Deductive Logic

University of Utah - Spring 2018
HONOR 3300 (Course ID# 15284)
QB/QI Designation
TH 10.45-12.05pm, MHC 1206B
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Logistics
Office Hours
M 1:00-2:00pm, or by appointment, in my office, CTIHB 402A.
Grade Categories
• Homework;
• Exams.
Course Texts
• Required: Paul Teller’s A Modern Formal Logic Primer (Vol. I & II) (the text is available as a PDF on the course Canvas site, or you may download the book free of charge).
• Recommended: Apostolos Doxiadis and Christos Papadimitrou’s Logicomix.
Teaching Assistants
Dan Molter: dan.molter[at]utah.edu
Website
HONOR 3300 has a Canvas website that contains old exams and other information.

The course
This course is about teaching you deductive logic. Logic is the science of argument, and mastering deductive logic will greatly assist you in more precisely articulating and evaluating arguments. We will be covering formal treatments of both sentence and predicate logic in this course. This will include basic logical concepts, primitive and derived rules, transcription, and proofs using natural deduction and truth-trees. Class time will consist of lectures and working through sample problems.

Learning Objectives
Over the course of the semester, students will:
• Master foundational logical concepts, e.g., validity, soundness, derivation, and interpretation;
• Derive advanced rules of inference from foundational ones;
• Formally describe centrally important logical concepts using the tools of deductive logic;
• Apply formal logical methods to test validity, prove entailment, demonstrate logical truths or falsehoods, etc.;
• Use the methods learned to solve logical problems;
• Demonstrate an ability to construct proofs using a variety of logical methods, e.g., truth trees, truth tables, and natural derivations.;
• Develop skills designed to improve performance on graduate entrance exams (e.g., MCAT, LSAT, GRE, etc.).
Reading, Homework, Topics & Estimated Exam Schedule

All exam dates are tentative, but will be given roughly every two weeks.

**Homework is due on the date exams are administered for corresponding chapters.**

**Sentence Logic (vol. I)**

- **Exam 1:** Transcription, Translation, and Truth Tables (Jan. 22)
  - Homework due: Vol. 1, Chapters one & two.
- **Exam 2:** Validity, Soundness, Logical Equivalence, and Natural Deductions (Primitive Rules) (Feb. 5)
  - Homework due: Vol. 1, Chapters three, four & five.
- **Exam 3:** Natural Derivation (Primitive & Derived Rules) (Feb. 19)
  - Homework due: Vol. 1, Chapters six & seven.

**Predicate Logic (vol. II)**

- **Exam 4:** Transcription, Translation, and Interpretations (Mar. 5)
  - Homework due: Vol. 2, Chapters one, two, three & four.
- **Exam 5:** Natural Derivation (I) (Mar. 26)
  - Homework due: Vol. 2, Chapter five.
- **Exam 6:** Natural Derivation (II) (Apr. 9)
  - Homework due: Vol. 2, Chapter six.

**Truth Trees (vol. 1 & II)**

- **Exam 7:** Truth Trees (Apr. 23)
  - Homework due: Vol. 1, Chapters eight & nine; Vol 2, seven & eight.

**Makeup Exam: Comprehensive (May 1, 1:00-3:00 pm)**

For details of how your overall grade will be determined, please see the grade worksheet below.

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1 Chapter two may end up getting dropped or pushed to exam 5 or 7 if we need the time.
Grades

Your grade in this class will be based on (i) turning in your homework assignments on time; (ii) sitting for exams; and (iii) your performance on the exams. There will be seven exams, worth 100 points each. A joint homework/exam sitting grade will also be assigned and worth 100 points. Your overall grade will be determined by dropping the lowest of these eight scores and taking the average.

Homework

You will be assigned homework for each chapter covered in the Teller texts. **Homework is due in class on the day the exam is administered for the assigned chapter.** **No late homework will be accepted.** Your homework will be checked to ascertain that you have made a reasonable effort to complete it. You will be expected to check your own answers against the answer key (available on the course site, or http://tellerprimer.ucdavis.edu/).

Exams

You will get regular feedback on your progress in the course through seven in-class exams, scheduled roughly every two weeks (see above). Each exam will cover the material recently presented in class and assigned in the homework. Though the exams are not, strictly speaking, cumulative, the material is and this will be reflected on the exams. Previous course exams are available on the Canvas website and provide a good indication of what your exams will look like.

Students learn logic at different paces or simply have off days. Recognizing this, I have developed a system that allows students to maximize their performance in class. For each exam you will receive two distinct grades, one for taking the exam, the other based on your performance on that exam.

You will receive credit simply by sitting for and taking each exam. Along with your homework, this will be factored into your overall grade (see below). **Please bring your own blue books for the exams.**

Exams are also graded based on your performance. However, for the first six exams administered it is your choice whether or not I grade your performance. You will have the option of turning your exam in to one of two piles, either a “Count This Exam” pile, or a “Please Do NOT Count This Exam” pile. If you opt not to have an exam count, you will need to take the make-up exam at the end of the semester (see below).

Make-Up Exam

There will be only ONE make-up exam, administered during finals week. You must take this make-up exam if you opted to not count any of your first six exams (or if you missed any of the first six exams, for any reason). The make-up will be cumulative over these six exams and its score will be used for all of the regular exams for which you have no score. E.g., if you opted against counting three exams and scored an 87 on the make-up exam, then you would be credited with an 87 for each of those three exams. You will not need to take the make-up unless you missed one of the first six tests (unless you want to take it for fun!).
So there is some strategy involved in this class. You must decide for each exam whether or not to place it in the “Count This Exam” pile, or whether you think you will perform better on the make-up exam. Once you’ve turned in an exam, your decision is final.

**Overall Grade**

Your final grade will be calculated as follows. Each test is worth 100 points. You will be assigned up to 100 additional points on the basis of homework and sitting for exams. There are 7 exams and 7 homework assignments; completing 13 or 14 of these earns you 100 points. Completing fewer than 13 earns you fewer points (e.g., completing 10 assignments earns you a 10/13, or 76.9 points). In short, simply sitting for each exam and turning in all your homework on time earns the same as getting an A+ on one exam. That’s a pretty good deal! Your lowest grade will be dropped from your cumulative homework grade and your exam scores (the last exam is not admissible for dropping). The remainder of the grades will be averaged for your final grade.

**Advice**

Students vary enormously in how difficult they find logic. Some, who are very good at other things, find logic extremely hard. Others find it extremely easy. If you find you are having difficulty, get help before it’s too late! The material gets markedly more difficult as the course progresses, and if you do not understand the initial material, you will find it hard to ‘catch up’ later in the term. If you are having difficulty, please come to my office hours for personal help or visit with the course TA. We will also be happy to work with you by appointment if you are not free at those times.

The simplest and best advice I can give you is to **DO LOGIC PROBLEMS EVERY DAY**. Simply spending a mere 15 minutes working on one or two of your homework problems a day will be of immense value to your understanding of logic. Treat this as you would treat learning a new language. Do not wait until the day before an exam to try and learn the material.

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2 Everyone gets one DGP. Things come up, and I recognize that extenuating circumstances may force you to miss an exam, or feed your homework to your dog, etc. Rather than adjudicate excuses, I’m simply granting everybody one—and only one—free pass (i.e., the DGP). After that your grade is impacted.
Course Etiquette

Discussion Norms (From Chalmers’ Rules and Ned Markosian’s Classroom Rules)

In class we will use a standard philosophical convention for class discussions, the hand/finger system. If you have a new comment, raise your hand; if you have a follow up, raise a finger. This will help maintain a continuity of discussion, while also helping ensure voices get heard.

Class Norms:

1. **Norms of respect**
   1.1. Be nice, don't be mean. Be respectful.
   1.2. Don't interrupt.
   1.3. Don't roll your eyes, make faces, laugh at a classmate, etc., especially if you are disagreeing with someone. (Partial exception for signaling norm violations to me.)
   1.4. Don't be incredulous. Encourage exploring conceptual space.
   1.5. Acknowledge your interlocutor’s insights.
   1.6. Object to theses, don't object to people.
   1.7. If you notice someone else violating 1.1–6, speak up right away, even if—especially if—you are not the victim.

2. **Norms of constructiveness**
   2.1. Objections are great, but it’s also always OK to be constructive and build on a previous comment. Even the most destructive objection can often be cast in a constructive way and provide positive insights.
   2.2. *Philosophy is not a zero-sum game.* Don't worry about impressing anyone or ‘winning’.
   2.3. You don't need to keep pressing the same objection (individually or collectively) once it has been heard or acknowledged.
   2.4. Try to identify unstated assumptions and premises, and ask whether these are reasonable or justified.
   2.5. Try applying the ideas under consideration to new contexts, or under different conditions.
   2.6. Every once in a while, someone should offer a big picture comment to help us avoid getting lost in details.

3. **Norms of inclusion**
   3.1. Don't monopolize the discussion. Leave room for others to speak.
   3.2. Raise one question or comment at a time (then go back in the queue).
   3.3. Acknowledge previous comments where appropriate.
   3.4. Try to build on the points that have been made by others. Seek to connect the point under consideration to previous points or the larger discussion.
   3.5. *It’s OK to ask a question that you think may be unsophisticated or uninformed."
   3.6. Don't use unnecessarily offensive examples.

4. **Metanorms**
   4.1. When norms are violated, I will aim to gently point this out. Others should feel free to say something or signal to me that I should. If it’s more comfortable, it’s fine to quietly point out violations after class.
   4.2. If I violate the norms, feel free to say so then or afterwards.
   4.3. Try not to be defensive when a violation is pointed out; try to be respectful when pointing out a violation.
   4.4. Remember that it’s *quite possible to violate these norms without being a bad person.* (I've certainly done so!)
   4.5. Respect your instructor’s enforcement of these norms.
   4.6. These norms may be modified, negotiated, or shift over the course of the semester. That’s OK.
**In Class Expectations**

1. Show up on time; do not leave until class is over. Arriving to class late or leaving early is very distracting and disruptive, both to me and to other students. If you must leave class early, please select a seat such that you can leave in an unobtrusive manner;

2. Turn off your cell phone ringers, and please refrain from texting in class. If a cell phone rings during class or I catch you texting, I reserve the right to answer your phone or reply to your texts.

3. No web-surfing, newspaper reading or other related activities during class. If you feel these kinds of activities are more meaningful than paying attention in class, then by all means do it – just not in the classroom. My feelings won’t be hurt if you choose not to attend class;

4. Be respectful of others. We are going to have in-class discussions over controversial foundational philosophical issues. You may feel strongly about these, and disagree with your fellow students (or me!). Disagreement is fine, *ad hominem* attacks are not.

**E-mail correspondence**

I am very happy to correspond with you via e-mail, and this is the best way to contact me. I hardly ever check my voicemail, and rarely return student phone calls. E-mails, on the other hand, will typically get a response within 24 hours (and often much quicker). However, I do ask that you follow some minimal guidelines:

1. Please indicate which class you are writing to me about. I teach more than one course and it does neither of us any good if my reply is simply, “Which class are you writing me about?”

2. Please use a proper greeting. This may be formal (e.g., “Dear Prof. Haber”) or informal (“Hi Haber”). You may address me in whatever way you feel comfortable (so long as it is respectful!), though my preference is that you simply call me “Haber.” If you are unsure how to address me, you may simply use, “Dear Prof. Haber.”

3. Please sign your e-mail. All too often I get unsigned e-mails from students with inscrutable e-mail addresses. Please identify yourself to me.

These guidelines may be relaxed in obvious cases (e.g., in a string of e-mail replies). I will use similar guidelines in writing you. As stated above, I am happy to answer student e-mails, and tend to respond promptly (within a day). If I receive e-mails that fail to meet the guidelines above, I reserve the right to not respond.
Administrative and Campus Policies

The Americans with Disabilities Act

The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.

Addressing Sexual Misconduct/Title IX

Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

Wellness Statement

Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student's ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness at www.wellness.utah.edu or 801-581-7776.
**HONOR 3300 Grade Worksheet**  
(In ten easy steps!)

<table>
<thead>
<tr>
<th>step</th>
<th>Exam 1</th>
<th>Exam 2</th>
<th>Exam 3</th>
<th>Exam 4</th>
<th>Exam 5</th>
<th>Exam 6</th>
<th>Exam 7</th>
<th>Tally</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Enter exam grades</td>
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<td>2</td>
<td>If no exam grade, then enter makeup exam grade</td>
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<td>3</td>
<td>Add your seven exam scores together</td>
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<tr>
<td>4</td>
<td>Give yourself one point for each exam you sat for (graded or not)</td>
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<td>5</td>
<td>Give yourself one point for each homework turned in <strong>on time</strong></td>
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<td>6</td>
<td>Add total points from lines four &amp; five</td>
<td>Divide by 13</td>
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<td></td>
<td>Multiply by 100</td>
<td>(if &gt; 100, enter 100)</td>
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<td>7</td>
<td>Add rows three &amp; six</td>
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<td>8</td>
<td>Identify your lowest exam score</td>
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<td></td>
<td>(This may be your makeup exam score, or your homework/sitting score from line six)</td>
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<td>9</td>
<td>Subtract line eight from line seven</td>
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<td>10</td>
<td>Divide by seven and <strong>that’s your grade!</strong></td>
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