

# Symbolic Logic

**Place:** TBD

**Time:** TBD

**Instructor:** Eric de Araujo

**Office:** TBD

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**Office Hours:** TBD

## Texts & Materials

Required Textbooks:

- *The Logic Book*, 6th Edition, Merrie Bergmann, James Moor, and Jack Nelson

Any additional materials will be made available on Carmen.

## Course Description

This course is an introduction to deductive reasoning using propositional and predicate logic. This involves learning two logical languages and some logical concepts associated with them. We will represent some ordinary language reasoning in these languages. We will learn some mechanical methods for determining logical properties of sentences, collections of sentences, and arguments in these languages.

## Course Goals & Objectives

By completing this course, students will be able to:

- A. Represent claims and arguments in propositional and predicate logic by
  1. constructing well-formed sentences in logical languages,
  2. distinguishing between ill-formed and well-formed sentences in logical languages,
  3. writing arguments in standard form,
  4. translating sentences of ordinary language into a logical language (and vice versa), and
  5. explaining the expressive difference between propositional and predicate logic.
- B. Explain the logical properties about sentences and arguments in propositional and predicate logic by
  6. distinguishing arguments from mere sentences or collections of sentences,
  7. determining when an argument is valid or invalid, sound or unsound,
  8. determining when sentences are consistent, equivalent, logically true, logically false, logically indeterminate,

9. explaining what it means for sentential connectives to be truth functional,

C. Determine logical properties of sentences and arguments in propositional and predicate logic by

10. using truth tables to determine logical properties of sentences and arguments in propositional logic,

11. using interpretations to determine logical properties of sentences and arguments in predicate logic,  
and

12. using derivations to show validity of arguments in propositional and predicate logic.

## Schedule

Here is the schedule we hope to follow. The first table lists the topics and associated readings. You should read the material before the first day of discussion. Reading quizzes are due the day of the assigned reading. The second table lists when major assignments are due and when exams will occur. The schedule is subject to change as the course progresses.

### *Topic Structure*

We will progress through each topic using the same structure. Each topic begins with the reading and an entry quiz, has a mid-point quiz, and ends with an exit quiz. These are explained in **Course Mechanics** below. Here is what that will look like for each topic:

Component	Due Date	Venue	Includes Discussion
Reading	First Day of Topic		No
Entry Quiz		Online	
Mid-Point Quiz	Second Day of Topic	Online	Yes
Exit Quiz	1 class after End of Topic	In-Class	Yes

### *Schedule of Topics*

Number	Topic	Chapter	Day Start	Day End	Goals
1	Logical Concepts	1	2	3	B
2	The Language of Sentential Logic	2	4	6	A
3	Meaning in Sentential Logic	3	7	10	B, C
4	Proofs for Sentential Logic	5	11	14	B, C

5	The Language of Predicate Logic	7	16	19	A
6	Meaning in Predicate Logic	8	20	23	B, C
7	Proofs in Predicate Logic	10	25	28	B, C

*Schedule of Assignments and Exams*

Day	Topic	Quiz
2	1. Logical Concepts	Entry Quiz
3		Mid Quiz
4		Exit Quiz
5	2. The Language of Sentential Logic	Entry Quiz
7		Mid Quiz
7		Exit Quiz
8	3. Meaning in Sentential Logic	Entry Quiz
8		Mid Quiz
11		Exit Quiz
12	4. Proofs for Sentential Logic	Entry Quiz
12		Mid Quiz
16		Exit Quiz
15	<b>Exam 1 (Topics 1–3)</b>	
16	5. The Language of Predicate Logic	Entry Quiz
17		Mid Quiz
20		Exit Quiz
21	6. Meaning in Predicate Logic	Entry Quiz
21		Mid Quiz
25		Exit Quiz
24	<b>Exam 2 (Topics 4 and 5)</b>	
25	7. Proofs for Predicate Logic	Entry Quiz
26		Mid Quiz

28	Exit Quiz
Exam Week	Exam 3 (Topics 6 and 7)

## Grading

<i>Quizzes</i>	<i>45%</i>	<i>Exams</i>	<i>45%</i>
<i>Entry Quizzes</i>	<i>10%</i>	<i>Exam 1</i>	<i>15%</i>
<i>Mid Quizzes</i>	<i>15%</i>	<i>Exam 2</i>	<i>15%</i>
<i>Exit Quizzes</i>	<i>20%</i>	<i>Exam 3</i>	<i>15%</i>
<i>Participation</i>	<i>10%</i>		

## Course Mechanics

Here is how I plan to accomplish the goals of the course:

### *Quizzes*

Each topic has an entry, mid, and exit quiz. These quizzes are designed to give your progressively more practice with the content we are covering in each topic. Here is an explanation of each type of quiz:

- **Entry Quiz**  
These quizzes are intended to test your comprehension of our reading and give you an indication of what you will be able to do by the end of each topic. These quizzes are mostly graded on completion and completed online:
  - Completion =  $\frac{2}{3}$
  - Accuracy =  $\frac{1}{3}$
- **Mid Quiz**  
These quizzes are intended to prepare you to perform well on the exit quiz. These quizzes are mostly graded on accuracy, completed online, and have an accompanying discussion forum:
  - Completion =  $\frac{1}{3}$
  - Accuracy =  $\frac{2}{3}$
- **Exit Quiz**  
By the end of each topic, you should be able to perform well on the exit quiz. These quizzes are representative of what you will be tested on in the exams. They are done on paper and turned in class. They have an accompanying discussion forum.

## *Discussions*

We will have two forums to discuss what we are learning: during class and online.

Classes will be used to review what we are learning, clarify misconceptions, ask questions, model skills, and practice. Coming to class having tried the entry and mid quizzes will position you to take advantage of class discussions. You will know what to ask questions about and how to get help from myself and your peers.

We will have online discussion forums where you will talk about the mid and exit quizzes with your classmates. I will assign you a group to discuss each topic with. Individual group members will be assigned questions from the quiz to discuss in the forum. You are expected to state your answer and how you arrived at it. Then you will reply to your group members with a discussion of their answers. You are allowed to utilize the answers and rationales your group comes up with as long as you are contributing to the discussion yourself.

## *Exams*

There will be three exams throughout the course. Exam 1 will cover topics 1–3. Exam 2 will cover topics 4 & 5. Exam 3 will cover topics 6 & 7.

The exit quizzes will be a good guide for what to expect on the exams. I will also provide you with a study guide that states what concepts and skills you should know for each exam.

## *Office Hours*

Office hours tend to be an underutilized resource (unless something is due soon). You are welcome to come and chat about anything related to the course or even philosophy in general. Office hours can be a good way to clear up misconceptions and better understand how you are doing in the course. I will make an effort to find a time to meet if you cannot make it to the scheduled times.

## **Policies**

[I aim to keep policies consistent across courses. See the syllabi for previously taught courses for a list of my policies.]