

# Logic

(PHIL-2311-002)

Fall 2015

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**Office Hours:** W 2-3 and by appointment (email me with 24 hours notice)

**Section:** 002

**Time and Place of Class Meetings:** T/Th 12:30-1:50 Preston Hall 210

**Description of Course Content:** This course is an introduction to formal logic. Topics to be covered include (non-exhaustively) validity, deduction, implication, symbolization, truth functions, and truth tables. Syntax, semantics, and proof theory will be presented for both sentential logic and first-order predicate logic. Students will learn to use systems of natural deduction as well as semantic tableaux. If time permits, the course will also provide a basic introduction to elementary metatheory.

**Student Learning Outcomes:** Students will learn to execute and critically assess reasoning via both formal and natural language. They will also learn how to translate between formal and natural language for the purposes of clarity and the evaluation of reasoning. The assessment of these outcomes will be based on student performance on take-home problem sets and in-class examinations. The skills to be acquired in this course constitute the basic foundation for formal reasoning at all levels in philosophy, mathematics, linguistics, computer science and many other fields.

## **Required Textbook:**

*Simple Logic*

Daniel Bonevac. Oxford: OUP 1999

## **Descriptions of major assignments and examinations:**

Homework (weekly or semi-weekly problem sets)

Midterm Exam (short answer, translations, proofs)

Final Exam (similar to midterm in format)

**Attendance:** You should come to every lecture on time and fully prepared by having done the assigned reading for that lecture and any assigned homework from the previous lecture. That's what I expect of you. I will not always collect homework, but whenever I decide to collect it, you had better have it ready! That said, I do not plan to take attendance. You're adults and college is expensive. If it's not worth it to you to show up, it's not worth it *for* you to show up.

**No Screened Devices:** Students are not allowed to use screened devices (laptops, tablets, phones, etc.) during lecture. Exceptions will be made only for students who have an independently established need to use such devices for learning purposes (e.g. students with disability documentation).

## **Grading:**

Homework (30%--lowest score dropped)

Midterm (30%)

Final (40%)

**Expectations for Out-of-Class Study:** As noted above, you are expected to have prepared thoroughly for each meeting by reading and thinking critically about the assigned text(s) for that day's lecture, and by completing the assigned problem set from the preceding lecture. Beyond the time required to attend each lecture, expect the minimum required out-of-class preparation time to be two hours for each lecture. Expect to spend as many as twenty additional hours (throughout the semester) preparing for *each* exam. Becoming "fluent" in formal logic is much like becoming fluent in any other non-native language: it takes a great deal of time and effort!

**Note on Out-of-Class Group Work:** You are welcome to form study groups to work on the homework problem sets if you wish. However, each individual must complete and hand in his or her own work.

**Drop Policy:** Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://web.uta.edu/aao/fao/>).

**Disability Accommodations:** UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA)*, *The Americans with Disabilities Amendments Act (ADAAA)*, and *Section 504 of the Rehabilitation Act*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of a letter certified by the **Office for Students with Disabilities (OSD)**. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

**The Office for Students with Disabilities, (OSD)** [www.uta.edu/disability](http://www.uta.edu/disability) or calling 817-272-3364.

**Counseling and Psychological Services, (CAPS)** [www.uta.edu/caps/](http://www.uta.edu/caps/) or calling 817-272-3671.

Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at [www.uta.edu/disability](http://www.uta.edu/disability) or by calling the Office for Students with Disabilities at (817) 272-3364.

**Title IX:** *The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit [uta.edu/eos](http://uta.edu/eos). For information regarding Title IX, visit [www.uta.edu/titleIX](http://www.uta.edu/titleIX).*

**Academic Integrity:** Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

*I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.*

*I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.*

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

**Electronic Communication:** UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

**Student Feedback Survey:** At the end of each term, students enrolled in classes categorized as "lecture," "seminar," or "laboratory" shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term.

Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

**Final Review Week:** A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

**Emergency Exit Procedures:** Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

**Student Support Services:** UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to [resources@uta.edu](mailto:resources@uta.edu), or view the information at <http://www.uta.edu/universitycollege/resources/index.php>

## Course Schedule:

**(All page references are to Bonevac.)**

Aug. 27: Introduction  
No assigned reading

### Arguments

Sept. 1: Premises and Conclusions (2-7)  
Recognizing Arguments (10-15)

Sept. 3: Extended Arguments (24-28)  
Validity and Strength (42-45)

Sept. 8: Validity continued,  
Implication, Equivalence, and Form (47-49; 52-57)

### Propositional Logic

Sept. 10: Connectives and Truth Functions (218-221; 222-227)

Sept. 15: Symbolization and Syntax (228-233; 236-239)

Sept. 17: Symbolization (continued), Logical Properties, and Truth Tables (239-241; 243-247)

Sept. 22: Truth Tables for Arguments (249-255)

Sept. 24: Proof Theory: rules for conjunction and conditionals (298-308)

Sept. 29: Proof Theory: rules for disjunction and connectives (308-321)

Oct. 1: Proof Theory: rules for connectives (continued), algebra, indirect proofs (325-331; 333-337)

Oct. 6: Proof Theory: practice, practice, practice! (No additional reading for today)

Oct. 8: review for midterm

Oct. 13: midterm

Oct. 15: Tableaux for propositional logic through conjunction (260-274)

Oct. 20: Tableaux continued for propositional logic (274-294)

Predicate Logic

Oct. 22: Syntax: Quantifiers and variables (339-345)

Oct. 27: Syntax continued (345-347 + possible supplemental reading TBD)

Oct. 29: Symbolization (348-354)

Nov. 4: Symbolization (possible supplemental reading TBD)

Nov. 5: Symbolization: practice, practice, practice!

Nov. 10: Proof Theory: Quantified Proofs (370-374)

Nov. 12: Proof Theory: Universal Generalization (377-383)

Nov. 17: Proof Theory (possible supplemental reading TBD)

Nov. 19: Proof Theory: practice, practice, practice!

Nov. 24 Tableaux for predicate logic (358-367)

(Thanksgiving)

Dec. 1 Tableaux for predicate logic: practice, practice, practice!

Dec. 3 metatheory (time permitting)

Dec. 8: review for final

**Note:** *I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course.* DG