Paradox and Infinity

24.118 — Spring 2024

Course Info

- Recommended: 6.100A, 18.01
- Lecture: Mon & Wed
- 10am - 11am
- 32-141

Instructor Info

- Benjamin Brast-McKie
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TA Info

- Bess Ann Rothman
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- Recitation: Fri 10am
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- Katie Zhou
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- Recitation: Fri 11am
- 26-142
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- Kenneth Nathaniel Black
- Recitation: Fri 12pm
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Overview

This course will cover a number of important paradoxes from some of the technical topics in philosophy. We will begin by focusing on the infinite and the theories that these paradoxes have inspired. We will then move to consider paradoxes raised by the possibility of time travel as well as some decision theoretic paradoxes.

Material

Textbook

On the Brink of Paradox by Agustín Rayo (2019)

Other

All of the other required readings will be provided on Canvas.

Grading Scheme

20%	Problem Sets (4/5 assignments at %5 each)
20%	Reading Responses (4/5 assignments at %5 each)
20%	Short Essays (2 assignments at %10 each)
10%	Essay Final Exam (1 assignments at %10)
24%	Recitation Attendance (12/14 meetings at %2 each)
6%	Pop Quizzes (3/4 quizzes at %2 each)

Grades will not be curved. A+ = 97-100; A = 93-96; A- = 90-92; B+ = 87-89; B = 83-86; B- = 80-82; C+ = 77-79; C = 73-76; C- = 70-72; D = 60-69; F $<$ 60.

Problem Sets

There will be 5 problem sets where the lowest grade will be dropped. Some weeks will split the problem set between a quiz due on Canvas before recitation and a written portion to be submitted as a PDF on Canvas after recitation. You are welcome to work with at most two other students *in preparation*, but everything you submit must be your own work. You can find others to work with on `psetpartners.mit.edu`.

Reading Responses and Short Essays

There will be 5 reading responses (1000 words) where the lowest grade is dropping. There will also be 2 short essays (1500 words). You are encouraged to collaborate with at most two other students, talking through the topics and reading each other's work *in preparation*, but all submitted work must be entirely your own.

Recitations and Pop Quizzes

There will be 14 recitations throughout the term. You are expected to attend at least 12 of the 14 recitations, both preparing ahead of time and participating during.

There will also be 4 pop quizzes throughout the term where you can drop the lowest. Consider these easy points if you are up on your reading and present in class.

Piazza

Please enroll in Piazza where you can ask and answer questions: `https://piazza.com/mit/spring2024/24118`.

FAQs

What is a Paradox?

Not any false or contradictory statement is a paradox since it also has to be interesting! An interesting paradox ought to teach us something we didn't know before, suggesting ways to revise our assumptions to avoid that contradiction.

But do the paradoxes have anything to show for themselves?

To take one example, Russell's paradox played a critical role in driving the development of type theory and set theory, putting mathematics on a solid foundation (ZFC is accepted by most working mathematicians).

How much math will you need to know?

Elements of basic set theory will be introduced where some basic familiarity with logical notation will be assumed.

What are the risks?

Some philosophers devote their careers to studying paradoxes. Some might consider this a risk!

Learning Objectives

- Understand what drives the sense of perplexity or clash of intuitions in each of the paradoxes that we consider though out the course.
- Evaluate the range of responses for each paradox as well as the advantages and disadvantages had by each response.
- Practice closely reading of a number of philosophical papers, presenting the puzzles, arguments, and lessons which they contain in your own words.

Laptop Policy and Notes

Laptops, phones, and other distracting devices are not permitted in the lecture. Although it can be helpful to take down notes here are there, I will provide lecture notes after each class, so don't feel that you have to take down everything.

Academic Integrity

Blindly copying another's answer is cheating. By contrast, you are encouraged to talk through the topics covered in this course step-by-step with a classmate or two where in doing so everyone involved comes to understand each part for themselves. However, when it comes time to write up and submit the solutions, it is important that you do this for yourself without consulting others throughout the process.

There will be a number of written exercises throughout this course. You are not permitted to use ChatGPT (or other LLMs), though these will be of little help anyhow. Moreover, do not expect a high grade if what you turn in amounts to little more than a string of grammatical sentences that are loosely related in topic but otherwise fail to contribute to any kind of recognizable argument or analysis.

In writing philosophy papers and responses, you should cut straight to the chase, clearly stating what you will argue for while avoiding rambling introductions filled with platitudes or other loosely related facts. At the same time, you should make all necessary assumptions/definitions/implications/etc. completely explicit so that your work can stand on its own and be interpreted without any guess work.

Make-up Policy

Extensions for late work will not be granted without the official support of S^3 in which case you can assume that you will have my full support. Making arrangements IN ADVANCE of the due date is required except in particularly difficult circumstances.

Diversity and Inclusivity Statement

In all course-related activities and communications, you will be treated with respect. I welcome individuals of all ages, backgrounds, cultures, beliefs, ethnicities, gender identities and expressions, national origins, religious affiliations, abilities, sexual orientations, and other visible and non-visible differences. All members of this class are expected to help create a respectful, welcoming, and inclusive environment that can be enjoyed and shared by every member of the class.

Accommodations for Students with Disabilities

If you are a student with learning needs that require accommodation, please contact Disability and Access Services at `das-student@mit.edu` (or for assistive technology, `atic-staff@mit.edu`) as soon as possible, to make an appointment to discuss your needs and to obtain an accommodations letter. Please also e-mail me as soon as possible to set up a time to discuss your learning needs. As someone who has used these services in the past, you can assume that you will have my full support.

Class Schedule

Note: All supplementary readings will be provided on Canvas.

Part 1: Cantor's Paradise

(Week 1)	Infinite Cardinalities	*On the Brink of Paradox*, Ch. 1
Feb 05, 07		Problem Set 1 Due Friday 02/09
(Week 2)	The Higher Infinite	*On the Brink of Paradox*, Ch. 2
Feb 12, 14		Problem Set 2 Due Friday 02/16
(Week 3)	Omega Sequences	*On the Brink of Paradox*, Ch. 3
Feb 20, 21		Problem Set 3 Due Friday 02/23

Part 2: Paradox in Paradise

(Week 4)	Self Reference	"Mathematical Logic as Based on the Theory of Types" (Russell)
Feb 26, 28		Response 1 Due Sunday 03/03
(Week 5)	A Theory of Types	"Mathematics and Logic" (Weyl) and $\S\S 1-3$ of "The Foundations of Mathematics" (Ramsey)
Mar 4, 6		Response 2 Due Sunday 03/10
(Week 6)	Iterative Conception of Set	"The iterative conception of set" (Boolos)
Mar 11, 13		Response 3 Due Sunday 03/17
(Week 7)	Absolute Generality	"Speaking of Everything" (Cartwright)
Mar 18, 20		Essay 1 Due Friday 03/22

Part 3: Time Travel

(Week 8)	Watch the film "Timecrimes" (2007) over break	
Mar 25, 27	— SPRING BREAK —	
(Week 9)	Time Travel	*On the Brink of Paradox*, Ch. 4 and "The Paradoxes of Time Travel" Lewis (1976)
Apr 1, 3		Problem Set 4 Due Friday 04/05
(Week 10)	The Metaphysics of Time	"The Unreality of Time" McTaggart (1908)
Apr 8, 10		Response 4 Due Sunday 04/14
(Week 11)	Time and Change	"Time Without Change" Shoemaker (1969)
Apr 17		Essay 2 Due Sunday 04/21

Part 4: Newcomb's Problem

(Week 12)	Newcomb's Problem	*On the Brink of Paradox*, Ch. 5
Apr 22, 24		Problem Set 5 Due Friday 04/26
(Week 13)	Prisoners' Dilemma	"Prisoners' Dilemma is a Newcomb Problem" Lewis (1979)
Apr 29, May 1		Response 5 Due Sunday 05/05
(Week 14)	Surprise Exam (the paradox)	"The backward induction argument for the finite iterated prisoner's dilemma and the surprise exam paradox" Bovens (1997)
May 6, 8		No Assignment
(Week 15)	Final Review	Prepare questions
May 13		Essay Exam in Finals Week