



UNIVERSITY OF
CALGARY

FACULTY OF ARTS
DEPARTMENT OF PHILOSOPHY

PHIL 473 Lec 01 – “Philosophy of Logic”

Winter Term 2014

Course Outline

Lectures: Monday/Wednesday, 3:30-4:45pm in Science A 119

Instructor: Dr. Anders Kraal (Dr. Richard Zach)

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Office Hours: Tuesday/Friday 09:00-11:30

Course Description

This course comprises three main parts.

In Part I we raise the general question “What is logic?”, and address this question both from the point of view of the history of logic and from the point of view of contemporary logical theory. We also discuss questions pertaining to the aims, presuppositions, and possible limitations of the modern formalization project.

In Part II we reflect philosophically on a number of basic concepts made use of in standard systems of formal logic, e.g. conditionality, disjunction, negation, universal quantification, existential quantification, necessity, and identity. We survey standard accounts of these concepts and take a close look at some ways in which these accounts have been challenged in recent logical theory.

In Part III we examine how challenges to the above-mentioned logical concepts impact basic logical principles, for example the three traditional “laws of thought,” i.e. the law of non-contradiction, the law of excluded middle, and the law of identity. We also consider recent challenges to logical monism, i.e. the assumption that there is only one correct logic.

Evaluation and grading

Writing assignments

There will be 5 short writing assignments (10% each, or 50% of the final grade), due 20/1, 3/2, 10/3, 17/3, and 2/4; a midterm paper (20% of the final grade), due 24/2; and a final paper (30% of the final grade), due 14/4.

There will be no Registrar-scheduled final exam.

The writing assignments and midterm and final papers will be on topics covered in the lectures and expanded on in the readings. You will be given a choice of topics for the midterm and final papers. Midterm and final papers must be handed in to pass the course. All short writing assignments and papers are due before 4 pm on the date indicated in a drop-box labeled for this course and located in the main hallway of the Philosophy Department (12th floor, Social Sciences Building).

Evaluation and grades

The 5 short writing assignments are together 50% of the final grade (10 % each); the midterm paper 20% of the final grade; and the final paper 30% of the final grade. On each of these assignments you will receive a letter grade. "Slash grades" may occur (e.g. "A/B"), but no +/- grades (although +/- grades may appear in the final grade). The meanings of letter grades amount roughly to the following criteria:

A Excellent – superior performance, showing comprehensive understanding of subject matter.

B Good – clearly above average performance.

C Satisfactory – basic understanding of the subject matter.

D Minimal pass – marginal performance.

F Fail – unsatisfactory performance.

The quality of your writing will be a factor in grading. If you use terminology ambiguously, for example, you are likely to receive a lower mark.

Grading Scheme

The final grade will be the letter grade corresponding to the weighted average of your assignments and papers plus a margin of 0.2. For the final grade, +'s and -'s are possible, too; as defined in the Calendar, +/- adds/subtracts 0.3 grade points. In other words, a course average of 3.8 or higher receives an A; between 3.5 and 3.8, an A-; between 3.1 and 3.5, a B+; between 2.8 and 3.1, a B; and so on. There is no D- grade; to earn a D you require a course average of at least 0.8. The A+ grade is reserved for "truly outstanding" performance. (The .2 margin means that an average of A, A-, A- is an A but the average of A, A-, A- is A-.)

In computing your final grade, your marks will be converted to grade points and averaged according to the weights given above. The correspondence of letter grades with grade points is defined in the Calendar (A = 4, B = 3, C = 2, D = 1, F = 0). "Slash" grades receive 0.5 below the value of the higher grade (e.g., A/B = 3.5).

For example, someone who receives the grades 'B', 'B/C', 'C', 'B', 'A' on writing assignments 1, 2, 3, 4, and 5, along with 'B/C' on the midterm paper and 'A/B' on the final paper, will receive the average grade point 3 (since $3 \cdot .1 + 2.5 \cdot .1 + 2 \cdot .1 + 3 \cdot .1 + 4 \cdot .1 + 2.5 \cdot .2 + 3.5 \cdot .3 = 3$), i.e. the final grade B.

Policy on Late Assignments

Late assignments will be considered on a case-by-case basis. Where prior permission has not been obtained for handing in a late assignment, the grade will be docked 1/3 of a letter grade per day.

Required Texts

Primary course material

(This material will be available in the University Bookstore.)

Priest, Graham, *Doubt truth to be a liar*. Oxford: Oxford University Press, 2009.

Sainsbury, Mark, *Logical forms: An introduction to philosophical logic* (2nd edition). Oxford: Basil Blackwell, 2001.

Additional course material

(This material is either accessible online via the University Library, or will be accessible via a link to an external online source, or will be made accessible via BlackBoard. Note: we will often only be reading excerpts from this material.)

Aristotle, *The Metaphysics*, trans. Christopher Kirwan (Oxford: Clarendon Press, 1971). (BlackBoard.)

Beall, JC, and Greg Restall, "Logical pluralism," *Australasian Journal of Philosophy*, 78 (2000): 457-493. (Accessible online via the University Library.)

Dummett, Michael. "The philosophical basis of intuitionistic logic," in Dummett, *Truth and Other Enigmas* (Cambridge, Mass.: Harvard University Press, 1978), 215-247. (BlackBoard.)

Frege, Gottlob. "Begriffsschrift," in *The Frege Reader*, ed. and trans. Michael Beaney (Oxford: Blackwell): "Preface." (BlackBoard.)

Frege, Gottlob. "Notes for Ludwig Darmstaedter," in G. Frege, *Posthumous Writings*, eds. Hans Hermes et al, trans. Peter Long and Roger White (Oxford: Basil Blackwell, 1979), 253-257. (BlackBoard.)

Frege, Gottlob. "Logic," in *ibid.*, 1-8. (BlackBoard.)

Frege, Gottlob. "17 key sentences on logic," in *ibid.*, 174-175. (BlackBoard.)

Geach, Peter. "Identity," *Review of Metaphysics* 21:1 (1967): 3-12. (Accessible online via the University Library.)

Harman, Gilbert. "Logic and reasoning," *Synthese* 60 (1984): 107-127. (Accessible online via the University Library.)

Kripke, Saul. "Semantical considerations on modal logic," in L. Linsky (ed.), *Reference and modality* (Oxford: Oxford University Press), 62-72. (Originally published in 1963.) (BlackBoard.)

Plantinga, Alvin. "Actualism and possible worlds," *Theoria* 42 (1976): 139-160. (Accessible online via the University Library.)

Priest, Graham. "What's so bad about contradictions?" *The Journal of Philosophy* 95:8 (1998): 410-426. (Accessible online via the University Library.)

Quine, W.V.O. "On what there is," *The Review of Metaphysics* 2:5 (1948): 21-38. (Accessible online via the University Library.)

Russell, Bertrand. "On denoting," *Mind* 14 (1905): 479-493. (Accessible online via the University Library.)

Russell, Bertrand, and A.N. Whitehead. *Principia Mathematica*, vol. 1 (Cambridge: Cambridge University Press, 1910). Link:

<https://archive.org/stream/PrincipiaMathematicaVolumeI/WhiteheadRussell-PrincipiaMathematicaVolumeI#page/n45/mode/2up>

Russell, Bertrand. "Mathematics and the metaphysicians," in *Mysticism and Logic* (London: George Allen & Unwin Ltd, 1917), chap. 5. Link: <http://www.gutenberg.org/files/25447/25447-h/25447-h.htm#IV>

Tarski, Alfred. "On the semantic conception of truth," *Philosophy and Phenomenological Research* 4 (1944): 341-376. (Accessible online via the University Library.)

Tarski, Alfred. "On the concept of following logically," *History and Philosophy of Logic* 23 (2002): 155-196. (Accessible online via the University Library.)

Williamson, Timothy. *Modal logic as metaphysics* (Oxford: Oxford University Press, 2013). (Accessible online via the University Library.)

Wittgenstein, Ludwig. *Tractatus logico-philosophicus*, trans. D.F. Pears and B.F. McGuinness (London and New York: Routledge, 2001). (Accessible online via the University Library.)

Optional material

(This material is either accessible online via the University Library, or will be accessible via a link to an external online source, or will be made accessible via BlackBoard. Note: we will often only be reading excerpts from this material.)

Boger, George. "Aristotle's underlying logic" in D. Gabbay and J. Woods (eds.), *Handbook of the History of Logic*, vol. 1 (Amsterdam: North-Holland, 2004), 101-246. (Accessible online via the University Library.)

Carnap, Rudolf. "The elimination of metaphysics through logical analysis of language," trans. A. Pap, in *Science and Philosophy in the Twentieth Century*, vol. 2, ed. S. Sarkar. New York: Garland Publishing, Inc., 10-31. (Originally published in 1931.) (BlackBoard.)

Edgington, Dorothy. "Of Conditionals," *Mind*, 104:414 (1995): 235-329. (Accessible online via the University Library.)

Griffiths, Owen. "Problems for logical pluralism," *History and Philosophy of Logic* 34:2 (2013): 170-182. (Accessible online via the University Library.)

Hand, Michael, "Meaning, truth-conditions, and substitutional quantification," *Philosophical Studies* 68:2 (1992): 195-216. (Accessible online via the University Library.)

Hanson, Sven Ove. "Formalization in Philosophy," *The Bulletin of Symbolic Logic* 6:2 (2000): 162-175. (Accessible online via the University Library.)

Hintikka, Jaakko. "On the development of the model-theoretic viewpoint in logical theory," *Synthese* 77 (1988): 1-36. (Accessible online via the University Library.)

Lewis, David, *On the plurality of worlds* (Oxford: Blackwell, 1986). (BlackBoard.)

Plantinga, Alvin. *The nature of necessity* (Oxford: Clarendon Press, 1974). (BlackBoard.)

Priest, Graham. "The closing of the mind: How the particular quantifier became existentially loaded behind our backs," *The Review of Symbolic Logic* 1:1 (2008): 42-55. (Accessible online via the University Library.)

Read, Stephen. "Formal and material consequence," *Journal of Philosophical Logic* 23:3 (1994), 247-265. (Accessible online via the University Library.)

Read, Stephen. "What is wrong with disjunctive syllogism?" *Analysis* 41:2 (1981), 66-70. (Accessible online via the University Library.)

Routley, Richard, "On what there is not," *Philosophy and Phenomenological Research* 43:2 (1982): 151-177. (Accessible online via the University Library.)

Russell, Bertrand. *The problems of philosophy* (London: Williams & Norgate, 1912). Link: <http://www.gutenberg.org/files/5827/5827-h/5827-h.htm#link2HCH0007>

Russell, Bertrand. *Our knowledge of the external world* (London: George Allen & Unwin, 1914). Link: <http://www.gutenberg.org/files/37090/37090-h/37090-h.htm>

Streumer, Bart, "Reasons and entailment," *Erkenntnis* 66 (2007): 353-374. (Accessible online via the University Library.)

van Inwagen, Peter, "Why I don't understand substitutional quantification," *Philosophical Studies* 39:3 (1981): 281-285. (Accessible online via the University Library.)

Wang, Hao, "On formalization," *Mind* 64 (1955): 226-238. (Accessible online via the University Library.)

Woods, John, and Andrew Irvine, "Aristotle's early logic," in Dov Gabbay and John Woods (eds.), *Handbook of the History of Logic*, vol. 1 (Amsterdam: North-Holland, 2004), 27-99. (Accessible online via the University Library.)

Wyatt, Nicole. "What are Beall and Restall pluralists about?" *Australasian Journal of Philosophy* 82:3 (2004), 409-420. (Accessible online via the University Library.)

Mancosu, Paolo *et al.* "The development of mathematical logic from Russell to Tarski 1900-1935," in Leila Haaparanta (ed.), *The History of Modern Logic* (New York and Oxford: OUP, 2009). Link: <http://www.oxfordscholarship.com.ezproxy.lib.ucalgary.ca/view/10.1093/acprof:oso/9780195137316.01.0001/acprof-9780195137316-chapter-9>

Tentative Syllabus

Note: Page references in the reading assignments are approximate and may be revised further on.

PART I: What is logic?

8/1: A glance at the past (I): Aristotle's logic and theory of first principles

Readings: Aristotle, *The Metaphysics* (Book Gamma)

Optional: Woods and Irvine, "Aristotle's early logic"; Boger, "Aristotle's underlying logic"

13/1: A glance at the past (II): Frege and the early Russell on logical laws

Readings: Frege, "Notes for Ludwig Darmstaedter," "Logic," "17 Key Sentences on Logic"; Russell, "Mathematics and the Metaphysicians."

Optional: Russell, *The problems of philosophy* (chaps. 7-11)

15/1: A glance at the past (III): Wittgenstein and Carnap on logical laws

Readings: Wittgenstein, *Tractatus* (sections 4 through 5)

Short writing assignment #1 (due Monday 20/1)

20/1: More recent accounts (I): meta-logical approaches (esp. Tarski)

Readings: Tarski, "The semantic conception of truth"

Optional: Hintikka, "On the development of the model-theoretic viewpoint in logical theory" (pp. 1-13); Mancosu *et al.*, "The development of mathematical logic from Russell to Tarski" (chaps. 5 and 8)

22/1: More recent accounts (II): meta-logical approaches (esp. Tarski)

Readings: Tarski, "On the concept of following logically" (pp. 176-190)

27/1: More recent accounts (III): Sainsbury's reasons-based account

Readings: Sainsbury, *Logical forms* (pp. 1-9, 14-43); Harman, "Logic and reasoning"

Optional: Streumer, "Reasons and entailment"

29/1: More recent accounts (IV): proof-theoretic vs. model-theoretic approaches to validity

Readings: Priest, *Doubt truth to be a liar* (pp. 155-193)

Optional: Read, "Formal and material consequence"

Short writing assignment #2 (due Monday 3/2)

3/2: The modern formalization project (I): genesis

Readings: Frege, "Begriffsschrift": Preface; Russell and Whitehead, *Principia Mathematica* (Preface + pp. 1-3 of Introduction to 1st ed.); Quine, "On what there is"

Optional: Russell, *Our knowledge of the external world* (chap. 2); Carnap, "The elimination of metaphysics through logical analysis of language"

5/2: The modern formalization project (II): more recent perspectives

Readings: Sainsbury, *Logical forms* (pp. 43-53, 339-391)

Optional: Wang, "On formalization"; Hanson, "Formalization in philosophy"

PART II: A closer look at some key logical concepts

10/2: Disjunction

Readings: Sainsbury, *Logical Forms* (pp. 79-83); Read, "What is wrong with Disjunctive Syllogism?"

16/2: READING WEEK – NO LECTURES

Midterm paper (due Monday 24/2)

24/2: Negation

Readings: Sainsbury, *Logical forms* (pp. 74-76); Priest, *Doubt truth to be a liar* (pp. 31-33, 75-116)

26/2: Conditionals

Readings: Sainsbury, *Logical forms* (pp. 83-111)

Optional: Edgington, "Of Conditionals" (selections)

3/3: Quantifiers

Readings: Sainsbury, *Logical forms* (pp. 153-256; esp. 153-170, 225-239)

Optional: van Inwagen, "Why I don't understand substitutional quantification"; Hand, "Meaning, truth-conditions, and substitutional quantification"

5/3: Quantifiers, existence, and being

Readings: Sainsbury, *Logical forms* (pp. 167-170, 195-201, 239-249); Quine, "On what there is"

Optional: Priest, "The closing of the mind: How the particular quantifier became existentially loaded behind our backs"; Routley, "On what there is not"

Short writing assignment #3 (due Monday 10/3)

10/3: Quantifiers, names, and definite descriptions

Readings: Sainsbury, *Logical forms* (pp. 178-182, 188-195, 201-206); Russell, "On denoting"; Quine, "On what there is"

12/3: Quantifiers and identity

Readings: Sainsbury, *Logical forms* (pp. 182-188); Geach, "Identity"

Short writing assignment #4 (due Monday 17/3)

17/3: Varieties of necessity

Readings: Sainsbury, *Logical forms* (pp. 14-19, 257-338)

Optional: Plantinga, *The nature of necessity* (pp. 1-13)

19/3: Necessity and metaphysics (I): Kripke

Readings: Sainsbury, same as above; Kripke, "Semantical considerations on modal logic" (the first five paragraphs)

24/3: Necessity and metaphysics (II): Plantinga and Lewis

Readings: Sainsbury, same as above; Plantinga, "Actualism and possible worlds" (pp. 189-201); Lewis, *On the plurality of worlds* (Preface and pp. 1-20, 133-135)

26/3: Necessity and metaphysics (III): Williamson

Readings: Williamson, *Modal logic as metaphysics* (“Preface,” “Chap. 1,” “Methodological afterword”)

Short writing assignment #5 (due Monday 2/4)

PART III: Recent challenges

2/4: Challenges to logical monism

Readings: Beall and Restall, “Logical pluralism”; Priest, *Doubt truth to be a liar* (pp. 194-209)

Optional: Wyatt, “What are Beall and Restall pluralists about?”; Griffiths, “Problems for logical pluralism”

7/4: Challenges to the law of non-contradiction

Readings: Priest, “What’s so bad about contradictions?”; *Doubt truth to be a liar* (pp. 7-71)

9/4: Challenges to the law of excluded middle

Readings: Dummett, “The philosophical basis of intuitionistic logic”

14/4: Review

Final paper due 14/4

Academic Honesty

Cheating or plagiarism on any assignment or examination is regarded as an extremely serious academic offence, the penalty for which may be an F on the assignment, an F in the course, academic probation, or requirement to withdraw from the University. See the relevant sections on 'Academic Misconduct' in the current University Calendar. Intellectual honesty requires that your work include adequate referencing to sources. Plagiarism occurs when you do not acknowledge or correctly reference your sources. If you have questions about correct referencing, consult your instructor.

Academic Accommodation

It is the student's responsibility to request academic accommodation. If you are a student with a permanent disability or temporary impairment who may require academic accommodation, you must first register with the Student Accessibility Resource Office located in MacEwan Student Centre 452; phone 403-220-8237; email access@ucalgary.ca. Students who have not registered with the Student Accessibility Office are not eligible for academic accommodation. You are also required to discuss your needs with your instructor no later than fourteen (14) days after the start of this course. Go to <http://www.ucalgary.ca/access/> for further information.

Blackboard Help

Go to <http://www.ucalgary.ca/computersupport/onlineservices/blackboard> for Student Help and FAQs about Blackboard. Troubleshooting tips and a tutorial are available at <http://elearn.ucalgary.ca/blackboard/students>.

Student Advising and Information Resources

- General Academic Concerns and Program Planning– Have a question but not sure where to start? The Faculty of Arts' Program Information Centre (PIC) is your information resource for everything in Arts. Drop in at SS110, call 403-220-3580, or email artsads@ucalgary.ca. Advisors in the PIC Office can also provide assistance and advice in planning your program through to graduation. You can visit the Faculty of Arts website at <http://arts.ucalgary.ca/undersgraduate> for detailed information on common academic concerns.
- **Advice on Philosophy Courses** - You may find answers to your more specific questions about a philosophy degree on the Department of Philosophy's website <http://phil.ucalgary.ca> or contact one of Philosophy's current Undergraduate Advisors (see below)
- **Registration Overload/Prereq Waivers** – If you are seeking to register in a Philosophy course that is full or to get permission to waive the prereqs for a course, email the instructor of the course.

Protection of Privacy

The University of Calgary is under the jurisdiction of the provincial Freedom of Information and Protection of Privacy (FOIP) Act. The Department of Philosophy ensures the student's right to privacy by requiring all graded assignments be returned to the student directly from the instructor.

Student Ombudsperson and Students' Union Representatives

The Student Ombuds Office provides independent, impartial, and confidential support for students who require assistance or advice in addressing issues and concerns related to their academic careers. For more information, see www.ucalgary.ca/provost/students/ombuds. For the Students' Union Faculty of Arts rep: arts1@ucalgary.ca.

Safewalk

Call 403-220-5333 (24/7/365) for a Safewalk volunteer to accompany you safely to your destination on campus including parking lots, housing, and the LRT station or use a Campus Help Phone.

PHILOSOPHY DEPARTMENT

The Department of Philosophy is located on the 12th floor of the Social Sciences Building and on the web at www.phil.ucalgary.ca

PHILOSOPHY UNDERGRADUATE PROGRAM ADVISORS FOR WINTER 2014:

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Reid Buchanan buchanan@ucalgary.ca

Mark Migotti (Honours Program Advisor) migotti@ucalgary.ca

For assistance with registration issues in Philosophy courses, contact

Merlette Schnell (schnell@ucalgary.ca)