



**UNIVERSITY OF CALGARY**  
FACULTY OF ARTS  
Department of Philosophy

## **PHIL 279 Lec 01**

### **Logic I**

**Fall Term 2019**

**MWF 12:00–12:50, Administration 142**

#### **Course Outline**

**Instructor:** **Richard Zach** (he/him)  
**Email:** [rzach@ucalgary.ca](mailto:rzach@ucalgary.ca)  
**Office:** Social Sciences 1230  
**Office Hours:** MW 13:00–13:50, or by appointment  
**Phone:** (403) 220–3170

**Teaching Assistant:** **Bonnie Chin** (she/her)  
**Email:** [kingyeebonnie.chin@ucalgary.ca](mailto:kingyeebonnie.chin@ucalgary.ca)  
**Office:** Social Sciences 1231  
**Office Hours:** T 11:00–12:00, R 13:00–14:00  
**Phone:** (403) 220–8622  
**Tutorials:** W 10:00–10:50, Science A 107 (Tut 1)  
T 10:00–10:50, Science A 107 (Tut 2)  
W 9:00–9:50, Science A 107 (Tut 3)

**PASS Leader:** **Sarah Hatcher** (she/her)

Email is preferred over phone. However please keep the following in mind:

1. Please ensure that “Phil 279” or some other clearly identifying term occurs in the subject line. Otherwise there is a strong possibility that your message will be deleted unread as spam.
2. If you email to make an appointment please indicate the times when you are available.

3. Please make sure your first and last names are clearly included in the body of any email message.
4. We will not respond to email after 7pm or on weekends.

### **Course Information**

The course will introduce you to the semantics and proof-theory of first-order logic (FOL). We will learn how to “speak” the language of FOL, study the method of truth tables, become proficient in giving formal proofs, and learn how to construct and argue about first-order interpretations. These methods will enable you to answer, in particular cases, the questions that logic is primarily concerned with: When does something follow from something else? What are logical truths? Which arguments are logically valid? But the main payoff will be to get you to become comfortable with formal methods, and to use them to clarify and make precise logical relationships that are hard to understand or express otherwise. We will also look at some results and notions which are important for the applications of formal logic, such as the expressive power of truth-functional and first-order logic, as well as some important theorems relating semantics and proof theory (soundness, completeness). We will touch on applications of logic to philosophy, mathematics, and computer science.

### **Prerequisites**

There are no prerequisites.

### **Course Objectives**

By the end of the course, you should be able to ...

1. work with the formal languages of truth-functional and first-order logic, with the ability to translate natural language sentences into a formal language.
2. use truth tables to evaluate sentences and arguments in truth-functional logic.
3. understand the basic semantic concepts such as validity, entailment and logical equivalence, when they apply and how they can be used.
4. construct correct derivations in a natural deduction system for truth-functional and first-order logic, with and without identity.

5. use a proof system to determine whether or not a sentence is a logical truth, whether an argument is valid, and whether two formal sentences are equivalent.
6. construct interpretations that make first-order sentences true or false and to show using them that arguments are invalid.
7. appreciate some basic metatheoretic results, such as truth-functional completeness, and soundness and completeness of a natural deduction system for truth-functional logic.

### Required Readings

The textbook

P.D. Magnus, et. al., *forall x: Calgary. An Introduction to Formal Logic* (Fall 2019 edition)

is required for this course. It will be made available electronically via D2L.

### Assessment Components

*Tests.* There will be three in-class tests, on October 18, November 6, and December 6, each worth 15% of the final mark. Tests are closed book—no reference materials will be allowed during the tests. **There will be no registrar-scheduled final exam.**

*Pre-class quizzes.* There will be open-book quizzes covering the background readings for each week to be taken on D2L. There will be 10 quizzes in total. Quizzes will be available on D2L for seven days. There will be no quizzes due in the weeks of September 9 and December 2. Quizzes account for 5% of your final grade.

*Problem sets.* There will be 5 problem sets, each worth 10% of the final mark for a total of 50%. Problem sets are due by 12:00 noon on the following dates: September 27, October 11, October 25, November 8, and November 29. Problem sets may be submitted to the “Phil 279 L01” dropbox in the hallway outside SS 1253 or turned in at the beginning of class. Problem sets will not be accepted electronically.

### **Grade scheme**

Each test, quiz, and problem set will be assigned a raw point score, which is then normalized to a score out of 100 points. The final score is then computed according to the percentages given above. The following table will be used to convert the final score to letter grades (the ranges include the lower score and exclude the upper, e.g., 64 earns a B, not a B-):

95–100	A+	80–85	B+	67–70	C+	55–60	D+
90–95	A	75–80	B	64–67	C	50–55	D
85–90	A–	70–75	B–	60–64	C–	< 50	F

### **Course policies**

*Late policy.* You may turn in one problem set by 12:00 noon on the Monday following the due date, no questions asked. Otherwise, problem sets will not normally be accepted after the deadlines unless special permission has been given by the instructor ahead of time. Failure to submit a problem set on time will normally result in a mark of zero. Students who cannot submit an assignment or a test due to medical reasons or other reasonable grounds should contact the instructor as soon as possible.

*Checking your grades and reappraisals of work.* University policies for reappraisal of term work and final grades apply (see the *Calendar* section “[Reappraisal of Grades and Non-Disciplinary Academic Appeals](#)”). In particular, term work will only be reappraised within 10 calendar days of the date you are advised of your marks. Please keep track of your assignments (make sure to pick them up in lecture or in office hours) and your marks (check them on D2L) and compare them with the graded work returned to you.

### **Peer Assisted Study Sessions**

This course is supported by the PASS (Peer Assisted Study Sessions) program. PASS provides students with free, organized study groups facilitated by a student who has been successful in the course before. Attending PASS can help you build your understanding of course content as well as learn valuable study skills which will help you to succeed in the course. You will meet your PASS leader and receive more information in the first weeks of classes.

### **Important departmental, faculty, and university information**

*Academic Accommodations.* It is the student’s responsibility to request academic accommodations according to the University policies and pro-

cedures. The student accommodation policy can be found at [ucalgary.ca/access/accommodations/policy](http://ucalgary.ca/access/accommodations/policy).

Students needing an Accommodation because of a disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities:

[ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities.pdf](http://ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities.pdf)

Students needing an Accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to their instructor.

*Absence or Missed Course Assessments.* Students who are absent from class assessments (tests, participation activities, or other assignments) should inform their instructors as soon as possible. Instructors may request that evidence in the form of documentation be provided. If the reason provided for the absence is acceptable, instructors may decide that any arrangements made can take forms other than make-up tests or assignments. For example, the weight of a missed grade may be added to another assignment or test. For information on possible forms of documentation, including statutory declarations, please see [ucalgary.ca/pubs/calendar/current/m-1.html](http://ucalgary.ca/pubs/calendar/current/m-1.html).

*Student Support and Resources.* Full details and information about the following resources can be found at [ucalgary.ca/registrar/registration/course-outlines](http://ucalgary.ca/registrar/registration/course-outlines)

- Wellness and Mental Health Resources
- Student Success Centre
- Student Ombuds Office
- Student Union (SU) Information
- Graduate Students' Association (GSA) Information
- Emergency Evacuation/Assembly Points
- Safewalk

*Academic Advising.* If you are a student in the Faculty of Arts, you can speak to an academic advisor in the Arts Students' Centre about course planning, course selection, registration, program progression and more. Visit the Faculty of Arts website at [arts.ucalgary.ca/advising](https://arts.ucalgary.ca/advising) for contact details and information regarding common academic concerns.

For questions specific to the philosophy program, please visit [phil.ucalgary.ca](https://phil.ucalgary.ca). Further academic guidance is available by contacting David Dick (Undergraduate Program Director, [dgdick@ucalgary.ca](mailto:dgdick@ucalgary.ca)) or Jeremy Fantl (Honours Advisor, [jfantl@ucalgary.ca](mailto:jfantl@ucalgary.ca)). If you have questions regarding registration, please email Rebecca Lesser (Undergraduate Program Administrator, [phildept@ucalgary.ca](mailto:phildept@ucalgary.ca)).

*Writing Assessment and Support.* The assessment of all written assignments—and, to a lesser extent, written exam responses—is based in part on writing skills. This includes correctness (grammar, punctuation, sentence structure, etc.), as well as general clarity and organization. Research papers must include a thorough and accurate citation of sources. Students are also encouraged to use Writing Support Services for assistance (one-on-one appointments, drop-in support and writing workshops). For more information, and other services offered by the Student Success Centre, please visit [ucalgary.ca/ssc](https://ucalgary.ca/ssc).

*Online Resources and Electronic Devices.* Important information and communication about this course may be posted on D2L (Desire2Learn), UCalgary's online learning management system. Visit [ucalgary.service-now.com/it](https://ucalgary.service-now.com/it) for how-to information and technical assistance.

The instructor reserves the right to establish specific course policies regarding the use of electronic devices. If permitted, the use of devices must be exclusively for instructional purposes, and without disruption to the instructor or fellow students. Devices should be set to silent mode during lectures. Audio or video recording of lectures is not permitted without the written permission of the instructor. Students violating this policy are subject to discipline under the University of Calgary's Non-Academic Misconduct policy.

*Academic Misconduct/Honesty.* Cheating or plagiarism on any assignment or examination is as an extremely serious academic offense, the penalty for which will be an F on the assignment or an F in the course, and possibly a

disciplinary sanction such as probation, suspension, or expulsion. For information on academic misconduct and its consequences, please see the University of Calgary Calendar at [ucalgary.ca/pubs/calendar/current/k.html](http://ucalgary.ca/pubs/calendar/current/k.html).

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 referencing, please consult your instructor.

*University Policies.* The Instructor Intellectual Property Policy is available at [ucalgary.ca/policies/files/policies/Intellectual%20Property%20Policy.pdf](http://ucalgary.ca/policies/files/policies/Intellectual%20Property%20Policy.pdf)

The University of Calgary is under the jurisdiction of the provincial Freedom of Information and Protection of Privacy (FOIP) Act, as outlined at [ucalgary.ca/legalservices/foip](http://ucalgary.ca/legalservices/foip). The instructor (or TA) must return graded assignments directly to the student UNLESS written permission to do otherwise has been provided.

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright ([ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf](http://ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf)) and requirements of the copyright act ([laws-lois.justice.gc.ca/eng/acts/C-42/index.html](http://laws-lois.justice.gc.ca/eng/acts/C-42/index.html)).