

Phil 190Q/290Q: Philosophy of Mathematics

Spring 2007

Thurs. 2–5pm.

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Office hours: Mon. 2–3pm, Tues. 1pm–2pm, or by appointment.

Course Description

The basic purpose of the course will be to explain how contemporary Analytic philosophy of mathematics came to its current set of problems, and explore some of the main approaches which have been taken in addressing those problems. We will begin with a consideration of the view known as “logicism” (roughly speaking: that all mathematics is part of logic), which dominated Analytic philosophy in the middle decades of the 20th century, and look at some of the reasons why that view was largely abandoned. In the second part of the course, we will see how, with the widespread rejection of logicism, a new set of problems—particularly, questions about whether mathematical entities exist and, if so, what they are—came to seem pressing. We will then look briefly at three popular answers to those questions: realism, nominalism (and/or “fictionalism”), and structuralism.

Readings will be from primary text and, in parallel, from Shapiro’s textbook, *Thinking about Mathematics*. No familiarity with any particular area of mathematics (other than introductory-level logic) will be assumed, but students will be expected to pick up some technical knowledge as we go along, and some of the readings will include a fair amount of mathematical symbolism (hence the math prerequisite).

Course Requirements

Class participation; midterm paper (4-5 pages) or class presentation; final paper (approximately 8–10 pages). By May 1, you should decide which midterm assignment you are doing (and talk to me about topics). Midterm papers, for those who choose that option, are due May 15. The final paper is due June 12.

Texts

Gottlob Frege, *The Foundations of Arithmetic*, tr. J.L. Austin, 2nd revised ed. (ISBN: 0810106051).

Stewart Shapiro, *Thinking about Mathematics: The Philosophy of Mathematics* (ISBN: 0192893068).

Paul Benacerraf and Hilary Putnam, eds., *Philosophy of Mathematics: Selected Readings*, 2nd ed. (ISBN: 052129648X).

The above texts should be available at the Literary Guillotine. Readings not on the above list will be available on e-reserve.

Readings

I. Logicism and Its Demise

Apr. 5: Frege, *Foundations of Arithmetic*, §§1–17 (pp. 1–24) and §§45–61 (pp. 58–72). Recommended: Shapiro, *Thinking about Mathematics*, ch. 1 (pp. 3–20).

Apr. 12: Frege, *Foundations of Arithmetic*, §§62–91 (pp. 73–104); Shapiro, *Thinking about Mathematics*, beginning of ch. 5 (pp. 107–24).

Apr. 17: Carnap, “Empiricism, Semantics and Ontology” (Benacerraf and Putnam, pp. 241–71); Ayer, “The *a priori*” (Benacerraf and Putnam, pp. 315–28); Shapiro, *Thinking about Mathematics*, end of ch. 5 (pp. 124–39).

Apr. 24: Quine, “Truth by Convention” and “Carnap and Logical Truth” (Benacerraf and Putnam, pp. 329–76). Recommended: Shapiro, *Thinking about Mathematics*, ch. 6 (pp. 140–71).

May 1: Benacerraf, “What Numbers Could Not Be” (Benacerraf and Putnam, pp. 272–94); Putnam, “The Analytic and the Synthetic” (on e-res). Recommended: Shapiro, *Thinking about Mathematics*, ch. 7 (pp. 172–97). By this date, decide which midterm assignment you are doing.

II. New Problems

May 8: Quine, “On What There Is” (on e-res); Benacerraf, “Mathematical Truth” (Benacerraf and Putnam, pp. 403–20); Putnam, “What is Mathe-

mathematical Truth?” (on e-res). Recommended: Shapiro, *Thinking about Mathematics*, ch. 2 (pp. 21–45).

May 15: Chihara, *Ontology and the Vicious Circle Principle*, ch. 3, §§1–5 (pp. 84–120); ch. 4, §§1–4 (pp. 173–191) and §§7–8 (pp. 200–211). (on e-res) (and **midterm paper due**).

May 22: Field, *Science without Numbers*, “Preliminary Remarks” and ch. 1–5, except appendix to ch. 1 (pp. 1–16, 20–46) (on e-res); Shapiro, *Thinking about Mathematics*, ch. 9 (pp. 226–256).

May 29: Maddy, *Realism in Mathematics*, ch. 2, §§2–3 (pp. 50–75), and “Physicalistic Platonism” (on e-res); Shapiro, *Thinking about Mathematics*, ch. 8 (pp. 201–25).

June 5: Resnik, “Mathematics as a Science of Patterns: Ontology and Reference” and “Mathematics as a Science of Patterns: Epistemology”; D. Lewis, “Mathematics is Megethology” (all three on e-res); Shapiro, *Thinking about Mathematics*, ch. 10.

June 12: **final paper due**.