

UGRD 20742-1

# Paradoxes

M 9:30–11:40; R 8:30–9:30 | Classroom TBA

## INSTRUCTOR:

**Juliana Lima**

[juliana.lima@apu.edu.in](mailto:juliana.lima@apu.edu.in)

<https://julianaflima.github.io/>

My Office: B2-AB 2<sup>nd</sup> floor, cabin 6 | Office Hours: W 10:50–11:50

Study Hours: T 1:00–2:00 | B2-AB 2nd floor, MR

## COURSE DESCRIPTION AND OBJECTIVES

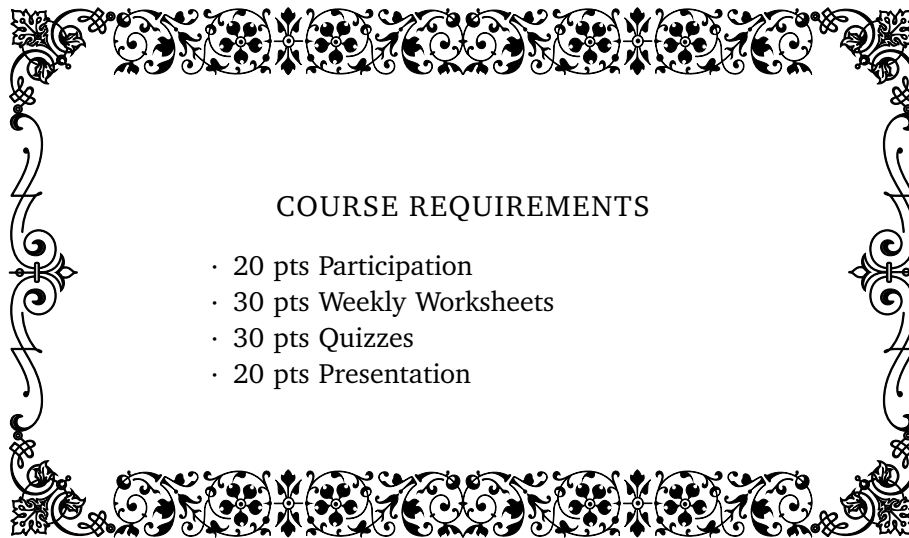
In this course, students will be introduced to different logical formal systems. We begin by learning about Propositional Logic to understand the logical connections of complex sentences with basic connectives – such as, “and”, “or”, “if.., then..”, and “if, and only if” – and the limitations of the system. We move to Predicate Logic, as a new logic system that overcomes some of the limitations of Propositional Logic. We will explore its advantages and also its limitations.

In the last unit, we’ll learn how to extend and modify the logic systems learned to overcome the shortcomings of Propositional and Predicate Logic.

## LEARNING OBJECTIVES

By the end of the course, students should be able to:

- interpret the formal logics required for participating in discussions in advanced philosophy;
- apply formal logics to a wide range of problems, and use them to find solutions.;
- assess how well suited particular formal languages are in specific contexts, and adapt them or construct alternatives where they are unsuitable;
- Cooperate with others in exploring and presenting solutions to logical problems, listening to others with detailed understanding.



*Participation (20 pts)*

Students will be evaluated on their contribution to discussion in class – the questions they ask to other students presenting. The grade will be based on quality of contribution rather than number of questions or time spent talking. However, students are expected to contribute, even if this requires considerable affective work. A rubric will be provided to students at the start of semester.

*Weekly worksheets (30 pts)*

Acquisition of logic skills requires practice. Weekly worksheets will serve for this purpose.

There will be at least 9 homework assignments worth **3.5 points**/each. If we have more than 9 homework assignments, only the **9 highest scoring** solutions will be considered. Students can earn up to 30 points.

\*No extensions will be granted, except for documented medical emergencies.\*

*Quizzes (30 pts)*

Students will be evaluated on how well they have acquired the logical skill based on individual in-class quizzes.

There will be at least 2 quizzes worth **15 points**/each. If we have more than 2 quizzes, only the **2 highest scoring** quizzes will be considered.

\*No extensions will be granted, except for documented medical emergencies.\*

### *Presentation (20%)*

At the end of the semester, students will give individual presentations where they will explain what they have learned, how it has impacted their reasoning process, or how they expect this skill to impact their ability to think critically. This can be done in different ways, such as, presenting an improved solution to a previously submitted logic puzzle/paradox, a solution to a new paradox, an application of the skills in a different course, and the like.

Students will be evaluated based on in-class presentation and written submission (**1,000 words max.**).

\*No extensions will be granted, except for documented medical emergencies.\*

**NOTE:** Things change – the Fates are fickle. Information found on this syllabus is subject to revision as we progress through the semester: Readings and content may be added (or cut) depending on our rate of progress, and it may be necessary to amend the due date of the assignments. Revisions will be announced in lecture and posted online. It is each student's responsibility to keep informed of any changes.



If you are facing a major medical or another major difficulty that is keeping you from doing well in the class, contact me as soon as you can. I am happy to work with you to find the best course of action and, if possible, to help you complete the course successfully. But I can't help if you don't let me know about your circumstances as soon as they arise.



Don't wait until after the last week of classes to let me know about your circumstances. At that point there is virtually nothing I can do to accommodate you.



No last minute extension request will be entertained, except for documented medical emergencies. Emails requesting last minute undocumented or non-medical extensions will not be replied.



If you have any sort of disability that impacts your learning and need accommodation, please contact me or your mentor for guidance at the beginning of the semester.



### **MATERIALS**

- All course materials, information, assignments, etc. will be available on Moodle.
- All communications will be made through your school email address and Moodle.
- It is students' responsibility to check their email and course page on Moodle for the most up to date information about the course.

## GRADING

The usual grading scale will apply: 0-29% U, 30-39% E, 40-49% D, 50-59% C, 60-69% B, 70-79% A-, 80-89% A, 90-100% O

## ACADEMIC INTEGRITY

You are expected to uphold the highest standards of academic integrity. Your work must be your own. Submitting work which you have not composed yourself, or using another person's ideas without due credit, or failing to mark another person's words with appropriate quotation marks all constitute plagiarism. The instructor reserves the right to assess penalties for violations of academic integrity, which may include giving a failing grade for an assignment, for the entire course, or referral to a University disciplinary committee.

## TENTATIVE SCHEDULE OF ACTIVITIES

Lectures in this course are tentatively organized in the following way:

- **Lectures** where the content will be explained and discussed. They are 2 hours/week and will follow a structure determined mostly by the instructor but responsive to students's needs.
- **Seminars** are a place for students to share questions or doubts about topics discussed in the previous week. They are 1 hour/week and take place a day before the homework is due to give all students the opportunity to improve their skills. The structure of the seminar will be mostly determined by students.
- **IBL modules** do not have lectures. Students will work together in small groups to find solutions to a problem sheet outside class. Then students from each small group will explain their solutions to the other small groups. Other students will ask questions, and clarifications. Students will discuss amongst themselves whenever there is lack of clarity or unanimity about a solution, and when alternative solutions are suggested. The class will proceed when the whole group is satisfied. The instructor will remain mostly silent until the group is satisfied, then providing feedback on the spot.

## TENTATIVE SCHEDULE OF ACTIVITIES

### *Unit 1 – Propositional Logic*

#### **1.1 Paradox of Material Conditional**

*Week 1* Aug 18

Overview of the course



- Week 2* Aug 22–25 Basic Ideas and Tools &  
Transcription between English and Sentence Logic  
*Reading:* Teller.P *A Modern Formal Logic Primer*, Volume I, Chapter 1 & 2.  
Smullyan,R.M. *What is the name of this book: The riddle of Dracula and other logical puzzles copy*, Chapter 3: #29–30; Chapter 4: #47–50.; Chapter 5: #67a–68b.
- 
- Week 3* Aug 29 Validity and Conditionals  
Sept 1 *Reading:* Teller.P *A Modern Formal Logic Primer*, Volume I, Chapter 4.  
Smullyan,R.M. *What is the name of this book: The riddle of Dracula and other logical puzzles copy*, Chapter 6: #73, #76–77, #80–81.
- 
- Week 4* Sept 5 Logical Equivalence, Logical Truths, and Contradictions  
*Reading:* Teller.P *A Modern Formal Logic Primer*, Volume I, Chapter 3.  
Smullyan,R. *What is the name of this book? The riddle of Dracula and other logical puzzles*, Chapter 3.  
Sept 8 IBL module  
*Reading:* none.
- 
- Week 5* Sept 12–15 IBL module  
*Reading:* none.
- 
- Week 6* Sept 19–22 Quiz # 1  
Propositional Logic (translations & Abbreviated truth-tables)
- 
- Week 7* Sept 26–29 IBL module  
*Reading:* none.



Unit 2 – Predicate Logic

**2.1 Negative Existential Sentences**

<i>Week 8</i>	Oct 10	Syntax & Transcription <i>Reading:</i> Teller.P <i>A Modern Formal Logic Primer</i> , Volume II, Chapter 1 & 4. Smullyan,R. <i>What is the name of this book? The riddle of Dracula and other logical puzzles</i> , Chapter 7: #88–94.
	Oct 13	Quiz #2 Propositional Logic (abbreviated truth-tables)

---

<i>Week 9</i>	Oct 17–20	Semantics and Validity <i>Reading:</i> Teller.P <i>A Modern Formal Logic Primer</i> , Volume II, Chapter 5.
---------------	-----------	--

---

<i>Week 10</i>	Oct 27	IBL module <i>Reading:</i> none.
----------------	--------	-------------------------------------

**2.2 Barber Paradox**

<i>Week 11</i>	Oct 31 Nov 3	IBL module <i>Reading:</i> none.
----------------	-----------------	-------------------------------------

---

<i>Week 12</i>	Nov 7–10	IBL module <i>Reading:</i> none.
----------------	----------	-------------------------------------

---

<i>Week 13</i>	Nov 14–17	IBL module. <i>Reading:</i> none.
----------------	-----------	--------------------------------------

---

Unit 3 – : *The Road Ahead – what else is there in the world of Logic?*

*Week 14* Nov 21–24 IBL module: Multiple Occurrences of Quantifiers  
*Reading:* none.



*Week 15* Nov 28 Assessment Week  
Dec 1

