Syllabus for
MCDANIEL COLLEGE

ELEMENTARY LOGIC | PHI 2233 | Section 01 | (4 Credit Hours) | Spring 2015 | Department of Philosophy

CLASSROOM: Hill Hall 005 | **INSTRUCTOR**: Micah Tillman, Ph.D. | **OFFICE**: BMC 114
CLASS TIME: TuTh 2:40pm – 4:10pm | **E-MAIL**: mtillman@mcdaniel.edu | **HOURS**: TuTh 10am–11; 1pm–2:30

COURSE DESCRIPTION

McDaniel Plan: Quantitative Reasoning

From the Online Course Catalog: "An introduction to formal logic, propositional and predicate. The study of various forms of inference, theorems, derivations, and proofs."

From Tillman: "Elementary" literally means, "dealing with the elements" [of a thing or subject]. The title of this course, therefore, means, "The basic elements used to construct logic." A better title would be, "Introduction to Symbolic Logic," but there it is.

This course is about a discovery the mathematician George Boole made in the mid-1800s. His discovery was that you can do math with meanings, not just with numbers. You can add numbers, multiply them, divide them, and so on, of course. But Boole discovered you can also add meanings, multiply them, divide them, and so on. While in normal math you work with numerical values, in Boole's meaning-math you work with "truth values."

But why should we care about Boole's discovery? The reason is that without Google searches, we'd actually have to memorize things. We wouldn't just be able to look everything up online.

But what's that got to do with Boole? Well, Google searches only work because Boole (and the people who followed him) worked out the mathematics of meanings. Without Boole's discovery, in fact, computers as we know them wouldn't exist. A machine that can only do numerical math is just a calculator. If you want a *computer*, you need a machine that can do semantic math—math with meanings. You need a symbolic logic machine.

You: But if computers are symbolic logic machines, why do we have to spend a whole semester doing symbolic logic?

Me: Well, why did you have to learn to add, subtract, multiply, and divide, when your calculator could do it for you?

You: Because the system is broken. Stupid school. I hate everything.

Me: But if you want to program computers, if you want to work with databases for libraries or bidnisses, if you want to do some types of linguistics, or if you want to be a(n Analytic) philosopher, you've got to know how to do symbolic logic for yourself.

You: But I don't want to be or do anything of those things.

Me: I know. The *content* of symbolic logic courses will do 99% of you no good. *Learning* the content *will*; it's a fantastic brain workout. But most students hate symbolic logic for the same reason they hate math, and they hate math for the same reason they hate exercise.

After teaching symbolic logic twice "the normal way," therefore, I decided something needed to change. Symbolic logic is a puzzle-solving *game*, but most people never realize it. To help them see the light, I created the "Chambergon Battle Logic" system (oooo! aaaaa! marvel!). It is isomorphic with symbolic logic—it has the same structure and rules, so everything you do in one system can be translated directly into the other. However, since it translates the rules of logic into visual and motivational forms, even people who hate "quantitative reasoning" can play it. You'll be learning and doing symbolic logic without the pain and suffering every other student in every other symbolic logic course across the world is going through.

Chambergon Battle Logic is a kind of cross between mazes, deck-building card games, and role-playing board games. You are given starting cards and a destination, and earn points by playing the right cards to reach your destination. By earning points, you level up—acquiring new powers that allow you to solve new puzzles. The level you reach by the end of the semester will be the primary factor in determining your grade for the course.

COURSE TOPICS

1. **The Operators (or "Connectives") of Symbolic Logic:** What they are, how they interrelate, and how they differ from non-logical operators/connectives.
2. **The Rules of Symbolic Logic:** What they are, how they interrelate, and how they may be mirrored in what are normally thought of as non-logical or non-rational rules.
3. **The Mereology of Meaning and the Transmission of Truth:** Those may be the coolest eight words I have ever written. We'll talk about what they mean as the semester proceeds. (Mystery! Oooo! Aaaaa!)

COURSE OBJECTIVES
1. To become comfortable working with the operators/connectives and rules of symbolic logic.
2. To improve your ability to recognize and produce logically valid arguments.

REQUIRED COURSE TEXTS AND SOFTWARE
1. Tillman. *Chambergon Battle Logic: An Introduction to Symbolic Logic (only More Gamey)*, 2nd Edition. Free on Blackboard.
2. Tillman. *Chambergon Battle Logic User's Manual*, 2nd Edition. Free on Blackboard.
3. Tillman. *Chambergon Battle Logic, the Game*. Java-based software. Free on Blackboard.

COMPUTER- AND INTERNET-ACCESS REQUIREMENT
1. To complete the requirements in this course, you will need daily access to a computer with internet access.
2. That computer must be capable of running Java-based programs. (In general, Macs and PCs are, but iPads are not.)
3. It will also greatly benefit you if you have a laptop that (a) can run Java-based programs (b) you can use in class, especially on "Match" and "Tournament" days.

OTHER COURSE REQUIREMENTS

Assignments

Area 1:	"At-Home" Games	60% of final grade. You will play these games at home on your computer, or in a computer lab if you do not have a computer. To see how many games you must complete to earn what grade, see the table on page 3.
Area 2:	Matches (4)	10% of final grade. The quizzes in this course will be "Matches" consisting of ca. 5 games you play in class on your laptop (or on paper if you do not have a laptop), perhaps combined with questions to which you will write answers on paper. In Matches, points are worth double. If you are unable to complete all the games in class, you will have a chance to play the games outside of class for normal (non-double) points.
	Tournaments (2)	30% of final grade. The midterm and final exams for this course will be "Tournaments" consisting of ca. 15 games you will play in class on your laptop (or on paper if you do not have a laptop), combined with questions to which you will write answers on paper. In Tournaments, points are worth triple. If you are unable to complete all the games in class, you will have a chance to play the games outside of class for normal (non-triple) points.

Grading System

Each Tournament's grade will be calculated by assigning a grade on the 4.0 scale to your performance on the games for the Tournament, assigning a grade on the 4.0 scale to your performance on the written portion of the Tournament, and then taking a weighted average of the two grades. The correspondence of 4.0-scale grades to letter grades is as follows:

A = 4.0; A- = 3.7; B+ = 3.3; B = 3.0; B- = 2.7; C+ = 2.3; C = 2.0; C- = 1.7; D+ = 1.3; D = 1.0; D- = 0.7; F = 0.0

Since a score of "4" on a 4.0 scale amounts to earning 100% of the available points:

3.7 = 92.5%, 3.3 = 82.5%, 3.0 = 75%, 2.7 = 67.5%, 2.3 = 57.5%, 2.0 = 50%, 1.7 = 42.5%, 1.3 = 32.5%, 1.0 = 25%, 0.7 = 17.5%, 0.0 = 0%

If a Match consists of both games and a written portion, the same type of system will be used as for Tournaments. However, if it consists only of games, your grade for that Match will be determined simply by the grade you earn from the games. (For example, if you earn 1,842 of 2,000 possible points, you have earned a 92.1% of the points, which is in the "3.3" range on the 4.0 scale—which means you will receive a B+.)

Grading System, cont.

You will begin the semester at Level 0. At Level 0 you have four "powers" (each corresponding to a rule of symbolic logic). To level up, you must earn a certain number of points—and as part of doing so, you must complete a certain number of games. Your final grade in Area 1 of the Assignments (see above) will depend on the level you have reached at the end of the semester.

	How many points must I earn to reach this level?	In earning those points, how many "Normal" games must I complete?	(How many of the "Normals" must be "Powers-Off" games?)	(How many of the "Normals" must be "Encoding" games?)	How many "Activation" (non-"Normal") Games must I complete to reach this level?	If I reach this level, what will my grade for Area 1 be?
Level 0	0	0	0	0	0	F
Level 1	1910	20	10	0	0	F+
Level 2	3000	30	15	0	0	D-
Level 3	5500	40	20	0	5	D
Level 4	8850	55	28	0	13	D+
Level 5	12700	70	35	8	20	C-
Level 6	15500	85	43	15	20	C
Level 7	19950	100	50	23	28	C+
Level 8	22200	105	53	25	30	B-
Level 9	25800	120	60	33	30	B
Level 10	28350	135	68	40	30	B+
Level 11	30900	150	75	45	30	A-
Level 12	34300	170	85	51	30	A

Your final grade for the class will be the weighted average (as specified under "Assignments, above) of your grades in Areas 1 and 2.

Passing the Course * * * IMPORTANT * * * IMPORTANT * * * IMPORTANT * * * IMPORTANT * * * IMPORTANT * * * IMPORTANT * * *

You must achieve at least a D- (0.7) average grade both in Area 1 and in Area 2 (see "Assignments," above). *Otherwise*, your performance in the course will be rated less-than-satisfactory, and thus *you will receive a C- (1.7) for the course* no matter what your other scores amount to.

Making Up or Rescheduling Assignments * * * IMPORTANT * * * IMPORTANT * * * IMPORTANT * * * IMPORTANT * * * IMPORTANT * *

Your travel plans (even if your parents made them) and appointments for non-urgent issues do not count as legitimate reasons for rescheduling an exam ("Tournament") or quiz ("Match"). If, however, you are dealing with a prescheduled medical appointment for a serious medical or mental health issue (e.g., chemotherapy, surgery, crisis counseling), or a prescheduled activity on behalf of the university (e.g., performing in, or traveling for, music performance, or playing in, or traveling for, or an official university athletic event) I will usually be able to reschedule the exam or quiz for you. The same is true of illnesses and other emergencies (e.g., family emergencies, or weather-related travel emergencies).

In non-emergency cases, the normal procedure is to take the exam or quiz *early*, so you must plan ahead. In emergency cases, the normal procedure will be to take the exam or turn in the paper late. *However*, (a) you must alert me via e-mail as soon as possible that you will need to reschedule (if you have a smart phone, use it) and (b) the difficulty of the exam or quiz may be increased proportionate to the extra amount of time you were given by the delay, so as to be fair to the rest of the class who had to take the exam or quiz on time. Be ye forewarned.

Alternative Lectures Online

I have a 1.5 hour commute. Should I ever be unable to make it to campus because of car trouble or inclement weather, I will e-mail you and post a replacement lecture video online. So, if you show up at class and I am not there, check your (university) e-mail. Likewise, if the University is closed because of weather or some other emergency, I will do the same thing, posting replacement lecture videos until the University reopens.

Cheating and Plagiarism

You will be turning in the game files you complete as you go along this semester. I will know if the files you turn in are copies of files that other students gave you, *so do not share files with each other*. When I discover that you have turned in someone else's files—and I assure you, once again, that *I will know*—I will report you to the authorities and request that that they give you an "F" for the course. The process will be very embarrassing for you—it will involve a big meeting in front of important people (including a Dean and the members of the Honor Board, some of whom are students who will recognize you around campus and know what you've done)—in addition to ruining your transcript (and thus potentially ruining your education). See the University's statement on the Honor Code:

http://www.mcdaniel.edu/undergraduate/the-mcdaniel-plan/build-your-education/the-honor-code

Honor Code

Please write McDaniel's Honor Code/Pledge ("I have neither given nor received unauthorized aid on this piece of work, nor have I knowingly tolerated any violation of the Honor Code"), and sign your name, on the back of all assignments you turn in by hand.

RESOURCES AND ACCOMMODATIONS

When needed, be sure to take advantage of the student support services offered by:

- The Writing Center: http://writingcenter.mcdaniel.edu/
- The Library: http://hoover.mcdaniel.edu/
- Student Academic Support Services: http://www.mcdaniel.edu/undergraduate/the-mcdaniel-plan/build-your-education/academic-support/
- Health Services & Wellness Center: http://www.mcdaniel.edu/contact/consumer-information/health-services Winslow Center, 2nd Floor
  (410) 857-2243 (from campus phone: 2243)
  Emergencies: Campus Safety, (410) 857-2202 (from campus phone: 2202), Winslow, Lower Level
  Call 911 (from campus phone: 9-911)
- Department of Campus Safety: http://www.mcdaniel.edu/undergraduate/24-7-journey/campus-safety Winslow, Lower Level
  Emergencies: Call 911 (from campus phone: 9-911), then[2] call Campus Safety: (410) 857-2202
  (from campus phone: 2202)

If you are one of the many people who face the challenge of a learning disability (e.g., A.D.D or dyslexia), please contact Student Academic Support Services (SASS) regarding "disability services." I will be more than happy to work with you regarding your needs. I'm the son, grandson, and nephew of psychologists, so I understand. However, you will need to have your needs properly documented by SASS, and get me all the necessary paperwork early enough to make the accommodations. And as always, let me know if you have any questions, as I want to be helpful.

NOTES

Changes to the Syllabus: This syllabus is the source for the rules, requirements, and schedule that we will follow in this course. However, if he believes prudence and/or justice calls for it, the instructor reserves the right to alter and/or revise the rules, requirements, and/or schedule. Any significant changes to the rules, requirements, or schedule regarding graded assignments will be communicated via e-mail and/or our course's Blackboard (http://bb.mcdaniel.edu), as well as in class.

Time Commitment: McDaniel's "10/4 rule" means you expect to spend 10 hours per class studying and working outside of class each week.

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[2] This seems to me to be the order recommended on the Department of Campus Safety website.

COURSE SCHEDULE (SUBJECT TO CHANGE)

Week/Class	Date	Read before Class	Assignment Due in Class	Topics to Discuss in Class	Suggested Homework after Class
Week 1					
Class 01	Tues. 01/27	N/A	N/A	Introduction to the Course; The Types of Logic; The Nature of Arguments and Propositions	
Class 02	Thur. 01/29	• *CBL*, Introduction	N/A	The Nature of Arguments and Propositions, cont.; The Logical Operators/Connectives; The Mereology of Meaning and Transmission of Truth	
Week 2					
Class 03	Tues. 02/03	• *CBL*, Chapter 0	N/A	Introduction to the Game; Level 0 Powers: Double Negation, Tautology, Conjunction Introduction, Conjunction Elimination	Games 000–009
Class 04	Thur. 02/05	• *CBL*, Chapter 0	N/A	Level 0 Powers, cont.	Games 015–019, 025–029
Week 3					
Class 05	Tues. 02/10	• *CBL*, Chapter 1	N/A	Level 1 Powers: DeMorgan's Theorem, Disjunction Elimination	Games 035–039
Class 06	Thur. 02/12	• *CBL*, Chapter 1	N/A	Level 1 Powers, cont.	Games 045–049
Week 4					
Class 07	Tues. 02/17	• *CBL*, Chapter 2	N/A	Level 2 Powers: Disjunction Introduction, Implication Activation Games	Normal Games: 055–059 Activation Games: 065–069
Class 08	Thur. 02/19	• *CBL*, Chapter 2	**Match 1 (Quiz 1); You must have reached Level 2 in order to complete the Match!!!**	Level 2 Powers, cont.	Games 070–074
Week 5					
Class 09	Tues. 02/24	• *CBL*, Chapter 3	N/A	Level 3 Powers: Modus Ponens, Hypothetical Syllogism, Constructive Dilemma	Normal Games: 085–089 Activation Games: 080–084
Class 10	Thur. 02/26	• *CBL*, Chapter 3	N/A	Level 3 Powers, cont.	Normal Games: 100–104, 115–119 Activation Games: 095–097
Week 6					
Class 11	Tues. 03/03	• *CBL*, Chapter 4	N/A	Encoding and Decoding (Standard Notation) Level 4 Powers: Modus Tollens, Contraposition, Commutation	Normal Games: 130–134 Activation Games: 098–099
Class 12	Thur. 03/05	• *CBL*, Chapter 4	**Match 2 (Quiz 2); You must have reached Level 4 in order to complete the Match!!!**	Encoding and Decoding (Standard Notation), cont. Level 4 Powers, cont.	Normal Games: 145–149, 160–164 Activation Games: 110–114
Week 7					
Class 13	Tues. 03/10	• Review *CBL*, Intro–ch. 4	N/A	Review: MAKE SURE YOU HAVE REACHED LEVEL 4!!!	MAKE SURE YOU HAVE REACHED LEVEL 4!!!
Class 14	Thur. 03/12	• Review *CBL*, Intro–ch. 4	**TOURNAMENT 1 (Midterm Exam) You must have reached Level 4 in order to complete the Midterm!!!**	**You must have reached Level 4 in order to complete the Midterm!!!**	N/A
Week 8					
Class xx	~~Tues. 03/17~~	NO CLASS.	SPRING BREAK	SPRING BREAK	SPRING BREAK
Class xx	~~Thur.03/19~~	NO CLASS.	SPRING BREAK	SPRING BREAK	SPRING BREAK

Week/Class	Date	Read before Class	Assignment Due in Class	Topics to Discuss in Class	Suggested Homework after Class
Week 9					
Class 15	Tues. 03/24	• *CBL*, Chapter 5	N/A	Level 5 Powers: Indirect Proof, Assumption, Conditional Proof	Games 175–179
Class 16	Thur. 03/26	• *CBL*, Chapter 5	N/A	Level 5 Powers, cont.	Games 185–189, 195–199
Week 10					
Class 17	Tues. 03/31	• *CBL*, Chapter 6	N/A	Level 6 Powers: Association, Exportation, Distribution	Normal Games: 205–209 Activation Games: 125–27
Class 18	Thur. 04/02	• *CBL*, Chapter 6	N/A	Level 6 Powers, cont.	Normal Games: 220–224, 235–239 Activation Games: 128–29, 140–44
Week 11					
Class 19	Tues. 04/07	• *CBL*, Chapter 7	N/A	Level 7 Powers: Biconditional Equivalence (Elimination/Introduction)	Games 250–254 Make sure you've reached Level 7!
Class 20	Thur. 04/09	• *CBL*, Chapter 7	**Match 3 (Quiz 3); You must have reached Level 7 to complete the Match!!!**	Level 7 Powers, cont.	Catch up on games you've missed
Week 12					
Class 21	Tues. 04/14	• *CBL*, Chapter 8	N/A	Introduction to Predicate Logic Level 8 Powers: Quantifier Negation, Universal Elimination, Existential Elimination	Games 265–269
Class 22	Thur. 04/16	• *CBL*, Chapter 8	N/A	Level 8 Powers, cont.	Games 275–279, 285–289
Week 13					
Class 23	Tues. 04/21	• *CBL*, Chapter 8	N/A	Level 8 Powers, cont:	Games 295–299
Class 24	Thur. 04/23	• *CBL*, Chapter 9	N/A	Level 9 Powers: Universal Introduction, Existential Introduction, Identity elimination	Games 305–309, 315–319
Week 14					
Class 25	Tues. 04/28	• *CBL*, Chapter 9		Level 9 Powers, cont:	Make sure you've reached Level 9! Keep working toward Level 12!
Class 26	Thur. 04/30	• *CBL*, Chapter 9	**Match 4 (Quiz 4); You must have reached Level 9 to complete the Match!!!**	Level 9 Powers, cont:	Work on the games you've missed, so you can reach Level 12
Week 15					
Class 27	Tues. 05/05	• Review *CBL*, Intro–ch. 9	N/A	Review	Make sure you have *at least reached Level 9*, but keep working to reach Level 12
Class 28	Thur. 05/07	• Review *CBL*, Intro–ch. 9	N/A	Review	Make sure you have *at least reached Level 9*, but keep working to reach Level 12
Finals					
Class 29	Tues. 05/12	Final Exam In our normal classroom	**TOURNAMENT 2 (FINAL EXAM) You must have reached Level 9 to complete the Tournament!!! Tuesday, May 12th 1:30pm–4:30pm**	**TOURNAMENT 2 (FINAL EXAM)** In our normal classroom	**Final Exam Tuesday, May 12th 1:30pm–4:30pm**