

**Seminar in Ancient Philosophy**  
**PHIL 8000**  
The Metaphysics of Mathematics  
Syllabus  
Fall, 2009

Professor Edward Halper  
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Hours: 3:15–3:45T / 12:15–12:45R  
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**Description and Objective:** Many Greek thinkers, especially, those influenced by Plato, regard mathematical entities as metaphysical principles. They address two interconnected issues: (1) What are mathematical entities? What kind of things are they? What are their principles and how do mathematical entities derive from these principles? (2) How do mathematical entities serve as principles of other things? In particular, how do the properties of mathematical entities manifest themselves in nature?

Plato recommends the study of mathematics as a preliminary to philosophy because mathematics share important characteristics of his first principles, the forms, and he also ascribes characteristics of mathematics to nature. However, it is really among his students in the Academy and his Neoplatonic followers that the role of mathematics is most developed, for they were able to draw upon developments in mathematics that were spurred, in part, by their presumed metaphysical importance. Unfortunately, much of this material exists in fragments or summaries. We will begin with Plotinus' *Ennead* VI.6 because it is relatively complete. Then, we will work through a portion of Nicomachus' of Gerasa *Introduction to Arithmetic*, a mathematical text that is, nonetheless, laden with Neoplatonic ideas. A similar mathematical text is Theon's of Smyrna *Mathematics Useful for Plato*, and the course will also consider a portion of it. Various philosophers wrote commentaries on these works. One is Iamblichus. We will read his *Concerning the General Science of Mathematics*. One chapter of this latter work is either a summary of or a quotation from Speusippus, Plato's successor as the head of the Academy. This will give us occasion to reconsider the role of mathematics in the Academy. In addition, we will look at a summary that Psellus made of the views on mathematics that Iamblichus attributes to Pythagoras in some lost books on the life of Pythagoras. Then, we will study a later work called *The Theology of Arithmetic*. It is sometimes ascribed to Iamblichus, but more likely draws upon a work of his with the same title. The course concludes with Philo's highly allegorical interpretation of *Genesis*. We will see that part of it is motivated by Neoplatonic metaphysics of mathematics.

Some philosophical ideas we will encounter will seem as reasonable as Plato, but other material may seem wildly implausible, perhaps even bordering on ridiculous. However, we will try to appreciate and, often, reconstruct the philosophical problems that motivate these accounts of mathematics. Despite initial appearances, there is some affinity between Pythagoreanism inspired number metaphysics and contemporary science.

The course will not assume knowledge of Greek or extensive familiarity with ancient philosophy. Our aim is to wrestle with interesting, important, and profound philosophical ideas that many important ancient philosophers engaged. Even though we are reading texts that are relatively neglected, you will find a body of secondary material. You will be expected to explore some of it in depth.

**Texts:** \*Plato, *Republic*, 521c-532d

*Philebus* 55d-57c

*Timaeus* 32a-c

*Parmenides* 142b-144b

\*Aristotle, *Metaphysics* A 6, B 5-6

*Physics* Γ 6, 205b3-32

*Plotinus' Ennead* VI.6, Loeb ed., trans. Armstrong

\*Nicomachus of Gerasa, *Introduction to Arithmetic*

\**Philosophy of the Commentators* ed. R. Sorabji: Selections

\*Theon of Smyrna, *Mathematics Useful for Plato*

\*Iamblichus, *Concerning the General Science of Mathematics*

\*Psellus, *On Physical Number* and *On Ethical and Theological Arithmetic*, excerpts from

Iamblichus' *On Pythagoreanism*, books 5-7 in Dominic J. O'Meara's *Pythagoras*

*Revived: Mathematics and Philosophy in Late Antiquity*, .

Pseudo-Iamblichus, *The Theology of Arithmetic*, trans. Robin Waterfield

Philo, *On the Account of the World's Creation Given by Moses*, Loeb edition.

\*Included in the course packet available at Pro Copy.

<b>Grading:</b>	Presentations	40%
	Course Paper	60%

**Assignments:** You will be asked to make three seminar presentations on an assigned passage. Your presentation should not be a summary of what is in the text. Instead, you should focus on what is philosophically interesting in it and try to articulate an issue. You will not generally be able to discuss more than one or two issues in depth. You can weigh alternative interpretations and propose your own interpretation. The challenge will often be to find what the philosophical issue is. If you do not make your seminar presentation when it is scheduled, you can expect a 0 on this assignment barring significant illness.

Your course paper should be a substantial piece of work on a carefully defined problem. If you wish, you can start from one of your seminar presentations, but you should reflect more deeply about it and draw on the pertinent secondary literature. The course paper will be due on the last day of class.

The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.

**Schedule:** I will be at a conference on October 27. That class will be rescheduled.

August	18	Introduction. Plato. Aristotle
	25	Plotinus, VI.6.1-11
September	1	Plotinus, VI.6.12-18

**Academic Honesty:** All academic work must meet the standards contained in "A Culture of Honesty." All students are responsible to inform themselves about those standards before performing any academic work.