PHIL 220g: Introduction to Logic
Fall 2024

Time and Place

Lecture	Tue, Thu 3:30 - 4:50pm	THH 101
Discussion Section	Mon 8 - 8:50am	MHP B7B
Discussion Section	Mon 9 - 9:50am	GFS 108
Discussion Section	Mon 8 - 8:50am	MHP 102
Discussion Section	Mon 9 - 9:50am	MHP 102
Discussion Section	Fri 10 - 10:50am	MHP B7B
Discussion Section	Fri 11 - 11:50am	THH 119
Discussion Section	Fri 10 - 10:50am	MHP 102
Discussion Section	Fri 11 - 11:50am	MHP 102

Instructor

Gabriel Uzquiano
STO 221
Phone: 213-740-1074

Email

Email: uzquiano@usc.edu

Please write 'PHIL 220' in the subject line when you email me (or your section leader). I will endeavor to reply to your email within 48 hours, and you should feel free to send a reminder if I cannot manage to do this within that period.

Office Hours

Thu 2 - 3pm	Open Discussion	STO 221
Wed 11 - 12:30pm	Online One-on-One Session	Zoom Room
	Make an appointment	https://usc.zoom.us/my/uzquiano

If you have a conflict with the scheduled office hours, please email me to make an appointment for another time.

Section Leaders

Benjamin Andrew
Email: bandrew@usc.edu
Office Hours: Tue 1 - 3pm and by appt. at MHP B5A

Antonio Maria Cleani
Email: cleani@usc.edu
Office Hours: Wed 3 - 5pm and by appt. at MHP B5C

Yangming Qin
Email: qinyangm@usc.edu
Office Hours: Mon 1 - 2 pm and by appt. at MHP B5C

Arthur Wu
Email: xinpengw@usc.edu
Office Hours: Tue 10 - 12 pm at MHP B7A

Course Description

The course will provide you with a suite of formal methods for the evaluation of natural language arguments. Logic plays an important role in most areas of human inquiry, and they contribute to the study of language and thought as the basis, for example, of formal semantics in linguistics and automated reasoning in AI. The course will consist of four major units.

1. **Reason and Argument**. We use arguments to reason and persuade others. Valid arguments guarantee the truth of the conclusion given the truth of the premises. We ask what sets *valid* arguments apart from the rest, and we look at the link between validity and truth.

2. **Propositional Logic**. We introduce the language of propositional logic in order to account for the validity of an important family of natural language arguments in terms of the behavior of propositional connectives such as 'not', 'and', 'or', and 'if ... , then ...'.

3. **Quantificational Logic**. We look at the language quantificational logic, which accounts for the validity of a variety of natural language arguments in terms of the behavior of some quantifier expressions such as 'all' or 'some'.

4. **Identity**. We finally expand the language of quantificational logic with identity in order to cover the validity of additional natural language arguments, e.g., those that involve number and definite descriptions.

Goals

By the end of this course students will be able to . . .

- identify the premises and the conclusion of natural language arguments
- provide formal representations of natural language sentences in the language of propositional and quantificational logic with identity
- use truth tables to determine whether arguments formulated in the language of propositional logic are valid
- deploy a natural deduction system to construct a proof of a conclusion from certain premises stated in the language of propositional and quantificational logic with identity

- construct models to establish the invalidity of arguments formulated in the language of quantificational logic with identity
- use a suite of formal methods to determine whether a natural language argument is propositionally or quantificationally valid

Course Materials

USC Logic Web

We will use USC Logic Web as an online companion to the course. The website includes tutorials for different aspects of propositional and quantificational logic covered in the course. Each tutorial is accompanied by a battery of problems you should be able to use to check your own progress with the material of the course. Solutions to the problems are available from a separate link.

Carnap

The online platform is powered by Carnap, which is a free and open software framework for the study of formal logic. To use the platform, you should first register with a google account, e.g., your USC address. Once registered as a Carnap user, you should follow the link below in order to enroll in the Carnap course associated with this class:

USC Introduction to Logic

We will post lecture notes, assignments, and other materials for the course in a custom table of contents to which you will directed when you click the 'Book' link at the top of the page.

Brightspace

We will use Brightspace to post grades for different components of the course and to and distribute some class materials such as the syllabus for the course.

Course Requirements

This is tentative and subject to change in the event of disruption.

Participation

The course will be based on active participation and discussion. You will be expected to be present both in lecture and in discussion section and be prepared to ask questions, contribute to discussion, and participate in discussion activities. Your participation score will be left to the discretion of your section leader.

Participation will account for 5% of your final grade.

Online Assignments

We will use the Carnap platform for weekly online assignments. These problems are specifically designed to help you acquire and practice core skills associated with the course objectives. The

problems will appear each week in Carnap under the label 'Assignments'. The platform will not generally provide you with hints but it will nevertheless immediately alert you if your answer is incorrect and it will allow you to change it until it is correct.

To earn full credit for these problems, you should submit your answers through the online platform by 11pm of the due date specified in the schedule below. By default, late (and even very late) submissions will receive partial credit provided they are submitted by midnight of the last day of classes, Fri. 12/6.

The best eight (out of ten) online problem sets will account for 35% of your final grade.

Check-in Quizzes

We will generally reserve the last 20 minutes of the Thursday session for a 10 minute check-in quiz. The purpose of the weekly quizzes is to check your comprehension of the central concepts introduced over the course of the week and to provide us with feedback as to how well these key concepts have been communicated. These check-in quizzes will often consist of one or two questions delivered through the Carnap platform.

The best ten (out of twelve) check-in quizzes will contribute 15% of your final grade.

Timed Tests

There will be three in-class timed tests. These tests are designed to both help you consolidate your comprehension of the material introduced by the unit and to evaluate your ability to apply the core skills of the unit. We will use the Carnap platform without the guardrails that are in place for the online assignments. That is, the platform will not immediately tell you whether your answer is correct or incorrect, and you will only find out after you submit your answers.

A practice timed test will be distributed at least one week prior to the exam, and solutions to the practice questions will be made available at least 48 hours prior to the exam.

Each timed test will account for 15% of your grade for a total 45% of your final grade.

Evaluation

Activities	**Weights**	**When**
Participation	5 %	Weekly
Online Exercises	35 %	Weekly
Check-in Quizzes	15 %	Weekly
Timed Test	15 %	Tue 9/17
Timed Test	15 %	Thu 10/17
Timed Test	15 %	Tue 2/29

Grading Scale

A	93 - 100	C	73 - 77
A-	90 - 93	C-	70 - 73
B+	87 - 90	D+	67 - 70
B	83 - 87	D	63 - 67
B-	80 - 83	D-	60 - 63
C+	77 - 80	F	0 - 60

Course Policies

Late Policies

Most online assignments will consist of either 20 or 10 exercises. By default, each online problem submitted on time in the Carnap platform will receive a maximum of either 5 or 10 points as the case may be for a total 100 points per problem set. Late exercises will receive a maximum of either 4 or 9 points for a total of either 80 or 90 points per problem set **provided they are submitted by midnight of the last day of classes, Fri. 12/6**.

Check-in quizzes cannot be made up or turned in late. This is because these assignments are difficult to fairly administer at alternative times and each of them is worth a minimal fraction of your overall grade.

Token System

Life can be complicated and in the event of an emergency, you might not be submit an assignment in time or you may find that a timed test did not reach the standard you had have hoped to achieve. In order to accommodate these and other unforeseen circumstances, you will be given *four tokens* to spend during the term. You can use a token to do one of the following:

- *extend a deadline* for an *online assignment* by 48 hours. That will allow you to earn full credit for the assignment provided you submit it within the extended deadline.
- *repeat* a *timed test* for full credit *within two weeks of the original test*. *You can only repeat one timed test.*

You should contact your discussion leader with sufficient time in order to use a token. They will keep track of token usage.

Schedule

This schedule is tentative and subject to change.

Date	Topic	Turn In
	Introduction	
Tue 8/27	Arguments	

Thu 8/29	Validity and Form	Quiz 1
Tue 9/3	Formal Languages	Online Assignment 1
	Propositional Logic	
Thu 9/5	Syntax of Propositional Logic	Quiz 2
Tue 9/10	Truth Tables	Online Assignment 2
Thu 9/12	Validity	Quiz 3
Tue 9/17	**Timed Test**	
Thu 9/19	Translation (Asynchronous)	
Tue 9/24	Complex Translation	Online Assignment 3
Thu 9/26	Natural Deduction: Conjunction	Quiz 4
Tue 10/1	Natural Deduction: Conditional and Disjunction	Online Assignment 4
Thu 10/3	Natural Deduction: Negation	Quiz 5
Tue 10/8	How to Construct Proofs	Online Assignment 5
Thu 10/10	**Fall Recess**	
Tue 10/15	Propositional Validity	Online Assignment 6
Thu 10/17	**Timed Test**	
	Quantificational Logic	
Tue 10/22	Syntax of Quantificational Logic	
Thu 10/24	Translation	Quiz 6
Tue 10/29	Issues with Translation	Online Assignment 7
Thu 10/31	Models	Quiz 7
Tue 11/5	Truth in a Model	Online Assignment 8
Thu 11/7	Validity in Quantificational Logic	Quiz 8
Tue 11/12	Natural Deduction and Quantification	Online Assignment 9
Thu 11/14	Common Mistakes and Strategies	Quiz 9
Tue 11/19	Quantificational Validity	
Thu 11/21	**Timed Test**	
	Identity	
Tue 11/26	Quantification and Identity	Online Assignment 10

Thu 11/28	**Thanksgiving Break**	
Tue 12/3	Validity in Quantificational Logic with Identity	
Thu 12/5	Number and Definite Descriptions	Quiz 10

Statement on Academic Conduct and Support Services

Academic Conduct

Plagiarism — presenting someone else's ideas as your own, either verbatim or recast in your own words — is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, "Behavior Violating University Standards" Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and consult university policies on scientific misconduct.

Support Systems

- Counseling and Mental Health Services (CMH) — (213) 740-9355 - 24/7 on call.

  Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

- National Suicide Prevention Lifeline — 1 (800) 273-8255 - 24/7 on call.

  Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

- Relationship and Sexual Violence Prevention Services (RSVP) — (213) 740-9355 (WELL), press 'o' after hours - 24/7 on call

  Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

- Office of Equity and Diversity (OED) — (213) 740-5086/Title IX - (213) 821-8298

  Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

- Reporting Incidents of Bias or Harassment — (213) 740-5086 or (213) 821-8298

  Avenue to report incidents of bias, hate crimes, and micro-aggressions to the Office of Equity and Diversity/Title IX for appropriate investigation, supportive measures, and response.

- The Office of Student Accessibility Services (OSAS) — (213) 740-0776

  Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

- USC Campus Support and Intervention — (213) 821-4710

  Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

- Diversity at USC — (213) 740-2101

  Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

- USC Emergency — UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call.

  Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

- USC Department of Public Safety — UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call

  Non-emergency assistance or information.