Phil 100 : Logic and Critical Analysis (Fall 2010)

Course website: http://www.artsci.wustl.edu/~grussell/Phil100F2010.html
Textbook: Language, Proof and Logic, by Barwise and Etchemendy
(you must by a new copy of this book, and take good care of your registration ID)
Book website: http://www2.stanford.edu/GUS/lpl/
Class Times: Tuesdays and Thursdays at 1-2:30 pm – 11:30-1pm
Class Location: Mallinckrodt 304
Prerequisites: None.

Instructor: Gillian Russell
Email: grussell - at - artsci - dot - wustl - dot - edu
Office Hours: Mondays 1-2pm or by appointment, Wilson Hall 209

Teaching Assistant:
Bryan Stagner
Email: bryan.r.stagner AT artsci DOT wustl DOT edu
Office Hours: Mondays 2-4pm

Course Description:

This course is an introduction to logic for students with no previous experience with the subject. Logic is the formal study of arguments, where argument is intended in a very specific sense. Whenever anyone puts forward a set of reasons for accepting a sentence, e.g.:

Most scientists are alarmists, so global warming is not a serious problem.

Or,

If Israel goes into the war, then the casualties will be much higher. But Israel will not go into the war, so casualty levels will be low.

they are providing an argument. An argument in our sense is a sequence of statements, one of which is supposed to follow from, or be supported by, the others. In logic we are interested in characterising what makes an argument a good argument.

In this course we will study the semantics and proof theory for truth-functional (or propositional) logic and first order predicate logic with quantifiers, concluding with soundness and completeness proofs.

Syllabus

Actions marked "optional" on the book's content's page are not required reading unless I explicitly say that they are to be read (below or in class.)

Week 1 - Tuesday 31st August and Thursday 2nd September

Reading: Introduction (LPL)
Software Manual (LPL cd)
You should use this time to familiarize yourself with the computer software, sorting out technical problems so that you know what you are doing when it is time to submit the first homework assignment. There will be a practice assignment and you should complete this as a way of familiarising yourself with the submission process.

Chapter 1: Atomic Sentences

Week 2 - 7th and 9th September

Chapter 2: The Logic of Atomic Sentences
Chapter 3: The Boolean Connectives - including section 3.8

Week 3 - 14th and 16th September

Chapter 4: The Logic of Boolean Connectives - including sections 4.5 and 4.6
Chapter 5: Methods of Proof for Boolean Logic

Week 4 - 21st and 23rd September

Chapter 6: Formal Proofs and Boolean Logic - including section 6.6 on proofs without premises
Chapter 7: Conditionals

Week 5 - 28th and 30th September

Chapter 8: The Logic of Conditionals
Soundness

Week 6 - 5th and 7th October

Chapter 9: Introduction to Quantifiers
Chapter 10: The Logic of Quantifiers

Week 7 - 12th and 14th October

Thursday 11th October: Review session for the midterm

Week 8 - 19th and 21st October

Tuesday 19th October: Midterm Examination
Thursday 21st October: No class

Week 9 - 26th and 28th October

Chapter 11: Multiple Quantifiers
Chapter 12: Methods of Proof for Quantifiers

Week 10 - 2nd and 4th November

Chapter 13: Formal Proofs and Quantifiers

Week 11 - 9th and 11th November

Chapter 14: More about Quantification

Week 12 - 16th and 18th November

Chapter 16: Mathematical Induction

Week 13 - 23rd and 25th November
Chapter 17: Advanced Topics in Propositional Logic

No class on Thursday 25th November (thanksgiving break)

**Week 14 - 30th October and 2nd November**

Chapter 18: Advanced Topics in FOL (18.1-18.3 only)

**Week 15 - 7th and 9th December**

Chapter 19: Soundness and Completeness (19.1 only)

Thursday 9th December: Review session for the final

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**Assessment**

The subject is largely mathematical in nature and assessment in this course will be by way of 6 problem sets to be done at home (60%), and midterm (20%) and final (20%) examinations. Problem sets should be turned in to your TA.

Assignments for this course can be downloaded as .pdf files from the table below.

**Policy on Late Work**

Late work will incur a penalty at a rate of 20 percent of the total possible grade every 24 hours.

**Academic Misconduct**

It is very important that you understand the rules for collaboration on this course. You may work with other students in order to solve the problems in your take-home problem sets, in fact, this is encouraged. However *each student must write up his or her own solutions alone*. You may not do it with another student looking over your shoulder to correct you. You may not do this from notes which another student has made, nor may you make notes on another student's written solutions. You may not lend or copy digital or paper homework solutions - at any stage of completion. Collaboration is, of course, completely forbidden during the midterm and final examinations. Sometimes it is unclear whether a hypothetical case of collaboration is permissible according to these rules, or whether it counts as misconduct, but it is your duty to ensure that ALL your collaborations are *clearly* permissible. One good way to do this is not to take any written notes whilst working with other students: use a chalk board or white board to work out ideas, or, if you use paper, dispose of the written solutions before you separate to write up your individual homeworks alone. The Grade Grinder incorporates sophisticated mechanisms for detecting plagiarism and I suggest you read about these mechanisms on the LPL website and in the LPL book. Students suspected of plagiarism or any other form of academic dishonesty or misconduct will be reported to the academic integrity officer for Arts and Sciences (currently Dean Killen), so that the incident may be handled in a consistent, fair manner, and so that substantiated charges of misconduct may be noted in students' records.
Homework Assignments

Homework assignments may be downloaded from this table.

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<th>ASSIGNMENT</th>
<th>DUE DATE</th>
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<tbody>
<tr>
<td>Practice assignment</td>
<td>Tuesday 7th September</td>
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<td>Assignment One</td>
<td>Tuesday 14th September</td>
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<td>Assignment Two</td>
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<td>Assignment Three</td>
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<tr>
<td>MIDTERM EXAMINATION</td>
<td>Tuesday 19th October, 2007, in class.</td>
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<td>Assignment Four</td>
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<td>Assignment Five</td>
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<tr>
<td>FINAL EXAMINATION</td>
<td>TBA</td>
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Related Links


Richard Zach's guide to the LPL celebrities: [Who are Fitch, Boole and Tarski?](http://www-csli.stanford.edu/LPL/)

Greg Restall's [Great Moments in Logic](http://www-csli.stanford.edu/LPL/)

For those students who wish to take the class pass/fail, final grades for the course of C- or above will constitute a pass.