battle," p. 176.

[6] Carrie B. Fried, "In-Class Laptop Use and Its Effects on Student Learning," *Computers and Education* 50.3 (April 2008): 906–914.

[7] Fried, "In-Class Laptop Use and Its Effects on Student Learning," p. 906.

If you use a laptop or other electronic device in class, please try to sit somewhere where your screen is less likely to be visible to others.

**Concealed carry**

If you carry a concealed handgun, familiarize yourself both with the relevant state and federal laws and with KU's weapons policy. See https://concealedcarry.ku.edu/ information.

**Academic misconduct**

The university policy on academic misconduct is set out in Article II, Section 6 of the University Senate Rules and Regulations. Examples of academic misconduct include (but are not limited to) "giving or receiving of unauthorized aid on examinations … or other assignments," "knowingly misrepresenting the source of any academic work," and "plagiarizing another's work." Penalties for academic misconduct include receiving a failing grade for the course, being suspended from the university, and being expelled. For further details, see policy.ku.edu/governance/ USRR#art2sect6.

**Schedule**

There is no class on Tuesday, 20 February 2019 or on Thursday, 22 February 2019 (annual meeting of the Central Division of the American Philosophical Association).

There is no class on Tuesday, 12 March 2019 or on Thursday, 14 March 2019 (Spring Break).

The final exam will be on **Thursday, 16 May 2019 from 1:30 PM to 4:00 PM** in 4033 Wescoe Hall.

A detailed and updated schedule will be posted on Blackboard as we go (under 'Schedule'). The precise schedule will depend on the pace at which we work through the material in class. We will cover the Introduction, Chapters 1–4, and (time permitting) Chapter 5.

Please note that we will cover the material in a different order than the text. Here is a list of the expected readings, in the order in which I expect to cover the material.

1. *Sentential logic*

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|---|---|---|
| 1.1. | Symbolization | Chapter 1.1, 1.3; Chapter 2.1–2.3 |
| 1.2. | Truth-tables | Chapter 1.2; Chapter 2.1, 2.10–2.11 |
| 1.3. | Derivations | Chapter 1.4–1.12; Chapter 2.4–2.9 |

*2. Predicate logic*

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|---|---|---|
| 2.1. | Symbolization | Chapter 3.1–3.5; Chapter 4.1–4.2 |
| 2.2. | Counter-models | Chapter 3.10; Chapter 4.9 |
| 2.3. | Derivations | Chapter 3.6–3.9; Chapter 4.3 |

*3. Predicate logic with identity*[*]

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|---|---|---|
| 3.1. | Symbolization | Chapter 5.1–5.2 |
| 3.2. | Counter-models | Chapter 5.4 |
| 3.3. | Derivations | Chapter 5.3 |

[*] Time permitting.