

SYLLABUS

Symbolic Logic, CSC/MATH/PHIL 401A/501A

Course Description

The goal of this course is literacy in several propositional logics. We will study propositional logic from syntactic, model-theoretic, and proof-theoretic perspectives, focusing both on classical logic and some of its alternatives and extensions.

Locations and Times

Monday / Wednesday / Friday, 1-1.50 pm
Physics/Atmospheric Sciences Building, room 220

Instructor Information

Dr Jason Turner
Social Sciences room 207
jasonturner@email.arizona.edu
Office Hours: Monday 2pm – 3pm ; Wednesday 11.30 am – 12.30 pm
My office hours are ‘open’; that means you don’t need an appointment to come see me during those times.
Just drop by! If you need to meet with me some time other than those, please contact me by e-mail to arrange an alternative.

Course Objectives and Expected Learning Outcomes

By the end of the course, you should be ‘logically literate’ in propositional logic: that is, you should understand the standard classical system of propositional logic, including both their model- and proof-theories, and be able to establish results in these systems. You should be familiar with several extensions and alternatives to the classical systems, and understand and be able to explain how these extensions or alternatives differ, in their relevant proof- or model-theoretic aspects, from the classical versions. You will also be familiar with, and be able to state and explain, some of the more basic metatheorems about classical and modal logic.

Topics

1. Introduction: Logic and Metalogic
2. Classical Propositional Logic
 - a. Semantics: Interpretations and Valuation Functions
 - b. Proof Theory: Henkin-style Proofs
 - c. Metatheorems: Deduction and Soundness-and-Completeness
3. Modal Propositional Logic
 - a. Possible World Semantics
 - b. Axiomatic Proof Theory
 - c. Metatheorems: Soundness and Completeness
4. Alternatives to Classical Propositional Logic
 - a. Many-Valued Logic
 - b. Supervaluationism
 - c. Intuitionism

Course Format and Teaching Methods

The classes will be in the form of ‘interactive lectures’; I will come with material to present, but there will be discussion (and in-class exercises) as well.

Required Texts

There is one required text: *Logic for Philosophy* by Theodore Sider (OUP)

Required Knowledge

This course presupposes familiarity with standard predicate logic. If you are not familiar with it you are very likely to fall behind and find it very hard to catch up. If you have taken an introductory symbolic logic class (such as PHIL 202) and done well, you should be fine. If you do not attend all lectures and do all of the homework, you will also find this class very hard.

Grading Policy

University policy regarding grades and grading systems is available at:

<http://catalog.arizona.edu/2014-15/policies/grade.htm>

Grade Distribution for this Course:

A: 90-100

B: 80-89

C: 70-79

D: 60-69

E: 0-59

Requests for incompletes (I) and withdrawal (W) must be made in accordance with university policies which are available at <http://catalog.arizona.edu/2014-15/policies/grade.htm#I> and <http://catalog.arizona.edu/2014-15/policies/grade.htm#W> respectively.

Roughly every two weeks, you will have either a homework assignment or an exam. Each homework assignment is worth 10% of your grade, and each exam is worth 20% of your grade. There will be a total of three exams and *five* homeworks; you get to drop your lowest homework grade.

As a rough guide, homeworks will be due on the first day of class in each of weeks 3, 7, 9, 13, and 15, and exams will be in weeks 5 and 11, and again during the final exam schedule. However, the exact dates are subject to change in response to how well the class is responding to the material. Please see the course d2l site for up-to-date information on exam dates and homework due dates.

Both homeworks and exams will consist largely of problems to be worked through or metalogical theorems to be proven.

Graduate Credit

Students taking the course for graduate credit will arrange, with me, a time for additional instruction on a regular basis. These graduate sessions will investigate the course material being covered at a higher level of detail as well as a few advanced topics not covered in the main class.

Graduate students will be expected to complete homeworks and exams at the same time and in the same manner as the undergraduate students. However, graduate homeworks and exams will also include more advanced exercised and draw, to some extent, from material covered in the additional graduate sessions.

Honors Credit

Students wishing to contract this course for Honors Credit should email me to set up an appointment to discuss the terms of the contract and to sign the Honors Course Contract Request Form. The form is available at <http://www.honors.arizona.edu/future-students/honors-credit-across-campus?destination=node/361>.

Late Work Policy

I post answer keys to homework and exams. Late work cannot be accepted once these keys have been posted, for what I hope are obvious reasons. If you have a compelling reason why you cannot turn in work on time, please contact the Dean of Students' office for assistance.

Attendance Policy

The UA's policy concerning Class Attendance and Administrative Drops is available at: <http://catalog.arizona.edu/2014-15/policies/classatten.htm>

The UA policy regarding absences on and accommodation of religious holidays is available at <http://deanofstudents.arizona.edu/policies-and-codes/accommodation-religious-observance-and-practice>.

Absences pre-approved by the UA Dean of Students (or Dean designee) will be honored. See: http://uhap.web.arizona.edu/chapter_7#7.04.02

Participating in course and attending lectures and other course events are vital to the learning process. As such, attendance is required at all lectures and discussion section meetings. Students who miss class due to illness or emergency are required to bring documentation from their healthcare provider or other relevant, professional third parties. Failure to submit third-party documentation will result in unexcused absences.

Assignment/Testing Schedule/Due Dates

Five homework assignments. Each day in class, certain problems (from the book or given in a handout) will be set as 'homework problems'. Of the homework problems, some will be singled out as 'to be handed in', and some will not. On the due date (check the Course d2l site for updates), you will be expected to hand in your answers to the singled-out homework problems assigned since the last 'homework day'. These will be graded for correctness and returned to you. 40% of your grade will be the average of the best **four** scores you receive out of these five assignments.

Three Exams. Three exams will be set during the semester. It is anticipated the two mid-term exams will occur in Weeks 5 and 11, although final dates will be set as is appropriate with the progression of the class. The third exam will occur during the scheduled final exam time during exam week. The exams will consist of problems of essentially the same sort you will see in homework assignments. Each exam will comprise 20% of your final grade.

Assignment Format

If you want to submit assignments electronically on the d2l site, that is fine with me. However, since most of the work is done most easily by paper and pencil (or pen if you're a brave soul), that can be inconvenient for many, and so I accept written work in class on the due date as well. Please make sure to have your name on your assignment and if you have multiple pages, staple them together.

Classroom Behavior

Don't text, chat, make phone calls, play games, read the newspaper, buy stuff from Amazon, check baseball scores, surf the web, or do any other distracting, non-class-related thing during class. Don't be having whispered (or loud!) conversations with the person next to you; it distracts the rest of us, even if we can't hear what you're saying. If you're not paying attention, you're going to find the class very difficult. And even if you don't care, others sitting around you do; they want to learn, and don't deserve to be distracted. So don't do it.

More formally: Students are asked to refrain from disruptive conversations with people sitting around them during lecture. Students observed engaging in disruptive activity will be asked to cease this behavior. Students who continue to disrupt the class will be asked to leave lecture or discussion and may be reported to the Dean of Students.

Some learning styles are best served by using personal electronics, such as laptops and iPads. I am not going to forbid them. But I really, *really* don't recommend using them. First, for this class, it will be especially difficult. We will be doing a lot of work using logical symbols and notation that you won't find on your keyboard, and it is *very* difficult to keep up taking notes about this stuff while hunting for the symbol you want. Second, more generally: ***students do better when they take notes by hand.*** Don't take my word for it: Listen to *Scientific American*.

(<http://www.scientificamerican.com/article/a-learning-secret-don-t-take-notes-with-a-laptop/>)

However, if you insist on using an electronic device, know that you may also distract those who do not wish to use them. So if you do use such devices, please sit to one side of the classroom.

The Arizona Board of Regents' Student Code of Conduct, ABOR Policy 5-308, prohibits threats of physical harm to any member of the University community, including to one's self. See: <http://policy.arizona.edu/threatening-behavior-students>.

Accessibility and Accommodations

It is the University's goal that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact Disability Resources (520-621-3268) to establish reasonable accommodations. For additional information on Disability Resources and reasonable accommodations, please visit <http://drc.arizona.edu/>.

If you have reasonable accommodations, please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate.

Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

Student Code of Academic Integrity

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See: <http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity>.

The University Libraries have some excellent tips for avoiding plagiarism available at: <http://www.library.arizona.edu/help/tutorials/plagiarism/index.html>.

Selling class notes and/or other course materials to other students or to a third party for resale is not permitted without the instructor's express written consent. Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA email to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of student email addresses. This conduct may also constitute copyright infringement.

Additional Resources for Students

UA Non-discrimination and Anti-harassment policy:
<http://policy.arizona.edu/sites/default/files/Nondiscrimination.pdf>

UA Academic policies and procedures are available at:
<http://catalog.arizona.edu/2014-15/policies/aaindex.html>

Student Assistance and Advocacy information is available at:
<http://deanofstudents.arizona.edu/student-assistance/students/student-assistance>

Confidentiality of Student Records

<http://www.registrar.arizona.edu/ferpa/default.htm>

Subject to Change Statement

Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.