Philosophy 240: Symbolic Logic Hamilton College
Fall 2008 Russell Marcus
Mondays, Wednesdays, Fridays: 9am - 9:50am Office: 210 College Hill Road, Room 201
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Syllabus

Course Description and Overview:

Philosophy has one main 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.

The two main techniques we will study are translation and derivation. We will start by establishing 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 language, and back. We will infer new claims from given ones, using prescribed rules of inference and proof strategies.

Courses covering the topics we will study are merely an introduction to an enormous and burgeoning field. We will study quantifier logic, which is of particular interest to philosophers, in detail. We will look at some extensions, including modal logics and three-valued logics, which are of special interest to philosophers.

Additionally, we will examine some philosophical questions surrounding 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.

There will be forty-two class meetings. Twenty-nine of them will be devoted to learning logical technique. In seven classes, we will pursue philosophical questions about logic. The remaining six classes, and the final, will be used for tests.

Texts

Patrick Hurley, *A Concise Introduction to Logic*, 10th edition, Wadsworth. The full text costs ~$130. I have ordered copies with just the sections we will use, and an appendix of interest to pre-law students. It will be available at the bookstore for $50.

Jennifer Fisher, *On the Philosophy of Logic*, Wadsworth. Seven classes this term will be devoted to the philosophy of logic, and this book will be our central text. It will be a good resource for your papers.

Other readings, including class notes, will be available either on ereserve or on the course website.

On-Line Resources

The website for this course is:

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

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.

Assignments and Grading:

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

Attendance
Homework (10%)
Seven Tests (70%, 10% each)
One three-to-six-page paper (20%)

Attendance: Classes are for your edification. It will be useful for you to come to class, but there is no direct penalty for missing class. Some students pick up on the technical material quickly. If you do skip a class, you should arrange to drop off, or have someone drop off, your homework, if you have homework due.

Homework: Homework assignments, listed on the schedule below, are due most classes. Some homework assignments are problem sets, from the Hurley text. Others are reading assignments, in preparation for classes in which we will discuss the philosophy of logic.

All students will be expected to turn in the first four problem sets, those which are due before the first exam. If you receive less than an 80% on any exam, you must hand in all problem sets which are due until the next exam. If you receive an 80% 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 need not be written out fully, but solutions must be.

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

Sample solutions to all homework problems are available either on line or in the back of the Hurley text. Acceptable solutions to most problems vary. We will begin most classes by reviewing a few homework questions. You are expected to have completed the homework and looked at the solutions provided before the beginning of class.

Use the text as a reference guide. The chapter sections include excellent examples, and solutions. Read on a need-to-know basis: when you have difficulty with specific problems, read the relevant sections of the chapter.

Tests: All 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 one more test of the same type as each of the first six tests. You will also have an opportunity, at the time of the final, to take a compensatory version of up to two of the first six tests. I will average the grade on the re-take with your original grade. If you miss a test during the term, the re-take 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 will be devoted to such topics. All papers will require a small amount of research. Papers may be mainly expository, especially those covering technical topics. But, the best papers will philosophical, and will defend a thesis. I will suggest topics and readings through the term. The Fisher text will also be useful in generating ideas.

Papers are due on December 12, 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	August 29	Arguments	**§1.1: I**.1, 3, 7, 14, 20, 27
2	September 1	Validity and Soundness; Translation using Propositional Logic	**§1.4: I**.1, 3, 7, 8, 10 **§1.2: VI**.1, 2, 4, 7, 9 **§6.1: I**.1-11, 13-16
3	September 3	Translation, Wffs	**§6.1: I**.21-23, 29, 30, 38, 39, 41-43 Homework Handout 1: Translating from Propositional Logic **§6.1: III**.1-10 **§6.2: I**.1-4, 9, 10
4	September 5	Truth Functions	Read Fisher, pp 106-111.
5	September 8	Philosophy 1: Conditionals	**§6.1: I**.34-37, 45, 47, 48, 50 **§6.2: III**.1-3, 6-11, 12, 21, 22, 24 **§6.2: II**.1-3, 13, 15\
6	September 10	More Truth Functions	**§6.2: IV**.1-5, 11, 12 Prepare for Test #1. Focus on §1.1, §6.1, and §6.2.
7	September 12	Test #1: Translation and Truth Functions	
8	September 15	Truth Tables for Propositions	**§6.3: I**.1-4, 11, 14 **§6.3: II**.1, 3, 5, 11 **§6.3: III**.1, 9, 10
9	September 17	Truth Tables for Arguments	Read Fisher pp 36-39 and pp 125-131.
10	September 19	Philosophy 2: Three Valued Logics	**§6.4: II**.2, 5, 10, 17, 19 **§6.4: I**.1, 3, 5, 10
11	September 22	Invalidity and Inconsistency: Indirect Truth Tables	**§1.5: II**.2, 3 **§6.5: I**.3, 6, 12, 13, 15 **§6.5: II**.2, 5, 9
12	September 24	Rules of Implication, I	Prepare for Test #2. Focus on §6.2 - §6.5.
13	September 26	Test #2:Truth Tables	**§7.1: III**.1-3, 5, 7, 8, 14, 21, 22 **§7.1: IV**.1, 3, 8 Note: §7.1-§7.4 contain unassigned problems in §I and §II. If you are finding the derivations in §III too difficult, start with a selection from §I and §II.
14	September 29	Rules of Implication, II	**§7.2: III**.2, 4, 8, 12, 16, 22 **§7.2: IV**.1, 2, 6, 8
15	October 1	Rules of Replacement, I	Read Fisher, pp 46-58.

Class	Date	Topic Name	Homework to do before the next class meets
16	October 3	Philosophy 3: Propositions and Logical Truths	**§7.3: III**.6-12, 14, 18, 19, 22, 26, 32 **§7.3: IV**.4, 9
17	October 6	Rules of Replacement, II	**§7.4: III**.2-5, 8, 10, 21, 24, 36, 38, 45 **§7.4: IV**.6, 8
18	October 8	Practice with Proofs	Prepare for Test 3. Focus on §7.1-7.4.
19	October 10	Test #3: Proofs I	
20	October 13	Conditional Proof	**§7.5: I**.3, 7, 9, 11, 14, 18, 20 **§7.5: II**.3, 5 Note: You need not try each problem without conditional proof, though trying a few may be edifying.
21	October 15	Indirect Proof	**§7.6: I**.1, 2, 4, 6, 13, 15, 17 **§7.6: II**.2, 4 Note: You need not try each problem without indirect or conditional proof, though trying a few may be edifying.
	October 17	**Fall Break**	
22	October 20	Logical Truths	**§7.7**: 1-3, 5, 9, 13, 16, 18 Read Fisher, pp 74-84.
23	October 22	Philosophy 4: Modal Logic	Prepare for Test #4. Focus on §7.5-§7.7, but really on all of Chapter 7.
24	October 24	Test #4: Proofs II	
25	October 27	Predicate Logic, Translation I	**§8.1**: 3, 4, 7-11, 14-17, 23-28, 35, 37
26	October 29	Predicate Logic, Translation II	**§8.1**: 2, 6, 18, 19, 21, 31-33, 39, 40, 44, 45, 50-53
27	October 31	Philosophy 5: Adequacy	**§8.1**: 34, 36, 38, 42, 46, 50, 54, 55, 58, 60 Homework Handout 2: Translating from Predicate Logic
28	November 3	Quantifier Introduction and Elimination I	**§8.2: I**.1-3, 7-9 **§8.2: II**.1, 3, 4, 6
29	November 5	Quantifier Introduction and Elimination II	Prepare for Test #5. Focus on §8.1.
30	November 7	Test #5: Predicate Logic Translation	**§8.2: I**.4, 5, 10, 12, 13 **§8.2: II**.5, 7, 9, 10
31	November 10	Changing Quantifiers	**§8.3: I**.1, 3, 7, 8, 10, 14 **§8.3: II**.3, 5, 9
32	November 12	Conditional and Indirect Proof, Predicate Versions	Read Fisher, pp 59-69.

Class	Date	Topic Name	Homework to do before the next class meets
33	November 14	Philosophy 6: Quine and Ontological Commitment	**§8.4: I**.1-4, 10, 12, 19, 21 **§8.4: II**.4, 6, 9
34	November 17	Invalidity	**§8.5: I**.1, 2, 10 **§8.5: II**.1, 2, 6, 10 **§8.5: III**.2, 4
35	November 19	Relational Predicates, Translation I	Prepare for Test #6. Focus on §8.2-8.5.
36	November 21	Test 6: Predicate Logic Derivations	**§8.6: I**.1-4, 7-10, 13, 14, 17, 19, 20
	Thanksgiving Break		
37	December 1	Relational Predicates, Translation II	**§8.6: I**.5, 6, 11, 12, 23, 24, 27, 30 Homework Handout 3: Translating from Relations
38	December 3	Relational Predicates, Derivations	**§8.6: II**.2, 3, 4, 7, 9, 13, 14, 19 **§8.6: III**.1, 4, 8
39	December 5	Identity, Translation I	**§8.7: I**. 2, 3, 6, 9, 10, 13, 14, 15, 17, 18, 22, 23, 24, 25 Read Fisher, pp 69-73.
40	December 8	Identity, Translation II	**§8.7: I**. 28, 31, 34, 35, 37-39, 40, 42, 43, 45, 46, 47, 50
41	December 10	Identity, Derivations	**§8.7: II**.2, 3, 5, 6, 9, 11, 12, 19 **§8.7: III**.2, 3, 7, 8, 10, 12, 13, 15 Read Fisher, pp 153-161.
42	December 12	Philosophy 7: The Right Logic?	Practice Problems Handout
	December 16 2pm - 5pm	Test 7: Relations and Identity Theory Plus, Compensatory Material	

Office Hours

My office hours for the Fall, 2008, term are 10:30am - noon, Monday through Friday.