PHIL2202
Symbolic 符號邏輯

Course Outline

Time：W 4:30pm-6:15pm	**Location： LHC 101**
Tut: TBA	

Course overview (as shown on CUSIS)

This is an intermediate-level course in formal logic, concentrating on standard first-order logic. The core of this course is the construction of formal systems for propositional logic and predicate logic. Four main styles of formal systems will be discussed:

1. Natural deduction,
2. Axiomatic proofs,
3. Semantic tableaux, and
4. Sequent calculi.

Advisory to Majors: to be taken in year 2 or above.

Learning outcomes (as shown on CUSIS)

1. Grasp concepts and methods in intermediate-level logic.
2. Understanding of the philosophical significance of modern logic.
3. Ability to construct formal systems of propositional and predicate logic.
4. Ability to analyze and critically evaluate formal systems.
5. Understanding of the characteristics and value of the four main styles of formal systems.

Additional learning outcomes:

6. Understanding of the proposed semantics for formal languages for propositional and predicate logics.
7. Ability to identify valid formulas and entailments for a given semantics of a formal language.
8. Ability to think creatively in constructing proofs.
9. Understanding of basic metalogical concepts.

Topics

1. Grammar and semantics for languages of propositional logic.

2. Grammar and semantics for languages of predicate logics.

3. Proof systems for propositional and predicate logic: semantic tableaux, axiomatic proofs, natural deduction, sequent calculi.

4. Basic metalogic.

This course is divided into two parts.

The first part focuses on the development of important skills for analyzing formal languages in propositional and predicate logic and for constructing and studying semantic tableaux and natural deduction proof systems. (We go through propositional logic quickly in this first part as it is assumed most students will be familiar with the basics.)

In the second part, we continue our studies of propositional and predicate logic by studying a single formal language for predicate logic and a single formal language for predicate logic. In doing so, we establish metalogical results. It is here where we study axiomatic proofs and sequent calculi.

Learning activities

1. One 2-hour lecture per week.

2. One 2-hour tutorial every other week.

3. Reading: Number of pages differs per week, but required readings with fewer pages tend to be denser.

4. Assignments: Practice exercises, tests

Assessment scheme

Task nature	***Description***	***Weight***
Participation in Tutorials	[see below]	20%
Midterm Exam	Held during week 7 lecture (first half only)	30%
Final Exam	Held during week 13 lecture (full lecture period)	50%

Remarks on Assessment Scheme

Expected participation in tutorials will include work on practice exercises, in class and sometimes as homework. Details will be discussed in the lecture.

Grade Descriptor

Please refer to: http://phil.arts.cuhk.edu.hk/~phidept/UG/Grade_descriptors.pdf

Required reading (our textbook)

Restall, Greg (2006). *Logic*. Montreal: McGill's University Press.

Sider, Theodore (2010). *Logic for Philosophy*. Oxford: Oxford University Press.

Recommended learning resources

Allen, Colin & Hand, Michael Robert (1992). *Logic Primer*. Cambridge, MA: MIT Press.

Bostock, David (1997). *Intermediate Logic.* Oxford: Clarendon Press.

Magnus, P.D. (2017). *Forallx: An Introduction to Formal Logic*. Open source.

Notes on the texts: These logic textbooks may serve as additional resources (and will include additional practice exercises) beyond our course's textbooks. *Logic Primer* and *Forallx* provide helpful introductions to symbolic logic and mainly focus on natural deduction proof systems. *Logic Primer* is especially terse. It presents what is necessary to grasp the formal apparatus being presented, and it leaves explanation behind. Bostock's *Intermediate Logic* is more advanced. It engages in metalogic from the start and focuses on proving metalogical results of the theories it discusses. It includes treatments of all four proof methods discussed in this course.

Course schedule (All lectures and tutorials will be held on campus; all readings are from our textbooks.)

Week	***Topics***	***Required reading***	***Tutorials***
1	Grammar and Semantics of Propositional Logic	Restall, chs. 1-3	
2	Semantic Tableaux	Restall, ch. 4	Tutorial 1: Weeks 1-2 review and practice*****
3	Natural Deduction	Restall, ch. 7, and "Natural Deduction Supplement 1"	
4	Grammar and Semantics of Predicate Logic	Restall, chs. 8-9	Tutorial 2: Weeks 3-4 review and practice
5	Natural Deduction for Predicate Logic	"Natural Deduction Supplement 2"	
6	Predicate Logic with Identity	Restall, chs. 11-12	Tutorial 3: Weeks 5-6 review and practice; midterm review
7	1st half: **Midterm*** 2nd half: Metalogic	Sider, ch. 1	
8	The Language PL	Sider, ch. 2 (§2.1 - §2.4 only)	Tutorial 4: Weeks 7-8 review and practice
9	Sequent Proofs in PL	Sider, ch. 2 (§2.5 only)	
10	Axiomatic Proofs in PL	Sider, ch. 2 (§2.6 -§2.8 only)	Tutorial 5: Weeks 9-10 review and practice
11	The Language PC	Sider, ch. 4 (§4.1 -§4.3 only)	
12	Axiomatic Proofs in PC	Sider, ch. 4 (§4.4 -§4.5 only)	Tutorial 6: Exam review
13	**Final Exam**		

***** Tutorials have not yet been scheduled (as of December 2021). After tutorials are scheduled, there may be a need to adjust the planned content of the tutorials and/or to move the midterm to Week 6. Students will be notified of any such changes well in advance.

Details of course website

Lecture notes and additional practice exercises will be provided on Blackboard.

Contact details for teacher(s) or TA(s)

Teacher	
Name:	Rimell, Nicholas
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TA	
Name:	
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Academic honesty and plagiarism

Attention is drawn to University policy and regulations on honesty in academic work, and to the disciplinary guidelines and procedures applicable to breaches of such policy and regulations. Details may be found at http://www.cuhk.edu.hk/policy/academichonesty/

With each assignment, students will be required to submit a signed declaration that they are aware of these policies, regulations, guidelines and procedures. For group projects, all students of the same group should be asked to sign the declaration.

For assignments in the form of a computer-generated document that is principally text-based and submitted via VeriGuide, the statement, in the form of a receipt, will be issued by the system upon students' uploading of the soft copy of the assignment. Assignments without the receipt will not be graded by teachers. Only the final version of the assignment should be submitted via VeriGuide.