

Deductive Logic
PHIL 3200-090 Summer 2024

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Course Description.

This class deals with formal standards for deductive reasoning. The students will learn to distinguish between valid and invalid arguments, and will acquire formal techniques for establishing validity, consistency, logical truth and other logical properties.

We will examine two general types of argument: those whose validity depends exclusively on the features of sentential connectives (such as ‘not’ and ‘and’), and those which also depend on the behavior of quantifiers (like ‘all’ and ‘some’). The former are the subject matter of sentential logic, to which we will devote the first part of the course; the latter concern predicate logic, the topic of the second part.

Course Objectives.

- To be aware of the importance of rigorous reasoning in any type of rational inquiry or debate
- To appreciate the complexity involved in natural-language communication, and to be able to recognize those aspects that are relevant to rational inference.
- To properly symbolize natural language sentences and arguments, and to understand the relation between these and their formal-language counterparts.
- To become familiar with notions such as validity, soundness, consistency, logical truth and logical form.
- To acquire formal techniques for detecting validity and invalidity in arguments, among other properties.
- To be able to apply these formal techniques for the evaluation of arguments expressed in English.

Prerequisites

None, though students who desire a more basic introduction to formal logic, providing some helpful background and conceptual foundation to this class, are encouraged to take PHIL 1250 (“Reasoning and Rational Decision Making”).

Teaching and Learning Methods.

Students are required to watch weekly lecture-style videos which will introduce the week's material. These videos will be contained in the "Media Gallery" sidebar tab, and will be important for course content, but also for reminders and information about other course requirements (e.g., assignment reminders). A variety of assignments will be required for this class including homework assignments, quizzes, a midterm, and a final exam.

Course Requirements

You should read all the required readings each week and watch the accompanying video lectures. Read any supplementary readings (when or if provided) to help further your understanding or to prepare for assignments. You are required to complete both a midterm and final exam, as well as nine homework assignments that occur most weeks (when there is not an exam) and several quizzes.

Materials and Resources

- Stan Baronett's *Logic*, 5th Edition, Available on Canvas
- Weekly Canvas Lectures

Grading

Grades will be based on the following:

1. Weekly Homework Assignments (30%)
2. Quizzes (30%)
3. Midterm (20%)
4. Final Exam (20%)

Grading Scale

A = 100% - 94%

A- = 93.9% - 90%

B+ = 89.9%–87%

B = 86.9%–84%

B- = 83.9% - 80%

C+ = 79.9%–77%

C = 76.9%–74%

C- = 73.9% - 70%

D+ = 69.9%–67%

D = 66.9%–64%

D- = 63.9% - 60%

E = 59.9%–0%

Class Policies

Dates/Deadlines: Deadlines are strict; late assignments will receive point deductions of a half letter grade per day. If you are unable to complete any one of the assignments on time, a typed explanation with appropriate documentation must be given to us before or within one week after the deadlines. All assignments will be available on the Monday of each week of the semester and will be due by Friday at 11:59PM. Students will be granted two late assignments (no questions

asked) each semester for either quizzes or weekly homework assignments. The midterm and final have strict non-negotiable deadlines unless pre-arranged with instructors.

Cheating/Plagiarism: Students are responsible for knowing and understanding the University's Code of Conduct as it pertains to plagiarism: <http://www.admin.utah.edu/ppmanual/8/8-10.html>.

In short, when you draw upon any source (class notes, an article, a website, a textbook, etc.), you must cite that source whether you are quoting from it directly or only paraphrasing it. The basic idea here is that you can draw on someone else's idea(s), but you cannot spin someone else's idea(s) as your own. Any assignment with evidence of plagiarism will be assigned a zero, and the student's action will be reported to the Dean. Furthermore, although working together on assignments for this class is allowed (indeed even encouraged!) cheating will not be accepted.

Disability Services: The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability and Access, 162 Olpin Union Building, 801.581.5020 (V/TDD). CDA will work with you and the professor to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the CDA.

University Safety Statement: The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.

Addressing Sexual Misconduct: Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

Wellness Statement: Personal concerns such as stress, anxiety, relationship difficulties, depression, cross cultural differences, etc., can interfere with a student's ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness at www.wellness.utah.edu or 801-581-7776.

Resource Centers: If you are a student veteran, the U of Utah has a Veterans Support Center located in Room 161 in the Olpin Union Building. Hours: M-F 8-5pm. Please visit their website

for more information about what support they offer, a list of ongoing events and links to outside resources: <http://veteranscenter.utah.edu/>. Please also let me know if you need any additional support in this class for any reason.

If you are a member of the LGBTQ community, we want you to know that our classroom is a safe zone*.

Additionally, the U of Utah has an LGBT Resource Center on campus. They are located in Room 409 in the Oplin Union Building. Hours: M-F 8-5pm. You can visit their website to find more information about the support they can offer, a list of events through the center and links to additional resources: <http://lgbt.utah.edu/>. Please also let me know if there is any additional support you need in this class.

If you are an English language learner, please be aware of several resources on campus that will support you with your language and writing development. These resources include: the Writing Center (<http://writingcenter.utah.edu/>); the Writing Program (<http://writing-program.utah.edu/>); the English Language Institute (<http://continue.utah.edu/eli/>). Please let us know if there is any additional support you would like to discuss for this class.

Course Schedule

***Please note that the schedule is subject to change as the semester progresses; all changes will be announced through Canvas.*

Week 1, May 13-17

Introduction to PHIL 3200; Statements and Arguments

To do:

- Watch Introductory Lecture to PHIL 3200
- Read: Chapter 1 “What Logic Studies”: Read 1A, 1B, 1C, and 1F
- Take **Quiz 1: Syllabus and Introduction Quiz by Friday, May 17th (at 11:59PM)**

Week 2, May 20-24

Introduction to Sentential Logic: Logical Translations and Operators

To do:

- Read: Chapter 7 “Propositional Logic”: 7A and 7B
- Watch Lecture on Logical Translations and Operators
- Complete Homework Assignment #1 by Friday, May 24th (at 11:59PM)

Week 3, May 27-31

Truth Tables for Propositions

To do:

- Read: Chapter 7 "Propositional Logic": 7D "Truth Tables for Propositions"
- Watch Lecture video on constructing and analyzing truth tables
- Complete Homework Assignment #2 by Friday, May 27th (at 11:59PM)
- Take Quiz 2: Truth Tables Quiz by Friday, May 31st (at 11:59PM)

Week 4, June 3-7

Introduction to Natural Deduction: Implication Rules I

To do:

- Read: Chapter 8 “Natural Deduction”: 8A, 8B, and 8C
- Watch lecture on Introduction to Natural Deduction
- Complete Homework Assignment #3 by Friday, June 7th (at 11:59PM)

Week 5, June 10-14

Natural Deduction: Implication Rules II

To do:

- Read: Chapter 8 "Natural Deduction": 8D
- Watch: Lecture video on Implication Rules II (Simp, Conj, Add, CD).
- Complete Homework Assignment #4 by Friday, June 14th (at 11:59PM)

Week 6, June 17-21

Natural Deduction, ctd., Replacement Rules I

To do:

- Read: Chapter 8 "Natural Deduction": 8E
- Watch lecture video on Replacement Rules
- Complete Homework Assignment #5 by Friday, June 21st (at 11:59PM)
- Take **Quiz 3: Replacement Rules I Quiz** by Friday, June 17th (at 11:59PM)

Week 7, June 24-28

Midterm Week

To do:

- Watch the lecture video reviewing for the Midterm
- Take the **Midterm Exam** by Friday, June 28th (at 11:59PM)

Week 8, July 1-5

Natural Deduction, ctd., Replacement Rules II

To do:

- Read: Chapter 8 "Natural Deduction": 8F
- Watch the lecture video on Replacement Rules II
- Complete Homework Assignment #6 by Friday, July 5th (at 11:59PM)

Week 9, July 8-12

Conditional and Indirect Proof

To do:

- Read: Chapter 9 "Predicate Logic": 9A, 9B, 9C
- Watch: Lecture video on Introduction to Predicate Logic
- Complete Homework Assignment #7 by Friday, July 12th (at 11:59PM)

Week 10, July 15-19

Introduction to Predicate Logic

To do:

- Read: Chapter 8: sections 8G and 8H; Chapter 9: sections 9D
- Watch the lecture video on Conditional and Indirect Proof Strategies
- Complete Homework Assignment #8 by Friday, July 19th (at 11:59PM)

Week 11, July 22-26

Predicate Logic: Identity and Descriptions

To do:

- Read: Chapter 9 "Predicate Logic": 9G
- Watch: Lecture video on handling identity statements and definite descriptions in predicate logic.
- Complete Homework Assignment #9 by Friday, July 26th (at 11:59PM)

Week 12, July 29-August 2

Final Exam Week

To do:

- Watch the video lecture on reviewing material
- Complete **Final Exam on Canvas by Friday, August 2 at 11:59PM**