

PHI251: Logic

Course Description

Logic is the business of evaluating arguments, sorting the good from the bad. In a good deductive argument, the conclusion follows from the premises. Such an argument is called a valid argument. Some arguments are valid in virtue of their logical form. Formal logic studies the logical form of arguments. In this course we will study two systems of formal logic: truth functional logic, and first-order logic. We will learn how to represent the logical forms of English arguments, and then develop a semantics as well as a system of natural deduction in each system of logic to determine the validity of arguments given such formal representations. Upon completing the course students will be familiar with basic model- and proof-theoretic concepts and techniques and be able to apply them to analyze and evaluate natural language arguments.

Contact information

Hamed Shirmohammadi

Email: hshirmoh@syr.edu

OH: TTH 12:40-1:40 on Zoom by appointment

Course Resources:

- Lecture notes (my notes along with other supplementary material will be posted on Blackboard).

Grades

(i) Three exams (The first two exam 25%, the last exam 30%): Exam dates:)

(ii) Quizzes (10%)

(iii) Homework assignments (10%)

There will be no extra credit.

A	93-100	C+	77-79
A-	90-92	C	73-76
B+	87-89	C-	70-72
B	83-86	D	60-69
B-	80-82	F	59 or less

Final grades are **rounded** to the nearest whole number. For example, 89.5 becomes a 90 which is an A-, but 89.4 becomes an 89 which is a B+.

Schedule

The following is a *tentative* schedule and subject to change as we proceed.

Week 1:

- Introduction to key notions
- Symbolization in TFL: Sentences of TFL

Week 2:

- Symbolization in TFL: Symbolizing sentences
- Symbolization in TFL: Symbolizing arguments

Week 3:

- Semantics for TFL: constructing truth tables
- Semantics for TFL: semantic concepts (logical properties, logical relations, validity)

Week 4:

- Semantics for TFL: partial truth tables
- Natural deduction for TFL : $\&E$, $\&I$, $\rightarrow E$

Week 5:

- Natural deduction for TFL : $\rightarrow I$, rules for negation
- Exam 1

Week 6:

- Natural deduction for TFL: rules for disjunction and biconditional

Week 7:

- Natural deduction for TFL: derived rules
- Symbolization in FOL

Week 8:

- Symbolization in FOL: Building blocks and Sentences of FOL, Symbolizations with monadic predicates
- Symbolization in FOL: Symbolizations with many-placed predicates

Week 9:

- Spring Break

Week 10:

- Semantics for FOL: Using interpretations
- Exam 2

Week 11:

- Semantics for FOL: Constructing Counterexamples

Week 12:

- Semantics for FOL: Constructing Counterexamples

Week 13:

- Natural deduction in FOL

Week 14:

- Natural deduction in FOL

Week 15:

- Natural deduction in FOL
- Exam 3

Course Policies

Academic Integrity

Syracuse University's academic integrity policy reflects the high value that we, as a university community, place on honesty in academic work. The policy defines our expectations for academic honesty and holds students accountable for the integrity of all work they submit. Students should understand that it is their responsibility to learn about course-specific expectations, as well as about university-wide academic integrity expectations. The university policy governs appropriate citation and use of sources, the integrity of work submitted in exams and assignments, and the veracity of signatures on attendance sheets and other verification of participation in class activities. The policy also prohibits students from submitting the same written work in more than one class without receiving written authorization in advance from both instructors. The presumptive penalty for a first instance of academic dishonesty by an undergraduate student is course failure, accompanied by a transcript notation indicating that the failure resulted from a violation of academic integrity policy. The presumptive penalty for a first instance of academic dishonesty by a graduate student is suspension or expulsion. SU students are required to read an online summary of the university's academic integrity expectations and provide an electronic signature agreeing to abide by them twice a year during pre-term check-in on MySlice. For more information and the complete policy, see <http://class.syr.edu/academic-integrity/policy/>.

Accommodations for Students with Disabilities

Syracuse University values diversity and inclusion; we are committed to a climate of mutual respect and full participation. There may be aspects of the instruction or design of this course that result in barriers to your inclusion and full participation in this course. I invite any student to meet with me to discuss strategies and/or accommodations (academic adjustments) that may be essential to your success and to collaborate with the Center for Disability Resources (CDR) in this process.

If you would like to discuss disability-accommodations or register with CDR, please visit their website at <https://disabilityresources.syr.edu>. Please call (315) 443-4498 or email disabilityresources@syr.edu for more detailed information.

CDR is responsible for coordinating disability-related academic accommodations and will work with the student to develop an access plan. Since academic accommodations may require early planning and generally are not provided retroactively, please contact CDR as soon as possible to begin this process.

University Attendance Policy

Attendance in classes is expected in all courses at Syracuse University. Students are expected to arrive on campus in time to attend the first meeting of all classes for which they are registered. Students who do not attend classes starting with the first scheduled meeting may be academically withdrawn as not making progress toward degree by failure to attend. Instructors set course-specific policies for absences from scheduled class meetings in their syllabi. It is a federal requirement that students who do not attend or cease to attend a class to be reported at the time of determination by the faculty. Faculty should use “ESPR” and “MSPR” in Orange Success to alert the Office of the Registrar and the Office of Financial Aid. Students should also review the university’s religious observance policy and make the required arrangements at the beginning of each semester.

Extensions and Absences

To request an extension on an assignment you need to contact me at least 24hrs before the due date.

If you expect to be absent from class for a religious observance, please notify me within the first two weeks of the semester.

Please note the dates of the exams. If you have a scheduling conflict for the exams due to a prior commitment, contact me in the first two weeks of class to discuss potential alternative arrangements.

Electronic Devices

Please do not use electronic devices during lectures. Phones, tablets, computers etc. should be put away and the volume muted. If you think you need to use an electronic device in class in order to succeed in this course, please come speak to me individually.

Email Policy

I will try to reply to emails about brief class-related questions within a day or two. For substantive inquiries, please come see me during office hours or schedule an appointment.