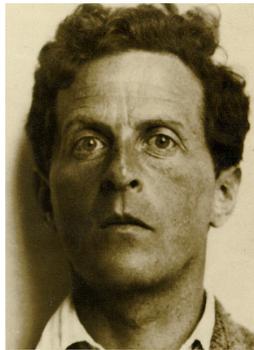
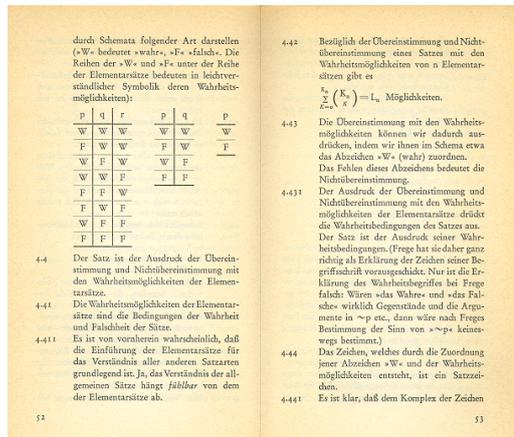


PL 1300 How To Think: Formal Logic and Causal Reasoning

The American University of Paris



Ludwig Wittgenstein
1889-1951



Tractatus logico-philosophicus,
1918

Term	Spring 2020	Credits	4
Schedule	Tuesday 12h10–13h30	Friday	16h30–17h50
Instructor	Assistant Professor Julian Culp	Email	jculp@aup.edu
Office hours	Tuesday + Friday 15h30-16h30	Office number	G-L19 (Grenelle)

COURSE DESCRIPTION

Often we disagree and each of us believes they are right and have good reasons for their belief. How can we resolve such conflicts? This course introduces you to important tools of reasoning, so that you can make better arguments, assess the arguments of others, and recognize typical mistakes in your own thinking and the thought of others.

We begin with a basic introduction to *deductive reasoning*, i.e. the ways in which we look for the information already contained in our existing knowledge, as it is formalized in propositional and predicate logic. In contrast to a purely mathematical logic course, we will connect the symbolic languages of logic to argumentation in natural language. You learn to spot and take apart the arguments – as well as *argumentative fallacies* – implied in everyday discourse or more elaborate arguments made by a philosopher. This, in turn, will improve your own ability to connect your ideas into coherent and consistent arguments.

As an introduction to *inductive reasoning*, by which we acquire new knowledge from the empirical study of the world around us, you will survey modern methods of causal reasoning as they are applied in the social and human sciences, in legal procedure, or in the design of policies intended to solve a problem. Working with many concrete examples but without requiring the maths of a statistics course, the course offers a wide-ranging introduction to causal reasoning itself, its conceptual implications, limitations, and problems.

Human beings, even the most modest and prudent, suffer from all kinds of *cognitive biases*, such as the “overconfidence effect” or a “knowledge illusion.” Whether intentionally or not, these and other such weaknesses are constantly used against you, and you yourself may be shooting yourself in your own foot right now just because you do not see the fallacy in your reasoning. We will therefore pay particular attention to such clunky mechanisms in our cognitive apparatus.

Last but not least, since this is a philosophy course, we will also *question the terms and foundations of our own argumentative practice*. What does logic do? Does it really provide any knowledge about the world? What does it mean when I say that a statement is true? What is truth? What is a cause? What are the consequences for our rational and empirical practice if there is no consistent answer to these questions, such that “truth” or “cause” might be empty terms?

LEARNING OUTCOMES

- Familiarity with elementary terms and methods of formal propositional logic (and predicate logic).
- Acquaintance with a range of fallacies and cognitive biases, and some idea about the structure of biased, fallacious, or uninformative thinking.
- Ability to apply elementary formal logic when analyzing arguments of others and building own arguments, including the ability to apply these techniques to real life examples, such as famous philosophical arguments or an argument in some news article.
- Ability to distinguish and -- at a basic level -- critique different concepts of causation, as well as to apply these concepts to real life cases.

CONTACT INFORMATION

For consultation and meetings, contact the instructor after class, by e-mail or during office hours.

BLACKBOARD

Course-related material, such as readings (except for the required textbooks), lecture slides, assignment tasks, etc., will be made available on the BLACKBOARD portal. Make sure that you have joined the course and that you adjust your settings to receive notifications and messages. Important up-dates will be communicated through the BLACKBOARD email function.

READINGS

The *required textbooks* is listed below and can be purchased at the AUP Bookstore:

- Kleinberg, Samantha. 2016. *Why? – A Guide to Finding and Using Causes*. Sebastopol: O'Reilly Media. [subsequently abbreviated as **KLEINBERG**]

In addition, it is recommended to purchase the following three books, although several of its chapters will be made available on Blackboard:

- Haight, Mary. 1999. *The Snake and the Fox: An Introduction to Logic*. London: Routledge. [subsequently abbreviated as **HAIGHT**].
- Nolt, John et al. 2011. *Schaum's Outline of Logic*, 2nd edition. New York: McGraw-Hill. [subsequently abbreviated as **NOLT**]
- Dobelli, Robert. 2013. *The Art of Thinking Clearly*. New York: Harper Collins. [subsequently abbreviated as **DOBELLI**].

Additional readings will be made available on BLACKBOARD. For the *mandatory readings* assigned to each session, please consult the *schedule* below.

A fine online resource for philosophy is *The Stanford Encyclopedia of Philosophy*: <https://plato.stanford.edu>. In case you are interested in studying a topic in further depth, please feel free to contact the instructor or AUP Library via library@aup.edu.

REQUIREMENTS AND GRADING

Requirement	Relative Weight of Final Grade
Take Home Logic Exam (February 14)	20%
Statement Logic Exam (March 13)	20%
Causal Reasoning Exam (April 17)	20%
2 Reading Responses (March 31 and April 24)	20%
Presentation (May 5)	10%
Participation	10%

It is the students' responsibility to meet the administrative and academic requirements of this course. Make sure that you familiarize yourself with these requirements and that you plan your time and your work reasonably.

Late submissions may be marked down up to 3.00 score points per day (24 hours) of lateness. For example, if you submit a 94.00/A/4.0 reading response 10 hours late, you may receive 91.00/A-/3.7. An extension can only be granted if you apply for it *before* the deadline expires.

Please remember that the readings and assignments are meant as springboards for your own independent and hopefully rewarding exploration of the topic.

Written Take Home Exams on February 14, March 13 and April 17

After the initial, the statement logic and the causal reasoning parts of the course you will be expected to review the material and write an exam. The exams will consist of a set of questions on the respective parts of the course. These questions will contain logical problems, knowledge questions regarding key terms and intellectual positions, as well as short essay questions that ask you to *reconstruct* and *discuss* philosophical texts and arguments that this course addresses. More information will be provided along the semester.

Reading Response due April 24

You will be expected to write 1 reading response to set questions that concern the reading. The reading response will guide your reading, foster your understanding and assessment of the texts, and prepare you for classroom discussions.

The reading response should be about 750 words each. It should be submitted via BLACKBOARD as PDF or *Word* document (.doc or .docx) or *PDF* file *by 23h59* on the day on which day are due. The font should be Times New Roman, the font size should be 12 pt. and the spacing should be 1.5.

Grading Criteria for the Reading Responses:

Coherence and strength of the argumentation	30%
Clarity and elegance of structure and writing	30%
Adequate use of relevant primary texts (and secondary literature)	15%
Correctness of form	15%
Originality of the thesis	10%

Presentation on Causal Reasoning and on May 5

We will have presentations during Part III on Causal Reasoning and during our last session on May 5 (Week 15). These will give you the opportunity to prepare (in group work) presentations of about 15 minutes. You should use either handouts or powerpoint slides for your presentations.

Grading Criteria for the Presentation:

Coherence and strength of the argumentation	30%
Clarity and elegance of the presentation	30%
Convincing examples	15%
Engagement with the audience	15%
Ability to respond adequately to objections	10%

Participation

Students are expected to come to every class meeting on time and be prepared to participate actively. The *student's preparation* includes, in particular, the careful reading of the assigned texts in advance of the planned session. When reading you should take notes and excerpt the core ideas of the texts – that is, you should engage in active reading.

Your participation grade will be assigned based on your *participation in class throughout the semester*. Your class participation throughout the semester will be assessed based on the following rubric (adapted from Bean, John and Peterson, Dean. 1998. "Grading classroom participation." In: *New Directions for Teaching and Learning* 74, 33-40). This rubric assumes you attend class and arrive on time. Absences or tardiness will also result in a lower class participation grade.

A	A student will receive an A if he/she: comes to class prepared; contributes readily to the conversation but doesn't dominate it; makes thoughtful contributions that advance the conversation; and shows interest in and respect for others' contributions and views.
B	A student will receive a B if he/she: comes to class prepared; makes thoughtful comments when called upon; contributes occasionally without prompting; and shows interest in and respect for others' contributions and views. This grade may also be appropriate for an active participant whose contributions are less developed or cogent than those of students who deserve an A .
C	A student will receive a C if he/she: comes to class prepared and listens attentively, but does not voluntarily contribute to discussions and gives only minimal answers when called upon. A student will also receive a C if he/she participates in discussion, but in a problematic way. Such students may talk too much, make rambling or tangential contributions, continually interrupt with digressive questions, bluff their way when unprepared, or otherwise dominate discussions, not acknowledging cues of annoyance from instructors or other students.
D or F	A student will receive a D or F if they often seem on the margins of the class and may have a negative effect on the participation of others. Such students often don't participate because they haven't come to class prepared. Students receiving an F may be actually disruptive, radiating negative energy via hostile or bored body language, or be overtly rude.

The grades for the requirements and for the entire course are based on the system below:

Letter Grade	4.0 Scale	Score	Meaning
A	4.0	94.00-100.00	Excellent
A-	3.7	90.00-93.99	Excellent
B+	3.3	87.00-89.99	Good
B	3.0	84.00-86.99	Good
B-	2.7	80.00-83.99	Good
C+	2.3	77.00-79.99	Satisfactory
C	2.0	74.00-76.99	Satisfactory
C-	1.7	70.00-73.99	Satisfactory
D+	1.3	67.00-69.99	Unsatisfactory
D	1.0	64.00-66.99	Unsatisfactory
D-	0.7	60.00-63.99	Unsatisfactory
F	0	0.00-59.00	Failure

ATTENDANCE

Attendance is required at *all* scheduled classes and will be taken every class. In case of absence, you should contact the instructor to explain the situation. You may miss up to 3 sessions without excuse – though each of these three unexcused absences will lower your participation grade. More than 3 unexcused absences will be reported to the *Student Development Team* and might result in a failing participation grade (0.00 score points). In the case of more than 7 absences, whether excused or unexcused, you might also be asked to withdraw from the course or receive a failing grade for the entire course.

Absences may only be considered excused if they are officially excused, e.g. because of (medically documented) student illness, participation in course-related study trips, family emergency or an appointment with the immigration office.

It is the student's responsibility to make up work for the missed class and to communicate with the professor for that purpose. Attendance at all exams is mandatory. Students must be mindful of this policy when making their travel arrangements, and especially during the Drop/Add and Exam Periods.

Punctuality is essential for uninterrupted and efficient coursework. It is a sign of respect not only for the professor, but also for your fellow students. If you are more than 20 minutes late, you will be marked absent.

ENGLISH LANGUAGE PROFICIENCY

As an Anglophone university, AUP is strongly committed to effective English language mastery at the undergraduate level. Most courses require scholarly research and formal written and oral presentations in English, and AUP students are expected to strive to achieve excellence in these domains as part of their course work. To that end, the evaluation includes English proficiency. Students can obtain help on specific academic assignments in the university *Writing Lab*. For more information, please visit <https://www.aup.edu/academics/academic-and-career-resources/academic-resource-center/writing-lab> – email: writinglab@aup.edu.

ACADEMIC MISCONDUCT

All work that you submit must be your own. Your sources must be properly cited. Direct quotations from others must be in quotation marks. If you have questions about how to attribute your sources, talk to the professor or to the staff of AUP's *Writing Lab* within the Academic Resource Center: <https://www.aup.edu/academics/academic-and-career-resources/academic-resource-center/writing-lab> – email: writinglab@aup.edu.

Plagiarism is a serious academic misconduct and will be dealt with accordingly. You should familiarize yourself with the university's policy on plagiarism at <http://www.aup.edu/academics/offices-resources/academic-resource-center/writing-lab/plagiarism>. For the sake of fairness and academic integrity, and in order to maintain the reputation of the degree you are earning with us, there will be no tolerance with plagiarism and other such forms of academic misconduct. Any conduct, whether intentional or unintentional, which creates the impression that some of the coursework you submit for grading is your own achievement when it is not will be reported to the *Academic Integrity Office* and may result in an "F" grade for the whole course.

Sometimes students present alien work as their own not because they want to earn an unfair advantage over their peers but rather because they feel unable to cope with the workload for some academic or personal reason. If this is the case, please do not hesitate to contact the professor or AUP's student guidance counselors Pamela Montfort via pmontfort@aup.edu or Yann Louis via ylouis@aup.edu. There is a lot that can be done to help you!

SCHEDULE

NB: This schedule is subject to change over the course of the semester.

INTRODUCTION

WEEK 1

- Jan 14 General Introduction: How to Think (I)
Jan 17 General Introduction: How to Think (II)

PART I: FORMAL LOGIC

A) TRUTH, SOUNDNESS, VALIDITY AND ARGUMENTS

WEEK 2

- Jan 21 Truth and Validity
Haight, Mary, "Truth and Validity," in HAIGHT, ch. 1 [BLACKBOARD].
Jan 24 Clarity
Haight, Mary, "Clarity (1)" and "Clarity (2)," in HAIGHT, ch. 2 and 3 [BLACKBOARD].

WEEK 3

- Jan 28 Premises
Haight, Mary, "Premises" and "More about premises," in HAIGHT, ch. 4 and 6 [BLACKBOARD].
Jan 31 Premises
Haight, Mary, "Logical truth" and "Still more about premises," in HAIGHT, ch. 7 and 8 [BLACKBOARD].

WEEK 4

- Feb 4 Argument-forms
"Haight, Mary, Argument-forms (1)" and "Argument-forms (2)," in HAIGHT, ch. 9 and 10 [BLACKBOARD].
Feb 7 Argument-forms
Haight, Mary, "Argument-forms (3)" and "Variables" in HAIGHT, ch. 11 and 12 [BLACKBOARD].

***** TAKE HOME LOGIC EXAM IS AVAILABLE. *****

B) PROPOSITIONAL/STATEMENT LOGIC

WEEK 5

Feb 11 Propositional/Statement Logic

Haight, Mary, “Statement logic,” “Clarity again,” and “The Fox again,” in HAIGHT ch. 15, 16 and 17 [**BLACKBOARD**].

Feb 14 The Logical Constants *AND* and *OR*

Haight, Mary, “The logical constants (1)” and “The logical constants (2),” in HAIGHT ch. 18 and 19 [**BLACKBOARD**].

***** TAKE HOME LOGIC EXAM IS DUE. *****

Feb 17–28 **SPRING BREAK**

WEEK 6

Mar 3 Truth Tables

Haight, Mary, “Truth tables” and “Necessity and contingency,” in HAIGHT ch. 20 and 21 [**BLACKBOARD**].

Mar 6 The Logical Constant *IF-THEN*

Haight, Mary, “The logical constants (3),” “*If-then* and validity (1),” and “*If-then* and validity (2),” in HAIGHT ch. 22, 23 and 24 [**BLACKBOARD**].

WEEK 7

Mar 10 The Logical Constant *IF AND ONLY IF*

Haight, Mary, “The logical constants (5)” and “The logical constants (6),” in HAIGHT ch. 27 and 28 [**BLACKBOARD**].

Mar 13 *****PROPOSITIONAL/STATEMENT LOGIC EXAM *****

WEEK 8

Mar 17 No Class [FACULTY RETREAT]

Mar 20 Discussion of Statement Logic Exam and Continuation of the Course Online

PART II: ARGUMENTATIVE FALLACIES

WEEK 9

Mar 24 Argumentative Fallacies (1)

Haight, Mary, “Some traditional fallacies,” in HAIGHT, ch. 5 [**BLACKBOARD**].

Mar 27 Argumentative Fallacies (2)

Haight, Mary, “Analogy,” in HAIGHT ch. 13 [**BLACKBOARD**].

PART III: CAUSAL REASONING

WEEK 10

Mar 31 Introduction to Causal Reasoning
“Beginnings,” in KLEINBERG, ch. 1.

Apr 3 The Psychology of Causal Reasoning
“Psychology,” in KLEINBERG, ch. 2.

WEEK 11

Apr 7 Correlation vs. Causation
“Correlation,” in KLEINBERG, ch. 3.

Apr 10 Finding Causes
“Observation” and “Experimentation,” in KLEINBERG, ch. 5 and 7.

WEEK 12

Apr 14 Explanation
“Explanation” in KLEINBERG, ch. 8.

Apr 17 ***** CAUSAL REASONING TAKE HOME EXAM *****

PART IV: COGNITIVE BIASES

WEEK 13

Apr 21 Psychological Evidence of Cognitive Biases
Tversky, Amos and Daniel Kahneman. 1982. “Judgment under Uncertainty: Heuristics and Biases,” in Daniel Kahneman, Paul Slovic and Amos Tversky (eds). *Judgment under Uncertainty*. Cambridge: Cambridge University Press, ch. 1, 3-22 [BLACKBOARD].

Apr 24 Thinking, Fast and Slow
Kahneman, Daniel. 2012. “The Characters of the Story” and “Attention and Effort,” in *ibid. Thinking, Fast and Slow*, ch. 1 and 2, 19-39 [BLACKBOARD].

***** READING RESPONSE IS DUE. *****

WEEK 14

Apr 28 Nudges
Thaler, Richard and Cass Sunstein. 2008. “Biases and Blunders,” in *ibid. Nudge*. London: Penguin Books, ch. 1, 17-39 [BLACKBOARD].

WEEK 15

May 5, 12h00 *****PRESENTATIONS DURING FINAL EXAM PERIOD*****

Dobelli, Rolf. 2013. *The Art of Thinking Clearly*. New York: Harper Collins, excerpts [BLACKBOARD].