

SPRING 2023

Achille Varzi

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**Teaching Assistants**

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- **GENERAL DESCRIPTION:** The purpose of this course is to provide a solid introduction to the concepts and methods of symbolic logic as a tool for the appraisal of complex patterns of reasoning. The course is self-contained, carrying no prerequisites. Nonetheless, it requires a definite willingness to master technicalities and to work at a high level of abstraction.

Note – The course is listed under two different numbers:

UN3411, Section 001 (Call Number: 10893) is restricted to undergraduate students

GR5415, Section 001 (Call Number: 10894) is restricted to graduate students

- **FORMAT:** The course is organized around two weekly lectures (UN3411/GR5415) and a weekly recitation section (UN3413). The recitation section is mandatory for all undergraduate students, optional for graduate students. Undergraduate students must register in one of the following sections:

UN3413, Section 001 (Call Number: 13823, TA: Samara) M 4:10–5:00 p.m. 101 Knox

UN3413, Section 002 (Call Number: 13824; TA: Artha) R 6:10–7:00 p.m. 707 Hamilton

UN3413, Section 003 (Call Number: 13825; TA: Noah) F 10:10–11:00 a.m. C01 80 Claremont Av

UN3413, Section 004 (Call Number: 13826; TA: Helen) F 4:10–5:00 p.m. 507 Hamilton

- **REQUIREMENTS:** One early quiz (10% of the final grade), two midterms (20% each for UN3411, 25% each for GR5415), and a final exam (40%). The remaining 10% of the grade for UN3411 will come from active participation in the recitation sections. The quiz, the two midterms, and the final exam will be administered as take-home assignments through CourseWorks (folder: *Assignments*); detailed instructions will be provided in due time.

Note – Graduate students taking the class for R-credit are only required to answer one question from each of the two midterms and from the final exam.

- **TEXTBOOK:** The textbook is Haim Gaifman's *A Course in Symbolic Logic*, which is available as a pdf document on CourseWorks (folder: *Files*).
- **ADDITIONAL MATERIAL:** All lecture slides, homework assignments, and homework solutions will be made available on CourseWorks (folder: *Files*) as the semester progresses. Students are advised to download/print the slides before the lectures and, of course, to do the homework before checking the solutions. Homework will not be graded. However, doing all homework on a regular and timely basis is the best way to master the material and prepare for the take-home assignments.

- **SPECIAL ACCOMMODATIONS:** In order to receive disability-related academic accommodations for this course, students must first be registered with their school's Disability Services office. Detailed information is available online for both the Columbia and Barnard registration processes. Please refer to the appropriate website for information regarding deadlines, disability documentation requirements, and drop-in hours (Columbia) or intake sessions (Barnard).
- **SCHEDULE:** Below is a tentative schedule for the entire duration of the course. Please note that the material is cumulative, so it is important to stay on top of things. You cannot skip some topics on the assumption that you'll catch up later.

Wk	Date	Topic	Readings	HW
1.	T 1/17	1. Introduction: what is logic about?	Introduction	
	R 1/19	2. Introduction: why "symbolic" logic?	Chapter 1	
2.	T 1/24	3. Sentential logic: preliminaries	2.0–2.1.0	
	R 1/26	4. Sentential logic: the negation and conjunction connectives	2.1.1–2.1.2, 3.0–3.1.2	HW1
3.	T 1/31	5. Sentential logic: truth-tables	2.1.3	
	R 2/2	6. Sentential logic: tautological equivalence	2.2.0–2.2.1	HW2
4.	T 2/7	7. Sentential logic: the disjunction connective	2.2.2, 3.1.3	HW3a
	R 2/9	8. Sentential logic: tautologies and contradictions	2.2.3	HW3b
QUIZ assigned, to be returned on F 2/10; will cover topics 1 through 8				
5.	T 2/14	9. Sentential logic: equivalence laws	2.5.0	
	R 2/16	10. Sentential logic: equivalence laws (cont'd)	2.5.1–2.5.2	HW4
6.	T 2/21	11. Sentential logic: conditional and biconditional	2.6, 3.1.4	
	R 2/23	12. Sentential logic: logical implication	4.0–4.2.0	HW5
7.	T 2/28	13. Sentential logic: implication laws	4.2.1–4.2.2	HW6a
	R 3/2	14. Sentential logic: the "fool-proof" method	4.3.2–4.4	HW6b
MIDTERM # 1 assigned, to be returned on F 3/3; will cover topics 1 through 14				
8.	T 3/7	15. Predicate logic: preliminaries	7.0, 7.3	
	R 3/9	16. Predicate logic w/o quantifiers: syntax	7.1.0	HW7
----- <i>Spring Break</i> -----				
9.	T 3/21	17. Predicate logic w/o quantifiers: semantics	5.0–5.1.4, 7.1.1	
	R 3/23	18. Predicate logic w/o quantifiers: derivations; equality	7.2	HW8
10.	T 3/28	19. Predicate logic w/ quantifiers: preliminaries	7.4.0–7.4.1, 8.1	HW9a
	R 3/30	20. Predicate logic w/ quantifiers: symbolization	8.2.2, 8.3.2–8.3.5	HW9b
MIDTERM #2 assigned, to be returned on F 3/31; will cover topics 15 through 20 (plus background)				
11.	T 4/4	21. Predicate logic w/ quantifiers: symbolization (cont'd)	8.3.6, 8.2.1, 8.2.3	
	R 4/6	22. Predicate logic w/ quantifiers: models and truth	9.1.0–9.1.1	HW10
12.	T 4/11	23. Predicate logic w/ quantifiers: models and truth (cont'd)	9.1.1	
	R 4/13	24. Predicate logic w/ quantifiers: logical implications	9.2.0–9.2.2	HW11
13.	T 4/18	25. Predicate logic w/ quantifiers: equivalence laws	9.2.3	
	R 4/20	26. Predicate logic w/ quantifiers: derivations	9.3	HW12
14.	T 4/25	27. Predicate logic w/ quantifiers: derivations (cont'd)	9.3	
	R 4/27	28. Review and conclusion		
FINAL EXAM, TBA — Comprehensive				