

**PHIL 005**  
**Spring, 2019**  
**Calendar of Class Meetings, Assignments, and Examinations**  
**REVISED 2019.03.01**

*Problem sets should be submitted at the start of lecture as indicated.*

- 01.16 Lecture 1: What is this course about?
- 01.23 Lecture 2: Truth-functional Logic: Syntax and Semantics
- 01.25 Problem Session 1
- 01.28 Lecture 3: Expressive Completeness of Truth-functional Logic  
*Problem Set 1 Due*
- 01.30 Lecture 4: Truth-functional Validity, Satisfiability, and Implication
- 02.01 Problem Session 2
- 02.04 Lecture 5: Monadic Quantification Theory (MQT): Syntax and Semantics  
*Problem Set 2 Due*
- 02.06 Lecture 6: MQT: Counting Structures
- 02.08 Problem Session 3
- 02.11 Lecture 7: MQT: Validity, Satisfiability, and Implication  
*Problem Set 3 Due*
- 02.13 Lecture 8: MQT: Homomorphisms and Monadic Equivalence of Structures
- 02.15 Problem Session 4: Practice Examination 1
- 02.18 Examination 1
- 02.20 SNOW DAY
- 02.22 Problem Session 5
- 02.25 Lecture 9: MQT: Decision Procedure for Validity, Satisfiability, and Implication
- 02.27 CLASS CANCELLED
- 03.01 Problem Session 6
- 03.11 Lecture 10: Polyadic Quantification Theory (PQT): Syntax and Semantics  
*Problem Set 4 Due*

03.13 Lecture 11: Exploring the Expressive Power of PQT: Simple Graphs, Linear Orders, and Functional Relations

03.15 Problem Session 7

03.18 Lecture 12: Exploring the Expressive Power of PQT: Equivalence Relations and Binary Functions

03.20 Lecture 13: Exploring the Expressive Power of PQT: Tournaments and Partial Orders

03.22 Problem Session 8

03.25 Lecture 14: Exploring the Expressive Power of PQT: Finite Spectra  
*Problem Set 5 Due*

03.27 Lecture 15: Review for Examination 2

03.29 Problem Session 9: Practice Examination 2

04.01 Examination 2

04.03 Lecture 16: Definability of Relations

04.05 Problem Session 10

04.08 Lecture 17: PQT: Symmetry, Automorphisms, and Isomorphisms  
*Problem Set 6 Due*

04.10 Lecture 18: PQT: Automorphisms and Definability: Orbits

04.12 Problem Session 11

04.15 Lecture 19: PQT: Validity, Satisfiability, and Implication  
*Problem Set 7 Due*

04.17 Lecture 20: PQT: Rigorous Informal Proof versus Formal Proof

04.19 Problem Session 12

04.22 Lecture 21: PQT: Soundness, Completeness, and Compactness

04.24 Lecture 22: PQT: Applications of Compactness

04.26 Problem Session 13

04.29 Lecture 23: Undecidability of Validity – The Church-Turing Theorem and Beyond  
*Problem Set 8 Due*

05.01 Lecture 24: Review for Final Examination

### **Schedule of Readings**

Readings will be assigned throughout the Term from the *LGIC 010 Textbook* by Scott Weinstein, Owain West, and Grace Zhang, available from the course webpage. Supplementary readings from *Deductive Logic* by Warren Goldfarb may be read along with the lectures according to the following schedule.

For Lectures 1-4 read Sections 1-16

For Lectures 5-9 read Sections 18-27

For Lectures 10-26 read Sections 28-41

### **Course Requirements and Grades**

There will be nine problem sets, with due dates specified in the calendar above, examinations in class on Monday, February 18 and Monday, April 1, and a final examination (see <https://www.registrar.upenn.edu/finals/index.html> for the scheduling of the final examination). 10% of the final grade will be based on participation in the problem sessions, 20% on the problem sets, 40% on the exams in class, and 30% on the final exam.