

LOGIC

PHIL 230 (3 hrs; MWF 12:00-12:50 PM; Science Center 202), Manchester University, Fall 2016

Instructor: Dr. Steve Naragon, Office: Academic Center 233 (Phone — *office:* 982-5041; *home:* 982-6033)

Required Text: Hurley, *A Concise Introduction to Logic*, 10th ed. (Wadsworth Publ., 2008). [available on Amazon.com for around \$10]

Course Objectives. This course has the highly practical aim of improving your ability *to think clearly*. Specifically, by the end of the semester you should have improved your abilities to: (1) identify arguments from other kinds of discourse, and separate what is relevant to an argument from what is not; (2) evaluate arguments in a reasoned and constructive way (as opposed to merely disagreeing with their conclusions); and (3) construct your own arguments that are clearly stated and free of fallacies.

On the more theoretical side, you will become familiar with different forms of deductive and inductive logic. Deductive forms include terminal (or syllogistic), propositional (or statement or sentential), and quantified predicate logics. Inductive forms include analogical, causal, statistical, and hypothetical, and includes work on calculating the probability of simple and compound events.

This will be, at times, a strenuous journey, but one not without rewards, perhaps the finest being the opportunity to contemplate beauty in its purest form. It also boosts your LSAT and GRE scores, for whatever that's worth.

Requirements

Attendance. The occasional student will be able to master this material simply by working through the text, but most students will need some help from class in order to fully understand what's going on. Apart from that, I will try to make class amusing.

Most class sessions will consist of four parts: (1) a brief quiz on the material discussed the previous day or drawn from the homework for the current day, (2) an explanation of the new material for that day, (3) a consideration of one or two practice exercises, and (4) a review of homework exercises (either orally or on the board). You should come to class each day having completed your homework to the best of your ability, and prepared to ask questions regarding concepts or homework exercises you didn't understand.

Exams. There will be four non-cumulative exams. [**Makeup:** Exams missed due to an excused absence are to be taken as soon as possible or else will be forfeited. It is your responsibility to see me about this.]

Quizzes. There will be a brief quiz nearly every day, given at the beginning of class, on material discussed the day before.

[**Makeup:** Missed quizzes can be made up in my office the following day or at the beginning of the next class session; it is your responsibility to make this arrangement.]

Homework. I assign homework for each day. Only the work listed as "**Bring to class**" will be graded; this needs to be typed and entered into Canvas by 9 AM that morning (**no late submissions**, so plan ahead). The other assigned homework will not be collected, but the daily quiz will often draw from it, and we will be working through it on the board during class. You must get in the habit of working through your homework before class, or else you will fall behind, you will be unable to participate as well as you could in class, you will be under-prepared for the exams, and you will either fail the course, withdraw, or wish you had.

I've tried to assign just enough homework for you to understand the necessary concepts, learn the basic skills, and then have repeated them enough to get them well stuck in your head. If you honestly believe that you've mastered the material before finishing the homework set, then there is no reason to keep working through the remaining exercises. If you work through the text, the homework exercises, and participate in class, you will almost certainly do well in this class, and become a much stronger and more agile thinker.

LogicCoach: On **Canvas** (under "Modules") is a link to a page to download the homework program **LogicCoach** (available for both Macs and Windows systems). You can do your homework here and have it instantly checked. It is no-frills, but it's free and it works.

Grading. The four exams are worth a total of 80% (22%, 14%, 22%, 22%); the set of quizzes (and turned-in homework) is worth 20%. I use the following letter grade conversion scale: A (94-100), A- (90-93), B+ (87-89), B (83-86), B- (80-82), C+ (77-79), C (73-76), C- (70-72), D+ (67-69), D (63-66), D- (60-62), F (0-59).

Weekly Work Schedule

Wed. Aug 31

Overview of Logic

1: Basic Concepts

Fri. Sep 2

1.1... Premise/Inference/Conclusion
1.1/ I: 1-15; II: 2, 3, 5, 6; III: 1-10 (definitions); IV: 1-10

Mon. Sep 5

1.2... Recognizing Arguments
1.2/ I: 1-15; IV: 1-11 (definitions); V: 1-10; VI: 1-10

Wed. Sep 7

1.3... Deduction and Induction
1.3/ I: 1-20; III: 1-15;
Bring to class: 1.3/IV

Fri. Sep 9

1.4-1.5... Validity and Invalidity
1.4/ I: 1-10; II: 1-10; III: 1-10; IV (definitions); V: 1-15
1.5/ I: 1-5

Mon. Sep 12

1.6... Extended Arguments
1.6/ I: 1-10

Wed. Sep 14

1.6... Extended Arguments (cont.)
1.6/ II: 1-12
Bring to class: 1.6/III

2: Language

Fri. Sep 16

2.1-2.2... The Meaning of Words
2.1/ II: 2, 3, 5, 6, 8; III: 1-10
2.2/ I: 1-5, II: 1-10

3: Informal Fallacies

Mon. Sep 19

3.1-3.2... of Relevance
3.1/ 1-10
3.2/ I: 1-15; II: 1-10
Bring to class: an example of one of the featured fallacies from a newspaper or website.

Wed. Sep 21

3.3... of Weak Induction
3.3/ I: 1-15; II: 1-10, III: 1-15
Bring to class: an example of one of the featured fallacies from a newspaper or website.

Fri. Sep 23

3.4... of Presumption, etc.
3.4/ I: 1-15; II: 1-15; III: 1-20
Bring to class: an example of one of the featured fallacies from a newspaper or website.

Mon. Sep 26

3.5... Fallacies in Ordinary Language
3.5/ I: 2, 5, 6, 8, 9, 12, 32, 33, 42, 48

Wed, Sep 28	1st Exam
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9-13: Induction

Fri. Sep 30

9.1-9.3... Analogical Reasoning
9/ II: 2, 3, 5, 9, 12
Bring to class: 9.2/II.9

Mon. Oct 3

10.1-10.3... Determining Causality
10/ I: 1-10; II: 1-5; III: 1-5

Wed. Oct 5

11.1-11.2... Probability
11/ I: 1-10; II: 1-10, 15

Fri. Oct 7

11.2... Probability: Bayes's Theorem
11/ II: 17, 20

Mon. Oct 10

12.1-12.6... Statistical Reasoning
12/ I: 1-10, 15, 17, 20; II: 2, 3; III: 1-20.

Wed. Oct 12

13.1-13.4... Hypothetical Reasoning
13/ I: 1-5; IV: 1-20.

Fri, Oct 14	2nd Exam
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Mon. Oct 17 --- Fall Break

4: Categorical Propositions

Wed. Oct 19

4.1-4.2... Quality, Quantity, Distribution
4.1/ 1-8
4.2/ I: 1-8; II: 1-4; III: 1-4; IV: 1-4

Fri. Oct 21

4.3... Venn Diagrams
4.3/ I: 1-8; II: 1-15; III: 1-15

Mon. Oct 24

4.4... Licit Inferences
4.4/ I: 1-12, II: 1-3, III: 1-10

Wed. Oct 26

4.5... Square of Opposition
4.5/ I: 1-5; II: 1-5; III: 1-10; IV: 1-20;
VI: 1-10

Fri. Oct 28

4.6-4.7... Translation
4.6/ I: 1-10; II: 1-10
4.7/ I: 1-30

5: Syllogisms

Mon. Oct 31

5.1... Standard Form, Mood & Figure
5.1/ I: 1-5; II: 1-5; III: 1-5; V: 1-10

Wed. Nov 2

5.2... Venn Diagrams
5.2/ I: 1-10; II: 1-5; III: 1-10

Fri. Nov 4

5.3-5.4... Rules
5.3/ I: 1-10; II: 1-5; III: 1-10
5.4/ I: 1-5

Mon. Nov 7

5.5-5.6... Enthymemes

5.5/ 2, 3, 5, 6, 8, 9

5.6/ I: 2, 3, 5, 6, 8; II: 2, 3, 5, 6

Wed, Nov 9	3rd Exam
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6: Propositional Logic

Fri. Nov 11

6.1... Symbols & Translations
6.1/ I: 1-40; III: 1-10

Mon. Nov 14

6.2... Truth Functions
6.2/ I: 1-10; II: 1-10; III: 1-15, IV: 1-10

Wed. Nov 16

6.3-6.4... Truth-Tables
6.3/ I: 1-5; II: 1-5; III: 2, 3
6.4/ II: 1-5

Fri. Nov 18

6.5... Indirect Truth-Tables
6.5/ I: 1-10; II: 1-5; III: 1-5

Mon. Nov 21

6.6... Argument Forms
6.6/ I: 1-20; II: 1-10; III: 2, 6, 9

Wed/Fri. Nov 23-25 --- Thanksgiving

7: Natural Deduction

Mon. Nov 28

7.1... Implication Rules I
7.1/ I: 1-10; II: 1-10; III: 1-10, 14

Wed. Nov 30

7.2... Implication Rules II
7.2/ I: 1-10; II: 1-10; III: 1-10

Fri. Dec 2

7.3-7.4... Replacement Rules
7.3/ I: 1-5; II: 1-10; III: 1-5, 21-25
7.4/ I: 1-10; II: 1-10; III: 1-10

Mon. Dec 5

7.5-7.6... Conditional & Indirect Proof
7.5/ I: 1-10; II: 2, 3
7.6/ I: 1-10; II: 3, 5

Wed. Dec 7

7.7... Proving Logical Truths
7.7/ I: 1-5

Fri. Dec 9

Catch-up and Review

Finals Week	4th Exam
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