Reappointment Packet
Russell Marcus
Hamilton College
January 2012

Teaching Materials

This file contains a selection of materials I have prepared and used in the courses I have taught at Hamilton, including one version of a syllabus for an independent study in advanced logic. Many of the materials I have constructed for symbolic logic are contained in my textbook, *What Follows*, which is included in its entirety elsewhere. Also included elsewhere is a full set of materials for Modern, containing lecture notes, all assignments, and in-class slides.

Philosophy 240: Symbolic Logic Hamilton College
Fall 2011 Russell Marcus
Mondays, Wednesdays, Fridays: 9am - 9:50am email: rmarcus1@hamilton.edu

Syllabus

Course Description and Overview:

Philosophy has one technical tool: logic. Formal logic is the study of arguments and inferences, made in artificial languages designed to maximize precision. This course is a standard introduction to elementary formal logic, covering propositional logic and predicate logic, including identity theory, functions, and second-order quantification. The central goal of this course is to provide you with a technical method of deciding what follows from what.

The two main techniques we will study are translation and derivation. We will establish a formal definition of valid inference using logical operators and truth functions. We will translate sentences of English into the formal languages of propositional and predicate logic, and back. We will use a proof system to infer new claims from given ones, following prescribed rules of inference and proof strategies.

Thirty of the forty-two class meetings will be devoted to learning logical techniques. There will be seven Philosophy Fridays during which we will examine some philosophical questions about logic. Some of these questions concern the status of logic, and its relation to the rest of our knowledge. Some of these questions concern how best to construct logical systems. The remaining five classes, and the final exam period, will be used for tests. You will be asked to write one essay.

Texts

The draft of my logic book, *What Follows*, is the main text of the course. It is available on the course website.

Other readings will also be available on the course website. These will be especially important for Philosophy Fridays and your paper assignment.

On-Line Resources

The website for this course is:

http://www.thatmarcusfamily.org/philosophy/Course_Websites/Logic_F11/Course_Home.html

The course website includes an html syllabus and schedule, homework solutions, class notes, course bibliography, other readings and handouts, and links to websites specifically selected for this course. Limited material, other than your grades, will be available on the Blackboard course pages. The Blackboard page will contain a link to the course website.

Office Hours

My office hours for the Fall 2011, term are 10:30am - noon, Monday through Friday. My office is upstairs in 202 College Hill Road.

Assignments and Grading:

Your responsibilities this course include the following, with their contributions to your grade calculation in parentheses:

Attendance
Homework (8%)
Six Tests (72%, 12% each)
One four-to-six page paper (20%)

Attendance: Classes are for your edification. It will be useful for you to attend class. There is no direct penalty for missing class. Some students pick up on the technical material quickly. If you do miss a class, you should arrange to drop off your homework, if you have homework due to be handed in.

Homework: Homework assignments and their due dates for approximately the first half of the term are listed on the schedule below. Assignments for Chapter 3 will be distributed later in the term. Most homework assignments are problem sets from Chapters 1-3. Other homework assignments are readings from Chapter 4, mainly in preparation for Philosophy Fridays.

All students will be expected to hand in the first six problem sets, those which are due before the first exam. If you receive less than an 85% on any exam, you must hand in all problem sets which are due before the next exam. If you receive an 85% or higher on the most recent exam, you may hand in your homework, if you wish, but it will not be required. When handing in homework, make it neat and presentable. There should be no ripped or crumpled pages. Problems should be clearly delimited. Questions may not need to be written out fully, but solutions must be.

Sample solutions to all homework problems are in the solutions manual, available on line. Acceptable solutions to most problems vary. We will begin most classes with time to review a few homework questions. You are expected to have completed the homework and looked at the sample solutions before the beginning of class. Mark any changes you make to your original solutions in a different-colored writing utensil so I can see where you may need help. Come to class prepared to ask questions which remain unanswered.

The homework assignments on the schedule are minimal. If you are still struggling with the material, you should do more problems.

Tests: All six tests are mandatory. Dates for the tests are given on the schedule below. No make-ups will be allowed for missed tests. If you are unable to take a test, you must request an arrangement from me in advance. The final exam will be of the same type as each of the first five tests. Be prepared: the final exam will cover the most difficult material in the course.

You will have an opportunity, at the time of the final, to take a compensatory version of up to two of the first five tests. I will average the grade on the compensatory exam with your original grade. If you miss a test during the term, the compensatory exam will be averaged with a 0. Practice problems for each test will be available on the course website.

Paper: Each student will write a short paper on a topic in logic, philosophy of logic, or the application of logic to philosophy. Seven class meetings, Philosophy Fridays, will be devoted to such topics. Readings for Philosophy Fridays come from Chapter 4 of *What Follows*. I expect you to do further research for your papers; suggestions are included in the text. Papers may be mainly expository, especially those covering technical topics. The best papers will philosophical, and will defend a thesis. I will suggest topics and readings through the term. **Papers are due on December 2**, though they may be submitted at any time during the course. More details about the papers will be distributed in class.

The Hamilton College Honor Code will be strictly enforced.

Schedule:

Class	Date	Topic Name	Homework to do before the next class meets
1	Friday August 26	Arguments Validity and Soundness	§1.1: 1, 3, 8, 20, 22, 27, 33, 35, 39 §1.2: 2-5, 13-18
2	Monday August 29	Translation using Propositional Logic Wffs	§1.3a: 11-20 §1.3b: 6-10 §1.4a: 1-5, 10-13 §1.4b: 1-5, 13, 14, 16
3	Wednesday August 31	Truth Functions	Read §4.3: Conditionals
4	Friday September 2	**Philosophy Friday #1**: Conditionals	§1.4b:12, 17-20 §1.5a: 1-4, 9-13, 17, 18 §1.5b: 1-5, 11, 12, 16 §1.5c: 4, 5, 7, 10
5	Monday September 5	Truth Tables for Propositions	Read §4.2: Disjunction, Unless, and the Sixteen Truth Tables §1.6a: 3, 8, 10, 19, 26 §1.6b: 6, 12, 15, 26 §1.6c: 3, 4, 6, 7, 26, 33
6	Wednesday September 7	Truth Tables for Arguments	Read §4.5: Adequacy
7	Friday September 9	**Philosophy Friday #2**: Adequate Sets of Connectives	§1.7: 1, 3, 4, 6, 8, 12, 13, 16, 19
8	Monday September 12	Invalidity and Inconsistency: Indirect Truth Tables	§1.8a: 3-5, 12-15, 20-23 §1.8b: 1, 3, 5, 17-19
9	Wednesday September 14	Rules of Implication I	Prepare for Test #1
10	Friday September 16	**Test #1**: Chapter 1	§2.1a: 1-3, 6-8, 16-18, 24 §2.1b: 4, 5, 8, 10
11	Monday September 19	Rules of Implication II	§2.2a: 1-12 §2.2b: 1-3, 10-15, 22, 24 §2.2c: 5, 7, 8
12	Wednesday September 21	Rules of Equivalence I	Read §4.4: Syntax, Semantics, and the Chinese Room
13	Friday September 23	**Philosophy Friday #3**: Syntax and Semantics	§2.3a: 1-4, 7, 10-12, 16, 19, 24, 25 §2.3b: 4, 7, 8, 10
14	Monday September 26	Rules of Equivalence II	§2.4a: 2, 4-8, 12-14, 20, 25, 26 §2.4b: 2, 3, 8
15	Wednesday September 28	Practice with Proofs	Prepare for Test #2
16	Friday September 30	**Test #2**: Derivations	Read §4.1: The Laws of Logic and Their Bearers

Class	Date	Topic Name	Homework to do before the next class meets
17	Monday October 3	Conditional Proof	§2.5a: 1-4, 14, 15, 17, 19 §2.5b: 4-7 §2.6a: 1, 4, 8, 10 §2.6b: 2, 6, 7
18	Wednesday October 5	Indirect Proof	Read §4.6: Three-Valued Logics
19	Friday October 7	**Philosophy Friday #4**: Three-Valued Logics	§2.7a: 1-3, 5-7, 16-18 §2.7b: 4, 6-10
20	Monday October 10	More on Proofs	Prepare for Test #3
21	Wednesday October 12	**Test #3**: Conditional and Indirect Methods	
	October 14	**Fall Break**	
22	Monday October 17	Predicate Logic, Translation I	§3.1a: 5-10 §3.1b: 2-4, 12, 13, 16-10 §3.1c: 1-5, 8-10
23	Wednesday October 19	Predicate Logic, Translation II	§3.1c: 17-20, 26-30, 39-43, 46, 48, 51, 52 §3.2: 2, 9, 12
24	Friday October 21	Derivations in Predicate Logic	Prepare for Test #4
25	Monday October 24	**Test #4**: Predicate Logic Translation	§3.3: 3, 4, 6, 8, 13, 18, 19, 23, 24, 31
26	Wednesday October 26	More Derivations and Changing Quantifiers	Read §4.7: Truth and Liars §3.3: 9, 16, 17, 22, 25
27	Friday October 28	**Philosophy Friday #5**: Truth and Liars	§3.4: 1, 2, 4, 8, 10, 13, 17, 22, 24
28	Monday October 31	Conditional and Indirect Proof, Predicate Versions	§3.5: 1, 3, 5, 8, 11, 14, 19, 20, 22
29	Wednesday November 2	Semantics for Predicate Logic	Read §4.8: Quantification and Ontological Commitment
30	Friday November 4	**Philosophy Friday #6**: Quantification and Ontological Commitment	§3.3: 38, 39, 42 §3.4: 9, 16, 18 §3.5: 10, 15 §3.6: 1, 2
31	Monday November 7	Invalidity in Predicate Logic	§3.7: 2-4, 8, 12, 15, 19, 20, 21, 33
32	Wednesday November 9	Translation Using Relational Predicates	Prepare for Test #5
33	Friday November 11	**Test #5**: Predicate Logic Derivations and Invalidity	§3.8:b: 1-15, 21-23, 32-37 §3.8c: 1-12

Class	Date	Topic Name	Homework to do before the next class meets
34	Monday November 14	Rules of Passage	§3.9a: 1-6 §3.9b: 4-9 §3.9c: 5-9, 15-18, 21, 27-31
35	Wednesday November 16	Derivations Using Relational Predicates	Read §4.9: Color Incomaptibility
36	Friday November 18	**Philosophy Friday #7**: Color Incompatibility	§3.10a: 3, 5, 8, 9, 11, 13, 20, 24 §3.10b: 3, 7, 10 §3.10c: 3, 5, 6
	Thanksgiving	**Break**	
37	Monday November 28	Translation Using Identity I	§3.11: 8-13, 22-26, 34-38
38	Wednesday November 30	Translation Using Identity II	§3.11: 4, 7, 14, 15, 27-31, 39-41, 43-45, 47 Finish Paper
39	Friday December 2	Derivations Using Identity **Papers are due**.	§3.12a: 2-4, 7, 10, 11, 15, 19 §3.12b: 2, 6, 8, 10
40	Monday December 5	Functions	§3.13a: 1-8 §3.13b: 2, 4, 5, 7, 8, 9
41	Wednesday December 7	Second-Order Logic	Read §4.10: Second-Order Logic and Set Theory §3.14: 1-20
42	Friday December 9	Catch-Up	Prepare for Test #6
	Thursday December 15 7pm - 10pm	**Test #6 (Final)**: Relations, Identity Theory, Functions, and Second-Order Logic	Plus, Compensatory Material

A Group Exercise Used in Symbolic Logic

Note to Reader: The first two pages of this exercise are the notes I use to introduce this jigsaw lesson in class. The following five pages are the worksheets used in class.

Class 37 - Translation Using Identity Theory

I. Introduction to the Identity Predicate

The identity predicate is a special predicate, with a special logic

Consider the following logical derivation:

1. Superman can fly.	Fs
2. Superman is Clark Kent.	???
So, Clark Kent can fly.	Fc

Identity, as in premise 2, is a relation among individuals.
We could write it 'Esc'.
But, identity has special logical properties, so we give it its own symbol, '='.
Identity sentences thus look a little different from other dyadic relations.

Clark Kent is Superman	c=s
Mary Ann Evans is George Eliot	m=g

But, they are just two-place relations.

To deny an identity, we can write either '~a=b' or 'a≠b'.
Negation applies to the identity predicate, and not to the objects related by that predicate.

We will discuss the special properties of the identity predicate on Monday.
Today, we will learn a bit of translating, using a group exercise called a jigsaw.

II. The Jigsaw

Overview:

Organize your base groups and divide tasks. (10 minutes)
Go to work groups and learn something. (10 minutes)
Go back to base groups and teach what you learned in the work groups to the other members of your base group. (25 minutes, 5 minutes per topic)

Before groups

Overview:

Organize your base groups and divide tasks. (10 minutes)
Go to work groups and learn something. (10 minutes)
Go back to base groups and teach what you learned in the work groups to the other

members of your base group. (25 minutes, 5 minutes per topic)

Hand out base-group puzzle pieces to establish base groups.

There should be five or six people in each base group.

There will be seven base groups for 35-39 people.

I will need seven puzzles, some with five pieces, some with six.

If there are 34 people, I can fill-in the missing piece.

If there are 30-33 people, we can go with six base groups of five or six people each.

Step 1: Base groups, Part I (5 minutes)

This is a very brief meeting of base groups to assign work groups.

Find the other four (or five) members of your base group.

Remember the other members of your base group, so you can get back together easily.

Write down their names.

Trade your base-group puzzle pieces for a new packet of work-group puzzle pieces.

This second packet of puzzle pieces determines each person's work group.

These pieces will not match each other.

Each of the work-group puzzle pieces has a picture on the front and a topic name on the back:

1. Only
2. Except
3. Superlatives
4. At least
5. At most

There will be two sets of work groups for each topic

Divide responsibilities among the five topics, using new jigsaw puzzle pieces.

If your group has six people, then two people must share one of the five pieces, and one task.

The best topic to share is superlatives, I think.

Step 2: Work groups (10 minutes)

Find the other two or three members of your work group.

Get a set of work sheets from the table in front of the class.

There will be at least 19 of these sheets in each packet, enough for the three or four members the work group and each person in each of their base groups.

Each work sheet has a few paradigm translations, and then some more for your group to solve.

Each person in the work group must be able to teach the task to the other members of his/her base group.

Take work sheets to give to the other members of your base group, when you return to them.

Step 3: Base groups, Part II (25 minutes)

Taking turns, hand out the work sheets from your work groups.

Show the rest of the group how to do the problems on the sheets.

Identity Theory Jigsaw Lesson
Work Group: At Least

I. Translation key:

b: Berkeley; c: *The Critique of Pure Reason*; d: Descartes; f: Frege
Cx: x is a coherentist; Ix: x is an idealist; Mx: x is a materialist; Px: x is a philosopher
Mxy: x is read more widely than y; Rxy: x respects y; Sxy: x studies y; Wxy: x wrote y

II. Examine the translations below, which use the key in I.

1. At least one materialist respects Berkeley.

   $(\exists x)(Mx \bullet Rxb)$

2. At least two materialists respect Berkeley.

   $(\exists x)(\exists y)(Mx \bullet Rxb \bullet My \bullet Ryb \bullet x \neq y)$

3. There are at least three materialists who respect Berkeley.

   $(\exists x)(\exists y)(\exists z)(Mx \bullet Rxb \bullet My \bullet Ryb \bullet Mz \bullet Rzb \bullet x \neq y \bullet x \neq z \bullet y \neq z)$

4. At least two idealist philosophers respect each other.

   $(\exists x)(\exists y)(Ix \bullet Px \bullet Iy \bullet Py \bullet x \neq y \bullet Rxy \bullet Ryx)$

5. At least three coherentists respect some book by Descartes.

   $(\exists x)(\exists y)(\exists z)\{Cx \bullet Cy \bullet Cz \bullet x \neq y \bullet x \neq z \neq y \neq z \bullet (\exists w)[(Bw \bullet Wdw) \bullet Rxw] \bullet (\exists w)[(Bw \bullet Wdw) \bullet Ryw] \bullet (\exists w)[(Bw \bullet Wdw) \bullet Rzw]\}$

III. Try these, using the key in I.

6. At least two philosophers are read more widely than Frege.

7. There are at least three philosophers who are read more widely than Frege.

8. At least four idealists study *The Critique of Pure Reason*.

Identity Theory Jigsaw Lesson
Work Group: At Most

I. Translation key:

b: Berkeley; d: Descartes; h: Hume; k: Kant; n: Nietzsche
Ex: x is an empiricist; Ix: x is an idealist; Px: x is a philosopher; Rx: x is a rationalist
Lxy: x likes y; Mxy: x is read more widely than y; Pxy: x plays billiards with y; Rxy: x respects y; Wxy: x wrote y
Lxyz: x likes y better than z

II. Examine the translations below, which use the key in I. Note that 'at most' statements make no existential commitments.

1. Nietzsche respects at most one philosopher.

   $(\forall x)(\forall y)[(Px \bullet Rnx \bullet Py \bullet Rny) \supset x=y]$

2. Nietzsche respects at most two philosophers.

   $(\forall x)(\forall y)(\forall z)[(Px \bullet Rnx \bullet Py \bullet Rny \bullet Pz \bullet Rnz) \supset (x=y \vee x=z \vee y=z)]$

3. Kant likes at most two empiricists better than Hume.

   $(\forall x)(\forall y)(\forall z)[(Ex \bullet Lkxh \bullet Ey \bullet Lkyh \bullet Ez \bullet Lkzh) \supset (x=y \vee x=z \vee y=z)]$

4. At most one idealist plays billiards with some rationalist.

   $(\forall x)(\forall y)\{Ix \bullet (\exists z)(Rz \bullet Pxz) \bullet Iy \bullet (\exists z)(Rz \bullet Pyz)] \supset x=y\}$

5. At most two rationalists wrote a book more widely read than every book written by Hume.

   $(\forall x)(\forall y)(\forall z)\{\{Rx \bullet (\exists w)[Bw \bullet Wxw \bullet (\forall z)(Bz \bullet Whz) \supset Mwz] \bullet Ry \bullet (\exists w)[Bw \bullet Wyw \bullet (\forall z)(Bz \bullet Whz) \supset Mwz] \bullet Rz \bullet (\exists w)[Bw \bullet Wzw \bullet (\forall z)(Bz \bullet Whz) \supset Mwz]\} \supset (x=y \vee x=z \vee y=z)\}$

III. Try these, using the key in I.

6. At most one philosopher is both an empiricist and a rationalist.

7. Berkeley respects at most two philosophers.

8. Some empiricists like Descartes but at most two.

Identity Theory Jigsaw Lesson
Work Group: Except

I. Translation key:

a: Aristotle; b: Berkeley; d: Descartes; g: Heidegger; i: Leibniz; l: Locke; n: Nietzsche; p: Plato; r: Arendt; s: Spinoza; t: Socrates
Bx: x is a book; Mx: x is a materialist; Px: x is a philosopher
Lxy: x likes y; Rxy: x respects y; Sxy: x studies y; Wxy: x wrote y

II. Examine the translations below, which use the key in I.

1. Every philosopher respects Locke.

   $(\forall x)(Px \supset Rxl)$

2. Every philosopher except Berkeley respects Locke

   $Pb \bullet {\sim}Rbl \bullet (\forall x)[(Px \bullet x \neq b) \supset Rxl]$

3. Nietzsche does not respect any philosopher except Spinoza.

   $Ps \bullet Rns \bullet (\forall x)[(Px \bullet x \neq s) \supset {\sim}Rnx]$

4. Some philosopher likes all philosophers except Plato and Aristotle.

   $Pp \bullet Pa \bullet (\exists x)\{Px \bullet (\forall y)[(Py \bullet y \neq p \bullet y \neq a) \supset Lxy]\}$

5. Every philosopher but Socrates wrote a book.

   $Ps \bullet {\sim}(\exists x)(Bx \bullet Wtx) \bullet (\forall x)[(Px \bullet x \neq t) \supset (\exists y)(By \bullet Wxy)]$

III. Try these, using the key in I.

6. All philosophers are materialists except Leibniz and Berkeley.

7. No philosopher but Arendt respects Heidegger.

8. Some books are studied by every philosopher except Nietzsche.

Identity Theory Jigsaw Lesson
Work Group: Only

I. Translation key

b: Berkeley; d: Descartes; h: Hume; k: Kant; l: Locke; n: Nietzsche; s: Spinoza;
Ex: x is an empiricist; Px: x is a philosopher; Rx: x is a rationalist
Lxy: x likes y; Mxy: x is read more widely than y; Pxy: x plays billiards with y; Rxy: x respects y

II. Examine the translations below, which use the key in I.

1. Nietzsche respects Spinoza

   Rns

2. Nietzsche respects only Spinoza

   $Rns \bullet (\forall x)(Rnx \supset x=s)$

3. Only Nietzsche doesn't like Nietzsche.

   $\sim Lnn \bullet (\forall x)(\sim Lxn \supset x=n)$

4. Only Locke plays billiards with some rationalist who is read more widely than Descartes.

   $(\exists x)(Rx \bullet Mxd \bullet Plx) \bullet (\forall x)[(Rx \bullet Mxd) \supset (\forall y)(Pyx \supset y=l)]$

5. Only Kant is read more widely than Descartes and Hume.

   $Mkd \bullet Mkh \bullet (\forall x)[(Mxd \vee Mxh) \supset x=k]$

III. Try these, using the key in I.

6. Nietzsche is the only philosopher read more widely than Descartes.

7. Kant is the only empiricist who is also a rationalist.

8. Only Locke and Berkeley are empiricist philosophers respected by some rationalist philosopher.

Identity Theory Jigsaw Lesson
Work Group: Superlatives

I. Translation key:

c: *The Critique of Pure Reason*; e: *The Ethics*; h: Hume; k: Kant; l: Locke; q: *The Inquiry Concerning Human Understanding*; s: Spinoza
Bx: x is a book; Ex: x is an empiricist; Px: x is a philosopher; Rx: x is a rationalist
Bxy: x is bigger than y; Dxy: x is more difficult to read than y; Mxy: x is read more widely than y; Oxy: x is more original than y; Wxy: x wrote y

II. Examine the translations below, which use the key in I.

1. *The Ethics* is more difficult to read than *The Enquiry Concerning Human Understanding*.

   Deq

2. Hume is the biggest philosopher.

   $Ph \bullet (\forall x)[(Px \bullet x \neq h) \supset Bhx]$

3. Hume is not the most difficult empiricist to read.

   $Eh \bullet \sim(\forall x)[(Ex \bullet x \neq h) \supset Dhx]$

4. *The Ethics* is the most difficult book by Spinoza to read.

   $Be \bullet Wse \bullet (\forall x)[(Bx \bullet Wsx \bullet x \neq e) \supset Dex]$

5. Either *The Critique of Pure Reason* or *The Ethics* is the most difficult book to read.

   $Bc \bullet Be \bullet (\forall x)[(Bx \bullet x \neq c \bullet x \neq e) \supset (Dcx \vee Dex)]$

III. Try these, using the key in I.

6. Spinoza is the most original philosopher.

7. The *Critique of Pure Reason* is the most well-read book written by Kant.

8. Some book is the biggest book written by an empiricist.

Philosophy 240: Symbolic Logic — Hamilton College
Fall 2011 — Russell Marcus
Mondays, Wednesdays, Fridays: 9am - 9:50am — rmarcus1@hamilton.edu

Logic Paper Assignment

1. Your paper should explore a topic in: a. logic; b. philosophy of logic; or c. the application of logic to philosophy. All papers must be double spaced, approximately four to six pages (1000 to 1800 words) in a reasonable font, such as 11 point Times. **The final draft of your paper is due on Friday, December 2**.

2. You may write on any of the Philosophy Friday topics in Chapter 4 of *What Follows*, or you may write on a different topic. You must get approval for any topic we have not discussed in Philosophy Friday. The relevant sections of Chapter 4 contain some specific suggestions for paper topics. Your paper must show evidence of independent research; it should not merely summarize the material in Chapter 4. The course bibliography has further readings. I urge you to meet with me before you write.

3. Observe basic rules of grammar and spelling. Avoid jargon. Write simply, and clearly. Proofread your paper. Asking a good writer to read and comment on your paper can be helpful; I encourage use of the Writing Center. Don't forget to cite all assistance you received on the paper.

4. Two important, idiosyncratic formatting guidelines: Do not right-justify (i.e. fully justify) your paper. Paginate.

5. Avoid history and biography. Focus on the arguments, or the logical machinery, rather than particular authors' explications of those arguments or presentations of that machinery.

6. Papers on logic proper may present a known result in some extension of the logic we study in class. These papers need not argue for a thesis, but should motivate the result discussed. Papers on the philosophy of logic or the application of logic to philosophy should defend a thesis. See below for further, general information about writing philosophy papers.

7. Any citation method which allows me easily to trace your sources is acceptable. My preferred method involves a list of references at the end of the paper, and citations made parenthetically within the text by merely noting the author and page number: "To be is to be the value of a variable" (Quine 50). If there is more than one work by an author in your list of references, disambiguate using year of publication: "To call a posit a posit is not to patronize it" (Quine 1960: 22). If your list of references contains entries from the same author in the same year, disambiguate using lower-case letters after the year, and indicate the distinction in the list of references: "All we really need in the way of holism... is to appreciate that empirical content is shared by the statements of science in clusters and cannot for the most part be sorted out among them" (Quine 1980b: viii). Internet sources must include a live URL. I must be able to trace the source.

8. Violations of academic integrity, like plagiarism, can and will lead to failing grades. Remember to acknowledge any assistance you have had on your paper, including assistance from the Writing Center. **The Hamilton College Honor Code will be enforced**.

Philosophy 203: History of Modern Western Philosophy
Spring 2011
Tuesdays, Thursdays: 9am - 10:15am
Benedict 105

Hamilton College
Russell Marcus
Office: 210 College Hill Road, Room 201
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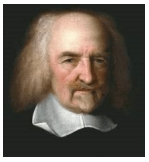
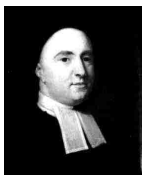
Syllabus





Course Description and Overview:

The modern era in western philosophy spans the sixteenth through the eighteenth centuries. Spurred mainly by advances in science, but also by criticisms of Church dogma, philosophers attempted to accommodate new learning with a broad view of human abilities, and to construct systematic understandings of the world. This course mainly surveys, chronologically, the work of eight philosophers of the modern era: Descartes, Hobbes, Spinoza, Leibniz, Locke, Berkeley, Hume, and Kant. Among the recurring topics to be discussed are the nature of mind, free will, space and time, the self, and scientific reasoning. In combination with Philosophy 201: History of Ancient Western Philosophy, this course will provide students a broad background in the history of western philosophy, preparing you for both advanced work in the history of philosophy and contemporary study of a wide range of topics including epistemology, philosophy of science, philosophy of mind, and metaphysics.

Texts

Required:

Roger Ariew and Eric Watkins. *Modern Philosophy: An Anthology of Primary Sources*, 2nd edition. Hackett, 2009.

Various supplementary handouts, available in class and on the course website.

Recommended:

Norman Melchert. *The Great Conversation, Volume II: Descartes through Derrida and Quine*. Oxford, 2007.

Jeffrey Tlumak. *Classical Modern Philosophy: A Contemporary Introduction*. Routledge, 2006.

Other recommended sources are listed in the Course Bibliography.

On-Line Resources

The course website is:

http://www.thatmarcusfamily.org/philosophy/Course_Websites/Modern_S11/Course_Home.html

The course website includes an html syllabus and schedule, class notes, other readings and handouts, and links to websites specifically selected for this course. I will use the Blackboard site *only* to post grades.

Assignments and Grading:

Your responsibilities this course include the following, with their contributions to your grade calculation in parentheses:

Attendance and participation
Readings
Presentation (10%)
Two papers (20%, 25%)
Midterm and Final Exams (20%, 25%)

Attendance: While there is no direct reward or penalty for attendance, I expect students to come to class prepared to discuss the assigned reading.

Readings: As this course is a broad survey, there is a lot of assigned reading. I have divided the readings into three categories: primary, secondary, and tertiary readings.

You are responsible for completing all primary readings, which cover all the central topics in the course. Exams will be based on the primary readings.

The secondary readings, consisting mainly of further primary sources, will be useful in illuminating the primary readings. I will sometimes refer to the secondary readings in class. You are responsible for the secondary readings assigned for your presentation topic, and you should try to complete as many of the secondary readings as possible.

The tertiary readings are mainly from the secondary sources (Melchert and Tlumak), and are optional.

To assist you with the readings, and to help prepare you for the midterm and final examinations, I will post reading guides, lists of questions, for all of the primary readings.

Presentation: Each student is required to participate in one in-class presentation, lasting approximately ten to fifteen minutes. Most presentations will be done in pairs, though there will be opportunities for solo presentations as well. I will distribute more specific guidelines, as well as a sign-up sheet, in class. I welcome, indeed encourage, you to use your presentation topic as the theme for your second paper.

Papers: Each student will write two short papers. The first paper, 4-6 pages on any theme from the *Objections and Replies* to Descartes's *Meditations,* is due on Tuesday, February 8. The second paper, 5-8 pages on any topic in the material from Spinoza, Leibniz, Locke, Berkeley, or Hume, is due on Tuesday, April 26. I will distribute more details about the each paper in class.

Exams: The midterm exam will be given in class on Thursday, March 10. The final exam will be given at the appointed exam time: Tuesday, May 10, 7pm-10pm. Both exams will be based on questions from the Reading Guides, though the final exam may also include a short essay topic.

The Hamilton College Honor Code will be strictly enforced

Office Hours

My office hours for the Spring 2011, term are 10:30am - noon, Monday through Friday. My office is in room 201 of 210 College Hill Road, which is at the northwest corner of CHR and Griffin Road.

Schedule:

Note: The readings listed in each row are to be completed *before* class.

Part I: Descartes

Class	Date	Topic	Primary Readings	Secondary Readings	Tertiary Readings
1	January 18	Early Modern Philosophy and the Scientific Revolution		David Rosenthal, "Philosophy and Its History" (Handout)	Melchert, Chapter 12
2	January 20	Sense Experience, Method, and Doubt	D*iscourse on Method*, Parts 1 and 2 (AW 25-33) *Meditations on First Philosophy*, through Meditation One (AW 35-42)	Montaigne, *Apology*, §7 (AW 4-13)	Melchert 319-327 Tlumak 1-22
3	January 25	The Cogito and Certainty	Meditations Two and Three (AW 43-54)	Bacon, from *New Organon* (AW 16-20) Galileo, from *The Assayer* (AW 21-24)	Melchert 327-332 Tlumak 22-38
4	January 27	The Cartesian World	Meditations Four through Six (AW 54-68) *Discourse*, Part 5 (AW 33-34)	Readings on the Ontological Argument (handout) Spinoza, from *Descartes's Principles of Philosophy* (AW 93-98)	Melchert 332-336 Tlumak 38-68
5	February 1	Descartes and His Critics	Descartes, "Arguments... Arranged in Geometrical Fashion" (AW 72-75)	Leibniz, Letters (AW 99-105)	Melchert 356-359

Part II: Hobbes and Spinoza

Class	Date	Topic	Primary Readings	Secondary readings	Tertiary Readings
6	February 3	Materialism	Hobbes, from *Leviathan* (AW 114-136)		Melchert, 361-371
7	February 8 **Paper 1 is due**	Monism, Parallelism	Spinoza, *Ethics*, Part I (AW 144-164)	Letters to Oldenburg and to Meyer (AW 137-143)	Melchert 438 Tlumak 77-88 Singer, "The Spinoza of Market Street"
8	February 10	Knowledge and Freedom	Spinoza, *Ethics*, Parts II and V (AW 164-195)		Tlumak 88-95; 100-102

Part III: Leibniz

Class	Date	Topic	Primary Readings	Secondary Readings	Tertiary Readings
9	February 15	Monads, Truth	*The Monadology* (AW 275-283)	Malebranche, from *The Search After Truth* (AW 200-223)	Tlumak 133-141
10	February 17	The Complete-World View of Substance, Harmony	*Discourse on Metaphysics* §1-§25 (AW 224-240)	Letters to Arnauld (AW 248-264)	Melchert 440
11	February 22	Theodicy, Necessity, and Freedom	*Discourse on Metaphysics* §25-§37 (AW 240-247) from *Theodicy* 405-417 (handout)	"Primary Truths" (AW 265-268) "A New System of Nature" (AW 269-274)	Tlumak 133-138; 159-163
12	February 24	Space and Time	Newton, Selections (AW 284-293) Letters to Clarke (AW 294-303)		Tlumak 164-171

Part IV: Locke

Class	Date	Topic	Primary Readings	Secondary Readings	Tertiary Readings
13	March 1	Against Innate Ideas, For the Primary/ Secondary Distinction	*Essay* Book I, Chapters I-II (AW 316-322); Book IV, Chapters I-II (AW 386-392) Book II, Chapters I-IX (AW 322-339)	Boyle, "Of the Excellency..." AW (308-315)	Melchert 372-381 Tlumak 106-110
14	March 3	Identity and the Self	*Essay*, Book II, Chapter XXVII (AW 367-377)	*Essay*, Book II, Chapters IX-XXIII (AW 337-367)	Tlumak 110-122
15	March 8	Abstract Ideas	*Essay*, Book III (AW 377-386)	Leibniz, Preface to the *New Essays* (AW 422-433) *Essay* Book IV, Chapters X-XVI (AW 405-421)	Tlumak 122-128

March 10: Midterm Exam

Part V: Berkeley

Class	Date	Topic	Primary Readings	Secondary Readings	Tertiary Readings
17	March 29	Three Arguments for Idealism	*Principles*, §1-33 (AW 447-453) *Three Dialogues*, Dialogue 1 (AW 454-474)		Melchert 385-395

18	March 31	Against Abstract Ideas	*Principles*, Preface (AW 438-446) *Principles* §86-100 (handout) *Three Dialogues*, Dialogue 2 (AW 474-484)	*Principles* §34-84 (handout)	Tlumak, Chapter 5
19	April 5	Mathematics, Science, Skepticism and Atheism	from *On Motion* (AW 504-508) *Principles*, §100-156 (handout)	*Three Dialogues*, Dialogue 3 (AW 484-503)	

Part VI: Hume

Class	Date	Topic	Primary Readings	Secondary Readings	Tertiary Readings
20	April 7	Impressions, Ideas, Facts, Relations	*An Enquiry Concerning Human Understanding*, I-IV (AW 533-548)	Bayle, "Pyrrho" (AW 512-516)	Melchert 397-409 Tlumak, 193-199
21	April 12	Causation and Induction	*An Enquiry Concerning Human Understanding*, V-VII (AW 548-564)		Tlumak, 199-205
22	April 14	The Self and Common Sense	from *A Treatise of Human Nature* Book I, Part 4, Section 6 (AW 525-532)	Reid, Selections (AW 641-653)	Melchert 409-415; 423-425
23	April 19	Free Will, Skepticism	*An Enquiry Concerning Human Understanding*, VIII-IX, XII (AW 564-576, 593-600)	*An Enquiry Concerning Human Understanding*, X-XI (AW 576-593)	Tlumak, 208-221

Part VII: Kant

Class	Date	Topic	Primary Readings	Secondary Readings
24	April 21	The Synthetic *A Priori*	*Critique of Pure Reason*, Prefaces and Introduction (AW 717-729)	Melchert 426-447 Tlumak, 244-254; 291-300
25	April 26 **Paper 2 is due**	Transcendental Aesthetic	*Critique of Pure Reason* (AW 729-737)	Tlumak, 254-257; 300-303
26	April 28	Transcendental Deduction	*Critique of Pure Reason* (AW 737-756)	Tlumak, 258-268; 303-312
27	May 3	The Refutation of Idealism, First Antinomy	*Critique of Pure Reason* (AW 781-783, 792-794)	Tlumak, 268-277; 312-320
28	May 5	The Ontological Argument	*Critique of Pure Reason* (AW 819-823)	Melchert 447-450 Tlumak, 285-291; 320-330

Final Exam: Tuesday, May 10, 7pm-10pm

Philosophy $2^2 3^3$: Intuitions and Philosophy Hamilton College
Fall 2011 Russell Marcus
Tuesdays and Thursdays, 2:30pm - 3:45pm rmarcus1@hamilton.edu

Syllabus

Course Description and Overview

We know a lot. We know that we exist, that we and others have conscious sensations, that seven and five are twelve, and that torturing innocent people is wrong. In part, we know these claims because we construct theories of knowledge, mind, mathematics, and ethics. But any theory must be checked against some data. Among these data are our intuitions: the way the world seems to us. *Intuitions and Philosophy* will explore the role of intuitions in our reasoning in epistemology, philosophy of mind, moral philosophy, metaphysics, and other areas. We will consider arguments in favor of using intuitions in philosophy, as well as research on the fallibility of ordinary reasoning. We will also examine some recent experimental results which call into question traditional philosophical methods and conclusions.

Texts

Michael DePaul and William Ramsey. *Rethinking Intuition: The Psychology of Intuition and Its Role in Philosophical* Inquiry. Rowman and Littlefield, 1998.
Joshua Knobe and Shaun Nichols. *Experimental Philosophy*. Oxford University Press, 2008.
Additional Readings, available on reserve, and on the course website.

On-Line Resources

The website for this course is:

http://www.thatmarcusfamily.org/philosophy/Course_Websites/Intuitions_F11/Course_Home.html

The course website includes an html syllabus, many of our readings, a course bibliography, class notes, assignments, other handouts, and links to websites specifically selected for this course. I will use the Blackboard site *only* to post grades.

Office Hours

My office hours for the Fall 2011, term are 10:30am - noon, Monday through Friday. My office is upstairs in 202 College Hill Road.

Assignments and Grading

Your responsibilities for this course include the following, with their contributions to your grade calculation in parentheses:

1. All the readings listed on the schedule below and seminar papers.
2. Twenty article prècis (10%)
3. Two seminar papers (2-4 pages) and presentations (40%; 20% each)
4. Term paper (8-12 pages) (30%)
5. Final exam (20%)

The **readings** on the schedule and any seminar paper for the day are to be completed before the class indicated. For additional readings, including background on the philosophical topics in Part III of the course, and full bibliographical information, see the Course Bibliography, available on the course website and as a handout.

Article prècis are 100- to 150-word summaries, or distillations, of some portion of an assigned reading. In preparing for most classes, you should write one prècis before class. You may choose to write about an entire article or to focus on a small portion of the article. If there is more than one reading, you may choose one reading on which to focus. You need not complete prècis for the two classes in which you are presenting a seminar paper. In lieu of up to five prècis, you can write a list of six-to-eight detailed questions on the reading.

Your twenty prècis are due at the end of the term, on **Friday, December 9**. I may collect some portion of them earlier, especially if you display a need for me to do so. You will mainly be graded on the completion of the twenty prècis, rather than their quality. I expect that the prècis will be useful to you in preparing both for classes and for the final exam.

Many classes will run as extended discussions of a 750- to 1500-word **seminar paper**. Each student in the course will write and present two seminar papers. We will sign up for seminar papers, by email, after the second class. Seminar papers should assimilate the assigned readings and summarize the main arguments. I also encourage you to include some critical analysis. You are instigating class discussion, focusing our thoughts on the central theses and raising questions. It is good practice to end a seminar paper with a few questions you believe will be useful for the class to consider. Each seminar paper is **due at noon by email to all seminar participants the day before the class in which it will be discussed** (i.e. Monday or Wednesday). This deadline is necessary for all participants in the seminar to be able to read the paper and prepare comments and questions for class.

You will lead the class on the day we discuss your seminar paper. You may be creative with your presentation. You may focus on the content of your paper. You may also discuss any particular difficulties in the material or topics that you were unable to cover in the paper. Your grade for the seminar paper will depend on both the paper and your presentation of it.

Your **term papers** will be completed in three stages. A one-to-two-paragraph abstract of your paper is due on Tuesday, October 18. A full draft of your term paper is due on Thursday, November 10. The final draft is due on Thursday, December 1. See the Paper Assignment for various options for topics. I will be happy to meet with you to discuss your topic, in advance. Failure to submit a draft or submitting an insufficient draft, will reduce your final paper grade by two steps (e.g. from B+ to B-).

The **final exam** will be on Friday, December 16, 2011, from 9am to noon. Preparatory questions will be posted on the course website.

On Grades: Grades on assignments will be posted on Blackboard, along with a running total, which I call your grade calculation. Your grade calculation is a guide for me to use in assigning you a final grade. There are no rules binding how I translate your grade calculation, which will appear in Blackboard as a percentage, into a letter grade. In particular, the Hamilton College key for translating your letter grades into percentages, used for graduate school admissions, is not a tool for calculating your final grade. I welcome further discussion of the purposes and methods of grading, as well as my own grading policies.

Both the Writing Center and the Oral Communications Center have an astoundingly wonderful set of resources to help you write and speak more effectively.

Schedule:
The readings listed are available from at least one of three different places:
DePaul and Ramsey, marked on the schedule as 'DR'
Knobe and Nichols, marked on the schedule as 'EP'
The course website, for everything else

Part I: Thought Experiments, Intuition and Reflective Equilibrium

Class	Date	Topic	Readings to do *before* class
1	Thursday 8/25	Thought Experiments, Intuitions, and X-Phi	Brown and Fehige, "Thought Experiments"
2	Tuesday 8/30	Foundationalism: Rationalism and Empiricism	Descartes, selections from *Meditations on First Philosophy* and *Objections and Replies* Locke, "Clear and Distinct Perception" Hume, selections from *An Enquiry Concerning Human Understanding*
3	Thursday 9/1	Wittgenstein and the Logical Empiricists	Melchert, "Analysis" Ayer, "Are Mistakes About One's Own Immediate Experience Only Verbal"
4	Tuesday 9/6	The Myth of the Given	Sellars, "Does Empirical Knowledge Have a Foundation?"
5	Thursday 9/8	Reflective Equilibrium in Science	Goodman, "The New Riddle of Induction"
6	Tuesday 9/13	The Scientific Method	Papineau, "Methodology: The Elements of the Philosophy of Science," §1, §3, and §5
7	Thursday 9/15	Reflective Equilibrium in Ethics	Rawls, from *A Theory of Justice*
8	Tuesday 9/20	Reflective Equilibrium in Linguistics	Chomsky, from *Knowledge of Language*, Chapters 1 and 2

Part II: Worries About Rationality

Class	Date	Topic	Readings to do *before* class
9	Thursday 9/22	Cognitive Biases	Tversky and Kahneman, "Judgment Under Uncertainty: Heuristics and Biases" McNerney, "Shifting Paradigms" Note: Different students will read different selections; see handout on Idiotfest 2011 for specific assignments
10	Tuesday 9/27	Rationality and Experimentation	Cohen, "Can Human Irrationality Be Experimentally Demonstrated" Replies from Evans and Pollard; Kahneman; and Stich
11	Thursday 9/29	Against Intuitions	Stich and Nisbett, "Justification and the Psychology of Human Reasoning"

Part III: X-Phi Against Intiutions

Class	Date	Topic	Readings to do *before* class
12	Tuesday 10/4	Epistemic Relativism	Weinberg, Nichols, and Stich, "Normativity and Epistemic Intuitions" (EP 2)
13	Thursday 10/6	Descriptivism and Direct Reference	Machery, Mallon, Nichols, and Stich, "Semantics, Cross-Cultural Style" (EP 3)
14	Tuesday 10/11	Free Will and Moral Responsibility I	Woolfolk, Doris, and Darley, "Identification, Situation Constraint, and Social Cognition: Studies in Attribution of Moral Responsibility" (EP 4)
15	Tuesday 10/18	Free Will and Moral Responsibility II **Abstract of Term Paper Due**	Nahmias, Morris, Nadelhoffer, and Turner, "Is Incompatibilism Intuitive?" (EP 5)
16	Thursday 10/20	Free Will and Moral Responsibility III	Nichols and Knobe, "Moral Responsibility and Determinism: The Cognitive Science of Folk Intuitions" (EP 6)
17	Tuesday 10/25	Intentionality	Knobe, "The Concept of Intentional Action: A Case Study in the Uses of Folk Psychology" (EP7)
18	Thursday 10/27	Intuitions and Cognitive Equilibrium	Gendler, "Philosophical Thought Experiments, Intuitions, and Cognitive Equilibrium"
19	Tuesday 11/1	Gender Differences I	Buckwalter and Stich, "Gender and Philosophical Intuition"
20	Thursday 11/3	Emily Esch's class visit	Prinz, "Empirical Philosophy and Experimental Philosophy" (EP 10)
Bonus	Friday 11/4	Emily Esch's public talk (title TBA)	
21	Tuesday 11/8	Gender Differences II	Buckwalter and Stich, "Gender and Philosophical Intuition"

Part IV: How To Do Philosophy

Class	Date	Topic	Readings to do *before* class
22	Thursday 11/10	Intuition in Psychology **Rough Draft of Term Paper Due**	Gopnik and Schwitzgebel, "Whose Concepts Are They, Anyway? The Role of Philosophical Intuition in Empirical Psychology" (DR 5)
23	Tuesday 11/15	Sources of Intuitions	Cummins, "Reflections on Reflective Equilibrium" (DR7)
24	Thursday 11/17	Defending Intuition I	Bealer, "Intuition and the Autonomy of Philosophy" (DR 12)
25	Tuesday 11/29	Defending Intuition II	Bealer, "Intuition and the Autonomy of Philosophy" (DR 12)
26	Thursday 12/1	Naturalizing Intuition **Final Draft of Term Paper Due**	Kornblith, "The Role of Intuition in Philosophical Inquiry: An Account with No Unnatural Ingredients" (DR 8)
27	Tuesday 12/6	Intuitions and X-Phi	Sosa, "Minimal Intuition" (DR 14) and "Experimental Philosophy and Philosophical Intuition" (EP 12)
28	Thursday 12/8	Whither Reflective Equilibrium	DePaul, "Why Bother with Reflective Equilibrium?" (DR 16)

Twenty Article Prècis Due: Friday, December 9, 4pm

Final Exam: Friday December 16, 9am to noon

Philosophy $2^2 3^3$: Intuitions and Philosophy — Hamilton College
Fall 2011 — Russell Marcus

Idiotfest 2011

Note to reader: This is the assignment sheet for a class exercise in which we surveyed a range of empirical results about human cognitive deficits. Each student presented on different phenomena.

Class 9, on Thursday, September 22, will be the debut of Idiotfest. We are going to look briefly at a sample of human biases and cognitive failures.

To accommodate a quick study of a wide range of human cognitive deficits, we are going to read two articles: Amos Tversky and Daniel Kahneman's "Judgment Under Uncertainty: Heuristics and Biases" and Sam McNerney's "Shifting Paradigms." The former is a classic presentation of human irrationality by the two psychologists fundamentally responsible for all recent rationality research. The latter is an independent-study project written last year by a Hamilton student.

These two papers are, together, too much for us each to read completely for one class. So each seminar participant will be responsible for a different section of one of the papers. Here are the available sections and topics:

Article	Topic	Presenter
Tversky and Kahneman	Representativeness, 1124-1127	Mike
Tversky and Kahneman	Availability, 1127-1128	Emir
Tversky and Kahneman	Adjustment and Anchoring, 1128-1130	Lindsay
McNerney	Cognitive Biases, 12-19	Russell
McNerney	Emotion and Reason, 19-27	Susannah
McNerney	Intuitions, 27-39	Jack
McNerney	Positive Psychology, 39-50	Julia
McNerney	Mistakes We Make, 50-57	Amanda

In class, we will have less than ten minutes to discuss each topic. I do not expect to cover each one in depth. Pick an interesting result or two to present and do it clearly and concisely. You are also welcome to introduce other human cognitive failings into the discussion. My intent is for us to get a broad view of human intellectual shortcomings.

A last caveat: I intend our interest in human shortcomings to be general rather than particular. There are lots of sad and amusing examples (e.g. Jackass, the Darwin Awards) of individual idiocies. I don't intend to focus on these, though we might mention some of them.

Philosophy $2^2 3^3$: Intuitions and Philosophy Hamilton College
Fall 2011 Russell Marcus

Seminar Paper/Presentation Assignment

During this semester, you will write and present two seminar papers, one in the first half of the course, and one in the second half. Many classes will run as discussions of the seminar paper for that day. Seminar papers should summarize important arguments and raise questions for discussion. In contrast to a standard, rhetorical philosophy paper, seminar papers may be mainly exegetical. You need not defend a thesis in a seminar paper, though some theme will be welcome. I expect some critical examination of the readings, though it need not be fully developed. Here are some general questions you might try to answer in your seminar papers.

What is the big picture? What questions is the author attempting to answer?
What thought experiments are relevant to the author's thesis?
What experiments, or scientific research, if any, are relevant to the author's thesis?
Is the author defending or criticizing the use of intuitions in philosophy? How?
How does this philosopher's approach to a particular question relate to or differ from others we have already seen?
Is the argument in the article convincing?
Would further analysis or experimental research support or refute the author's thesis?

Your seminar papers must demonstrate attempts to grapple with the primary reading for class. You may also consider secondary readings, or background readings. You are stimulating class discussion, focusing our thoughts on the central theses, and raising questions. It is good practice to end seminar papers with a few questions you believe will be useful for the class to discuss.

You will lead the class on the day we discuss your seminar paper. You may be creative with your presentation. You may focus on the content of your paper. You may also discuss any particular difficulties in the material or topics that you were unable to cover in the paper. Your grade for the seminar paper will depend on both the paper and your presentation of it.

Each seminar paper is due at noon the day before the class in which it will be discussed (i.e. Monday or Wednesday). This deadline is necessary for all participants in the seminar to be able to read the paper and prepare comments and questions for class. You may email the paper to me first, or you may email the paper to all the members of the class directly.

All students are expected to come to class having read the seminar paper or papers for that day. Every one should be prepared to ask questions, or make comments, on the paper for that day. Comments on the paper should be constructive.

Presentation Resources:

Please feel free to meet with me before your presentations. I will try to have notes for each class available in time for you to use them in your preparation.

Many students find the Oral Communications Center, located in KJ 222, helpful. They have a wealth of resources readily available, and are eager to help. The staff at the lab can assist you both with the content of your presentation, and with determining how best to present your material. When you have prepared a draft of your presentation, they can record you while you practice giving the presentation. You can watch the recording with a tutor, or by yourself. You can sign up for an appointment with a tutor on the door of the lab, or you can email them at: oralcomm@hamilton.edu.

Sign-ups

We will sign up for both seminar papers by email after the second day of class. Dates and topics available for seminar papers and presentations are posted on line.

Philosophy 110W: Introduction to Philosophy Hamilton College
Spring 2011 Office: 210 College Hill Road, Room 201
Russell Marcus rmarcus1@hamilton.edu

Syllabus

Course Description and Objectives:

This course will survey a range of topics of interest to philosophers and prepare the student for further work in several areas of philosophy. We will examine some perennial philosophical questions and their treatments by both classical thinkers and more contemporary philosophers. Topics to be discussed include the nature of reality, the veridicality of experience, space and time, personal identity, the nature of mind, and moral judgments.

Successful study of philosophy requires both quiet study and active engagement. I expect students in this course to read serious philosophy and to participate in class discussions. This course is designated as writing-intensive, which means that you will complete four writing assignments and have some opportunity to re-write in response to comments. Students will write four papers and a final exam. Additionally, each student will prepare an in-class presentation.

Texts:

Kolak, Daniel and Raymond Martin. *Wisdom Without Answers*: A Brief Introduction to Philosophy, fifth edition. Wadsworth, 2002.
Additional articles posted on the course website
My lecture notes, posted on the course website after classes.

On-Line Resources

The website for this course is:

http://www.thatmarcusfamily.org/philosophy/Course_Websites/Intro_S11/Course_Home.html

The course website includes an html syllabus, readings, lecture notes, assignments, other handouts, and links to good philosophy websites.

Assignments, Grading, and Due Dates

1. All the readings (or other preparatory assignments) listed below.
2. In-class participation (10%)
3. Four papers (60% total)
   - Paper 1 (600-800 words) due February 9 (10%)
   - Paper 2 (800-1000 words) due February 23 (10%)
   - Paper 3 (1250-2100 words)
     - due to peer reviewers March 30
     - due to me, with revisions, April 6 (20%)
   - Paper 4 (1000-1800 words) due May 4 (20%)
4. One ten-to-fifteen minute in-class presentation (10%)
5. Final exam (20%)

The given weights are rough, and subject to adjustment.

Readings and Classes: There are three kinds of readings (or movies) in this course:

1. Expository chapters from the Kolak and Martin text;
2. Illustrative readings or movies; and
3. Philosophical texts.

The nature of class discussion will vary depending on the assigned reading (or movie). Some classes, will be discussions. Some classes will be exegetical lectures.

Our class is a cooperative endeavor, and I expect you to attend every class. There is no immediate penalty for missing class. But, our class will be small, and any absence will be noted. You should discuss any missed classes with me, preferably in advance.

Papers: All papers will engage one or more of the philosophical texts, but may invoke any of the expository work from Kolak and Martin or the illustrative readings, as well. The first two papers will be short exegeses, critical analysis of a philosophical text. The third paper will be a standard, rhetorical essay, defending a thesis. The third paper will be distributed to peer reviewers who will comment on the essay. You will hand in your original essay, your peer comments, and a final, revised draft. The fourth paper will be a second, rhetorical essay.

Standards for academic writing vary by discipline. Philosophical writing should be clear and focused and attentive to every detail. Do not be misled by the brevity of some of our assignments. Expect to revise your papers several times before submitting them. We may discuss some of your work in class. Any student work I present to the class will be anonymized.

Many Hamilton students take advantage of the excellent tutors at the writing center, located in KJ 152. I do not require that you use the writing center, but I may make a strong suggestion that you do so after the first paper. You may approach them with early drafts of a paper, or even earlier in the writing process. You must make appointments, which you can do easily at their website: http://www.hamilton.edu/writing

You are always welcome to ask for my help on a paper, **in advance of the due date**. I do not have strict guidelines about how much time you must give me before the due date, but you must not expect me to provide comments in less than two full days.

Presentations: Your presentation will be an exegetical discussion of one of the philosophy readings. A more specific assignment will be distributed in class. We will sign up for presentations early in the term.

The Oral Communication Center, in KJ 222, can help you prepare an effective presentation. If you wish, you can practice your presentation, and have it recorded and analyzed. If you wish to do use the OCC, you should make an appointment early. See their website: http://www.hamilton.edu/OralCommunication

Final Exam: For each assigned philosophical text, I will prepare reading guides, which are lists of questions corresponding to the reading. You can use the reading guides to help you determine your comprehension of the assignments. The final exam will be based directly on the reading guides.

In addition to peer tutoring, both the Writing Center and the Oral Communications Center have an astoundingly wonderful set of resources to help you write and speak more effectively. Many of these resources are available on their respective websites.

The Hamilton College Honor Code will be enforced.

Schedule

Note: The readings listed in each row are to be completed before class.

Class	Date	Topic	Readings to do Before Class
1	January 19	What is Philosophy?	--
2	January 21	Reality	K&M 7: Reality Wells, "The Country of the Blind"
3	January 26	Plato's Cave	Plato, from *Republic* Descartes, from *Meditations on First Philosophy*
4	January 28	Experience	K&M 8: Experience Watch *Inception*
5	February 2	The Primary/Secondary Distinction	Locke, "On the Primary/Secondary Distinction" Berkeley, from the *Principles*
6	February 4	Commonsense Realism	Moore, "Proof of an External World" Wittgenstein, from *On Certainty*
7	February 9 **Paper 1 due**	Space and Time	K&M 1: Where K&M 2: When
8	February 11	Absolute and Relational Space	Newton, from *Principia* Leibniz, from *Letters to Clarke*
9	February 16	The A-Theory	Zimmerman, "The Privileged Present: Defending an "A-Theory" of Time
10	February 18	The B-Theory	Smart, "The Tenseless Theory of Time"
11	February 23 **Paper 2 due**	Personal Identity	K&M 3: Who Kafka, "Metamorphosis"
12	February 25	The Soul	Plato, from *Phaedo*
13	March 2	Memory Theory	Locke, "The Prince and the Cobbler" Reid, "Of Mr. Locke's Account of Our Personal Identity"
14	March 4	Irreducibility and Essentialism	Reid, "Of Identity" Kripke, from *Naming and Necessity*
15	March 9	The Bundle Theory	Hume, "The Self" Parfit, "Divided Minds and the Nature of Persons"

16	March 11	A Case Study	Dennett, "Where Am I?"
17	March 30 **Paper 3 due to peer reviewers**	The Mind	K&M 9: Consciousness Watch *Blade Runner*
18	April 1 **Peer reviews due to authors**	Dualism	Descartes, "On the Nature of Mind" Arnauld and Descartes, On the Mind
19	April 6 **Final draft of Paper 3 due**	Behaviorism	Skinner, from *Science and Human Behavior* Hempel, "The Logical Analysis of Psychology"
20	April 8	Materialism	Armstrong, "The Nature of Mind"
21	April 13	Functionalism	Fodor, "The Mind-Body Problem"
22	April 15	Epiphenomenalism	Locke, "On the Inverted Spectrum" Jackson, "Epiphenomenal Qualia"
23	April 20	Ethics	K&M 13: Ethics, Plato, "What is Right Conduct?"
24	April 22	The Ring of Gyges	Plato, "Why Should I Be Moral"
25	April 27	Consequentialism	Mill, from *Utilitarianism* Nozick, "The Experience Machine"
26	April 29	Deontology	Kant, from *Groundwork of the Metaphysic of Morals*
27	May 4 **Paper 4 due**	Abortion and Personhood	Noonan, "Abortion is Morally Wrong" Warren, "The Personhood Argument in Favor of Abortion"

May 6: Class and Charter Day (no class)

Final Exams

Section 01: Tuesday, May 10, 9am-noon
Section 02: Wednesday, May 11, 7pm-10pm.

Office Hours

My office hours for the Spring 2011, term are 10:30am - noon, Monday through Friday. My office is in room 201 of 210 College Hill Road, which is at the northwest corner of CHR and Griffin Road.

First Paper Assignment

1. Your first paper is due at the beginning of class on February 9. It should be double spaced, approximately 600 - 800 words, in a reasonable font, such as 11 point Times, with reasonable (e.g. one-inch) margins. Late papers will be penalized.

2. The topic for your first paper should be an exegesis (critical analysis) of some portion of a single philosophical reading on the syllabus from Classes 3, 5, or 6:

    Plato, from *Republic*
    Descartes, from *Meditations on First Philosophy*
    Locke, "On the Primary/Secondary Distinction"
    Berkeley, from the *Principles*
    Moore, "Proof of an External World"
    Wittgenstein, from *On Certainty*

    You may invoke any of the expository work from Kolak and Martin or the illustrative readings, but your space is limited.

3. Standards for academic writing vary by discipline. Philosophical writing should be attentive to every detail. Write simply, and clearly. Minimize use of jargon. Observe standard rules of grammar and spelling. Avoid history and biography. Focus on the arguments.

4. Do not be misled by the brevity of the assignment. Expect to revise your paper several times before submitting it.

5. In the future, I will recommend consulting others about how to improve your papers prior to submitting them. For this assignment, please work exclusively by yourself.

6. Two important, idiosyncratic formatting guidelines:
    Do not right justify (i.e. fully justify) your paper.
    Paginate.

7. References to our assigned readings may be indicated in line: "Some truths there are so near and obvious to the mind, that a man need only open his eyes to see them" (Berkeley, §6). Other sources require a list of references at the end of the paper, along with in-line citations. Internet sources must include a live URL. I must be able to trace any source.

8. We may discuss some of your work in class. Any student work I present to the class will be anonymized.

9. You may re-write the first paper, for a possible improved grade. All rewrites must be completed by December 4.

10. Violations of academic integrity, like plagiarism, will lead to failing grades. Acknowledge any assistance you have had on your paper.

The Hamilton College Honor Code will be enforced.

The following guidelines apply to a standard rhetorical paper. Our first paper assignment is to present only an exegetical portion of a rhetorical paper.

Some General Guidelines For Writing A Philosophy Paper

1. Introduce your paper by briefly stating your thesis, the conclusion you will defend. Be specific. Your paper should be an extended argument supporting your thesis.

2. Argue for your thesis. Each element of your paper should relate directly to your specific thesis. When editing your paper, think about the role that each paragraph plays in support of your thesis. Think about the role that each sentence plays in each paragraph.

3. Provide plenty of road signs along the way. (E.g. "First I will argue..., then I will argue..."; "In the last section, I showed that...") Make sure that you and the reader know the narrative structure of your paper, and the role of each part.

4. Connect, rather than merely concatenate, the various assertions in your paper. Beware of beginning paragraphs or sentences with claims like, "Another argument is..." Show how each of the portions of your paper fit together.

5. Consider the best objections to any thesis you defend. Consider responses to those objections, and counter-responses. Avoid straw persons, arguments which no one really holds but which are easy to refute.

6. Avoid arguments from authority. Do not accept without question what any philosopher says. Argue your own point of view, but through the writings of the philosophers.

7. Conclude your essay by summarizing what you intended to say in the paper. You may indicate questions for further research. You may indicate the limits of your argument. (E.g. "My argument only shows that Descartes's argument is faulty, not that his conclusion is false.")

8. Write tight. Edit down.

Links to excellent advice for writing philosophy papers are available on the course website.

Second Paper Assignment

1. Your second paper is due at the beginning of class on February 23. It should be double spaced, approximately 800-1000 words, in a reasonable font, such as 11 point Times, with reasonable (e.g. one-inch) margins. Late papers will be penalized.

2. In your second paper, compare and contrast the arguments of two philosophers on a single topic discussed in Classes 7-10. You may choose between comparing the arguments of Newton and Leibniz on the nature of space and comparing the arguments of Zimmerman and Smart on the nature of time. You may invoke any of the expository work from Kolak and Martin or the illustrative readings, but your space is limited.

3. Standards for academic writing vary by discipline. Philosophical writing should be attentive to every detail. Write simply, and clearly. Minimize use of jargon. Observe standard rules of grammar and spelling. Avoid history and biography. Focus on the arguments.

4. Do not be misled by the brevity of the assignment. Expect to revise your paper several times before submitting it.

5. Feel free to consult others about how to improve your papers prior to submitting them. The Writing Center has excellent peer tutoring; make an appointment in advance. Acknowledge any assistance you have had on your paper.

6. Two important, idiosyncratic formatting guidelines:
   Do not right justify (i.e. fully justify) your paper.
   Paginate.

7. References to our assigned readings may be indicated in line: “Some truths there are so near and obvious to the mind, that a man need only open his eyes to see them” (Berkeley, §6). Other sources require a list of references at the end of the paper, along with in-line citations. Internet sources must include a live URL. I must be able to trace any source.

8. We may discuss some of your work in class. Any student work I present to the class will be anonymized.

9. You may re-write the second paper, for a possible improved grade. All rewrites must be completed by December 4.

10. Violations of academic integrity, like plagiarism, will lead to failing grades.

The Hamilton College Honor Code will be enforced.

Third Paper Assignment

1. Your third paper is due in two stages. It is due to peer reviewers at the beginning of class on March 30. Peer reviews are due to authors at the beginning of the next class, April 1. The final draft of your paper, along with an original draft and the peer-review comments you received, is due on April 6. Your paper should be double spaced, approximately 1250 - 2100 words, in a reasonable font, such as 11 point Times, with reasonable (e.g. one-inch) margins. Late papers will be penalized.

2. Your third paper should be a standard, rhetorical paper, defending a thesis. The topic of your paper should be some theme from our readings on personal identity, Classes 11-16:

    Plato, from *Phaedo*
    Locke, "The Prince and the Cobbler"
    Reid, "Of Mr. Locke's Account of Our Personal Identity"
    Reid, "Of Identity"
    Kripke, from *Naming and Necessity*
    Hume, "The Self"
    Parfit, "Divided Minds and the Nature of Persons"
    Dennett, "Where Am I?"

3. Standards for academic writing vary by discipline. Philosophical writing should be attentive to every detail. Write simply, and clearly. Minimize use of jargon. Observe standard rules of grammar and spelling. Avoid history and biography. Focus on the arguments.

4. Feel free consult the Writing Center in addition to the class peer-review process. Remember to acknowledge all assistance you have had on your paper.

5. Two important, idiosyncratic formatting guidelines:
    Do not right justify (i.e. fully justify) your paper.
    Paginate.

6. References to our assigned readings may be indicated in line: "Some truths there are so near and obvious to the mind, that a man need only open his eyes to see them" (Berkeley, §6). Other sources require a list of references at the end of the paper, along with in-line citations. Internet sources must include a live URL. I must be able to trace any source.

7. We may discuss some of your work in class. Any student work I present to the class will be anonymized.

8. You may not re-write the third paper for an improved grade.

9. Violations of academic integrity, like plagiarism, will lead to failing grades.

The Hamilton College Honor Code will be enforced.

Instructions to Peer Reviewers

1. Provide the author of the paper you are reviewing with criticism that you believe will help the author improve the paper. Make sure to indicate both what is good in the paper and what could use improvement.

2. Focus on the philosophical content of the paper. You may make suggestions about grammar, word choice, sentence structure, and organization. But, try to focus on the arguments.

> Is the author's thesis clear?
> Are the exegetical passages correctly interpreted?
> Does the body of the paper support the thesis?
> Is the narrative cohesive?
> How could the author improve the paper?

3. All comments should be made respectfully and tactfully. Be honest and critical. Make sure that you understand the difference between being critical, which is good, and being rude. Focus on the paper, rather than the author to avoid personal attacks. It is better to write, "The paper contains dangling participles," than, "You dangle your participles."

4. You have two days to complete your peer reviews. Hard copies of your comments, roughly 300-600 words, are due to the authors at the beginning of class on April 1.

Fourth Paper Assignment

1. Your fourth paper is due at the beginning of class on May 4. Your paper should be double spaced, approximately 1000 - 1800 words, in a reasonable font, such as 11 point Times, with reasonable (e.g. one-inch) margins. Late papers will be penalized.

2. Your fourth paper should be a standard, rhetorical paper, defending a thesis. The topic of your paper should be some theme from our readings on either the nature of mind or ethics, Classes 17-27:

Mind	Ethics
Descartes, "On the Nature of Mind"	Plato, "What is Right Conduct?"
Arnauld and Descartes, On the Mind	Plato, "Why Should I Be Moral"
Skinner, from *Science and Human Behavior*	Mill, from *Utilitarianism*
Hempel, "The Logical Analysis of Psychology"	Nozick, "The Experience Machine"
Armstrong, "The Nature of Mind"	Kant, from *Groundwork of the Metaphysic of Morals*
Fodor, "The Mind-Body Problem"	Noonan, "Abortion is Morally Wrong"
Locke, "On the Inverted Spectrum"	Warren, "The Personhood Argument in Favor of Abortion"
Jackson, "Epiphenomenal Qualia"	

3. Standards for academic writing vary by discipline. Philosophical writing should be attentive to every detail. Write simply, and clearly. Minimize use of jargon. Observe standard rules of grammar and spelling. Avoid history and biography. Focus on the arguments.

4. Feel free consult the peer tutors in the Writing Center. Remember to acknowledge all assistance you have had on your paper.

5. Two important, idiosyncratic formatting guidelines:
   Do not right justify (i.e. fully justify) your paper.
   Paginate.

6. References to our assigned readings may be indicated in line: "Some truths there are so near and obvious to the mind, that a man need only open his eyes to see them" (Berkeley, §6). Other sources require a list of references at the end of the paper, along with in-line citations. Internet sources must include a live URL. I must be able to trace any source.

7. We may discuss some of your work in class. Any student work I present to the class will be anonymized.

8. You may not re-write the fourth paper for an improved grade.

9. Violations of academic integrity, like plagiarism, will lead to failing grades.

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Supplemental End-of-Term Course Evaluation

1. Please rank the topics in the course from 1-5, with 1 being your favorite.

◯ Metaphysics/Epistemology
◯ Space and Time
◯ Personal Identity
◯ Philosophy of Mind
◯ Ethics

2. For my own learning, preparing and doing my presentation was:

◯ very valuable ◯ somewhat valuable ◯ not very valuable

3. For my own learning, listening to other people's presentations was, overall:

◯ very valuable ◯ somewhat valuable ◯ not very valuable

4. Agree or disagree: "I found preparing for the presentation to be very hard work."

◯ agree ◯ disagree

5. Agree or disagree: "For future terms, I would recommend *not* assigning any presentations. The lecture and discussion were more productive."

◯ agree ◯ disagree

6. How useful did you find the movies and fiction readings for understanding the philosophical content of the course?

◯ very valuable ◯ somewhat valuable ◯ not very valuable

7. Pick one:

◯ Future classes should have more movies
◯ Stick to the purely philosophical readings

8. How would you feel about taking this course as a larger, non-writing-intensive class? (You may choose more than one response.)

◯ It would be more enjoyable.
◯ I'd worry about the size of the course suppressing discussion.
◯ I wouldn't have taken the course if it weren't writing intensive.

9. Would you prefer to have had a midterm, given that there is going to be a final?

◯ Yes, it would have prepared me for the final.
◯ No, one exam is enough.

10. Please comment on the amount of work you did for this course.

◯ It was more work than I should have been expected to do.
◯ It was a reasonable load.
◯ I got by without doing much work.
◯ Work? Hah! My infinite mind grasps all philosophical concepts immediately.

11. Here is a list of all the readings (or movies) I assigned. Please indicate if you think the reading was exceptionally good or exceptionally bad. You need not mark every reading (or any, but please try)!

Exceptionally Good		Exceptionally Bad
◯	Kolak and Martin, *Wisdom Without Answers*	◯
◯	Wells, "The Country of the Blind"	◯
◯	Plato, from *Republic*	◯
◯	Descartes, from *Meditations on First Philosophy*	◯
◯	*Inception*	◯
◯	Locke, "On the Primary/Secondary Distinction"	◯
◯	Berkeley, from the *Principles*	◯
◯	Moore, "Proof of an External World"	◯
◯	Wittgenstein, from *On Certainty*	◯
◯	Newton, from *Principia*	◯
◯	Leibniz, from *Letters to Clarke*	◯
◯	Zimmerman, "The Privileged Present: Defending an "A-Theory" of Time	◯
◯	Smart, "The Tenseless Theory of Time"	◯
◯	Kafka, "Metamorphosis"	◯
◯	Plato, from *Phaedo*	◯
◯	Locke, "The Prince and the Cobbler"	◯
◯	Reid, "Of Mr. Locke's Account of Our Personal Identity"	◯
◯	Reid, "Of Identity"	◯
◯	Kripke, from *Naming and Necessity*	◯
◯	Hume, "The Self"	◯
◯	Parfit, "Divided Minds and the Nature of Persons"	◯
◯	Dennett, "Where Am I?"	◯
◯	*Blade Runner*	◯
◯	Descartes, "On the Nature of Mind"	◯
◯	Arnauld and Descartes, On the Mind	◯
◯	Skinner, from *Science and Human Behavior*	◯
◯	Hempel, "The Logical Analysis of Psychology"	◯
◯	Armstrong, "The Nature of Mind"	◯
◯	Fodor, "The Mind-Body Problem"	◯
◯	Locke, "On the Inverted Spectrum"	◯
◯	Jackson, "Epiphenomenal Qualia"	◯
◯	Plato, "What is Right Conduct?"	◯
◯	Plato, "Why Should I Be Moral"	◯
◯	Mill, from *Utilitarianism*	◯
◯	Nozick, "The Experience Machine"	◯
◯	Kant, from *Groundwork of the Metaphysic of Morals*	◯
◯	Noonan, "Abortion is Morally Wrong"	◯
◯	Warren, "The Personhood Argument in Favor of Abortion"	◯

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Toward a Primary/Secondary Distinction

Note to reader: This is a worksheet I use in a short, small-group lesson applying The Boyle-Galileo-Locke Primary/Secondary distinction.

Using LP1, LP2, and their corollaries, rank each quality of an apple from 1 (veridical) to 5 (mis-representative).

LP1: If one perceives an object as having two (or more) incompatible ideas, then those ideas do not represent real properties of the object.
LP1C1: Even if a change in us entails the change in the perceived quality, the ideas which change can not be veridical.
LP1C2: Qualities that appear different to different observers are not veridical.

LP2: If an idea of an object is the same under all conditions, that idea is veridical.
LP2C: If every observer receives the same idea from an object, then that idea is veridical.

Then, determine which properties you think are not really qualities of an apple and those which really are qualities of the apple.

_____ Red
_____ Round
_____ Cool to the touch
_____ Sweet, though a bit sour
_____ Shiny
_____ Smooth
_____ Crunchy, when chewed
_____ Weighs 4 oz.
_____ Has a mass of 120 grams
_____ Sits still on the table
_____ Is one apple
_____ Being considered by you
_____ Smells like an apple

A Group Exercise on Zeno's Paradoxes

Note to reader: I use the following pages as a 75-minute group exercise (a jigsaw lesson) on Zeno's paradoxes of motion and their solutions. For a sketch of the structure of a jigsaw lesson, see my instructions for a jigsaw lesson for identity theory in logic, above. The questions for each group to consider are provided here after the worksheets.

Zeno's Paradox #1. The Achilles

Achilles, who is the fastest runner of antiquity, is racing to catch the tortoise that is slowly crawling away from him. Both are moving along a linear path at constant speeds. In order to catch the tortoise, Achilles will have to reach the place where the tortoise presently is. However, by the time Achilles gets there, the tortoise will have crawled to a new location. Achilles will then have to reach this new location. By the time Achilles reaches that location, the tortoise will have moved on to yet another location, and so on forever. Zeno claims Achilles will never catch the tortoise. He might have defended this conclusion in various ways—by saying it is because the sequence of goals or locations has no final member, or requires too much distance to travel, or requires too much travel time, or requires too many tasks. However, if we do believe that Achilles succeeds and that motion is possible, then we are victims of illusion, as Parmenides says we are.

It won't do to react and say the solution to the paradox is that there are biological limitations on how small a step Achilles can take. Achilles' feet aren't obligated to stop and start again at each of the locations described above, so there is no limit to how close one of those locations can be to another. It is best to think of the change from one location to another as a movement rather than as incremental steps requiring halting and starting again. Zeno is assuming that space and time are infinitely divisible; they are not discrete or atomistic. If they were, the Paradox's argument would not work.

One common complaint with Zeno's reasoning is that he is setting up a straw man because it is obvious that Achilles cannot catch the tortoise if he continually takes a bad aim toward the place where the tortoise is; he should aim farther ahead. The mistake in this complaint is that even if Achilles took some sort of better aim, it is still true that he is required to go to every one of those locations that are the goals of the so-called "bad aims."

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Standard Solution to Zeno's Paradox #1. The Achilles

Achilles' path [the path of some dimensionless point of Achilles' body] is a linear continuum and so is composed of an actual infinity of points. (An actual infinity is also called a "completed infinity" or "transfinite infinity.") Achilles travels a distance d_1 in reaching the point x_1 where the tortoise starts, but by the time Achilles reaches x_1, the tortoise has moved on to a new point x_2. When Achilles reaches x_2, having gone an additional distance d_2, the tortoise has moved on to point x_3, and so forth. This sequence of non-overlapping distances (or intervals or sub-paths) is an actual infinity, but happily the sum of its terms $d_1 + d_2 + d_3 + \ldots$ is a finite distance that Achilles can readily complete while moving at a constant speed, because the sequence of sub-paths converges fast enough. In his argument, Zeno drew the incorrect conclusion that the sequence cannot be completed because it has no final member (or requires too much distance to travel, or requires too much travel time).

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Zeno's Paradox #2. The Dichotomy (Racetrack)

In his Progressive Dichotomy Paradox, Zeno argued that a runner will never reach a fixed goal along the racetrack. The reason is that the runner must first reach half the distance to the goal, but when there he must then cross half the remaining distance, then half of the new remainder, and so on. If the goal is one meter away, the runner must cover a distance of 1/2 meter, then 1/4 meter, then 1/8 meter, and so on ad infinitum. The runner cannot reach the final goal, says Zeno.

The runner will not reach the final goal for four reasons: (1) there is not enough time, (2) there is too far to run, (3) the actually infinite sequence has no final member, and (4) there are so many tasks to complete.

The problem of the runner getting to the goal can be viewed from a different perspective. According to the Regressive version of the Dichotomy Paradox, the runner cannot even take a first step. Here is why. Any step may be divided conceptually into a first half and a second half. Before taking a full step, the runner must take a 1/2 step, but before that he must take a 1/4 step, but before that a 1/8 step, and so forth ad infinitum, so Achilles will never get going. The original distance between the runner and the goal is not relevant.

The Dichotomy paradox, in either its Progressive version or its Regressive version, assumes for the sake of simplicity that the runner's positions are point places. Actual runners take up some space. But this is not a controversial assumption because Zeno could have reconstructed his paradox by speaking of the point places occupied by the tip of the runner's nose.

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Standard Solution to Zeno's Paradox #2. The Dichotomy (Racetrack)

The runner reaches the points 1/2 and 3/4 and 7/8 and so forth on the way to his goal, but under the influence of Bolzano and Cantor, who developed the first theory of sets, the set of those points is no longer considered to be potentially infinite. It is an actually infinite set of points abstracted from a continuum of points–in the contemporary sense of "continuum" at the heart of calculus. And the ancient idea that the actually infinite series of path lengths $1/2 + 1/4 + 1/8 + \ldots$ is infinite had to be rejected in favor of the new theory that it converges to 1.

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Zeno's Paradox #3. The Arrow

A moving arrow must occupy a space equal to itself at any moment. That is, at any moment it is at the place where it is. But places do not move. So, if at each moment, the arrow is occupying a space equal to itself, then the arrow is not moving at that moment because it has no time in which to move; it is simply there at the place. The same holds for any other moment during the so-called "flight" of the arrow. So, the arrow is never moving. Similarly, nothing else moves.

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Standard Solution to Zeno's Paradox #3. The Arrow

The Standard Solution to the Arrow Paradox uses the "at-at" theory of motion, which says that being at rest involves being motionless at a particular point at a particular time, and that being in motion does, too. The difference between rest and motion has to do with what is happening at nearby moments. An object cannot be in motion in an instant, but it can be in motion at an instant in the sense of having a speed at that instant, provided the object occupies different positions at times before or after that instant so that the instant is part of a period in which the arrow is continuously in motion.

Zeno would have balked at the idea of motion at an instant, believing that all motion occurs only over a duration of time, and that durations divide into intervals but never into indivisible instants. However, in calculus, speed at an instant (instantaneous velocity) is the limit of the speed over an interval as the length of the interval tends to zero. The derivative of position x with respect to time t, namely dx/dt, is the arrow's speed, and it has non-zero values at specific places at specific instants during the flight, contra Zeno. The speed during an instant or in an instant, which is what Zeno is calling for, would be 0/0 and so is undefined. Using these modern concepts, Zeno cannot successfully argue that at each moment the arrow is at rest or that the speed of the arrow is zero at every instant. Therefore, advocates of the Standard Solution conclude that Zeno's Arrow Paradox has a false, but crucial, assumption and so is unsound.

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Zeno's Paradox #4. Limited and Unlimited

Suppose there exist many things. Then there will be a definite or fixed number of those many things, and so they will be "limited." But if there are many things, say two things, then they must be distinct, and to keep them distinct there must be a third thing separating them. So, there are three things. But between these, …. In other words, things are dense and there is no definite or fixed number of them, so they will be "unlimited." This is a contradiction, because the plurality would be both limited and unlimited.

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Standard Solution to Zeno's Paradox #4. Limited and Unlimited

The weakness of Zeno's argument can be said to lie in the assumption that "to keep them distinct, there must a third thing separating them." Zeno would have been correct to say that between any two physical objects that are separated in space, there is a place between them, because space is dense, but he is mistaken to claim that there must be a third physical object there between them. Two objects can be distinct at a time simply by one having a property the other does not have.

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Zeno's Paradox #5. Large and Small

Suppose there exist many things. These things must be composed of parts which are not themselves pluralities. Yet things that are not pluralities cannot have a size or else they'd be divisible into parts and thus be pluralities themselves.

But the parts of pluralities are so large as to be infinite. The parts cannot be so small as to have no size since adding such things together would never contribute anything to the whole so far as size is concerned. So, the parts have some non-zero size. If so, then each of these parts will have two spatially distinct sub-parts, one in front of the other. Each of these sub-parts also will have a size. The front part, being a thing, will have its own two spatially distinct sub-parts, one in front of the other; and these two sub-parts will have sizes. Ditto for the back part. And so on without end. A sum of all these sub-parts would be infinite. Therefore, each part of a plurality will be so large as to be infinite.

Thus every part of any plurality is both so small as to have no size but also so large as to be infinite.

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Standard Solution to Zeno's Paradox #5. Large and Small

There are many errors here in Zeno's reasoning, according to the Standard Solution. He is mistaken at the beginning when he says, "If there is a plurality, then it must be composed of parts which are not themselves pluralities." A university is an illustrative counterexample. A university is a plurality of students, but we need not rule out the possibility that a student is a plurality. What's a whole and what's a plurality depends on our purposes. When we consider a university to be a plurality of students, we consider the students to be wholes without parts. But for another purpose we might want to say that a student is a plurality of biological cells. Zeno is confused about this notion of relativity, and about part-whole reasoning.

A second error occurs in arguing that the each part of a plurality must have a non-zero size. In 1901, Henri Lebesgue showed how to properly define the measure function so that a line segment has nonzero measure even though (the singleton set of) any point has a zero measure. Lebesgue's theory is our current civilization's theory of measure, and thus of length, volume, duration, mass, voltage, brightness, and other continuous magnitudes.

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Zeno's Paradox #6. Infinite Divisibility

Imagine cutting an object into two non-overlapping parts, then similarly cutting these parts into parts, and so on until the process of repeated division is complete. Assuming the hypothetical division is "exhaustive" or does comes to an end, then at the end we reach what Zeno calls "the elements." Here there is a problem about reassembly. There are three possibilities. (1) The elements are nothing. In that case the original objects will be a composite of nothing, and so the whole object will be a mere appearance, which is absurd. (2) The elements are something, but they have zero size. So, the original object is composed of elements of zero size. Adding an infinity of zeros yields a zero sum, so the original object had no size, which is absurd. (3) The elements are something, but they do not have zero size. If so, these can be further divided, and the process of division was not complete after all, which contradicts our assumption that the process was already complete. In summary, there were three possibilities, but all three possibilities lead to absurdity. So, objects are not divisible into a plurality of parts.

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Standard Solution to Zeno's Paradox #6. Infinite Divisibility

We first should ask Zeno to be clearer about what he is dividing. Is it concrete or abstract? When dividing a concrete, material stick into its components, we reach ultimate constituents of matter such as quarks and electrons that cannot be further divided. These have a size, a zero size (according to quantum electrodynamics), but it is incorrect to conclude that the whole stick has no size if its constituents have zero size. [Due to the forces involved, point particles have finite "cross sections," and configurations of those particles, such as atoms, do have finite size even if composed of zero-size quarks and electrons.] So, Zeno is wrong here.

On the other hand, is Zeno dividing an abstract path or trajectory? Let's assume he is, since this produces a more challenging paradox. If so, then choice (2) above is the one to think about. It's the one that talks about addition of zeroes. Let's assume the object is one-dimensional, like a path. According to the Standard Solution, this "object" that gets divided should be considered to be a continuum with its elements arranged into the order type of the linear continuum, and we should use Lebesgue's notion of measure to find the size of the object. The size (length, measure) of a point-element is zero, but Zeno is mistaken in saying the total size (length, measure) of all the zero-size elements is zero. The size of the object is determined instead by the difference in coordinate numbers assigned to the end points of the object. An object extending along a straight line that has one of its end points at one meter from the origin and other end point at three meters from the origin has a size of two meters and not zero meters. So, there is no reassembly problem, and a crucial step in Zeno's argument breaks down.

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Zeno's Paradox #7. The Grain of Wheat

Version 1: When a bushel of wheat grains crashes to the floor, it makes a sound. Since the bushel is composed of individual grains, each individual grain also makes a sound, as should each thousandth part of the grain, and so on to its ultimate parts. But this result contradicts the fact that we actually hear no sound for portions like a thousandth part of a grain, and so we surely would hear no sound for an ultimate part of a grain. Yet, how can the bushel make a sound if none of its ultimate parts make a sound?

Version 2: When a bushel of wheat grains crashes to the floor, it makes a sound. The bushel is composed of individual grains, so they, too, make an audible sound. But if you drop an individual millet grain or a small part of one or an even smaller part, then eventually your hearing detects no sound, even though there is one. Therefore, you cannot trust your sense of hearing.

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Standard Solution to Zeno's Paradox #7. The Grain of Wheat

Zeno mistakenly assumes that there is no lower bound on the size of something that can make a sound. There is no problem, we now say, with parts having very different properties from the wholes that they constitute. The iterative rule is initially plausible but ultimately not trustworthy, and Zeno is committing both the fallacy of division and the fallacy of composition.

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Zeno's Paradoxes[1]

Work groups questions:

1. What assumptions about space, motion, or time does Zeno make? Are these assumptions commonsensical? Are they defensible?

2. Can the paradox be solved by abandoning one or more assumptions?

3. Consider the standard solution. Are there alternatives?

Base group questions

1. How are the standard solutions similar?

2. Do Zeno's paradoxes point to a serious worry about space?

3. Can we solve the paradoxes without denying the existence of change?

[1]Adapted from http://www.iep.utm.edu/zeno-par/#H3

Philosophy 405: Knowledge, Truth and Mathematics
Fall 2010
Mondays and Wednesdays: 2:30pm - 3:45pm
Library 211

Hamilton College
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Syllabus

Course Description and Overview:

This course is divided into two parts. The first part, covering roughly the first nine weeks of the term, is an historical survey of the philosophical questions which arise from considering how to explain our knowledge of mathematics. Do we have a priori knowledge of necessary truths? Is our knowledge of mathematics empirical? Do we really have mathematical knowledge at all? The readings in the first part of the course, covered mainly chronologically, range from ancient philosophy through the twentieth century, with special attention paid to the fruitful period between Frege, in the late nineteenth century, and Gödel. We will devote the second part of the course, the last five weeks of the term, to recent work, including my own, on the indispensability argument.

Mathematics has a long and prominent place in philosophy. Plato's students were implored to excel in mathematics; a sign over the door to his Academy said, "Let no one enter who is ignorant of geometry." Aristotle wrote, "Mathematics has come to be the whole of philosophy for modern thinkers" (*Metaphysics* I.9: 992a32).

Some prominent philosophers in the early modern period were mathematicians, including Descartes, who developed analytic geometry, and Leibniz, who developed the calculus. In the late nineteenth and early twentieth centuries, philosophers including Frege and Russell made advances in the foundations of mathematics proper. In recent years, many philosophers have made contributions to set theory and mathematical logic, independently of their philosophical work.

In the other direction, mathematicians from Euclid forward have contributed to philosophy. Cantor's work on transfinite numbers transformed the philosopher's concept of infinity, which had played a central role in philosophical debate about God and the origins of the universe for millennia. Other philosophical topics like necessity and contingency have received mathematical treatment which has changed the way philosophers argue about these concepts. Indeed some mathematicians, like Hilbert, Gödel, von Neumann, and Tarski, are central philosophical figures.

Even philosophers who have not contributed to mathematics have made mathematical insights central to their work. Berkeley tried to debunk the calculus on philosophical grounds. Kant's transcendental idealism begins with the question of what the structure of our reasoning must be in order to yield mathematical certainty. Wittgenstein's *Remarks on the Foundations of Mathematics* contain core elements of his philosophical positions.

Still, even philosophers who spend time with mathematics deny that the relationship of mathematics to philosophy is particularly close. Wittgenstein wrote that philosophy, "Leaves mathematics as it is, and no mathematical discovery can advance it." (*Philosophical Investigations*, §124) Kripke implored that, "There is no mathematical substitute for philosophy."

In this course, in addition to examining the philosophical questions which arise from considerations of our knowledge of mathematics, we will try to see what makes mathematics so interesting to philosophers, and also what contributions mathematics can make to philosophy.

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.
Various readings, available on the course website

On-Line Resources:

The website for this course is:

http://www.thatmarcusfamily.org/philosophy/Course_Websites/Math_F10/Course_Home.html

Limited material will be available on the Blackboard course pages. The Blackboard page will include a link to the course website. The course website includes an html syllabus, course schedule, course bibliography, class notes, assignments, other readings and handouts, and links to websites specifically selected for this course.

Assignments and Grading

Your responsibilities for this course include the following, with their contributions to your grade calculation in parentheses:

1. All the primary readings listed below, including seminar papers.
2. Twenty reading prècises (10%)
3. Two seminar papers/presentations (2-4 pages; 5-10 minutes) (40%; 20% each)
4. Term paper (8-12 pages) (30%)
5. Final exam (20%)

Readings are to be completed before the class indicated. The Primary Readings are required; the secondary readings are optional. Some secondary readings, notably the readings from the Brown and Shapiro texts, are introductory elucidations of the primary readings. Some secondary readings are further scholarly articles on a given topic, critical commentaries on the primary readings, or extended studies of a point we will study only briefly. All of the readings on the syllabus that are not from either the Brown or Shapiro texts will be accessible from the course website. The course bibliography includes further readings, many of which are also accessible from the course website.

Reading prècises are 100- to 150- word summaries, or distillations, of some portion of an assigned reading. In preparing for most classes, you should write one prècis before class. You may choose to write about an entire reading, or to focus on a small portion of one reading. If there is more than one reading, you may choose one reading on which to focus. You need not complete prècises for the two classes in which you are presenting a seminar paper. In lieu of up to five prècises, you can write a list of 6-8 detailed questions on the reading. Your twenty prècises are due on **Friday, December 10, at 4pm**. You will mainly be graded on the completion of twenty prècises, rather than their quality. I expect that the prècises will be useful to you in preparing both for classes and for the final exam.

Many classes will run as extended discussions of a 750- to 1500-word **seminar paper**. Seminar papers should assimilate the assigned readings and summarize the main arguments. I also encourage you to include some critical analysis. You are instigating class discussion, focusing our thoughts on the central theses, and raising questions. It is good practice to end a seminar paper with a few questions you

believe will be useful for the class to consider. Each seminar paper is **due at noon by email to all seminar participants the day before the class in which it will be discussed** (i.e. Sunday or Tuesday). This deadline is necessary for all participants in the seminar to be able to read the paper and prepare comments and questions for class.

You will lead the class on the day we discuss your seminar paper. You may be creative with your presentation. You may focus on the content of your paper. You may also discuss any particular difficulties in the material, or topics that you were unable to cover in the paper. Your grade for the seminar paper will depend on both the paper and your presentation of it. Each student in the course will write and present two seminar papers.

Your **term papers** will be completed in three stages. A one-paragraph abstract of you paper is due on **Wednesday, October 13**. A full draft of your term paper is due on **Monday, November 15**. The final draft is due on **Monday, December 6**. See the Paper Assignment handout for various options for paper topics. I will be happy to meet with you to discuss your topic, in advance. Failure to hand in a draft, or handing in an insufficient draft, will reduce your final paper grade by two steps (e.g. from B+ to B-).

The **final exam** will be on **Wednesday, December 15**, from 9am to noon. Preparatory questions will be posted on the course website.

Both the Writing Center and the Oral Communications Center have an astoundingly wonderful set of resources to help you write and speak more effectively.

The Hamilton College Honor Code will be enforced.

Contacting Me

My office hours for the Fall 2010, term are 10:30am - noon, Monday through Friday. My office is room 201 of 210 College Hill Road, which is at the northwest corner of CHR and Griffin Road. My email address is rmarcus1@hamilton.edu.

Schedule:

	Date	Topic	Primary Readings	Secondary Readings
1	Monday, August 30	What is Mathematics? What is Philosophy of Mathematics?	Brown, Chapter 1 Shapiro, pp 21-29	
2	Wednesday, September 1	Pythagoras and the Pythagoreans	Kline, "The Creation of Classical Greek Mathematics" Kline, "The Greek Rationalization of Nature"	
3	Monday, September 6	Plato's Platonism	Selections from Plato on Mathematics Aristotle, *Metaphysics* I.9	Shapiro, pp 49-63 Brown, Chapter 2
4	Wednesday, September 8	Aristotle	Aristotle, *Metaphysics* XIII.1-3 Aristotle, *Physics* II.2 Lear, "Aristotle's Philosophy of Mathematics"	Shapiro, pp 63-71 Aristotle, *Metaphysics* XIII-XIV
5	Monday, September 13	Modern Rationalism I	Descartes, Third and Fifth Meditations Descartes, Synthetic Presentation from Second Replies Leibniz, "Meditations on Knowledge, Truth, and Ideas"	Kline, "Coordinate Geometry" Kline, "The Mathematization of Science"
6	Wednesday, September 15	Modern Rationalism II	Locke, *Essay*, Bk 1, Ch. 1 Leibniz, Selections from *New Essays*	Kline, "The Creation of the Calculus"
7	Monday, September 20	Modern Empiricism	Locke, *Selections on Mathematics* Selections from Berkeley's *Principles* Selections from Hume on Mathematics	
8	Wednesday, September 22	The Synthetic *A Priori* I	Kant, *Prolegomena*, §§1-2 Selections from Kant's *Critique*	Shapiro, pp 76-91
9	Monday, September 27	The Synthetic *A Priori* II		
10	Wednesday, September 29	Radical Empiricism	Mill, *System of Logic*, Book II, §V and §VI Frege, from *The Foundations of Arithmetic*, I	Shapiro, pp 91-102

	Date	Topic	Primary Readings	Secondary Readings
11	Monday, October 4	Cantor's Paradise	Tiles, "Cantor's Transfinite Paradise"	Dauben, "Cantor's Philosophy of the Infinite" Tiles, "Numbering the Continuum"
12	Wednesday, October 6	Logicism	Frege, from *The Foundations of Arithmetic*, II Russell, "Letter to Frege" Frege, "Letter to Russell"	Shapiro, pp 107-115 Russell, "On Our Knowledge of General Principles" Russell, "How *A Priori* Knowledge is Possible"
13	Monday, October 11	Formalism and Incompleteness	Hilbert, "On the Infinite" Johann von Neumann, "The Formalist Foundations of Mathematics"	Brown, Chapter 5 Shapiro, pp 140-168 Smullyan, "The General Idea Behind Gödel's Proof"
14	Wednesday, October 13 **Abstracts due**	Gödel Platonism	"What is Cantor's Continuum Problem? (1964)"	Shapiro, pp 201-212 Brown, Chapter 11 Feferman, et al., "Introductory Note..." Gödel, "What is Cantor's Continuum Problem? (1947)
15	Monday, October 18	Intuitionism	Heyting, "Disputation" Brouwer, "Intuitionism and Formalism" Brouwer, "Consciousness, Philosophy, and Mathematics"	Brown, Chapter 8 Shapiro, pp 172-189
16	Wednesday, October 20	Conventionalism	Carnap, "Empiricism, Semantics and Ontology" Ayer, "The A Priori"	Shapiro, pp 124-133 Brown, Chapter 9
17	Monday, October 25	Two Dogmas of Empiricism	Quine, "Two Dogmas of Empiricism"	Shapiro, pp 212-220 Grice and Strawson, "In Defense of a Dogma"
18	Wednesday, October 27	The Problem	Benacerraf, "Mathematical Truth" Field, "Knowledge of Mathematical Entities"	Shapiro, pp 29-39
19	Monday, November 1	The Indispensability Argument	Quine, "Existence and Quantification" Quine, "On What There Is" Quine on Recreation	Azzouni, "On 'On What There Is'" Marcus, "Quine's Indispensability Argument"
20	Wednesday, November 3	Dispensabilism I	Field, from *Science without Numbers*	Shapiro, pp 226-237 Brown, Chapter 4

	Date	Topic	Primary Readings	Secondary Readings
21	Monday, November 8	Dispensabilism II	Field, "Introduction: Fictionalism, Epistemology, and Modality" MacBride, "Listening to Fictions: A Study of Fieldian Nominalism"	Melia, "Field's Programme: Some Interference"
22	Wednesday, November 10	The Weasel	Melia, "Weaseling Away the Indispensability Argument"	Colyvan, "Mathematics and Aesthetic Considerations in Science? Melia, "Response to Colyvan"
23	Monday, November 15 **Draft due**	The Eleatic and the Indispensabilist	Colyvan, "The Quinean Backdrop" Colyvan, "The Eleatic Principle"	Marcus, "The Eleatic and the Indispensabilist"
24	Wednesday, November 17	Mathematical Recreation	Leng, "What's Wrong with Indispensability? (Or, the Case for Recreational Mathematics)" Colyvan, "Mathematical Recreation versus Mathematical Knowledge"	Marcus, "Why the Indispensability Argument Does Not Justify Belief in Mathematical Objects" Maddy, "Indispensability and Practice" Sober, "Mathematics and Indispensability"
25	Monday, November 29	The Explanatory Argument	Baker, "Are There Genuine Mathematical Explanations of Physical Phenomena?" Mancosu, "Mathematical Explanation: Problems and Prospects," §3	Lyon and Colyvan, "The Explanatory Power of Phase Spaces"
26	Wednesday, December 1	The Nominalist Against the Explanatory Argument	Bangu, "Inference to the Best Explanation and Mathematical Realism"	
27	Monday, December 6 **Paper due**	The Platonist Against the Explanatory Argument	Marcus, "Explanation and Indispensability"	Brown, Chapter 3
28	Wednesday, December 8	Contemporary Platonism	Katz, "Conclusion: The Problems of Philosophy" Katz, "The Epistemic Challenge to Realism" Katz, "Toward a Realistic Rationalism"	Marcus, "Toward Autonomy Realism"

Prècises due: Friday, December 10
Final Exam: Wednesday, December 15, 9am.

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Some Sets of Mathematical Axioms

Note to reader: This is a handout I constructed to illustrate the reduction of mathematics to set theory using axioms of logic.

Propositional Logic, following Mendelson, *Introduction to Mathematical Logic*
The symbols are ~, ⊃, (,), and the statement letters A_i, for all positive integers i.

All statement letters are wffs.
If α and β are wffs, so are ~α and (α ⊃ β)
If α, β, and γ are wffs, then the following are axioms:
A1: (α ⊃ (β ⊃ α))
A2: ((α ⊃ (β ⊃ γ)) ⊃ ((α ⊃ β) ⊃ (α ⊃ γ)))
A3: ((~β ⊃ ~α) ⊃ ((~ β ⊃ α) ⊃ β))
β is a direct consequence of α and (α ⊃ β)

Zermelo-Fraenkel Set Theory, again following Mendelson, but with adjustments
ZF may be written in the language of first-order logic, with one special predicate letter, ∈.

Substitutivity: $(\forall x)(\forall y)(\forall z)[y=z \supset (y \in x \equiv z \in x)]$
Pairing: $(\forall x)(\forall y)(\exists z)(\forall u)[u \in z \equiv (u = x \vee u = y)]$
Null Set: $(\exists x)(\forall y) \sim x \in y$
Note that the null set axiom ensures the existence of an empty set.
We can introduce a constant, ∅, such that $(\forall x) \sim x \in \varnothing$.
Sum Set: $(\forall x)(\exists y)(\forall z)[z \in y \equiv (\exists v)(z \in v \bullet v \in x)]$
Power Set: $(\forall x)(\exists y)(\forall z)[z \in y \equiv (\forall u)(u \in z \supset u \in x)]$
Selection: $(\forall x)(\exists y)(\forall z)[z \in y \equiv (z \in x \bullet \mathscr{F} u)]$, for any formula $\mathscr{F}$ not containing y as a free variable.
Infinity: $(\exists x)(\varnothing \in x \bullet (y)(y \in x \supset Sy \in x)$
Note: 'Sy' stands for $y \cup \{y\}$, the definitions for the components of which are standard.

Peano Arithmetic, again following Mendelson, with adjustments
P1: 0 is a number
P2: The successor (x') of every number (x) is a number
P3: 0 is not the successor of any number
P4: If x'=y' then x=y
P5: If P is a property that may (or may not) hold for any number, and if
i. 0 has P; and
ii. for any x, if x has P then x' has P;
then all numbers have P.

Note: P5 is called mathematical induction, and is actually a schema of an infinite number of axioms.

Birkhoff's Postulates for Geometry, following James Smart, *Modern Geometries*
Postulate I: Postulate of Line Measure. The points A, B,... of any line can be put into a 1:1 correspondence with the real numbers x so that $|x_B - x_A| = d(A,B)$ for all points A and B.
Postulate II: Point-Line Postulate. One and only one straight line l contains two given distinct points P and Q.
Postulate III: Postulate of Angle Measure. The half-lines l, m... through any point O can be put into 1:1 correspondence with the real numbers a(mod 2π) so that if $A \neq 0$ and $B \neq 0$ are points on l and m, respectively, the difference $a_m - a_l \pmod{2\pi}$ is angle∠AOB. Further, if the point B on m varies continuously in a line r not containing the vertex O, the number a_m varies continuously also.
Postulate IV: Postulate of Similarity. If in two triangles △ABC and △A'B'C', and for some constant k>0, d(A', B') = kd(A, B), d(A', C')=kd(A, C) and ∠B'A'C'=±∠BAC, then d(B', C')=kd(B,C), ∠C'B'A'=±∠CBA, and ∠A'C'B'=±∠ACB.

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Spring 2010
M, W: 1-2:15pm

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A Proof that 2+2=4

We presume the language of first-order logic with identity.
Note two properties of identity, which I will use without explicitly mentioning in the proof:

T: $(\forall x)(\forall y)(\forall z)[(x=y \bullet y=z) \supset x=z]$
Id: $(\forall x)x=x$

We will need a predicate 'N', for the property of being a number, the addition symbol, +, which stands for a function from numbers to numbers, and a successor function, s (all standard in axiomatizations of number theory), with the following governing axioms. (The functions and their compositions are governed by axioms of any standard set theory, which I presume implicitly.)

Z: N_0
S: $(\forall x)(Nx \supset Nsx)$
R: $(\forall x)(\forall y)(x+y = y+x)$
A: $(\forall x)(\forall y)(x+sy = s(x+y))$
IE: $(\forall x)(x+0=x)$

Note that for convenience, I will write the constant '0' as it is standardly written, rather than as a lower-case letter, as is typical in first-order logic. I will write the successor symbol as 'S' when it precedes numerals, such as the other numbers which I introduce as follows:

$1 =_{df} S0$
$2 =_{df} S1$
$3 =_{df} S2$
$4 =_{df} S3$

The proof:

1.	$2+2 = 2+2$	by Id
2.	$= 2 + S1$	by definition of '2'
3.	$= S(2 + 1)$	by A
4.	$= S(2 + S0)$	by definition of '3'
5.	$= SS(2 + 0)$	by A
6.	$= SS2$	by IE
7.	$= S3$	by definition of '3'
8.	$= 4$	by definition of '4'

QED

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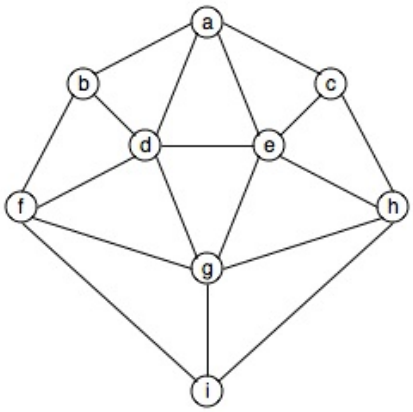
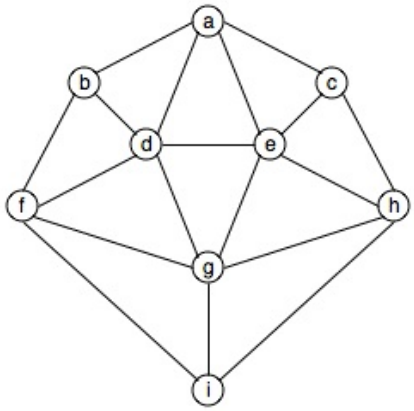
Constructive and Non-Constructive Proofs

A Constructive Proof:

Definition: A coloring of a graph is an assignment of a color to each node of the graph.
Definition: A graph is 3-colorable if any coloring which uses only three colors does not assign the same color to any two nodes which share a branch.
Definition: A graph is 4-colorable if any coloring which uses only four colors does not assign the same color to any two nodes which share a branch.

Theorem: There are graphs which are 4-colorable but which are not 3-colorable.
Proof: In two stages. Present a graph which is not 3-colorable but which is 4-colorable. (See below.
Stage 1: Prove that the graph is not 3-colorable. Stage 2: Show that the graph is 4-colorable.





A Non-Constructive Proof

Claim: There exist irrational numbers x and y such that x^y is rational.

Proof:

Let z = $\sqrt{2}^{\sqrt{2}}$.
Either z is rational or z is irrational, though we do not know which.
If z is rational then z is our desired number with x = y = $\sqrt{2}$.
If z is irrational, then let x = z and y = $\sqrt{2}$.

$x^y = \left(\sqrt{2}^{\sqrt{2}}\right)^{\sqrt{2}} \quad \sqrt{2}^{\sqrt{2}\cdot\sqrt{2}} \quad \sqrt{2}^{2} \quad = \quad = 2.$

On these different assignments of irrational values to x and y, x^y is again rational.
Whether z is rational or irrational, there exist irrational numbers x and y such that x^y is rational.
QED

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.

Philosophy 208: The Language Revolution
Fall 2011
Tuesdays, Thursdays, 9am - 10:15am

Hamilton College
Russell Marcus
rmarcus1@hamilton.edu

Syllabus

Course Description and Overview

If there is one unifying theme for twentieth-century philosophy, it is the study of language. Some philosophers believed that all philosophical questions arise from misuses of language. Others believed that clarifying our uses of language can lead us to solutions to perennial philosophical questions, like the mind and body problem, or whether God exists. Still others explored the nature of language and its uses for its own sake. The profound developments in logic in the twentieth century were concomitant with this focus on language.

We will start by looking briefly at some pre-twentieth-century views of language and Frege's seminal work on language in the late nineteenth century, especially his distinction between sense and reference. The second part of the course, roughly the first half of the term, will focus on the nature of reference: How do words hook on to the world? The third part of the course, roughly the second half of the term, will focus on the nature of meaning: How does language get its content? At the end of the term, we will look briefly at linguistic ontology. Along the way, we will read some of the most important philosophers of the twentieth century, including Russell, Wittgenstein, Tarski, Hempel, Strawson, Grice, Quine, Putnam, Chomsky, and Kripke.

Texts

Required readings are listed below and available on the course website, as will be my class notes. There are many good secondary sources in philosophy of language. See the course bibliography, available on the website.

On-Line Resources

The website for this course is:

http://www.thatmarcusfamily.org/philosophy/Course_Websites/Language_F11/Course_Home.html

The course website includes the syllabus and schedule, readings, class notes, handouts, and links to websites specifically selected for this course. I will use the Blackboard site *only* to post grades.

Office Hours

My office hours for the Fall 2011, term are 10:30am - noon, Monday through Friday. My office is upstairs in 202 College Hill Road.

Assignments and Grading

Your responsibilities this course include the following, with their contributions to your grade calculation in parentheses:

Attendance and participation
Readings
Two Précis (10%; 5% each)
In-Class Presentation (20%)
Two papers (45%; 20% for the first and 25% for the second)
Final Exam (25%)

Attendance and Readings: While there is no direct reward or penalty for attendance, I expect students to come to class prepared to discuss the assigned reading.

Précis: The two précis are on specific, assigned topics. The first topic is Frege's distinction between sense and reference. It is due on September 15. The second topic is a theme of your choice in David Rosenthal's lecture, "Translation and Understanding," on October 17 at 4pm. The second précis is due on October 20. Each précis is to be no more than 500 words. I expect you to have to work to say what you want to say in so few words.

Presentation: Each student is required to participate in one in-class presentation. Presentations will mainly be done in pairs, though there are some opportunities for solo presentations. You should prepare a ten-to-fifteen minute presentation. Given discussion, your time leading the class may vary from half a class period to a full class period. I will distribute more specific guidelines, as well as a sign-up sheet, in class. I welcome, indeed encourage, you to use your presentation topic as the theme for either your first or second paper.

Papers: Each student will write two short papers. The first paper, 4-6 pages on any theme from Part II of the course (Reference) is due on Thursday, October 6. The second paper, 5-8 pages on any topic in the material from Part III of the course (Meaning) is due on Tuesday, December 6. I will distribute more details about each paper in class.

Final Exam: The final exam will be given on Wednesday, December 14, 9am - noon. Preparatory questions will be posted on the website.

On Grades: Grades on assignments will be posted on Blackboard, along with a running total, which I call your grade calculation. Your grade calculation is a guide for me to use in assigning you a final grade. There are no rules binding how I translate your grade calculation, which will appear in Blackboard as a percentage, into a letter grade. In particular, the Hamilton College key for translating your letter grades into percentages, used for graduate school admissions, is not a tool for calculating your final grade. I welcome further discussion of the purposes and methods of grading, as well as my own grading policies.

Both the Writing Center and the Oral Communications Center have astoundingly wonderful sets of resources to help you write and speak more effectively.

The Hamilton College Honor Code will be enforced.

Topics and Readings

Part I: Before the Revolution

Class	Date	Topic	Readings for Class
1	August 25	Introduction: Plato and the Moderns	Lewis Carroll, *Through the Looking Glass*, Chapter 6 Selections from Plato's "Sophist" Selections from Berkeley's *Principles* Locke, "Of Words" Swift, "Getting Rid of Words"
2	August 30	Contrasting Non-Linguistic and Linguistic Responses to the Ontological Argument	Selections Anselm, Gaunilo, Descartes, Caterus, Hume and Kant
3	September 1	Introduction: Two Nineteenth-Century Views	Meinong, "The Theory of Objects," §1-§6 Mill, "Of Names"

Part II: Reference

Class	Date	Topic	Readings for Class
4	September 6	Frege's Projects	Martinich, Introduction to *The Philosophy of Language* Frege, from Preface to *Begriffsschrift* Frege, from Preface to *Grundlagen*
5	September 8	Fregean Intensionalism	Frege, "The Thought: A Logical Inquiry"
6	September 13	The Sense/Reference Distinction	Frege, "On Sense and Reference"
7	September 15 **Précis 1 due**	The Description Theory	Russell, "Descriptions"
8	September 20	Presupposition	Strawson, "On Referring"
9	September 22	The Attributive/Referential Distinction	Donnellan, "Reference and Definite Descriptions"
10	September 24	Direct Reference I	Kripke, from *Naming and Necessity*
11	September 29	Direct Reference II	Kripke, from *Naming and Necessity*
12	October 4	Natural Kinds	Putnam, "Meaning and Reference"

Part III: Meaning

Class	Date	Topic	Readings for Class
13	October 6 **Paper #1 due**	Logical Empiricism	Wittgenstein, from *Tractatus Logico-Philosophicus* Ayer, "The Principle of Verification"
14	October 11	The Verification Theory	Hempel, "Empiricist Criteria of Cognitive Significance: Problems and Changes"
Bonus	Monday October 17	David Rosenthal's Lecture, "Translation and Understanding"	

15	October 18	Meaning Holism I	Quine, "Two Dogmas of Empiricism"
16	October 20 **Précis 2 due**	Meaning Holism II	Quine, "Ontological Relativity"
17	October 25	Meaning Holism III	Quine, "Ontological Relativity"
18	October 27	Meanings Skepticism I	Wittgenstein, "Meaning as Use" Wittgenstein, "On Private Language"
19	November 1	Meanings Skepticism II	Wittgenstein, from *Remarks on the Foundations of Mathematics* Kripke, "On Rules and Private Languages"
20	November 3	Meanings Skepticism III	Kripke, "On Rules and Private Languages"
21	November 8	Intention-Based Semantics I	Grice, "Meaning"
22	November 10	Intention-Based Semantics II	Schiffer, from *Meaning*
23	November 15	Tarski's Theory of Truth	Tarski, "The Semantic Conception of Truth and the Foundations of Semantics"
24	November 17	Truth Theories as Meaning Theories	Davidson, "Truth and Meaning"
25	November 29	The New Intensionalism	Katz, "Introduction" and "Sense"

Part IV: Linguistic Ontology

Class	Date	Topic	Readings for Class
26	December 1	Conceptualism	Chomsky, "Language and Problems of Knowledge"
27	December 6 **Paper #2 due**	Platonism	Katz, "The Unfinished Chomskyan Revolution"
28	December 8	Nominalism	Devitt, "Linguistics is Not Psychology"

Final exam: Wednesday, December 14, 9am - Noon

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Presentation Assignment

During this semester, you will participate in one presentation to the class. Presentations will mainly be done in pairs, though there are some opportunities for solo presentations.

Your presentation should demonstrate your attempts to grapple with some portion of the reading for class. You should summarize central theses, focus on arguments, and raise questions for discussion. In contrast to a standard, rhetorical philosophy paper, your presentation may be mainly exegetical. Connect the various assertions in your presentation; avoid mere lists. I welcome some critical examination of the readings, though the criticism need not be fully developed.

Here are some general questions you might try to answer in your presentation.

What is the big picture? Is the central topic about meaning, or reference, or ontology, or something else? What questions is the author attempting to answer?
What is the relation between the analysis in the reading and actual linguistic practice?
How does this philosopher's approach to a particular question differ from others we have already seen?
What would this philosopher's theory of meaning/theory of reference look like?
Is the argument in the article convincing?
With what premises would philosophers whose work we have already studied agree or disagree?
What arguments or phenomena is the author missing?
Is the central claim you are examining true?

Shared presentations should show significant evidence of shared work and understanding. To assist me with the assignment of a grade, after the presentation, each presenter should send me a confidential email containing brief details concerning how the preparatory work was distributed. I understand that the person who speaks the most during the presentation may not be the person most responsible for the work. I hope that your work, and your grades, will ordinarily be distributed equally.

Your presentation may be as ambitious as you wish. You might generate discussion by presenting a controversial position. You might ask interesting questions. You may be creative about how to interact with the class. You may do a PowerPoint presentation. You may do something more inventive, like have us break into groups to prepare a debate.

You should prepare a ten-to-fifteen minute presentation. Given discussion, your time leading the class may vary from half a class period to a full class period.

I welcome, indeed encourage, you to use your presentation topic as the theme for either your first or second paper.

Resources

Please feel free to meet with me before your presentations. I will try to have notes for each class available in time for you to use them in your preparation.

Many students find the Oral Communications Center, located in KJ 222, helpful. They have a wealth of resources readily available, and are eager to help. The staff at the lab can assist you both with the content of your presentation, and with determining how best to present your material. When you have prepared a draft of your presentation, they can record you while you practice giving the presentation. You can watch the recording with a tutor, or by yourself. You can sign up for an appointment with a tutor on the door of the lab, or you can email them at: oralcomm@hamilton.edu. Their website offers valuable resources.

Sign-ups

We will sign up for presentations by email after the second day of class, Tuesday, August 30. The following dates and articles are available presentation topics.

September 8: Frege, "The Thought: A Logical Inquiry"
September 13: Frege, "On Sense and Reference"
September 15: Russell, "Descriptions"
September 20: Strawson, "On Referring"
September 22: Donnellan, "Reference and Definite Descriptions"
September 24: Kripke, "Naming and Necessity"
October 4: Putnam, "Meaning and Reference"
October 18: Quine, "Two Dogmas of Empiricism"
October 20: Quine, "Ontological Relativity"
October 27: Wittgenstein, "On Private Language"
November 1: Kripke, "On Rules and Private Languages"
November 8: Grice, "Meaning"
November 10: Schiffer, from *Meaning*
November 15: Tarski, "The Semantic Conception of Truth and the Foundations of Semantics"
November 17: Davidson, "Truth and Meaning"
November 29: Katz, "Introduction" and "Sense"
December 1: Chomsky, "Language and Problems of Knowledge"

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Final Exam Review

The final exam will consists of three parts. Answer five questions from each of the first two parts, for a total of ten responses. You may substitute up to three questions from part three for questions in parts one and two. Your responses should be organized, approximately one-to-three paragraphs long. Each response will be worth ten points.

The exam will consist of at least eight of the following questions in Parts I and II and four of the following questions in Part III.

Part I

1. How does Locke argue that words stand for ideas in our minds?

2. Provide an example of a non-linguistic reply to the ontological argument. Why is it not a linguistic solution? Provide an example of a linguistic reply to the ontological argument. Why is it linguistic?

3. What is the problem of empty reference? How does Meinong solve it?

4. For Frege, what is a thought/proposition? How do thoughts/propositions exist in a third realm? That is, how are they distinct from both psychological objects (ideas) and physical objects?

5. What is intensionalism? Why do we call Frege an intensionalist?

6. Describe Frege's three motivations for the sense/reference distinction. How does the distinction between sense and reference solve these three problems?

7. How does Russell solve Frege's puzzle without positing senses?

8. How do Frege and Russell differ in their analysis of 'the king of France is wise'? How do their analyses differ on their attributions of a truth value to that sentence?

9. What is the difference between referring and asserting or ascribing? According to Strawson, how does this difference indicate a problem with Russell's theory of definite descriptions?

10. How does 'the purple platypus on my left has no teeth' suffer from a failure of presupposition? How would Strawson's analysis of this sentence differ from that of Russell? From that of Frege?

11. Consider, "The Dean of Faculty is well-educated." Provide an attributive interpretation and a referential interpretation of that sentence.

12. Show that whether a speaker believes that a description of a person actually holds of the person is independent of whether a speaker uses that description referentially or attributively.

13. What's wrong with the simple descriptivism of Frege and Russell? Explain the Aristotle objection.

14. How are the Gödel/Schmidt and Jonah cases counter-examples to cluster descriptivism?

15. What is a rigid designator? Distinguish rigid from non-rigid designators. What does Kripke's claim that names are rigid designators mean?

16. What is externalism about meaning? How does Putnam's Twin Earth example support externalism?

Part II

1. What is the verifiability criterion of meaning? How might the verifiability criterion of meaning be circular?

2. What are the two dogmas of empiricism? How are they related?

3. What is the connection between the analytic/synthetic distinction and the problem of radical translation?

4. Distinguish underdetermination, indeterminacy of translation, and inscrutability of reference. Is reference inscrutable? Explain.

5. How do the terms 'five' 'red' and 'apples' differ in their meaning? How does Wittgenstein use these terms to oppose the Augustine/Locke theory of meaning?

6. According to Wittgenstein, what is a private language? Why can't we have one?

7. Describe Kripke's quus/plus problem. Why does the problem arise?

8. Distinguish skeptical solutions from straight solutions. How does Kripke depict Wittgenstein as providing a skeptical solution to the rule-following paradox?

9. How is IBS a reductionist program? How is IBS a two-step reductionist program?

10. Describe at least one counter-example to Grice's analysis of speaker meaning based on deception.

11. What is Schiffer's account of mutual knowledge*? How does it help avoid the counter-examples to a Gricean account of meaning?

12. What is the liar sentence? What problem does the liar present for a theory of truth? How does Tarski avoid the problem of the liar?

13. How does Davidson propose to use Tarski's work to explain meaning? Is Davidson's proposal successful? Explain.

14. How does Katz's new intensionalism differ from Fregean intensionalism? Describe the autonomous theory of sense, and its related version of analyticity.

Part III

1. What is Chomsky's poverty of the stimulus argument? How does it support both nativism and the existence of a universal grammar?

2. Distinguish E-language from I-language. How does Chomsky argue that we should understand language as I-language?

3. Characterize and distinguish linguistic nominalism, linguistic conceptualism, and linguistic platonism.

4. Why is infinity in linguistics incompatible with concretism in the foundations of linguistics?

5. How does Devitt attempt to make linguistic reality, with its use of linguistic types, compatible with nominalism?

Philosophy 355: Contemporary Philosophy
Fall 2008
Tuesdays and Thursdays: 9am - 10:15am
Benedict 201

Hamilton College
Russell Marcus
Office: 210 College Hill Road, Room 201
email: rmarcus1@hamilton.edu

Syllabus

Course Description and Overview:

Last spring, I sent an email to the students enrolled in this course, asking you to choose three of a selection of ten recent articles in top philosophy journals. The two articles most often chosen were:

"The Philosophy and Neuroscience Movement," by Pete Mandik and Andrew Brook; and
"What is the Significance of the Intuition that Laws of Nature Govern?" by Susan Schneider.

This course will mainly focus on those two articles. These were apt choices, since they are in areas of philosophy that are currently quite popular. For the first article, we will focus on the problem of consciousness. The second article discusses the status and interpretation of laws of nature, as well as the role of intuitions in contemporary philosophy.

Our two main articles presume a familiarity with the current literature in philosophy of mind and cognitive neuroscience, on the one hand, and in philosophy of science, on the other. Much of our work will consist of background reading in those areas to facilitate a better understanding of the chosen articles. The background readings are mostly recent, as well.

At the end of the term, we will spend two classes on some amusing logic puzzles, including the ones in another article from the original list of ten:

"A Simple Solution to the Hardest Logic Puzzle Ever," by Brian Rabern and Landon Rabern.

Texts

Churchland, Paul M. *Matter and Consciousness*, revised edition. MIT Press, 1988.

Articles available on ereserve or on the course website. (See below for the schedule of readings and see the course bibliography for full citations.)

On-Line Resources

The website for this course is:

www.thatmarcusfamily.org/philosophy/Contemporary/Course_Home.htm

The course website includes an html syllabus, many of our readings, a course bibliography, class notes, assignments, other handouts, and links to websites specifically selected for this course. Only limited material, other than your grades, will be available on the Blackboard course pages. The Blackboard page will contain a link to the course website.

Assignments and Grading:

Your responsibilities for this course include the following, with their contributions to your grade calculation in parentheses:

Attendance and Participation
Two presentations (20%; 10% each)
Two four-to-six-page papers (40%; 20% each)
Midterm (20%)
Final (20%)

Attendance and participation: Classes are for your edification. You are responsible for any material presented in class, and any announcements made in class. If you miss a class, you should make sure find out what you have missed. Repeated missed classes may result in a re-structuring of your grade calculation.

Presentations: Each student's presentation will introduce a reading or readings to the class. Some classes will have more than one presentation. Students whose presentations are on the same day may work together. Presentations should last at least ten minutes, but may last as long as a full class period. More information about presentations, including a sign-up sheet, will be distributed in class.

Papers: You may write your papers on the topics you present, but this is not a requirement. Papers generally consist of a thesis, defending or criticizing work we are reading. These are not research papers, but some reading beyond the articles on the syllabus is likely to be useful and generally will be expected. More information about the paper assignments will be distributed in class. **The first paper is due on Tuesday, October 14. The second paper is due on Tuesday, December 9.**

Midterm and Final: The two exams will encourage breadth, in contrast to the papers and presentations, which encourage depth. The exams will be based straightforwardly on the readings and class discussions. Sample questions will be distributed before the exams.

Schedule:
Note: The number in parentheses following the day's topic indicate slots for student presentations.

Part I: Consciousness and Neuroscience

Date	Topic	Readings to be Completed *Before* Class
Thursday, 8/28	Introduction Dualism and Behaviorism	
Tuesday, 9/2	Dualism and Behaviorism	Descartes, from *Meditations on First Philosophy* Skinner, from *Science and Human Behavior* Hempel, "The Logical Analysis of Psychology" Churchland, pp 7-25
Thursday, 9/4	Reductionism and the Identity Theory (1)	Place, "Is Consciousness a Brain Process?" Churchland, pp 26-35
Tuesday, 9/9	Functionalism and the Multiple Realizability Objection (2)	Putnam, "The Nature of Mental States" Fodor, from "Something on the State of the Art" Churchland, pp 36-38
Thursday, 9/11	Troubles with Functionalism (2)	Block, "Troubles with Functionalism" Churchland, pp 38-42
Tuesday, 9/16	Qualia I (1)	Nagel, "What is it Like to be a Bat?"
Thursday, 9/18	Qualia II (2)	Locke, "On Inverted Spectra" Jackson, "Epiphenomenal Qualia"
Tuesday, 9/23	Against Qualia (2)	Dennett, "Quining Qualia"
Thursday, 9/25	Eliminativism and Folk Psychology (2)	Rorty, from *Philosophy and the Mirror of Nature* Churchland, pp 43-49 Churchland, pp 56-62
Tuesday, 9/30	The Hard Problem (1)	Chalmers, "Facing Up to the Problem of Consciousness"
Thursday, 10/2	Neuroscience (1)	Churchland, Chapter 7
Tuesday, 10/7	Inattention Blindness Blind Sight (2)	Mack and Rock, "Inattentional Blindness: An Overview" Weiskrantz, "The Case of Blindsight"
Thursday, 10/9	Philosophy, Neuroscience, and Consciousness	Brook and Mandik, "The Philosophy and Neuroscience Movement"
Tuesday, 10/14	Catch-up/Review	**First Paper Due**
Tuesday, 10/21	Methods	Kripke, from *Naming and Necessity*
Thursday, 10/23	Midterm	

Part II: Laws of Nature and Their Governance

Date	Topic	Readings to be Completed *Before* Class
Tuesday, 10/28	Intuition and Reflective Equilibrium (2)	Daniels, "Reflective Equilibrium" Stich, "Reflective Equilibrium, Analytic Epistemology, and the Problem of Cognitive Diversity"
Thursday, 10/30	Modalities (2)	Nolt, "Modal Logics"
Tuesday, 11/4	Laws and the D-N model (2)	Hempel, "Laws and Their Role in Scientific Explanation"
Thursday, 11/6	Humean Supervenience and MRL (2)	Hume on Laws of Nature Lewis, "Introduction" Lewis, "Humean Supervenience Debugged"
Tuesday, 11/11	Why Be a Humean? (2)	Maudlin, "Why be a Humean?"
Thursday, 11/13	Carroll and the Mirror (2)	Carroll, "The Humean Tradition" Carroll, from *Laws of Nature*
Tuesday, 11/18	Governance I (2)	Beebee, "The Non-Governing Conception of Laws of Nature"
Thursday, 11/20	Governance II (2)	Loewer, "Humean Supervenience"
Tuesday, 12/2	Schneider on Carroll	Schneider, "What is the Significance of the Intuition that Laws of Nature Govern?"
Thursday, 12/4	Schneider on Governance	

Part III: Logic Puzzles

Date	Topic	Readings to be Completed *Before* Class
Tuesday, 12/9	Knights and Knaves (3)	Smullyan, "Knights and Knaves" **Second Paper Due**
Thursday, 12/11	The Hardest Logic Puzzle Ever (1)	Rabern and Rabern, "A Simple Solution to the Hardest Logic Puzzle Ever"

Final Exam: Thursday, December 18, 7pm - 10pm

Proposed Articles for Philosophy 355: Contemporary Philosophy
Russell Marcus, Hamilton College, Fall 2008
April 29, 2008

Note to Reader: This is a copy of an email I sent to all students enrolled in Contemporary Philosophy for Fall 2008 soliciting their input in my design for the course.

Instructions: Below are a selection of recent philosophy articles. We are going to study two or three of them. They are mostly quite sophisticated, so I will construct a syllabus over the summer with material that will prepare us to understand the articles we choose. Please select (at least) three articles whose topics interest you. More information about each article is available on online. There are articles on philosophy of mind, metaphysics, philosophy of logic, philosophy of language, and philosophy of science. I will compile the preferences from the class, and make the selections.

1. "A Simple Solution to the Hardest Logic Puzzle Ever," Brian Rabern and Landon Rabern, *Analysis* 68:2, April 2008.

An old-fashioned logic puzzle, presupposing very little symbolic logic.

2. "Ramsey + Moore ≠ God," David Barnett, *Analysis* 68:2, April 2008.

Philosophy of logic, on the nature of conditional (if...then...) statements.

3. "Self-Bias, Time-Bias, and the Metaphysics of Self and Time," Caspar Hare, *The Journal of Philosophy* 106:7, July 2007.

A topic in ethics, metaphysics, and the connection between the two.

4. "The Philosophy and Neuroscience Movement," Pete Mandik and Andrew Brook, *Analyse & Kritik* 29(1): 382-397.

A movement dedicated to applying neuroscience to traditional philosophical problems and using philosophical methods to illuminate issues in neuroscience began about twenty-five years ago. Results in neuroscience have affected how we see traditional areas of philosophical concern such as perception, belief-formation, and consciousness. There is an interesting interaction between some of the distinctive features of neuroscience and important general issues in the philosophy of science. And recent neuroscience has thrown up a few conceptual issues that philosophers are perhaps best trained to deal with. After sketching the history of the movement, we explore the relationships between neuroscience and philosophy and introduce some of the specific issues that have arisen.

See: http://www.petemandik.com/philosophy/papers/brookmandik.pdf

5. "Twin-earth externalism and concept possession," Derek Ball, *Australasian Journal of Philosophy* 85.3, September 2007.

It is widely believed that Twin-Earth-style thought experiments show that the contents of a person's thoughts fail to supervene on her intrinsic properties. Several recent philosophers have made the further claim that Twin-Earth-style thought experiments produce metaphysically necessary conditions for the possession of certain concepts. I argue that the latter view is false, and produce counterexamples to several proposed conditions. My thesis is of particular interest because it undermines some attempts to show that externalism is incompatible with privileged access.

6. "What is the significance of the intuition that laws of nature govern?" Susan Schneider, *Australasian Journal of Philosophy* 85.2, July 2007.

Recently, proponents of Humean Supervenience have challenged the plausibility of the intuition that the laws of nature 'govern', or guide, the evolution of events in the universe. Certain influential thought experiments authored by John Carroll, Michael Tooley, and others, rely strongly on such intuitions. These

thought experiments are generally regarded as playing a central role in the lawhood debate, suggesting that the Mill-Ramsey-Lewis view of the laws of nature, and the related doctrine of the Humean Supervenience of laws, are false. In this paper, I take on these recent challenges, arguing that the intuition that the laws govern should be taken seriously. Still, I find the recent discussions insightful, in certain ways. Employing some ideas from one of the critics (Barry Loewer), I draw some non-standard conclusions about the significance of the thought experiments to the lawhood debate.

7. “Computational modelling vs. Computational explanation: Is everything a Turing Machine, and does it matter to the philosophy of mind?” Gualtiero Piccinini, *Australasian Journal of Philosophy* 85.1, March 2007.

According to pancomputationalism, everything is a computing system. In this paper, I distinguish between different varieties of pancomputationalism. I find that although some varieties are more plausible than others, only the strongest variety is relevant to the philosophy of mind, but only the most trivial varieties are true. As a side effect of this exercise, I offer a clarified distinction between computational modelling and computational explanation.

8. “On Linking Dispositions and Conditionals,” David Manley and Ryan Wasserman, *Mind* 117: 59-84, January 2008.

Analyses of dispositional ascriptions in terms of conditional statements famously confront the problems of finks and masks. We argue that conditional analyses of dispositions, even those tailored to avoid.nks and masks, face five further problems. These are the problems of: (i) Achilles' heels, (ii) accidental closeness, (iii) comparatives, (iv) explaining context sensitivity, and (v) absent stimulus conditions. We conclude by offering a proposal that avoids all seven of these problems.

9. “A Tale of Two Envelopes,” Bernard D. Katz and Doris Olin, *Mind* 116: 903-926, November 2007.

This paper deals with the two-envelope paradox. Two main formulations of the paradoxical reasoning are distinguished, which differ according to the partition of possibilities employed. We argue that in the first formulation the conditionals required for the utility assignment are problematic; the error is identified as a fallacy of conditional reasoning. We go on to consider the second formulation, where the epistemic status of certain singular propositions becomes relevant; our diagnosis is that the states considered do not exhaust the possibilities. Thus, on our approach to the paradox, the fallacy, in each formulation, is found in the reasoning underlying the relevant utility matrix; in both cases, the paradoxical argument goes astray before one gets to questions of probability or calculations of expected utility.

10. “The Turing Test as Interactive Proof,” Stuart M. Shieber, *Nous* 41 (4), 686–713, December 2007.

In 1950, Alan Turing proposed his eponymous test based on indistinguishability of verbal behavior as a replacement for the question "Can machines think?" Since then, two mutually contradictory but well-founded attitudes towards the Turing Test have arisen in the philosophical literature. On the one hand is the attitude that has become philosophical conventional wisdom, viz., that the Turing Test is hopelessly flawed as a sufficient condition for intelligence, while on the other hand is the overwhelming sense that were a machine to pass a real live full-fledged Turing Test, it would be a sign of nothing but our orneriness to deny it the attribution of intelligence. The arguments against the sufficiency of the Turing Test for determining intelligence rely on showing that some extra conditions are logically necessary for intelligence beyond the behavioral properties exhibited by an agent under a Turing Test. Therefore, it cannot follow logically from passing a Turing Test that the agent is intelligent. I argue that these extra conditions can be revealed by the Turing Test, so long as we allow a very slight weakening of the criterion from one of logical proof to one of statistical proof under weak realizability assumptions. The argument depends on the notion of interactive proof developed in theoretical computer science, along with some simple physical facts that constrain the information capacity of agents. Crucially, the weakening is so slight as to make no conceivable difference from a practical standpoint. Thus, the Gordian knot between the two opposing views of the sufficiency of the Turing Test can be cut.

Dinner and a Movie*
at the Marcuses

with esteemed guest, Pete Mandik

Wednesday, October 8

Dinner
Served around 6pm

Movies Times
The Great Pumpkin ~7pm
Waking Life ~7:30pm

My home
23 Fountain Street, in the village of Clinton

Directions
Go straight down the hill on College Road to the village.
When you reach the green, don't curve left with 12B.
Instead, continue straight to the end of the road.
Make a right onto Fountain Street.
We're halfway up the first block on the left, #23.

Transportation
I can provide rides down the hill (and back up).
We will meet at 5:45 from the philosophy building.
Let me know if you need a ride, so I can plan.

RSVP
By 4pm Tuesday, please
via email to rmarcus1@hamilton.edu
Remember to let me know if you will need a ride

*The Movies will be shown weather permitting.
Dinner will be served in any case.

Independent Study in Advanced Logic
Spring 2011

Hamilton College
Russell Marcus
rmarcus1@hamilton.edu

Syllabus

This course will proceed in two parts. The first part consists of metalogical work, and will rely on Hunter's *Metalogic*. The second part consists of modal logical work, and will rely on Priest's *An Introduction to Non-Classical Logics*.

Hunter, Geoffrey. *Metalogic: An Introduction to the Metatheory of Standard First-Order Logic*. University of California Press, 1973.

Priest, Graham. *An Introduction to Non-Classical Logics*, 2nd edition. Cambridge University Press, 2008.

There will also be a variety of handouts, as indicated below. For homework, sometimes I will assign specific problem sets. At other times, you will choose how much of a set of problems to do. For assessment, I'm planning two midterms and a final. I'll consider an additional option of writing a paper.

There are twenty-two topics on the list below. We will try to complete approximately two each week, especially at the beginning. This pace will give us some flexibility during the more hectic parts of the term. We will meet on Mondays, at 1pm.

Part A: Metalogic

I: Formal Theories
Topics: Formal theories, model theory and proof theory, effective methods
Assignments: Hunter, §1 - §7

II. Proof Methods
Topics: *Reductio ad Absurdum*, Mathematical Induction
Assignments: Morash, Proof by Mathematical Induction (or similar)

III. Set Theory
Topics: Basic set-theoretic vocabulary, Cantor's diagonal lemma
Assignments: Hunter, §8 - §11, Appendix I

IV. Informal incompleteness of number theory
Topics: number theory, functions
Assignments: Hunter, §12 - §14

V. Propositional language
Topics: Language P, Functions, Semantics for P
Assignments: Hunter, §15 - §19

VI. Metalogical results for P
Topics: Adequacy, Interpolation Theorem, Mathematical Induction
Assignments: Hunter, §20 - §21
Handout on adequacy

VII. System PS

Topics: Axiomatic systems, Consistency
Assignments: Hunter, §22 - §25
Handouts on axiomatic systems

VIII. More on System PS
Topics: Deduction Theorem, Using Mathematical Induction, Interpolation Theorem
Assignments: Hunter, §26-28

IX. Semantic Completeness I
Topics: Post and Kalmár's Proofs
Assignments: Hunter, §29 - §31

X. Semantic Completeness II
Topics: Henkin's method
Assignments: Hunter, §32

XI. Syntactic Completeness
Topics: Decidability, Effective Procedures
Assignments: Hunter, §33 - §36

Midterm I

XII. Quantificational language
Topics: Languages Q and Q^{+}
Assignments: Hunter, §38 - §40

XIII. Quantificational systems
Topics: System QS, Consistency, Some meta-theorems
Assignments: Hunter, §41 - §43
Handout on Consistency

XIV. Löwenheim-Skolem
Topics: Compactness, Completeness
Assignments: Hunter, §44 - §46

XV. Identity
Topics: Consistency, Categoricity
Assignments: Hunter, §47 - §49

XVI. Decidability and Undecidability
Topics: Monadic Predicate Logic, Generalized Gödel Theorem
Assignments: Hunter, §50 - §51

Midterm II

Part B: Modal Logics

I. Truth Trees

Topics: Semantic Trees for Propositional and Predicate Logics
Assignments: Klenk, "Proof Trees for Sentential Logic"
Klenk, "Proof Trees for Predicate Logic"
Bergmann, Moor, and Nelson, "Syntax and Semantics for Relations, Identity, and Functions"

II. The Material Conditional

Topics: Set theory, mathematical induction, conditionals
Assignments: Priest, Mathematical Prolegomenon, Chapter 1

III. Basic Modal Logic

Topics: Modal tableaux, possible worlds, modal realism
Assignments: Priest, Chapter 2

IV. Normal Modal Logics

Topics: Accessibility relations, S5, tense logic
Assignments: Priest, Chapter 3

V. Non-normal Modal Logics

Topics: Strict conditionals, paradoxes of strict implication, explosion
Assignments: Priest, Chapter 4

VI. Conditional Logics

Topics: Conditional semantics, similarity spheres
Assignments: Priest, Chapter 5

Final Exam