PHI 322–01C: Symbolic Logic

University of Wisconsin at Stevens Point, Fall Semester 2020
Virtual Class
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Virtual Office Hours: 7-8 (PM) M/W and by appointment

Course Description

This course will cover the semantics and syntax of sentential (or propositional) logic and predicate logic. We will learn how to translate sentences in natural language into formal logic and examine the logical relationships of arguments in a formal context, including truth-tables for sentential logic and proofs (or derivations) for both sentential and predicate logic.

Course Learning Outcomes

Students will be able to:

- translate natural language into sentential logic
- identify the logical relationships of connectives
- construct truth-tables in sentential logic
- perform proofs in sentential logic
- demonstrate whether arguments are valid or invalid
- translate natural language into predicate logic
- identify how the existential and universal quantifiers function
- perform proofs in predicate logic

Required Texts

- Allen, Colin and Michael Hand. *Logic Primer*. Second Edition. MIT Press.
- This website for practicing proofs will be helpful: https://logic.tamu.edu/
- Other materials will be posted to Canvas.

How this semester will work:

This class can be completed entirely online, somewhat on your own pace, with no live component. We will be holding a weekly (virtual) live meeting Thursday 11:00 - 12:15 (which is during our scheduled class time). In the live meetings we will discuss course material, address questions, work through examples, and try to replicate the learning dynamic usually found in the in-person classes. These sessions will not be recorded and are not mandatory. I will also have office hours Monday and Wednesday 7-8. If you would like to meet during office hours, you will have to email me earlier so I can send you a link to our Zoom virtual office. If you can't meet during this time, I will be happy to schedule a time to meet that will work for both of us.

Late policy and timing of quizzes and exams:

You may work ahead on the material, but you will only be able to complete quizzes during the week that they are due. The reason for this is two-fold: to motivate students to develop weekly habits to engage with the material, and so that students do not get too far ahead before taking exams. Exams will have to be taken anytime during the class day they are assigned. Thus, you cannot take them early or late, but only anytime during the day that they are assigned. Exams can only be taken late with a university approved absence (e.g., note from a healthcare provider). Furthermore, you need to contact me immediately in order to reschedule the exam as early as possible. If this condition is not met, you may not be able to re-take the exam.

Graded Assignments

1. Ten Quizzes (20% total)
2. Four Exams (80% total)

Quizzes: Quizzes will be questions or problems related to the lectures or readings. We will have 12 quizzes or assignments, but only the best 10 will count. You have access to quizzes a few days in advance, but they must be completed by the end of the day that they are assigned. Quizzes will be open book and open note.

Exams: There will be four exams. Exam dates are (tentatively) listed on the schedule and exams must be completed anytime during the day that they are due. The text, outside notes, or other materials are not allowed on the exam. However, you will be provided a sheet with the derivation rules for Exam II and Exam IV.

Final grades will be determined on the following scale:

100-93	A	<87-83	B	<77-73	C	<67-60	D
<93-90	A-	<83-80	B-	<73-70	C-	<60	F
<90-87	B+	<80-77	C+	<70-67	D+		

Academic Honesty: If you commit any acts of academic dishonesty (such as plagiarism on written work or cheating on an exam) you will earn a zero for that work (and possibly other disciplinary actions). Please refer to the Student Academic Standards and Disciplinary Procedures for more information (https://www.uwsp.edu/dos/Documents/CommunityRights.pdf#page=11).

Americans with Disabilities Act (ADA) Statement: The ADA is a federal law requiring educational institutions to provide reasonable accommodations for students with disabilities. For more information about UWSP's policies, see: http://www.uwsp.edu/stuaffairs/Documents/RightsRespons/ADA/rightsADAPolicyInfo.pdf.

If you require *classroom and/or exam accommodations*, please register with the Disability and Assistive Technology Center and then contact me at the beginning of the course. For more information, please visit the Disability Center's office, located at 604 LRC or their webpage at: http://www.uwsp.edu/disability/Pages/default.aspx.

*Note that the schedule may change. If changes are made, you will be notified via email.

R Sep 3	Syllabus and Introductory Lecture
T Sep 8	Why study logic? Sentences, truth-values, and arguments. Deductive vs Inductive Logic. Validity, Soundness, Logical Consistence and Logical Equivalence
R Sep 10	**Semantics and Syntax of Sentential Logic (LP 1.1 – 1.3)** Symbolization, connectives, truth function & truth conditions
T Sep 15	Atomic sentences, Conjunctions, Disjunctions, and Complex Sentences
R Sep 17	Conditionals and Biconditionals
T Sep 22	Continued
R Sep 24	**Truth-Tables (LP 2.1 – 2.5)** Truth-Value Assignments and Truth-Tables for Sentences
T Sep 28	Truth-Functional Validity
R Oct 1	Continued and Review
T Oct 6	**EXAM I**
R Oct 8	**Derivations in Sentential Logic (LP 1.4 – 1.6)** Derivation System in SD
T Oct 13	&I and &E; vI and vE
R Oct 15	$\rightarrow$I and $\rightarrow$E; Reductio ad absurdum (RAA)
T Oct 20	$\leftrightarrow$I and $\leftrightarrow$E; Complex Arguments
R Oct 22	Continued and Review
T Oct 27	**EXAM II**
R Oct 29	**Syntax and Semantics of Predicate Logic (LP 3.1 – 3.3)** Introduction to PL
T Nov 3	Existential and Universal Quantifiers
R Nov 5	A,E,I, and O sentences; contradictories
T Nov 10	Continued
R Nov 12	Continued
T Nov 17	**EXAM III**
R Nov 19	**Derivations in Predicate Logic (LP 3.3 – 3.4)** Introduction to derivations in PL
T Nov 24	$\forall$E, and $\exists$I
R Nov 26	Thanksgiving Break
T Dec 1	$\forall$I and $\exists$E
R Dec 3	Derivation Rules of PL
T Dec 8	Continued
R Dec 10	Continued and Review

Final: Exam IV: Tuesday, December 15th