

PHIL B103: Introduction to Logic
Bryn Mawr College
Spring '23

Instructor: Augie Faller
Office: Old Library 122
Office Hours: Thursdays 3–4pm and by appointment
Email: afaller@brynmawr.edu
TA: Coco Norr
Email: cnema@brynmawr.edu

Course Description

Logic is the study of formal reasoning, which concerns the nature of valid arguments and inferential fallacies. In everyday life our arguments tend to be informal and sometimes imprecise. The study of logic concerns the structure and nature of arguments, and so helps to analyze them more precisely. Topics will include: valid and invalid arguments, determining the logical structure of ordinary sentences, reasoning with truth-functional connectives, and inferences involving quantifiers and predicates. This course does not presuppose any background knowledge in logic.

Course Materials

Required: Language, Proof and Logic, by Barker-Plummer, Barwise, and Etchemendy (CSLI Publications, 2nd Edition). Referred to hereafter as LPL.

LPL consists of a textbook, a CD containing software, and a software manual. The CD contains both Windows and Macintosh versions of four computer programs: Tarski's World, Boole, Fitch and Submit.

Each copy of the textbook-software package comes with a non-transferable license that will permit its owner (you) to use the resources of the LPL web site, including the Grade Grinder. Using the Grade Grinder is a required part of this course, which means that you must hold a valid license to use the site.

It is extremely likely that the license associated with a used copy of LPL will have already been registered by the book's former owner and therefore will no longer be valid for your use. **Therefore your only way to guarantee that you have a valid license to use the Grade Grinder is to purchase a new copy of LPL.** There are print and paperless packages available.

Computer Notes

- To take this course, you will need access to a computer (PC or Mac).
- When you do homework problems, you will typically load an exercise file from the “LPL Software” folder, then modify or add to it, then save the result. In doing so, it is important to save the modified file to a different folder, both to make it easier to submit the results when necessary and to preserve the original file unaltered in case you make a mistake and need to try again.
- In MacOS Ventura, the most recent deployed versions of Tarski’s World and Hyperproof packages do not work. Experimental versions of Tarski’s World and Hyperproof apps are available for MacOS 13 (Ventura) from the Downloads tab on the LPL website. MacOS Ventura users will need to download and install the latest version of the package and also download and install the experimental version (Hilbert) of either the Tarski’s World or Hyperproof app and install it. Use the Hilbert version of Tarski’s World or Hyperproof app instead of the one that came in the package.
- If you experience any problems with the programs or with submitting files to the Grade Grinder, there are a few places to look for solutions. First, consult the FAQ page at the LPL web site. Look through the various pages on the programs. If that doesn’t work, you can reach out to me or the TA. Alternatively, you can contact the Help Desk at LPL.

Technology in the Classroom

Our default mode will be no technology in the classroom. Students will take notes using a notebook and can either bring the textbook to class or consult their notes. Exceptions to this policy will be made during the semester as necessary.

If you are a student with a disability that has a technology accommodation, please let me know as soon as possible.

Accessibility

Bryn Mawr College is committed to providing equal access to students with a documented disability. Students needing academic accommodations for a disability must first register with Access Services. Students can call 610-526-7516 to make an appointment with the Director of Access Services, Deb Alder, or email her at dalder@brynmawr.edu to begin this confidential process. Once registered, students should schedule an appointment with the

professor as early in the semester as possible to share the verification form and make appropriate arrangements. Please note that accommodations are not retroactive and require advance notice to implement. More information can be obtained at the Access Services website. (<http://www.brynmawr.edu/access-services/>)

Any student who has a disability-related need to record this class first must speak with the Director of Access Services and to me, the instructor. Class members need to be aware that this class may be recorded.

Evaluation

Assignment	Description	Value
Participation	Students are expected to attend class and to contribute regularly.	10%.
Problem sets	Most weeks there will be a problem set posted to Moodle, using the textbook software and/or on paper. The assignments will be due before class on Tuesdays.	35%
Quizzes	There will be two quizzes, completed in class. See course schedule below.	15% each
Final exam	There will be a final exam during finals week	25%

Grade breakdown:

Grade	Grade Points	Percentage Range
A	4.0	94–100%
A-	3.7	90–93%
B+	3.3	87–89%
B	3.0	83–86%
B-	2.7	80–82%
C+	2.3	77–79%
C	2.0	73–76%
C-	1.7	70–72%
D	1.0	60–69%
F	0	0–59%

Grading Policies

- Late homework assignments will be docked 1/3 letter grade for each day they are late.
- Extensions can be given on assignments, but you should ask in advance.

- If you must miss a quiz, arrangements can be made, but you must talk to me in advance.
- Students are allowed two absences without penalty, after which not attending class will hurt your participation grade. Exceptions can to this policy can be made in some circumstances; please be in touch with me if you believe you will need an exception.

Notes on Academic Integrity

You may work together on the homework assignments. However, the LPL software will know if you submit another student's assignment as your own; please do the software assignments completely on your own computer.

If I have reasons to suspect plagiarism, I will ask that you report yourself to the Bryn Mawr Honor Board. See the Bryn Mawr Honor Code and Honor Board Hearing Process in the Student Handbook for more information.

Title IX

Bryn Mawr/Haverford College is committed to fostering a safe and inclusive living and learning environment where all can feel secure and free from harassment. All forms of sexual misconduct, including sexual assault, sexual harassment, stalking, domestic violence, and dating violence are violations of Bryn Mawr/Haverford's policies, whether they occur on or off campus. Bryn Mawr/Haverford faculty are committed to helping to create a safe learning environment for all students and for the College community as a whole. If you have experienced any form of gender or sex-based discrimination, harassment, or violence, know that help and support are available. Staff members are trained to support students in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, and more.

The College strongly encourages all students to report any incidents of sexual misconduct. Please be aware that all Bryn Mawr/Haverford employees (other than those designated as confidential resources such as counselors, clergy, and healthcare providers) are required to report information about such discrimination and harassment to the Bi-College Title IX Coordinator.

Information about the Colleges Sexual Misconduct policy, reporting options, and a list of campus and local resources can be found on the Colleges website:

<https://www.brynmawr.edu/inside/policies-guidelines-handbooks/title-ix>

Schedule

Topics for each of the lectures are listed below, along with the corresponding reading assignments in Language, Proof and Logic (LPL), listed by section numbers. Ideally, you will complete the assigned reading before class and try some of the problems so that you can ask questions in class as needed. Lectures will cover the LPL material but will not merely repeat it. In addition to the readings in LPL, you should read the relevant sections of the Software Manual, as needed.

Date	Topics	Reading
January 17	Intro to course. Using the software: how to submit homework files.	Introduction pp. 1–10
January 19	Individual constants; predicate symbols; atomic sentences; general first-order languages	§1.1–§1.4
January 24	Function symbols; valid and sound arguments; methods of proof.	§1.5, §2.1, §2.2
January 26	Class canceled	
January 31	Formal proofs; constructing proofs in Fitch; demonstrating nonconsequence.	§2.3–§2.5
February 2	Negation symbol \neg ; conjunction symbol \wedge ; disjunction symbol \vee ; remarks about the game.	§3.1–§3.4
February 7	Ambiguity and parentheses; equivalent ways of saying things; translation.	§3.5–§3.7
February 9	Tautologies and logical truth; logical and tautological equivalence; logical and tautological consequence.	§4.1–§4.3
February 14	Tautological consequence in Fitch; valid inference steps; proof by cases.	§4.4, §5.1, §5.2
February 16	Indirect proof (proof by contradiction); arguments with inconsistent premises; conjunction rules.	§5.3, §5.4, §6.1
February 21	Review	
February 23	Test 1	
February 28	Disjunction rules; negation rules	§6.2, §6.3
March 2	The proper use of subproofs; strategy and tactics; proofs without premises.	§6.4–§6.6
March 7	Spring Break	
March 9	Spring Break	

March 14	Material conditional symbol \rightarrow ; biconditional symbol \leftrightarrow ; conversational implicature.	§7.1–§7.3
March 16	Informal methods of proof; formal rules of proof for \rightarrow and \leftrightarrow ; Soundness and completeness; Review	§8.1–§8.4
March 21	Variables and atomic wffs; the quantifier symbols \forall and \exists ; wffs and sentences.	§9.1–§9.3
March 23	Semantics for the quantifiers; the four Aristotelian forms.	§9.4, §9.5
March 28	Translating complex noun phrases; tautologies and quantification.	§9.6, §10.1
March 30	First-order validity and consequence; first-order equivalence and DeMorgan's laws.	§10.2, §10.3
April 4	Review; Other quantifier equivalences; multiple uses of a single quantifier.	§10.4, §11.1
April 6	Test 2	
April 11	Mixed quantifiers; the step-by-step method of translation; paraphrasing English; Ambiguity and context sensitivity.	§11.2–§11.5
April 13	Valid quantifier steps; the method of existential instantiation; the method of general conditional proof.	§12.1–§12.3
April 18	Proofs involving mixed quantifiers; universal quantifier rules.	§12.4, §13.1
April 20	Existential quantifier rules; strategy and tactics.	§13.2–§13.3
April 25	Soundness and completeness (briefly); review exercises: practice with proofs.	§13.4–§13.5
April 27	Review	