PHIL 1001: Introduction to Logic (Spring 2024, 4 units)

January 10, 2024

Teaching Staff, Meeting Times, and Communication

Instructor: Prof. Samuel C. Fletcher (scfletch@umn.edu)
Preferred Address: Prof. Fletcher, he/his
Lectures: Tu/Th 1:00–2:15 in Anderson 210
Office Hours: Tu/Th 11:15–12:15 and by appointment in Heller 754

Teaching Assistant: Michelle Hirschboeck (hirs0030@umn.edu)
Preferred Address: Michelle, she/her
Discussion Sections: M 12:20–1:10, 1:25–2:15 in Blegen 205
Office Hours: M 11–12 and by appointment in Heller 772

Teaching Assistant: Tomoya Imaizumi (imaiz002@umn.edu)
Preferred Address: Tomoya, he/his
Discussion Sections: F 12:20–1:10, 1:25–2:15 in Blegen 205
Office Hours: Th 2:30–3:30 and by appointment in Heller 775

Course Tutor: Michael Calasso (calas005@umn.edu)
Preferred Address: Michael, he/his
Office Hours: M 3:30–4:30 and by appointment in Heller 775

Course Website: `https://canvas.umn.edu/courses/410313`. We will send class announcements via Canvas, so please enable Canvas notifications so that you can know of them in a timely manner.

Timely Communication: We prefer that you contact us via Canvas Inbox or email, and will respond within two business days. We expect the same of any email or Canvas queries to you.

Course Requirements

Textbook: Russell Marcus. *Introduction to Formal Logic*, Oxford University Press, 2018. You will automatically be charged for the e-book version through your student account

unless you opt out. By the first day of class, you will receive instruction on receiving access via an email either from Verba Software or from the U of MN Bookstores. You can opt out of this via a link in this email, or by explicit request to (inclusiveaccess@umn.edu with your course information before January 26, 2024.

Technology: Every lecture requires the use of a laptop, smartphone, or tablet computer with reliable internet access and a recommended web browser (Mozilla Firefox or Google Chrome) that will allow you to access our course's Canvas site. If you anticipate having technology issues, please consult the UMN Technology Help page.

Prior Courses: No prerequisites are assumed, but you should be ready to be challenged in lecture to think about arguments in a different way than you may be accustomed.

Description and Objectives

This is an introductory course in formal logic. Just as many of the sciences use mathematics to formally represent systems (whether physical, biological, social, etc.), logic uses a formal language to represent arguments and good patterns of reasoning. And, just as there are many sorts of mathematics, there are many sorts of logic. This course focuses on propositional logic (**PL**) and predicate logic (in its monadic (**M**) and first-order (**F**) forms). For both of these logical systems, we will cover: their grammar (syntax), how to translate between them and English, their notions of meaning and truth (semantics), and their allowed patterns of inference (derivations/proofs). By the end of the semester, students will:

1. be familiar with the concept of formality and able to apply its associated techniques to evaluate and analyze arguments using a formal language;

2. identify logical concepts relevant to certain widespread forms of reasoning and inference; and

3. understand some of the strengths and limitations of particular formal systems and tools.

Instructional Time and Student Effort

There will be 200 minutes of instructional time per week, 150 of which will be in lecture and 50 of which will be in discussion section. In lectures, the instructor will introduce new concepts and methods using PDF slides, audience response polls using ChimeIn, peer-to-peer discussion, and class-wide Q & A. In discussion sections, teaching assistants will focus on review of and practice with new concepts and methods introduced. You should expect to spend, on average, about 400 minutes per week completing reading and homework assignments, practicing methods, and studying for exams. In any given week, you may spend more or less than this. Spending more or less time does not necessarily indicate that you are *achieving* less or more, respectively. In particular, studying *effectively* for exams for shorter periods of time often leads to higher achievement that studying *ineffectively* for longer periods of time. Discussion sections especially will touch on effective study strategies.

Assessment

Basis for Evaluation

Exams (51%) There will be 3 open-book exams during scheduled class times and administered through Canvas, each worth 17% of your grade: on Tuesday, February 20th, covering chapters 1–2; on Thursday, April 4th, covering chapters 3.1–3.5, 3.7–4.3, and 5.1; and on Monday, May 6th, covering chapters 4.4–4.8 and 5.2–5.3. You can take the exams in any private space. Although the exams will not be cumulative, understanding much of the material in the later parts of the course depends on mastering that of the earlier parts. This includes the last exam, which is scheduled for 8:00–10:00 a.m. (as it is during the finals period). The exams will not require any special technology, but it is especially important for you to use a computer with a reliable internet connection while taking them.

Homework (38.5%) There will be 12 homework assignments due just before the beginning of lecture on Tuesdays before exam 2, and Thursdays after exam 2. You may discuss the homework problems with your classmates; if you do, include their names with your homework when you submit it. You should submit your homework via Canvas, preferably using the Word or PDF template provided, or in person before lecture begins. (If you decide to submit a document with handwriting, please ensure that your writing is legible; illegible homework will not be graded.) Late homework will be accepted on Canvas up to 24 hours past due, but with a multiplier of 75% (i.e., the final score on a late homework will be 75% of the regular score). After 24 hours, late homework will not be accepted. Nevertheless, your lowest homework score will be dropped, so that the remaining assignments will each be worth 3.5% of your grade. This is to allow automatic flexibility with occasional technical difficulties while submitting assignments; no further homework will be waived for these reasons.

Participation (10.5% + 2.5% Extra Credit) During lectures, there will be periodic ChimeIn questions that you can use to help test your understanding—not to verify your attendance!—and that will be graded for completeness, not correctness. Sometimes I will direct you to discuss a question with some of your classmates if the class does not have a consensus on it. Your teaching assistants will circulate to answer your questions and spur discussion. Each daily participation score is worth 0.5% of your grade. Your expected participation score is based on your best 21 (out of 26) daily participation scores. This policy is designed to mitigate technical issues that may arise while connecting to the Canvas site and the occasional non-excused absence; no further participation will be waived for these reasons. Nevertheless, any additional participation beyond these 21 will count as extra credit at the same rate.

If you request to submit any assignment for regrading, you must provide to me an argument in writing detailing the grounds for your request no more than one week but no less than one day (24 hours) after grades for that assignment are released. If your request is granted, the resulting new grade overrides the old one, whether higher or lower.

Understanding Your Letter Grade

In past versions of this course, I have applied a curve to exams or to finals grades. If I plan to do so this semester, I will notify you via Canvas announcement with details concerning how. Whether or not a curve is applied, final grades will be converted from numeral scores to letter grades as follows.

How to Compute Your Letter Grade

		$90 > B+ \geq 87$	$80 > C+ \geq 77$	$70 > D+ \geq 67$	
A ≥ 93	$87 > B \geq 83$	$77 > C \geq 73$	$67 > D \geq 63$	F < 60
$93 > A- \geq 90$	$83 > B- \geq 80$	$73 > C- \geq 70$	$63 > D- \geq 60$	

Grades in the following ranges represent the following corresponding levels of achievement relative to the level necessary to meet course requirements:

A: Outstanding.
B: Significantly above.
C: Adequate in every respect.
D: Worthy of credit despite not fully meeting course requirements.
F: Not meeting enough course requirements to be deserving of credit.

Students taking this course "pass/fail" will receive an "S," representing satisfactory achievement, for any standard final letter grade of "C-" or higher that they would have been assigned. Such students will receive an "N," representing unsatisfactory achievement, for any standard final letter grade of "D+" or lower that they would have been assigned.

For additional information about University policies about grading and transcripts, please refer to the UMN policy library.

Policies

Student Conduct Code

The University seeks an environment that promotes academic achievement and integrity, that is protective of free inquiry, and that serves the educational mission of the University. Similarly, the University seeks a community that is free from violence, threats, and intimidation; that is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and that does not threaten the physical or mental health or safety of members of the University community.

As a student at the University you are expected adhere to the Board of Regents' Student Conduct Code. Note that the conduct code specifically addresses disruptive classroom conduct, which means "engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach or student learning." The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities.

Use of Personal Electronic Devices in the Classroom

The University establishes the right of each faculty member to determine if and how personal electronic devices are allowed to be used in the classroom. In this class, the use of laptops, tablets, and other electronic devices is permitted as long as it would not reasonably be a distraction to others. Reasonable distractions include movies, games, and social media. Students violating this policy will be asked to put their offending device away for the rest of the class session. Using personal electronic devices in the classroom setting, especially in these ways, can hinder instruction and learning, not only for the student using the device but also for other students in the class.

Scholastic Dishonesty

You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. According to the student conduct code, "scholastic dishonesty" includes: plagiarizing; cheating on assignments or examinations, including the unauthorized use of online learning support and testing platforms; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, misrepresenting, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis. If it is determined that a student has cheated, the student may be given an "F" or an "N" for the course, and may face additional sanctions from the University. For additional information, please see the UMN policy library.

Artificial intelligence (AI) language models, such as ChatGPT, and online assignment help tools, such as Chegg®, are examples of online learning support platforms: they can not be used for course assignments except as explicitly authorized by the instructor. The following actions are prohibited in this course:

- submitting all or any part of an assignment statement to an online learning support platform;

- incorporating any part of an AI generated response in an assignment; and

- submitting your own work for this class to an online learning support platform for iteration or improvement.

Any assignment content composed by any resource other than you, regardless of whether that resource is human or digital, must be attributed to the source through proper citation. Unattributed use of online learning support platforms and unauthorized sharing of instructional property are forms of scholastic dishonesty and will be treated as such.

The Office for Community Standards has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty. If you have additional questions, including if you are in doubt as to whether you are using an online learning support platform appropriately in this course, please discuss your situation with me.

Makeup Work and Extensions for Legitimate Absences

Students will not be penalized for absence during the semester due to unavoidable or legitimate circumstances. Such circumstances include verified illness (inclusive of dependents), medical conditions relating to pregnancy, participation in intercollegiate athletic events, subpoenas, jury duty, military service, bereavement, religious observances, and participation in formal University system governance. Such circumstances do not include voting in local, state, or national elections. For complete information, please see the UMN policy library.

Under such legitimate circumstances leading a student to be absent for any exam or assignment, including class participation, that student must contact me at least two weeks in advance of the exam or assignment, or as soon as possible if the circumstances are known later, to schedule a make-up exam or assignment or an extension on the assignment deadline, as I deem appropriate.

Appropriate Student Use of Class Notes and Course Materials

Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes beyond the classroom community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. Such actions violate shared norms and standards of the academic community. For additional information, please see the UMN policy library.

Sexual harassment, Sexual Assault, Stalking and Relationship Violence

The University prohibits sexual misconduct, and encourages anyone experiencing sexual misconduct to access resources for personal support and reporting. If you want to speak confidentially with someone about an experience of sexual misconduct, please contact your campus resources including the Aurora Center, Boynton Mental Health or Student Counseling Services. If you want to report sexual misconduct, or have questions about the University?s policies and procedures related to sexual misconduct, please contact your campus Title IX office or relevant policy contacts.

Instructors are required to share information they learn about possible sexual misconduct with the campus Title IX office that addresses these concerns. This allows a Title IX staff member to reach out to those who have experienced sexual misconduct to provide information about personal support resources and options for investigation. You may talk to instructors about concerns related to sexual misconduct, and they will provide support and keep the information you share private to the extent possible given their University role.

For additional information, please consult the Board of Regents' policy on the matter.

Equity, Diversity, Equal Opportunity, and Affirmative Action

The University provides equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. To this effect, please notify me if you have a preferred name or pronoun not indicated in your official enrollment data. For more information, please consult the Board of Regents' policy on the matter.

Disability Accommodations

The University of Minnesota is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center (DRC) is the office that collaborates with students who have disability-related barriers to learning to explore reasonable accommodations, tools, and resources.

- If you are registered with the DRC and have a current accommodation letter, please share your letter with me as soon as possible so that we can discuss how your accommodations will be implemented in this course. The sooner I know about your disability access-needs, the more equipped I can be to facilitate accommodations. You may reach out to me or your access consultant/disability specialist if you have any questions or concerns about your accommodations.

- If you are not registered with the DRC and are experiencing or think you may be experiencing disability related to a mental health, attention, learning, chronic health, sensory, or physical condition, and would like to discuss accommodations and/or resources, please contact the DRC at 612-626-1333.

- If you have a short-term medical condition, such as a broken arm, I may be able to assist in minimizing classroom barriers. In situations where additional assistance is needed, you should contact the DRC as noted above.

Mental Health and Stress Management

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University of Minnesota services are available to assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health Website.

Academic Freedom and Responsibility

Academic freedom is a cornerstone of the University. Within the scope and content of the course as I have defined it, this includes the freedom to discuss relevant matters in

the classroom. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled. Reports of concerns about academic freedom are taken seriously, and there are individuals and offices available for help, including me, the Philosophy Department Acting Chair Prof. Valerie Tiberius (tiberius@umn.edu), your adviser, or College of Liberal Arts Associate Dean for Arts and Humanities Josephine Lee (jolee@umn.edu).

Tentative Course Schedule

As the section title indicates, the course schedule is open to (reasonable) modification in light of the class's progress. All readings, except this syllabus, are from our course textbook; you are advised to have the reading assigned for a particular day done before that day's lecture. Each homework assignment will be posted on the course Canvas site at least one week before it is due.

Date	Topic	Reading	Assignments/Notes
Tu 1/16	Introduction/What is logic?	Course Syllabus, Ch. 1.1–1.3	
Th 1/18	Arguments & Logical Concepts I	Ch. 1.4	
Tu 1/23	Arguments & Logical Concepts II	Ch. 1.5	
Th 1/25	**PL**: Syntax & Translation I	Ch. 2.1–2.2	
Tu 1/30	**PL**: Syntax & Translation II	Ch. 2.1, 2.8	HW #1 due
Th 2/1	**PL**: Semantics I	Ch. 2.3–2.4	
Tu 2/6	**PL**: Semantics II	Ch. 2.5–2.6	HW #2 due
Th 2/8	**PL**: Semantics III	Ch. 2.7	
Tu 2/13	**PL**: Inference I	Ch. 3.1	HW #3 due
Th 2/15	**PL**: Inference II	Ch. 3.2–3.3	
Tu 2/20			Exam 1
Th 2/22	**PL**: Inference III	Ch. 3.3	
Tu 2/27	**PL**: Inference IV	Ch. 3.4–3.5	HW #4 due
Th 2/29	**PL**: Inference V	Ch. 3.7–3.9	
Tu 3/5			Spring Break
Th 3/7			Spring Break
Tu 3/12	**PL**: Inference VI	Ch. 3.10	HW #5 due
Th 3/14	**M** & **F**: Syntax & Translation I	Ch. 4.1, 4.3	
Tu 3/19	**M** & **F**: Syntax & Translation II	Ch. 4.1, 4.3	HW #6 due
Th 3/21	**M** & **F**: Syntax & Translation III	Ch. 4.2, 5.1	
Tu 3/26	**M** & **F**: Syntax & Translation IV	Ch. 4.2, 5.1	HW #7 due
Th 3/28	**M** & **F**: Semantics I	Ch. 4.7	
Tu 4/2	**M** & **F**: Semantics II	Ch. 4.7, 5.2	HW #8 due
Th 4/4			Exam 2

Date	Topic	Reading	Assignments/Notes
Tu 4/9	**M** & **F**: Semantics III	Ch. 4.8, 5.2	
Th 4/11	**M** & **F**: Semantics IV	Ch. 4.8	HW #9 due
Tu 4/16	**M** & **F**: Inference I	Ch. 4.4	
Th 4/18	**M** & **F**: Inference II	Ch. 4.4, 4.6	HW #10 due
Tu 4/23	**M** & **F**: Inference III	Ch. 4.5	
Th 4/25	**M** & **F**: Inference IV	Ch. 4.6, 5.3	HW #11 due
Th 5/2			HW #12 due
M 5/6			Exam 3,
			8:00–10:00 a.m.