Philosophy 405: Knowledge, Truth and Mathematics Russell Marcus
Fall 2010 rmarcus1@hamilton.edu

Course Bibliography

This bibliography contains both full references for all readings listed on the syllabus and suggestions for further reading. The first page lists several readers, to which the later pages refer. The following pages are organized according to the course schedule.

Assigned Texts:

James Robert Brown, *Philosophy of Mathematics: An Introduction to the World of Proofs and Pictures*, New York: Routledge, 2000.
Stewart Shapiro, *Thinking About Mathematics: The Philosophy of Mathematics*, New York: Oxford, 2000.

Another Good Introductory Text:

GV: George, Alexander and Daniel J. Velleman. *Philosophies of Mathematics*. Blackwell, 2002.

History of Mathematics

K: Kline, Morris. *Mathematical Thought from Ancient to Modern Times*. New York: Oxford University Press, 1972.

Readers that Cover Several Topics:

BP: Benacerraf, Paul, and Hilary Putnam, eds. Philosophy of Mathematics: Selected Readings, second edition. Cambridge: Cambridge University Press, 1983.
A collection, including many of the papers on our syllabus.
E: Ewald, William. *From Kant to Hilbert*. Oxford: Clarendon Press, 1986.
Source material for just about everything from Berkeley to Brouwer.
H: Hart, W.D. ed. *The Philosophy of Mathematics*. Oxford, 1996.
Another good reader, a bit more contemporary than Benacerraf and Putnam.
VH: Van Heijenoort, Jean. *From Frege to Gödel: A Source Book in Mathematical Logic, 1879-1931*. Cambridge: Harvard University Press, 1967.
Source material for the foundations of mathematics in its key early-twentieth-century period.

Some Contemporary Collections:

BL: Bueno, Otávio and Øystein Linnebo. *New Waves in Philosophy of Mathematics*. Palgrave Macmillan, 2009.
CG: Cellucci, Carlo and Donald Gillies. *Mathematical Reasoning and Heuristics*. King's College, 2005.
LPP: Leng, Mary, Alexander Paseau, and Michael Potter. *Mathematical Knowledge*. Oxford, 2007.
S: Schirn, Matthias. *The Philosophy of Mathematics Today*. Oxford, 1998.

1. Introduction

For further reading:

Barker, Stephen. *Philosophy of Mathematics*. Prentice Hall, 1964.

Chapter 1 of **GV**.

2. Pythagoras and the Pythagoreans

On the syllabus:

Kline, "The Creation of Classical Greek Mathematics" and Kline, "The Greek Rationalization of Nature" are from Chapters 2 and 7, pp 24-37 and 145-154, of **K**.

For further reading:

Galilei, Galileo. *The Assayer*.

Heath, Thomas. *A History of Greek Mathematics*. Oxford: Clarendon Press, 1921.

Heath, Thomas. *A Manual of Greek Mathematics*. Oxford: Clarendon Press, 1931.

Russell, Bertrand. *A History of Western Philosophy*. Routledge: 2004.

Quine, W.V. "Whither Physical Objects." In *Essays in Memory of Imre Lakatos*: Boston Studies in the Philosophy of Science XXXIX, Cohen, Feyarabend, and Wartofsky, eds, Dordrecht: D. Reidel Publishing Company, 1976.

3. Plato's Platonism

On the syllabus:

Selections from Plato on Mathematics are all in: Hamilton, Edith, and Huntington Cairns, eds. *The Collected Dialogues of Plato*. Princeton: Princeton University Press, 1985. *Timaeus* 27d-29d; *Phaedo* 100b-105c; *Theaetetus* 184b-187b; *Republic* 507b-517c, 523e–527d; *Meno* 81b-85c.

For further reading:

Heath, Thomas. *A Manual of Greek Mathematics*. Oxford: Clarendon Press, 1931.

Katz, Jerrold J. *Realistic Rationalism*. Cambridge: The MIT Press, 1998, pp 14-15.

Moravcsik, J. *Plato and Platonism*. Oxford: Blackwell, 1992.

Wedberg, Anders. *Plato's Philosophy of Mathematics*. Greenwood Press, 1977.

4. Aristotle

On the syllabus:

Aristotle, "Books XIII and XIV" are from his *Metaphysics*, in: Barnes, Jonathan. *The Complete Works of Aristotle*. Princeton: Princeton University Press, 1984.

Lear, Jonathan. "Aristotle's Philosophy of Mathematics" *Philosophical Review* v 91 (1982), pp 161-92.

For further reading:

Annas, Julia. *Aristotle's Metaphysics, Books M and N*. Oxford: 1976.

Barnes, Jonathan. "Metaphysics." In *The Cambridge Companion to Aristotle*, Jonathan Barnes, ed. Cambridge, 1995.

Bostock, D. "Aristotle, Zeno and the Potential Infinite" in *Proceedings of the Aristotelian Society* vol 73 (1972-3), pp 37-51.

Muller, Ian. "Aristotle on Geometrical Objects." *Archiv für Geschichte der Philosophie* 52, 1970.

5-6. Modern Rationalism

On the syllabus:

Descartes, "Third Meditation" and Descartes, "Fifth Meditation" are AT34-36 and AT63-71, and may be found in: Cottingham, John, Robert Stoothoff, and Dugald Murdoch, eds. *The Philosophical Writings of Descartes*. Cambridge: Cambridge University Press, 1984.

Kline, "Coordinate Geometry," "The Mathematization of Science," and "The Creation of the Calculus" are Chapters 15, 16 and 17 in **K.**

Leibniz, "Meditations on Knowledge, Truth, and Ideas" is pp 22-27 in: Leibniz, G.W. *Philosophical Essays.* Indianapolis: Hackett, 1989.

Leibniz, Selections from *New Essays* can be found in: Leibniz, G.W. *New Essays on Human Understanding*. Cambridge University Press, 1996. Preface, 43-51, 77-88, 156-160, 406-415.

Locke's essay is widely available. Here's one reference: Locke, John. *Essay Concerning Human Understanding*. Indianapolis: Hackett, 1996.

For further reading:

Bennett, Jonathan. *Learning from Six Philosophers*. Oxford, 2003.

Hofstadter, Douglas. *Gödel, Escher, Bach: An Eternal Golden Braid*. Basic Books, 1999.

Mancosu, Paolo. *Philosophy of Mathematics and Mathematical Practice in the Seventeenth Century*. Oxford University Press, 1996.

7. Modern Empiricism

On the syllabus:

Selections from Berkeley's *Principles* can be found in: Berkeley, George. *A Treatise Concerning the Principles of Human Knowledge*. Indianapolis: Hackett, 1982. Introduction §§11-17; Main Text §§118-132. (Actually, I took the selection from the Ariew and Watkins reader in modern philosophy, vol. 1.)

Some of the Selections from Hume on Mathematics come from the *Enquiry:* Hume, David. *An Enquiry Concerning Human Understanding*. Indianapolis: Hackett, 1993. §IV Part I and §XII Part III.

The rest of the Selections from Hume on Mathematics come from the *Treatise*: Hume, David. *A Treatise on Human Nature*. Oxford University Press, 2001. Book 1, Part 1, §VII and Book 1, Part iii, §I

See Classes 5-6 for a Locke reference.

For further reading:

Bennett, Jonathan. *Learning from Six Philosophers*. Oxford, 2003.

E contains Berkeley's *Analyst*, in which Berkeley attacks the calculus and its infinitesimals, and selections from *A Treatise on Fluxions,* a reply to Berkeley from Colin MacLaurin.

8-9. The Synthetic *A Priori*

On the syllabus:

Selections from Kant's *Critique* are from: Kant, Immanuel. *Critique of Pure Reason*, translated by Norman Kemp Smith. New York: St. Martin's Press, 1984. Bx-xii, A6-11 (B11-24), A19-22 (B33-36), A137-147 (B176-187), A712-738 (B740-766), A162-176 (B202-218), A218-225 (B265-273).

Kant, Immanuel. *Prolegomena to Any Future Metaphysics That Will Be Able to Come Forward as a Science*. Indianapolis: Hackett, 2002.

For further reading:

Friedman, Michael. *Kant and the Exact Sciences.* Harvard University Press, 1992.

Kitcher, Philip. "Kant and the Foundation of Mathematics." *Philosophical Review* v. 84 (1975): 23-50.

Sutherland, "Kant's Philosophy of Mathematics and the Greek Mathematical Tradition." *Philosophical Review* v. 113 (2004): 157-201.

10: Radical Empiricism

On the syllabus:

Frege, from *The Foundations of Arithmetic*, I is §7-§10 of: Frege, Gottlob. *Foundations of Arithmetic*. Evanston: Northwestern University Press, 1980.

Mill, John Stuart. *A System of Logic*. New York, Harper and Brothers, 1893.

For further reading:

Balaguer, Mark. "Against (Maddian) Naturalized Platonism." *Philosophia Mathematica* (3), v. 2 (1994): 97-108.

Maddy, Penelope. *Realism in Mathematics*. Oxford: Clarendon Press, 1990.

11. Cantor's Paradise

On the syllabus:

Dauben, Joseph Warren. *Georg Cantor: His Mathematics and Philosophy of the Infinite*. Princeton: Princeton University Press, 1979.

Tiles, "Cantor's Transfinite Paradise" and "Numbering the Continuum" are Chapters 4 and 5, respectively, in: Tiles, Mary. *The Philosophy of Set Theory: An Historical Introduction to Cantor's Paradise*. Mineola: Dover, 2004

For further reading:

See the Boolos, Parsons, and Wang articles on the concept of set in **BP**.

Cantor, Georg. *Contributions to the Founding Theory of Transfinite Numbers.* Dover, 1955.

GV, Chapter 3.

Yarnelle, John. *An Introduction to Transfinite Mathematics*. Heath, 1964.

There are lots of fine set theory texts. I like: Enderton, Herbert. *The Elements of Set Theory*. Academic Press, 1977.

12. Logicism

On the syllabus:

Frege, from *The Foundations of Arithmetic*, II, is §§1-6, §§12-17, and §§45-91 of: Frege, Gottlob. *Foundations of Arithmetic*. Evanston: Northwestern University Press, 1980.

Russell, "On Our Knowledge of General Principles" and "How *A Priori* Knowledge is Possible" are Chapters 7 and 8 of: Russell, Bertrand. *The Problems of Philosophy*. London; Oxford University Press, 1959.

The letters from Frege and Russell are in **VH**.

For further reading:

Burgess, John. *Fixing Frege*. Princeton: Princeton University Press, 1995.

Gillies, D.A. *Frege, Dedekind, and Peano on the Foundations of Arithmetic*. The Netherlands: Van Gorcum and Co., 1982.

Russell, Bertrand. *Introduction to Mathematical Philosophy*. London; Routledge, 1993.

Russell, Bertrand. *The Principles of Mathematics*. New York: Norton, 1996.

GV, Chapter 2.

13. Formalism and Incompleteness

On the syllabus:

Hilbert, "On the Infinite" and Johann (John) von Neumann, "The Formalist Foundations of Mathematics" are both in **BP**.

Smullyan, "The General Idea Behind Gödel's Proof" is the first chapter in: Smullyan, Raymond. *Gödel's Incompleteness Theorems.* New York: Oxford University Press, 1992.

For further reading:

Curry, H.B. *Outlines of a Formalist Theory of Mathematics.* North-Holland, 1951.

Goldstein, Rebecca. *Incompleteness: The Proof and Paradox of Kurt Gödel*. Norton, 2005.

GV, Chapters 6 and 7.

Hintikka, Jaakko. *On Gödel*. Wadsworth, 2000.

Hofstadter, Douglas. *Gödel, Escher, Bach: An Eternal Golden Braid*. Basic Books, 1999.

Mancosu, Paolo. *From Brouwer to Hilbert: The Debate on the Foundations of Mathematics in the 1920s*. New York: Oxford University Press, 1998.

Smith, Peter. *An Introduction to Gödel's Theorems*. Cambridge, 2007.

14. Gödel Platonism

On the syllabus:

The two versions of the Gödel paper, as well as the Feferman et al. introductory note are all in: Feferman, Solomon et al., eds. *Kurt Gödel: Collected Works*, Vol. II. New York: Oxford University Press, 1995.

15. Intuitionism

On the syllabus:

Heyting, "Disputation;" Brouwer, "Intuitionism and Formalism;" and Brouwer, "Consciousness, Philosophy, and Mathematics" are all in **BP**.

For further reading:

Dummett, Michael. *Elements of Intuitionism*. Oxford University Press, 1977.

Gentzen, Gerhard. "The Concept of Infinity in Mathematics." In *The Collected Papers of Gerhard Gentzen*, M.E. Szabo, ed. North-Holland Publishing Company, 1969.

GV, Chapters 4 and 5.

Körner, Stephen. *The Philosophy of Mathematics.* Dover, 1986.

16. Conventionalism.

On the syllabus:

Ayer, "The A Priori: is Chapter 4 of: Ayer, A.J. *Language, Truth and Logic. New York: Dover, 1952.*

Carnap, "Empiricism, Semantics and Ontology" is reprinted in Benacerraf and Putnam, but also in: Carnap, Rudolph. *Meaning and Necessity: A Study in Semantics and Modal Logic*. Chicago: The University of Chicago Press, 1988

For further reading:

Dummett, Michael. "Wittgenstein's Philosophy of Mathematics" *Philosophical Review* v 68 (1959): 324-348.

Kripke, Saul. *Wittgenstein on Rules and Private Language*. Harvard University Press, 1982.

Quine, "Truth by Convention," is in **BP**.

Wittgenstein, Ludwig. *Remarks on the Foundations of Mathematics*. Cambridge: The MIT Press, 1991. See the website for selections from: Part 1: §§3-5, 33-35, 61, 63, 113, 116-118, 143, 148-150, 156, 168; Part III: §§16, 25-27, 39, 66-67, 82, 85, 87; Part IV, §§56-57; Part V: §§9, 10, 12, 14, 16; Part VI: §§7, 8, 16, 21, 24, 30, 38-39, 41, 46-49; Part VII: §§11, 15, 29, 34-35, 43, 61, 66-67, 74

Wright, Crispin. *Wittgenstein on the Foundations of Mathematics*. Harvard University Press, 1980.

17. Two Dogmas of Empiricism

On the syllabus:

Grice, H.P. and P.F. Strawson. "In Defence Of A Dogma." *Philosophical Review* 65: 141-58.

Quine, "Two Dogmas of Empiricism" is in: Quine, W.V. *From a Logical Point of View*. Cambridge: Harvard University Press, 1980.

18. The Problem

On the syllabus:

Benacerraf, "Mathematical Truth" is in *The Journal of Philosophy*, Vol. 70, No. 19, (Nov. 8, 1973), pp. 661-679, and in **H**.

Field, "Knowledge of Mathematical Entities" is from the introduction to: Field, Hartry. *Realism, Mathematics, and Modality*. Oxford: Basil Blackwell, 1989.

For further reading:

Benacerraf, "What Mathematical Truth Could Not Be - I," is in **S**.

Hart, "Access and Inference," is in **H**.

Potter, "What is the Problem of Mathematical Knowledge?" In **LPP**.

Steiner, Mark. *Mathematical Knowledge*. Cornell University Press, 1975.

19. The Indispensability Argument

On the syllabus:

Azzouni, Jody. 1998. "On 'On What There Is'." *Pacific Philosophical Quarterly* 79: 1-18.

Marcus, "Quine's Indispensability Argument" is an unpublished manuscript.

Quine, "Existence and Quantification" is in: Quine, W.V. *Ontological Relativity and Other Essays*. New York: Columbia University Press, 1969.

Quine, "On What There Is" is in: Quine, W.V. *From a Logical Point of View*. Cambridge: Harvard University Press, 1980.

Quine on Mathematical Recreation is from "Reply to Charles Parsons," In Hahn, Lewis Edwin and Paul Arthur Schilpp, eds. 1986. *The Philosophy of W.V. Quine*. La Salle: Open Court.

For further reading:

Colyvan, Mark. *The Indispensability of Mathematics*. Oxford University Press, 2001.

Paseau, Alexander. "Scientific Platonism." In **LPP**.

Putnam, Hilary. *Philosophy of Logic*. In his *Mathematics, Matter, and Method: Philosophical Papers, Vol. I*. Cambridge: Cambridge University Press, 1971.

Resnik, Michael. *Mathematics as a Science of Patterns*. Oxford: Oxford University Press, 1997.

20-21. Dispensabilism

On the syllabus:

Field, Hartry. 1980. *Science Without Numbers*. Princeton: Princeton University Press.

Field, Hartry, "Introduction: Fictionalism, Epistemology, and Modality" is pp 1-14, of his *Realism, Mathematics, and Modality*, Oxford: Basil Blackwell, 1989.

MacBride, Fraser. 1999. "Listening to Fictions: A Study of Fieldian Nominalism." *The British Journal for the Philosophy of Science* 50.3: 431-55.

Melia, Joseph. 1998. "Field's Programme: Some Interference." *Analysis* 58.2: 63-71.

For further reading:

Burgess, John, and Gideon Rosen. *A Subject with No Object*. New York: Oxford, 1997.

Hellman, Geoffrey. *Mathematics Without Numbers*. New York: Oxford University Press. 1989.

Kitcher, Philip. "Arithmetic for the Millian." *Philosophical Studies* v 37 (1980), pp 215-36.

22: The Weasel

On the syllabus:

Colyvan, Mark. "Mathematics and Aesthetic Considerations in Science." *Mind* 111: 69-78, 2002.

Melia, Joseph. "Weaseling Away the Indispensability Argument." *Mind* 109: 455-479, 2000.

Melia, Joseph. "Response to Colyvan." *Mind* 111: 75-79, 2002.

For further reading:

Colyvan, Mark. "There's No Easy Road to Nominalism." *Mind*, forthcoming.

Azzouni, Jody. *Deflating Existential Consequence: A Case for Nominalism*. New York: Oxford University Press, 2004.

23: The Eleatic and the Indispensabilist

On the syllabus:

Colyvan, "The Quinean Backdrop" and "The Eleatic Principle" are from Chapters 2 and 3 of his *The Indispensability of Mathematics*. Oxford University Press, 2001.

Marcus, "The Eleatic and the Indispensabilist" is an unpublished manuscript.

For further reading:

Balaguer, Mark. 2008. "Fictionalism in the Philosophy of Mathematics." *The Stanford Encyclopedia of Philosophy* (Fall 2008 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/fall2008/entries/fictionalism-mathematics/>.

24: Mathematical Recreation

On the syllabus:

Colyvan, "Mathematical Recreation versus Mathematical Knowledge," is in **LPP**.

Leng, Mary. 2002. "What's Wrong With Indispensability? (Or, The Case for Recreational Mathematics)." *Synthese* 131: 395-417.

Maddy, Penelope. "Indispensability and Practice." *The Journal of Philosophy* 89: 275-289, 1992.

Marcus, "Why the Indispensability Argument Does Not Justify Belief in Mathematical Objects" is an unpublished manuscript

Sober, Elliott. "Mathematics and Indispensability." *The Philosophical Review* 102: 35-57, 1993.

25: The Explanatory Argument

On the syllabus:

Baker, Alan. 2005. "Are There Genuine Mathematical Explanations of Physical Phenomena?" *Mind:* 114: 223-238.

Lyon, Aidan and Mark Colyvan. 2008. "The Explanatory Power of Phase Spaces." *Philosophia Mathematica* 16.2: 227-243.

Mancosu, Paolo. "Explanation in Mathematics." *The Stanford Encyclopedia of Philosophy* (Fall 2008 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/fall2008/entries/mathematics-explanation/>.

For further reading:

Friedman, Michael. "Explanation and Scientific Understanding." *The Journal of Philosophy* 71.1: 5-19, 1974.

Kitcher, Philip. "Explanatory Unification." *Philosophy of Science* 48: 507-31, 1981.

Leng, Mary. 2005. "Mathematical Explanation." In **CG**.

26: The Nominalist Against the Explanatory Argument

On the syllabus:

Bangu, Sorin Ioan. "Inference to the Best Explanation and Mathematical Realism." *Synthese* 160: 13-20, 2008.

For further reading:

Marcus, "Problems with Quine's Indispensability Argument" is an unpublished manuscript.

27: The Platonist Against the Explanatory Argument

On the syllabus:

Marcus, "Explanation and Indispensability" is an unpublished manuscript.

For further reading:

Burgess, John. 1983. "Why I Am Not a Nominalist." *Notre Dame Journal of Formal Logic* 24.1: 93-105.

28: Contemporary Platonism

On the syllabus:

Katz, "Conclusion: The Problems of Philosophy" is Chapter 8 of: Katz, Jerrold J. *The Metaphysics of Meaning*. Cambridge: The MIT Press, 1990.

Katz, "The Epistemic Challenge to Realism" and "Toward a Realistic Rationalism" are from Chapters 2 and 6 (pp 23-51, 177-187), respectively, of: Katz, Jerrold J. *Realistic Rationalism*. Cambridge: The MIT Press, 1998.

Marcus, "Toward Autonomy Realism" is an unpublished manuscript.

For further reading:

Balaguer, "A New Platonist Epistemology" is chapter 3 of: Balaguer, Mark. *Platonism and Anti-Platonism in Mathematics*. New York: Oxford University Press, 1998.

Bonjour, Laurence. *In Defense of Pure Reason*. Cambridge University Press, 1997.