

**Philosophy 5700: Advanced Metaphysics**  
Spring 2017

*Updated 30 January 2017*

Instructor: Ben Caplan  
Time: T Th 3:55 PM – 5:15 PM  
Location: ~~218 Enarson~~ 136 Jennings (note the change of location)  
Office: 372 University Hall  
Office hours: Th 2:15 PM – 3:45 PM, or by appointment  
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**Course description**

This course is on the ontology of arithmetic, particularly the natural numbers. We will talk about the number 2. We might also talk about similar cases, like the number 3. We might or might not talk about harder cases, like the number 1, or even harder cases, like the number 0.

This is not a course in mathematics, and it does not presuppose any particular knowledge of mathematics.

The general topic of the course lies at the intersection of metaphysics and philosophy of mathematics, but our approach will be metaphysical. In keeping with this approach, we will mostly be reading work by metaphysicians rather than by philosophers of mathematics.

We will be making several substantive assumptions. First, we will be assuming that there are natural numbers. For example, we will be assuming that there is such an entity as the number 2. Second, we will be assuming that we can know things about the natural numbers. For example, we will be assuming that we can know that there is such an entity as the number 2, that it is a number, that it is between the number 1 and the number 3, and so on. Third, we will be assuming that, at least in principle, questions about the natural numbers can be answered. For example, we will be assuming that there is a determinate answer to the questions “Is the number 2 located in spacetime?,” “Is the number 2 identical to the number 3?,” “Is the number 2 a property?,” and so on.

Specific topics to be addressed include whether, if the natural numbers exist, they nonetheless might have failed to exist; whether facts about the natural numbers obtain in virtue of facts about other, non-mathematical entities; and how the natural numbers are related to properties and relations. For example, are the natural numbers properties of things, properties of pluralities of things, properties of sets of things, relations among things, or slots in properties of (or relations among) things or pluralities of things?

## Course requirements

Short writing assignment	10%
Problem set	20%
First paper	30%
Final paper	40%

The short writing assignment should be less than a page. The first paper should be about 3 or 4 pages. The final paper should be about 5–7 pages. Due dates will be announced in class at least one week in advance.

## Readings

Readings are, or will be, available electronically (e.g. via Carmen (Canvas)). I will often presuppose that students will have the relevant texts in front of them in class.

## Meeting times

In accordance with Faculty Rule 3335-8-15, which prohibits any change in the time of a scheduled class without the approval of the registrar’s office, chairs, and deans, I will not *officially* change the starting time of the class to 4 PM.

## Academic misconduct

In accordance with Faculty Rule 3335-5-487, all suspected cases of academic misconduct will be reported to the university’s Committee on Academic Misconduct. For further details, see the Code of Student Conduct at [studentaffairs.osu.edu/resource\\_csc.asp](http://studentaffairs.osu.edu/resource_csc.asp).

## Accessibility

I’m committed to making this class as accessible as possible. If you have any particular accommodation requests, please speak to me as soon as possible.

## Nondiscrimination and Title IX

Ohio State prohibits discrimination on the basis of age, ancestry, color, disability, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, race, religion, sex, sexual orientation, or veteran status in its programs, activities, employment, and admission.

Title IX—a portion of the United States Education Amendments of 1972, Public Law No. 92-318, 86 Stat. 235 (23 June 1972), codified at 20 U.S.C. Section 1681–1688—states (in part), “No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving federal financial

assistance.”

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you can find resources at [titleix.osu.edu](http://titleix.osu.edu) or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at [titleix@osu.edu](mailto:titleix@osu.edu).

## **Schedule**

There is no class on 14 and 16 March 2016 (Spring Break).

A detailed and updated schedule will be posted online.

## **Tentative outline**

### **1. Frege and Benacerraf**

*Numbers are not properties of things*

Gottlob Frege, “Is Number a property of external things?,” from *Die Grundlagen der Arithmetik: eine logisch mathematische Untersuchung über den Begriff der Zahl* (Breslau: Koebner, 1884), trans. by J.L. Austin as *The Foundations of Arithmetic: A Logico-Mathematical Enquiry into the Concept of Number*, 2nd ed. (Evanston, IL: Northwestern University Press, 1980), §§21–25.

*Numbers are not sets*

Paul Benacerraf, “What Numbers Could Not Be,” *Philosophical Review* 74.1 (Jan. 1965): 47–73.

*A reply to Benacerraf?*

Nathan Salmon, Appendix (“The Determinacy of Identity”) to “Modal Paradox: Parts and Counterparts, Points and Counterpoints,” *Midwest Studies in Philosophy* 11 (1986): 75–120, at 110–114, esp. 110–112.

### **2. Contingency and Grounding**

*Background on modality*

Alvin Plantinga, “Preliminary Distinctions and Remarks,” from *The Nature of Necessity* (Oxford: Clarendon, 1974), 1–13.

*Are numbers contingent?*

Gideon Rosen, “A Study in Modal Deviance,” in *Conceivability and Possibility*, ed. Tamar Szabó Gendler and John Hawthorne (Oxford: Clarendon, 2002), 283–307.

*Background on grounding*

Gideon Rosen, “Metaphysical Dependence: Grounding and Reduction,” in *Modality: Metaphysics, Logic, and Epistemology*, ed. Bob Hale and Aviv Hoffman (Oxford: Oxford University Press, 2010), 109–135.

*Are numbers fundamental?*

Gideon Rosen, “The Reality of Mathematical Objects,” in *Meaning in Mathematics*, ed. John Polkinghorne (Oxford: Oxford University Press, 2011), 113–131.

**3. Properties and Relations***Background on properties and relations*

Bertrand Russell, “The World of Universals,” from *The Problems of Philosophy*, 1912 (Oxford: Oxford University Press, 1959), 91–100.

*Numbers are properties of sets*

Penelope Maddy, “Perception” (excerpt) and “Numbers,” from *Realism in Mathematics* (Oxford: Clarendon, 1990), 58–63, 81–106.

*Numbers are relations between things*

John Bigelow, “Numbers as Relations,” from *The Reality of Numbers: A Physicalist’s Philosophy of Mathematics* (Oxford: Clarendon, 1988), 48–54.

*Numbers are properties of pluralities*

Byeong-uk Yi, “Numbers and Relations,” *Erkenntnis* 49.1 (July 1998): 93–113.

*Background on slots in universals*

Cody Gilmore, “Slots in Universals,” *Oxford Studies in Metaphysics* 8 (2013): 187–233.

*Are numbers slots in universals?*

Øystein Linnebo, "Structuralism and the Notion of Dependence,"  
*Philosophical Quarterly* 58.230 (Jan. 2008): 59–79.