

SYMBOLIC LOGIC

<u>Professor</u>	<u>Teaching Assistants</u>
<p><i>Justin Clarke-Doane</i></p> <p>Department of Philosophy 712B Philosophy Hall Phone: 212 - 854 - 3246 Office Hours: By Appointment jc4345@columbia.edu</p>	<p><i>Ye Eun Jeong</i> yj2540@columbia.edu</p> <p>TA Session: Tues., 1:10 - 2:00pm (716 Phil Hall)</p> <p>Office Hours: Tues., 4:00 - 5:00pm (722 Phil Hall)</p> <p><i>Chuyu Tian:</i> ct2823@columbia.edu</p> <p>TA Session: Mon., 6:10-7:00pm at 716 Phil Hall</p> <p>Office Hours: Fri., 2-4pm (722 Phil Hall)</p> <p><i>Cornelia Mayer:</i> cm4267@columbia.edu</p> <p>TA Session: Wed., 11:10-12am (716 Phil Hall)</p> <p>Office Hours: Fri., 9-11 am (722 Phil Hall)</p>

Summary

This is an advanced introduction to classical sentential and predicate logic. No previous acquaintance with logic is required, but a willingness to master technicalities and to work at a certain level of abstraction is needed.

Required Text

Yaqub, Aladdin. (2015) *An Introduction to Metalogic*. Broadview Press.

Meeting Details

The class meets on **TR 7:40pm-8:55pm, 309 Havemeyer Hall.**

Requirements

Attendance of class and of your TA session will count for **10%** of your grade.

Homework will count for **50%** of your grade.

Assignments are weekly. They will generally come from the text and distributed in class or by email. Solutions to starred exercises are in the book for you to check your work.

Two exams, a midterm (**distributed MARCH 7 / due MARCH 21**) and a final (**distributed APRIL 18 / due MAY 2**), will together count for **40%** of your grade (each contributing **20%**).

Tentative Schedule of Lessons

1. First-Order Predicate Logic

Tuesday, January 16: Syntax of PL

Thursday, January 18: Semantics of PL

Tuesday, January 23: Logical Concepts in PL

Thursday, January 25: Proof Theory of PL

2. Resources of the Metatheory

Tuesday, January 30: Linguistic and Logical Resources

Thursday, February 1: Arithmetic Resources

Tuesday, February 6: Set-theoretic Resources

Thursday, February 8: Economical Version of PL

3. Soundness and Completeness Theorems

Tuesday, February 13: Soundness Theorem
Thursday, February 15: Completeness Theorem

Tuesday, February 20: Compactness Theorem
Thursday, February 22: Elementary Equivalence & Isomorphism

Tuesday, February 27: Properties of PL Sets
Thursday, February 29: Löwenheim-Skolem Theorem

4. Computability

Tuesday, March 5: Effective Procedures & Computability
Thursday, March 7: Turing Computability

[MIDTERM DISTRIBUTED MARCH 7 / DUE MARCH 21]

Tuesday, March 12: [NO CLASS - SPRING RECESS]
Thursday, March 14: [NO CLASS - SPRING RECESS]

Tuesday, March 19: The Halting Problem
Thursday, March 21: Partial Recursive Functions

5. Incompleteness

Tuesday, March 26: Peano Arithmetic (PA)
Thursday, March 28: Representability in PA

Tuesday, April 2: Arithmetization of the Metatheory
Thursday, April 4: Diagonalization & First Incompleteness Theorem

Tuesday, April 9: Consequences
Thursday, April 11: Incompleteness of Second-Order PL

Tuesday, April 16: Second Incompleteness Theorem
Thursday, April 18: (catch up)

[FINAL EXAM DISTRIBUTED APRIL 18 / DUE MAY 2]

Tuesday, April 23: (catch up)

Thursday, April 25: (catch up)

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<http://www.college.columbia.edu/academics/academicintegrity>

Please also familiarize yourself with Columbia University's honor code at:

<https://www.college.columbia.edu/ccshonorcode>

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