

Phil 586 — Philosophy of Mathematics
Fall 2010 – Prof. Kevin C. Klement (Please call me “Kevin.”)
Mon., Wed., Fri. 12:20–1:10pm in 121 Bartlett

Course description: A survey of the major philosophical approaches to the nature of mathematics, mathematical truth and the ontology of numbers. Topics include the apriority and necessity of mathematical truth, logicism, formalism, intuitionism, views on infinity, Hilbert’s program, Platonism, naturalism, nominalism, fictionalism and structuralism.

Contact info: My office is 358 Bartlett Hall. My office phone is 545-5784. My office hours are Mondays 3:30–4:30pm, Wednesdays 11am–noon and by appt. You may also e-mail me at klement@philos.umass.edu.

Webpages: We have a homepage at <http://courses.umass.edu/phil586-klement/> but most content is on our SPARK page: <https://spark.oit.umass.edu>.

Texts: These have been ordered at Amherst Books in downtown Amherst, but may not arrive in time. They will also be available on SPARK, electronically.

- Gottlob Frege, *The Foundations of Arithmetic* (Northwestern Univ. Press 1980).
- Stewart Shapiro, *Thinking about Mathematics* (Oxford Univ. Press 2000).
- Smaller pieces and articles available electronically through SPARK.

Course requirements: Your final grade is based on the following: (1) in-class participation (10%), (2) midterm essay exams (25% each $\times 2 = 50\%$ total), and (3) final exam or paper (40%).

Midterm exams: These will be in essay format, and will cover all the material covered in class up until that exam (for the first exam), or all that covered in between the first exam and this one (for the second).

Final exam or term paper: You have a choice between taking a comprehensive final exam, or writing a final term paper (8–10 pages for undergraduates; 12–16 pages for graduate students). The final exam will be an essay exam covering all the material covered in the course. The paper should aim to constitute an original contribution to any of the topics, philosophers or controversies discussed in the course. The amount of outside research undertaken is left to your discretion, though at least a quick examination of the important secondary literature on your topic is recommended, especially for graduate students. It is probably best to discuss your chosen topic with me beforehand.

Participation: You are expected to attend class regularly and participate by asking questions, and raising points for discussion.

Reading Schedule (Subject to change!)

Date	Material Covered
W Sept 8	Course introduction
F Sept 10	Shapiro, <i>Thinking about Mathematics</i> , chap. 1
M Sept 13	Shapiro, <i>Thinking about Mathematics</i> , chap. 2
W Sept 15	Shapiro, <i>Thinking about Mathematics</i> , chap. 3; Plato, <i>Republic</i> , selections; Aristotle, <i>Metaphysics</i> , selections
F Sept 17	Shapiro, <i>Thinking about Mathematics</i> , chap. 4, §§1–2; Kant, <i>Prolegomena to Any Future Metaphysics</i> , selections
M Sept 20	Shapiro, <i>Thinking about Mathematics</i> , chap. 4, §§3–4; Mill, <i>A System of Logic</i> , selections
W Sept 22	Shapiro, <i>Thinking about Mathematics</i> , chap. 5, §1; Frege, <i>The Foundations of Arithmetic</i> , §§1–17
F Sept 24	Frege, <i>The Foundations of Arithmetic</i> , §§18–44
M Sept 27	Frege, <i>The Foundations of Arithmetic</i> , §§45–61
W Sept 29	Frege, <i>The Foundations of Arithmetic</i> , §§62–69
F Oct 1*	Frege, <i>The Foundations of Arithmetic</i> , §§70–86
M Oct 4	Frege, <i>The Foundations of Arithmetic</i> , §§87–109
W Oct 6	Shapiro, <i>Thinking about Mathematics</i> , chap. 5, §2; Russell, “The Regressive Method of Discovering the Premises of Mathematics”
F Oct 8	Russell, <i>Introduction to Mathematical Philosophy</i> , selections
M Oct 11	Columbus day. Class moved to Tuesday.
Tu Oct 12	Shapiro, <i>Thinking about Mathematics</i> , chap. 5, §3; George and Velleman, “Set Theory” from their <i>Philosophies of Mathematics</i>
W Oct 13	Shapiro, <i>Thinking about Mathematics</i> , chap. 5, §4; Wright, <i>Frege’s Conception of Numbers as Objects</i> , selections
F Oct 15	Boolos, “Is Hume’s Principle Analytic?”; Dummett, “Neo-Fregeans: In Bad Company?”
M Oct 18	Carnap, Heyting and von Neumann, “Symposium on the Foundations of Mathematics”
W Oct 20	EXAM 1
F Oct 22	Shapiro, <i>Thinking about Mathematics</i> , chap. 6
M Oct 25	Shapiro, <i>Thinking about Mathematics</i> , chap. 7
W Oct 27	Brouwer, “Intuitionism and Formalism”; “Mathematics, Science and Language”
F Oct 29	Weyl, “The Current Epistemological Situation in Mathematics”
M Nov 1	Hilbert, “On the Infinite”
W Nov 3	Bernays, “The Philosophy of Mathematics and Hilbert’s Proof Theory”
F Nov 5	Curry, “Remarks on the Definition and Nature of Mathematics”
M Nov 8	Dummett, “The Philosophical Basis of Intuitionistic Logic”
W Nov 10	No class. (Thursday class schedule.)
F Nov 12	EXAM 2
M Nov 15	Shapiro, <i>Thinking about Mathematics</i> , chap. 8
W Nov 17	Benacerraf, “What Numbers Could Not Be”; “Mathematical Truth”
F Nov 19	Putnam, <i>Philosophy of Logic</i> , selections; “What is Mathematical Truth?”
M Nov 22	Burgess, “Why I Am Not a Nominalist”
W Nov 24	Maddy, “Indispensability and Practice”; <i>Naturalism in Mathematics</i> , selections
F Nov 26	No class. (Thanksgiving break.)
M Nov 29	Shapiro, <i>Thinking about Mathematics</i> , chap. 9
W Dec 1	Field, “Mathematical Objectivity and Mathematical Objects”
F Dec 3	Chihara, “Nominalism”; Rosen and Burgess, “Nominalism Reconsidered”
M Dec 6	Shapiro, <i>Thinking about Mathematics</i> , chap. 10
W Dec 8	Resnick, “Mathematics as a Science of Patterns”, selections; Parsons, “The Structuralist View of Mathematical Objects”
F Dec 10	MacBride, “Structuralism Reconsidered”
FINALS	FINAL EXAM or PAPER DUE