PHIL012 - Symbolic Logic Syllabus

July 22, 2025

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This syllabus provides course information (Part 1), course and university policies (Part 2), and a calendar of events (Part 3).

0.1 Part 1. Course Information

- **Location:** Health and Hum Dev 350
- **Days & Times:** MWF 905-955AM
- **Website:** https://www.davidagler.com
- **Office Location / Hours:** 242 Sparks Building: By appointment and Friday 11:15-12.

Table 1: Instructors and TA Contact Information

Name	Role	Contact Information
David W. Agler	Instructor	
Nicole George	Learning Assistant	
Sabrina Bailon	Learning Assistant	

0.1.1 Course Description

This is an introductory course in symbolic logic. Logic is a science of the analysis of good and bad arguments. Symbolic logic is a particular branch of logic that studies good arguments using a formal or artificial language. This course will articulate two different formal languages: propositional logic and predicate logic. In both languages, we will examine how these artificial languages relate to English (a natural language), different ways in which formal languages can be used to determine whether arguments are valid (or invalid), and how to reason using these languages.

0.1.2 Course Objectives

- Objective 1, Learn Two Symbolic Languages: Students will learn the symbols, syntax, and semantics of two different symbolic languages (propositional & predicate logic) and how these languages relate to English (chs. 1, 2, 6).
- Objective 2, Learn Key Analytical Skills & Vocabulary: Students will learn how to use the symbolic languages to determine fundamental features of language and how to talk about these features using analytical vocabulary (chs. 1,3,4,7).
- Objective 3, Learn How to Formally Test Arguments: Students will learn how to use various mechanical tests (known as "decision procedures") to (i) test propositions, sets of propositions, and arguments for various properties, e.g., validity and to (ii) develop counter-models for valid arguments (chs. 3,4,6,7).
- Objective 4, Learn How to Solve a Proof: Students will learn how to formally solve proofs in two different languages. That is, they will learn a set of inference, derivation, or "proof" rules and use these rules to show that a conclusion follows from a set of premises (chs.5,8).
- Objective 5, Learn to Think Like a Logician: Students will articulate how certain methods and procedures used in logic relate to various logical properties that belong to everyday arguments and arguments in symbolic languages (chs. 4,6,7).
- Objective 6, Respectful Dialogue: Students will engage in respectful conversation with classmates as well as collaborate with their peers to better learn logic.

0.1.3 Course Materials

1. REQUIRED: Agler, David W. 2025. *Symbolic Logic: Syntax, Semantics, and Proof Handouts*. This book will be provided in two formats: (1) a paperback copy and (2) an electronic copy. The cost is covered by the course fee associated with this course.
2. My Logic Homepage. This page includes logic handouts, practice exams, and links to specific videos.
3. Introduction to Logic - 2022. This is a link to an 11-hour video that covers the major topics of symbolic logic. Use this video to review and catch up on topics if you miss class.

0.1.4 Course Assignments

Evaluation for this course is determined as follows:

Table 2: Course Assignment, Numbers, and Percentages

Assignment	Number	Percentage
Homework	4	18
Quizzes	4	8
Exams	4	72
Attendance	N	2

0.1.5 Attendance & Late Policy

Attendance is positively correlated with passing this course. By attending class, you not only have the opportunity to learn the material and ask questions, but you also (1) get access to the daily extra-credit assignments and (2) reduce your workload with respect to homework as some of the homework exercises are completed in class. Attendance is taken via a QR code displayed in class (or via a sign-in sheet).

- Excused Absence: To be excused from class, you must (1) email me *prior* to the start of class begins *and* (2) provide either (a) official documentation that *specifically* confirms you are unable to attend that particular class session or (b) a university excused class absence form. If it is physically impossible for you to email me before class begins (e.g., coma, incarceration), you must notify your college, campus contact, or Student Care & Advocacy as soon as is reasonable.
- Late Policy: If you are more than ten minutes late, you will be marked as "late", receiving 80% of the 100% credit for the day.

0.1.6 Homework

Homework for a unit is due immediately before you take the exam for that unit. Full credit will be awarded provided you put complete (but not necessarily correctly solve) each problem (this involves showing any relevant work). Homework is graded out of 10 points.

Deductions:

- 1pt is deducted for each Exercise Set that is missing.
- 1pt is deducted if papers not stapled or clipped.
- 1pt is deducted if exercise sets are not clearly labeled, e.g., Ex 3.35.

0.1.7 Quizzes

Quizzes are in CANVAS. Quizzes are open-book and open-note. Quizzes consist mainly of multiple-choice and truth-false questions. These are low-cost assignments designed to prepare you for the exam.

0.1.8 Classroom Recording

No recording of classroom lectures is permitted without either (1) expressed written permission of the instructor or (2) as permitted by the Campus Disability Coordinator (SDR). See Academic Integrity

0.1.9 Exams

Exams take place in class. Each exam covers a single unit. Practice exams are available on the logic page of my website.

0.1.10 Extra Credit

There is a significant amount of extra credit available in this course. Extra-credit assignments come in the form of logic puzzles, questions about logic that go beyond the scope of the course, applications of logic, and logic-related activities. The most important policies surrounding extra-credit are as follows:

1. Since extra-credit is *supplemental*, there is no late (or excused) work.
2. All extra-credit assignments are assigned in class and you must turn them during class to receive credit.
3. All grading for extra-credit assignments is not subject to review.

0.2 Part 2. Policies

0.3 Email Correspondence

Email me with questions you have! However, keep in mind best email practices when emailing. This ensures your email does not wind up in a junk folder and that I can respond to you quickly with the answer that you want. It is helpful to include helpful specifics, e.g., your name, the class you are in, the problem and page number of the problem, etc.

0.4 Late Work

If you cannot attend an exam or complete an assignment, it is your responsibility to email me *before* class begins (the due date). If you do not, your work will be considered late and thus subject to a penalty of a letter grade for each day I do not hear from you. In rare cases, however, it is impossible to contact me before class begins, e.g., emergencies. In these cases, it will be necessary for you to produce documentation that clearly indicates that (i) you could not attend the exam and (ii) it would have been unreasonable (or impossible) for you to contact me to notify me of your absence.

0.5 Grading Scale, Rounding, Curving

- A: 93-100
- A-: 90–92
- B+: 87–89
- B: 83–86
- B-: 80–82
- C+: 77-79
- C: 70-76
- D: 60-69
- F: 0-59

Grades are rounded as follows: xx.5 rounds up, while xx.4 rounds to xx (Example: 88.50 rounds to 89.0 while 88.49 rounds to 88). See University Policy 47-00. Individual assignments are not curved. However, in the case that the average grade for students who have fully completed the course is below 75%, a curve will be instated so that the average grade of students who completed the course is 75%.

0.5.1 Grade Appeals

Feel free to email if you believe there is an error with your grade. You have a maximum of two weeks to appeal any grade from the date it is entered into CANVAS. Otherwise, the grade for that assignment (attendance) is considered final.

0.5.2 University Policies

Penn State University has several university policies concerning disability, academic misconduct, counseling and psychological services,and diversity, equity, and inclusion. Below you will find links to these statements and further resources. An electronic version of this syllabus is available in CANVAS.

1. Disability Statement
2. Academic Integrity
3. Counseling & Psychological Services
4. Report Bias
5. Equity at Penn State
6. Polices & Rules for Undergraduate Instruction and Curriculum
7. Penn State Red Folder

0.6 Part 3. Calendar

This calendar is divided into four Units.

0.6.1 Unit 1 – Introduction to Propositional Logic

0.6.1.1 Lesson 1 – Introduction to Logic

- Reading: Ch. 1
- Homework: Exercises 1.1-1.8

0.6.1.2 Lesson 2 – The Language of Propositional Logic

- Reading: Ch. 2
- Homework: Exercises 2.9-2.26 (skip Exercise 2.27)
- Assessments: Quiz 1, Homework 1, Exam 1

0.6.2 Unit 2 – PL Tables and Trees

0.6.2.1 Lesson 3 – Truth Tables for Propositional Logic

- Reading: Ch. 3
- Homework: Exercises 3.28-3.36 (skip 3.37-3.39)

0.6.2.2 Lesson 4 – Truth Trees for Propositional Logic

- Reading: Ch. 4
- Homework: Exercises 4.40-4.48
- Assessments: Quiz 2, Homework 2, Exam 2

0.6.3 Unit 3 – PL Derivations

0.6.3.1 Lesson 5 – Proofs for Propositional Logic

- Reading: Ch. 5
- Exercises: 5.49-5.60 (skip 5.61-5.64)
- Assessments: Quiz 3, Homework 3, Exam 3

0.6.4 Unit 4 – RL Language, Trees, and Derivations

0.6.4.1 Lesson 6 – The Language of Predicate Logic

- Reading: Ch. 6
- Exercises: 6.65-6.79
- Assessments: Quiz 4

0.6.4.2 Lesson 8 – Proofs for Predicate Logic

- Reading Ch. 8
- Exercises: 8.80-8.84 (For 8.84, only 1-5)
- Assessments: Homework 4, Exam 4

0.6.5 Notes

1. Due dates for assignments are posted in CANVAS, sent electronically through CANVAS via Announcements, and announced in class.
2. Portions of this syllabus are subject to revision. Any significant changes will be announced in class.
3. This syllabus is available in the following formats upon request: .md, .pdf, .html, .odt, .docx., .rtf, .tex