Introduction to Symbolic Logic

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DESCRIPTION

Logic is the study of arguments. In this course, we will use formal tools to analyze arguments and explain what makes them good or bad. We will study two systems of formal logic—sentential logic and predicate logic—and develop a "metatheory" for these systems to address questions regarding their power and dependability. Students will leave the course with the ability to break down arguments and analyze their truth conditions, to prove that a conclusion follows from some premises, and with a generally more robust understanding of reasoning and argumentation.

ACCOMMODATION

This has been a strange, hard year. I will work with all students interested in taking this course to ensure that it's possible to. If you have a disability, are in a different time zone, are struggling with mental or physical health, or if there is anything else that might prevent you from fully participating in this course, let me know as soon as you can, and we will figure something out.

EXPECTATIONS

As stated above, I will work with all students interested in taking this course to ensure that it's possible to. But here are a few expectations I have to make sure we all get the most out of the course.

Readings: Readings should be completed before meetings.

Attendance: Meetings will take place synchronously, but will be recorded for students who can't make it (in particular, students in time zones where the meeting time is unreasonable). Attendance isn't required, but if you are planning on watching the meetings anyways, I *highly encourage* you to attend synchronously if you can for at least three reasons. First, I want to know you! Second, it's very difficult for me to lecture to a black screen, so the quality of instruction will be higher if you attend meetings. Third, because discussion section and lecture are merged together in this course, coming to our meetings is the best way to work on practice problems and get live feedback.

Video: If possible, keep your video on during lecture. Seeing faces (rather than lecturing into a void) greatly increases the quality of my instruction!

ASSIGNMENTS

Problem sets (6 x 13% = 78%): Problem sets are due on Wednesdays at 2:50pm ET. You can complete problem sets by hand or electronically, but you must submit them to Canvas electronically. If you are working by hand, please try to photograph your work carefully! You will have access to problem sets at least a week before they are due. Collaboration on problem sets is encouraged.

Take-home final (22%): The take home final will be open book, but collaboration is not allowed. The exam will be released at 6:30pm ET on June 24 and due at 6:30pm ET the following day, June 25.

Grading

A+: [98-100]
A: [93-98)
A-: [90-93)
B+ [87-89)
B: [83-87)
B-: [80-83)
C+ [77-80)
C: [73-77)
C-: [70-73)
etc.

Readings

There's no required textbook for the course. All the readings are drawn from P.D. Magnus et al.'s *forallx Calgary: An Introduction to Formal Logic* and other texts that will be made available on Canvas.

Schedule

Unit 1: Truth-functional logic (a.k.a. Sentential Language)

W May 5: Validity and soundness; logical connectives
    forallx pp. 27-42, 69-71

M May 10: Symbolization in TFL
    forallx pp. 49-54, 64-66

W May 12: Truth tables and semantic properties
    forallx pp. 77-92, 96-104
    *Problem set 1 due

M May 17: TFL derivation rules
    forallx pp. 109-138

W May 19: TFL derivation strategies
    forallx pp. 141-159
    *Problem set 2 due

M May 24: Conditionals
    Excerpts from Jonathan Bennett, *A Philosophical Guide to Conditionals*

Unit 2: Metatheory

W May 26: Definition by recursion and proof by induction
    The Logic Book pp. 226-233
    *Problem set 3 due

M May 31: No class (Memorial Day)

W June 2: The soundness of the derivation rules
   The Logic Book pp. 244-251
   *Problem set 4 due

M June 7: The completeness of the derivation rules, part 1
   The Logic Book pp. 252-258

W June 9: The completeness of the derivation rules, part 2
   The Logic Book pp. 259-261
   *Problem set 5 due

UNIT 3: FIRST-ORDER LOGIC (A.K.A. PREDICATE LANGUAGE)

M June 14: Quantifiers and symbolization in FOL
   forallx pp. 191-233

W June 16: Interpretations
   forallx pp. 257-288
   *Problem set 6 due

M June 21: FOL derivations
   forallx pp. 289-318

Th June 24: Final exam released at 6:30pm ET

F June 25: Final exam due at 6:30pm ET