

# PHILOSOPHY OF LOGIC

Fall 2020: Mon 11:00-14:00; Department of Philosophy of Science at Sharif University of Technology. Instructor: Seyed N. Mousavian ([seyed.mousavian@ualberta.ca](mailto:seyed.mousavian@ualberta.ca)).  
Office Hours: Tue 11:00-14:00 & by appointment.

## PROVISIONAL SCHEDULE

Week 01, Feb 17/Bah 28: Propositions

- 1- *Gottlob Frege. The thought* (1918) (Beaney, 325).
- 2- *Frege-Russell Correspondence* (1904) (Davidson, 53).
- 3- *Peter Hanks. Recent work on propositions* (2009).

Week 02, Feb 24/Esf 05: The Nature of Truth

- 4- *William Alston. A Realist Conception of Truth* (1996) (Lynch, 41).
- 5- *Michael Dummett. Truth* (1958) (Lynch, 229).

Week 03, Feb 27/Esf 08: A Semantic Theory of Truth

- 6- *Alfred Tarski. The semantic conception of truth and the foundations of Semantics* (1944) (Lynch, 331).

Week 04, Mar 02/Esf 12: Tarski's Theory and Correspondence Theory

- 7- *Hartry Field. Tarski's Theory of Truth* (1972) (Lynch, 365).
- 8- *Scott Soames. What is a Theory of Truth?* (1984) (Lynch, 397).

Week 05, Mar 09/Esf 19: Logical Notions

- 9- *Arthur N. Prior. The runabout inference ticket* (1960)
- 10- *Nuel D. Belnap. Tonk, plonk and plink* (1962).
- 11- *Richard E. Grandy. What Do 'S' and 'R' Stand for, Anyway?* (1986) (Hughes, 50).
- 12- *Alfred Tarski. What are logical notions?* (1986) (John Corcoran (ed.)).

Week 06, Mar 16/Esf 26: Logical Consequence

- 13- *Alfred Tarski. On the concept of logical consequence* (1935) (Jacquette, 210).

Week 07, Apr 06/Far 18: Truth and Logical Consequence

- 14- *John Etchemendy. Tarski on truth and logical consequence* (1988) (Jacquette, 247).

Week 08, Apr 13/Far 25: Indicative Conditionals

- 15- *Frank Jackson. On Assertion and Indicative Conditionals* (1979)
- 16- *Dorothy Edgington. Do conditionals have truth conditions?* (1986) (Hughes, 28).
- 17- *Dorothy Edgington. Conditionals, Truth and Assertion* (2009) (Ravenscroft, 283).

Week 09, Apr 20/Ord 01: Counterfactuals

- 18- *Robert Stalnaker. A theory of conditionals* (1968) (Stalnaker 2019, 1-16).
- 19- *David Lewis. Counterfactual dependence and time's arrow* (1979).

Week 10, Apr 27/Ord 08: Quantification

- 20- *W. V. O. Quine. Existence and quantification* (1969) (Hughes, 162).
- 21- *Charles Parsons. A Plea for Substitutional Quantification* (1971) (Jacquette, 56).
- 22- *Ruth Barcan Marcus. Nominalism and the Substitutional Quantifier.* (1978) (Barcan Marcus 1995, 111).
- 23- *Peter Van Inwagen. Why I Don't Understand Substitutional Quantification* (1980).

Week 11, May 04/Ord 15: Modality and Reference

- 24- *W. V. O. Quine. Three grades of modal involvement* (1953) (Quine 1963, 156).
- 25- *W. V. O. Quine. Reference and modality* (1961) (Quine 1961, 139).
- 26- *Ruth Barcan Marcus. A Backward Look at Quine's Animadversions on Modalities* (1990) (Barcan Marcus 1995, 216).

Week 12, May 11/Ord 22: Quantified Modal Logic

- 27- *Saul Kripke. Semantical considerations on modal logic* (1963).
- 28- *Robert Stalnaker. The Interaction of Modality with Quantification and Identity* (1994) (Stalnaker 2003, 144).

Week 13, May 18/Ord 29: Counterpart Theory

- 29- *David Lewis. Counterpart theory and quantified modal logic* (1968) (Jacquette, 292).
- 30- *A.P. Hazen. Counterpart-theoretic semantics for modal logic* (1979).

Week 14, Jun 01/Kho 12: The True Quantified Modal Logic

- 31- *Nathan Salmon. On the Logic of What Might Have Been* (1989) (Salmon, 129).
- 32- *Bernard Linsky and Edward Zalta. In Defense of the Simplest Quantified Modal Logic* (1996).

Week 15, Jun 08/Kho 19: Contingent Logical Truths

- 33- *Edward Zalta. Logical and analytic truths that are not necessary* (1988).
- 34- *Joseph Almog. Logic and the World.* (1989) (Almog, 43).

All the required readings will be provided electronically.

**Prerequisites:**

Foundations of Logic and/or Logic I.

**Course Content:**

Quine begins his classic book, *Philosophy of Logic* (Quine 1986, 2<sup>nd</sup> ed, 1), with the following quote:

“Contrariwise,” continued Tweedledee, “if it was so, it might be; and if it were so, it would be; but as it isn’t, it ain’t. That’s logic.” - Lewis Carroll

Philosophy of logic, in one sense, asks “what is logic?”. “Logic”, Quine continues, is “the systematic study of the logical truths” (ibid, 1). Philosophy of logic explores the possible meanings, consequences and limitations of this characterization, among others. Here is

another formulation. Modern symbolic logics are symbolic languages to represent logical reasoning. Symbolism, however, is not always innocent. Recall: “some of the notions that have been thought absolutely fundamental in philosophy have arisen, I think, entirely through mistakes as to symbolism” (Russell *The Philosophy of Logical Atomism in Logic and Knowledge* 1956, 185-86). A philosophical study of logical symbolism, concepts and systems, is philosophy of logic.

“Frege (*Posthumous Writings* 1970, 126) wrote that “the word ‘true’ characterizes logic” (Hintikka and Sandu *What is Logic?* 2006, 13). Truth requires truth-bearers, or so it has been argued. Propositions are characterized as ultimate truth-bearers. After a short introduction, we will begin with “propositions”, particularly with Frege’s “thoughts” and Russell’s criticism, and conclude by reviewing some recent theories of propositions. Then, we will turn to “truth.” We will spend three weeks on two main questions: “What is the nature of truth, if there is any?” and “What is a semantic theory of truth?” We will introduce the realist conception of truth vs. the verificationist/antirealist conception of truth and Tarski’s groundbreaking work on the semantic conception of truth. (We overlook some of the most important views on both questions, e.g. pragmatism and Kripke’s theory.) The impact of Tarski’s paper, in both logic and philosophy, cannot be overestimated. We will end this part by examining a widely discussed question in the literature: What is the relationship between Tarski’s theory and correspondence theory? The next three weeks will be devoted to the study of logical notions, particularly the nature of logical constants, and two conceptions of “logical consequence”. Then, we will move to “conditionals”: “what is the meaning of “if”?” Two kinds of conditionals can be distinguished: indicative and counterfactual. Consider the following two examples: “If Oswald didn’t kill Kennedy, someone else did” (indicative) and “If Oswald hadn’t killed Kennedy, someone else would have” (counterfactual). Assertions and truth-conditions of indicative conditionals as well as Stalnaker’s and Lewis’s theories of counterfactuals will be studied. The rest of the course will be on quantification and modality. First, we will review the historically and philosophically significant debate on two interpretations of quantifiers: objectual vs. substitutional. Then we will “reread” Quine’s criticisms of modal logic and Ruth Barcan’s reply to them. Kripke’s classic (1963) lays a new foundation for quantified modal logic (QML). An alternative way of formalizing modal reasoning with quantifiers is introduced in Lewis’s “counterpart theory”. Allen Hazen (1979) is the best entry to the difficulties that adding an “actuality operator” to the language of counterpart theory may create. Given the legitimacy of quantified modal logic, one may ask “What is the “true” QML?” Nathan Salmon, on the one hand, “argues” that “the conventionally accepted system S5 of (first-order) modal propositional logic, and even the weaker system S4, embody an invalid pattern of modal reasoning” (Salmon 1989/2005, 129). Bernard Linsky and Edward Zalta, on the other hand, defend S5 as a formal system that is metaphysically adequate and neutral “to a larger degree that was thought heretofore” (Linsky and Zalta 1994, 451). This discussion raises the question of the relationship between logic and the world. We will conclude with some arguments for and against “contingent logical truths.”

### **Course Objectives:**

This course has three main objectives. First, it is intended to develop your knowledge of the philosophical foundation of modern logic, including propositional, first-order and modal logic. Second, it aims at providing necessary tools for reading, interpreting and reconstructing modern classical texts in philosophy of logic, particularly, and in analytic

philosophy, generally. The emphasis is on understanding, rather than memorizing, the readings and associated arguments. Third, it is designed to improve your philosophical writing skills. The *assignments* constitute a substantial part of the course (for graduate students) and play a significant role in your understanding of the course content.

### Course Evaluation:

Weekly Assignments	39%
Midterm Paper	20%
Final Paper	35%
Class Participation	6%

#### Weekly Assignments: 39%

We will have 13 weekly assignments. Each assignment is a very short “review” paper (500  $\pm$  100 words) in which you try to recover a central argument from a designated text and clearly present it. The topic and text will be introduced at the end of each session and the paper is due on the following Sunday night at 23:59 (please send all your assignments, midterm and final papers to [snmousavian@yahoo.ca](mailto:snmousavian@yahoo.ca), and only to this address). Each assignment will be worth 3% of your final grade. There is an *inflexible* late penalty on assignments: for each *hour* that the assignment is late, up to 3 hours, you lose 30% of your mark; for example, if your grade is 75 (out of 100) and your assignment is just one hour late, you’ll get 50. For this reason, I strongly recommend you to email your assignments on time, even if you believe you could still improve them.

#### Midterm Paper: 20%

The midterm paper is due on Apr 12/Far 24, 23:59. It is a short “research” paper (3000  $\pm$  250 words) in which you demonstrate a careful understanding of the materials covered in class and develop your own critical perspective on the topic under consideration. The paper should have a main question (which is usually expressed in the title). Concerning that question, you should articulate: **(i)** your main claim, **(ii)** an argument for it, **(iii)** a smart criticism of your position, and **(iv)** a careful response to the criticism. The main body of the paper should involve *your own analysis and argument* for the position you are defending.

#### Class Participation: 6%

To get A or A+ for participation you need to:

1. Take part in all sessions (do not miss any classes)
2. Do all the readings carefully before each class.
3. Ask your questions.
4. Help others ask their questions.
5. Listen actively.

#### Final Paper: 35%

The deadline will be finalized after the midterm. The final paper is a midsize “research” paper (6000  $\pm$  500 words). Please read the midterm paper description.

**Evaluation for undergraduate and master's students:**

Undergraduate students will be assessed on the basis of their midterm (30%) and final papers (50%) as well as understanding of the required readings and class participation (20%). Master's students are required to submit 5 weekly assignments (20%), midterm (30%) and final papers (40%) and actively participate in all sessions (10%).

**Note on Plagiarism:**

“Plagiarism is presenting someone else’s work or ideas as your own, with or without their consent, by incorporating it into your work without full acknowledgement. All published and unpublished material, whether in manuscript, printed or electronic form, is covered under this definition. Plagiarism may be intentional or reckless, or unintentional. Under the regulations for examinations, intentional or reckless plagiarism is a disciplinary offence.”  
(<https://www.ox.ac.uk/students/academic/guidance/skills/plagiarism?wssl=1>)

“No student shall submit the words, ideas, images, or data of another person as his or her own in any academic writing, essay, thesis, research project or assignment in a course or program of study.” (<https://blog.ualberta.ca/helping-students-understand-copyright-and-plagiarism-e7a6a7c1fa9c>)

Penalties for plagiarism include failure in the assignment, failure in the course, suspension, and expulsion.

**Calculation of final grade:**

All grades will be awarded out of 100 and students’ final grade will be arithmetically calculated according to the above percentages. The final mark will be based on 20 using the following table:

Percentage	Letter Grade	Out of 20
100-90	A+	18.01-20.00
86-89	A	17.01-18.00
82-85	A-	16.01-17.00
77-81	B+	15.50-16.00
72-76	B	14.50-15.49
68-71	B-	14.00-14.49
64-67	C+	13.01-13.99
60-63	C	12.01-13.00
56-59	C-	11.01-12.00
52-55	D+	10.01-11.00
50-51	D	10
0-49	F	<10

Cutoffs for rounding up or down and distinguishing between A and A+ will be decided by the instructor at the end of semester based on the general quality of your work. I reserve the right to change the grade schedule at any time.

## References:

- Almog, Joseph et al. (1989). *Themes from Kaplan*. New York, NY: Oxford University Press.
- Barcan Marcus, Ruth (1995). *Modalities: Philosophical Essays*. New York, NY: Oxford University Press.
- Beany, Michael. (1997). *The Frege Reader*. Malden, MA: Blackwell.
- Belnap, N.D. (1961), "Tonk, Plonk, and Plink," *Analysis* 22, 130-34,
- Davidson, Mathew. (2007). *On Sense and Direct Reference*. New York, NY: McGraw-Hill.
- Hanks, Peter. (2009). "Recent Work on Propositions", *Philosophy Compass* 4/3: 469–486.
- Hazen, Allen. (1979). "Counterpart-Theoretic Semantics for Modal Logic," *The Journal of Philosophy* 76/6, 319-338.
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- Jacquette, Dale. (2002). *Philosophy of Logic: An anthology*. Malden, MA: Blackwell.
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- Lynch, Michael P. (2001). *The Nature of Truth*. Cambridge, MA: MIT Press.
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- Salmon, Nathan. (2005). *Metaphysics, Mathematics, and Meaning*. Oxford: Oxford University Press.
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- Stalnaker, Robert C. (2003). *Ways a World Might Be: Metaphysical and Anti-Metaphysical Essays*. Oxford: Oxford University Press.
- Stalnaker, Robert C. (2019). *Knowledge and Conditionals: Essays on the Structure of Inquiry*. Oxford: Oxford University Press.
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- Zalta, Edward N. (1988). "Logical and Analytic Truths that are not Necessary," *The Journal of Philosophy* 85/2, 57-74.