

SPRING 2021

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 modern 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.
- ▶ **FORMAT:** The course is organized around two weekly lectures (UN3411/GR5415) and a weekly recitation section (UN3413). The recitation section is mandatory for undergraduate students, optional for graduate students. Undergraduate students must be registered in one of the following sections:
UN3413 Section 001 (Call Number: 12109) Day & Time: M 7:10–8:00 p.m. Instructor: Devin
UN3413 Section 002 (Call Number: 12110) Day & Time: T 9:10–10:00 a.m. Instructor: Shuai
UN3413 Section 003 (Call Number: 13366) Day & Time: F 10:10–11:00 a.m. Instructor: Natalia
UN3413 Section 004 (Call Number: 17230) Day & Time: R 8:10–9:00 p.m. Instructor: Alex
All lectures and recitation sections will be online only. Zoom links are accessible through CourseWorks, where Cloud recordings of all lectures will also be available for 30 days. Recitation sections will start in week 2.
- ▶ **REQUIREMENTS:** One early quiz (10% of the final grade), two midterms (20% each), and a final exam (40%). The remaining 10% of the grade will come from active participation in the recitation sections. The quiz, the two midterms, and the final exams will be administered as take-home assignments. Each assignment will be posted on CourseWorks as pdf document to be printed, completed, and returned by email (as a scanned or photographed attachment) within 24 hours. Detailed instructions will be provided in due time. 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 in electronic form on CourseWorks (folder: *Files*).
- ▶ **ADDITIONAL MATERIAL:** All lecture slides, homework assignments, and homework solutions will be made available on CourseWorks (folder: *Files*) as the term 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. (Motto: "In theory there is no difference between theory and practice; in practice there is"—Yogi Berra).

► **SPECIAL ACCOMMODATIONS:** In order to receive disability-related academic accommodations for this course, students must first be registered with their school Disability Services (DS) 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	Reading(s)	H/W
1.	T 1/12	1. Introduction and overview	Chapter 1	
	R 1/14	2. Sentential logic: preliminaries; the negation connective	2.0–2.1.1, 3.0–3.1.1	
2.	T 1/19	3. Sentential logic: the conjunction connective	2.1.2, 3.1.2	
	R 1/21	4. Sentential logic: truth-tables, logical equivalence	2.1.3, 2.2.0–2.21	HW1
3.	T 1/26	5. Sentential logic: disjunction; tautologies & contradictions	2.2.2–2.2.3, 3.1.3	
	R 1/28	6. Sentential logic: equivalence laws	2.5.0	HW2
4.	T 2/2	7. Sentential logic: using the equivalence laws	2.5.1–2.5.2	HW3a
	R 2/4	8. Sentential logic: conditional & biconditional	2.6, 3.1.4	HW3b
QUIZ (10%), to be returned on F 2/5 — will cover topics 1 through 7				
5.	T 2/9	9. Sentential logic: logical implication	4.0–4.2.0	
	R 2/11	10. Sentential logic: general implication laws	4.2.1	HW4
6.	T 2/16	11. Sentential logic: more implication laws	4.2.2	
	R 2/18	12. Sentential logic: the fool-proof method	4.3.2–4.4	HW5
7.	T 2/23	13. Predicate logic: preliminaries	7.0, 7.3	HW6
	R 2/25	14. Predicate logic w/o quantifiers: syntax	7.1.0	
TEST (20%), to be returned on F 2/26 — will cover topics 1 through 12				
Spring Break				
8.	T 3/9	15. Predicate logic w/o quantifiers: semantics	5.0–5.1.4, 7.1.1	HW7
	R 3/11	16. Predicate logic w/o quantifiers: derivations; equality	7.2	
9.	T 3/16	17. Predicate logic w/ quantifiers: preliminaries	7.4.0–7.4.1, 8.1	HW8
	R 3/18	18. Predicate logic w/ quantifiers: symbolization	8.2.2, 8.3.2–8.3.5	
10.	T 3/23	19. Predicate logic w/ quantifiers: more on symbolization	8.3.6, 8.2.1, 8.2.3	HW9
	R 3/25	20. Predicate logic w/ quantifiers: models and truth	9.1.0–9.1.1	HW10
TEST (20%), to be returned on F 3/26 — will cover topics 13 through 18 (plus background)				
11.	T 3/30	21. Predicate logic w/ quantifiers: models and truth (cont'd)	9.1.1	
	R 4/1	22. Predicate logic w/ quantifiers: logical implications	9.2.0–9.2.2	HW11
12.	T 4/6	23. Predicate logic w/ quantifiers: equivalence laws	9.2.3	
	R 4/8	24. Predicate logic w/ quantifiers: derivations	9.3	HW12
13.	T 4/13	25. Predicate logic w/ quantifiers: derivations (cont'd)	9.3	
	R 4/15	26. Review and conclusion		HW13
FINAL EXAM (40%), TBA — Comprehensive				