

LOGIC

BUCKNELL UNIVERSITY, FALL 2019

Time: MWF 8-8:52 or 9:00-9:52, Room: Coleman Hall 221

Instructor: Robby Finley, robby.finley@bucknell.edu. Office: 231 Vaughan Lit.

Course Description: This course is an introduction to theories of argumentation. Arguments come in many varieties and can differ with respect to purpose, rhetorical effectiveness, clarity, language of expression, and much more. This course is focused on one aspect of arguments, sometimes called the *form* of arguments, which is a feature arguments can share independent of their content or particular wording. For example, I might argue that Joan is either at home or practicing boxing, and since you told me she is not at home, she must be boxing. On another occasion, you might argue that your wallet isn't in your pocket, but it must be either in your pocket or in your car, so it must be in your car. Despite being about different subjects, these two arguments share a logical form sometimes called *disjunctive syllogism*: given two exhaustive options, if one fails the other must be true.

This course approaches different theories of the form of arguments, broadly construed. We first learn the right sort of terms and language for rigorously talking about what features of arguments are important to form. We then learn a formal theory for representing and evaluating the deductive validity of arguments. Next, we focus on identifying inductively valid arguments, which tell us that their conclusion is likely or probable. From there, we move on to informally categorizing many *bad* arguments that are invalid, i.e. logical fallacies. We end by looking at cases where psychological results tell us that most people reason badly, so that we might apply our tools more aptly and understand where mistakes in reasoning are likely to occur.

Textbook: We will be using Sinott-Armstrong and Fogelin's *Understanding Arguments*, 9th edition, 2015. There are many editions of this book, but do try to get the ninth. It is available at the bookstore but also at many other retailers, where the price (!!!) may differ widely. I strongly encourage you to take a peek around other options. Other readings will be made available online.

The Logician's Pact: In becoming logicians, students should intend (and expect) to learn the following:

1. By the end of this course, students will know and be able to articulate validity-relevant features of arguments, many types of logical fallacies, theories of basic probabilistic reasoning, and a proof system and semantics for sentential logic. Students will be able to use what they have learned to evaluate the validity of many types of arguments in their daily lives.
2. Students will have a strong grasp on how to translate the arguments they encounter during daily life into a formal representation that allows them to apply their technical skills in evaluating that argument.
3. Students will develop their abilities to critically discuss and evaluate arguments in any domain, be they in philosophy or other fields.
4. Students will build a firm foundation for further study of formal logic. They will walk away with a grasp of sentential logic that can be easily extended into studies of more sophisticated logical systems if they so choose.

Office Hours: W 2-4pm, and by appointment. You can book 30 min slots on my [google appointment page](#). If I run out of slots I will always try to add more (when I can). Please do not hesitate to come to office hours or schedule a meeting if you have any questions about course material, assigned questions, or returned work (or just metaphysics/philosophy in general).

Requirements: Class attendance, quizzes, and required problem sets. Two mid-term examinations, each composing 15% of the final grade, and one final examination, composing 20% of the final grade. A project called "Arguments in the Wild," where students share arguments they have found and how they think one should formalize them (15%). The remaining portion of the grade is composed of homework checks (20%) and quizzes (15%).

Homework: Most classes I will provide you with a list of homework problems to complete by the next class, some from the book and some not. Problem sets might include technical exercises, logical puzzles, short reflections, or online components. There will be no formal attendance check, but one might not be surprised to learn that one has to be in attendance for homework to be checked and on days where no homework might be due there could be quizzes that require attendance.

Arguments in the Wild: As a kind of capstone project, every student will be expected to partake in a project where we collect together examples of arguments from commercials, song lyrics, news, magazines, or any other form of media. Each student will provide a couple of examples of their findings in a class blog and then evaluate a series of other student's findings and formal representations of arguments. The goal is to create an online repository of informal arguments and formalizations of those arguments for all students to appeal to. More details will be given as we get closer to the activity.

Tests: There will be occasional quizzes, mostly to stimulate discussion and make sure basic concepts are clear to everyone. Some will be announced ahead of time, some will not. While these will be graded, they are not intended to be stressful or harmful (i.e. they will be graded with a light hand). Mid-term tests will each be 50 minutes long and take place at the beginning of the respective class marked on the syllabus. The Final will be comprehensive and will be scheduled by the registrar.

Course Outline: Some assignments and readings might be changed as we go along, depending on interest and questions. I will always keep an updated (and more detailed) version of the syllabus online. The speed of the class will largely depend on your interests and each class may progress at different paces - this is why I keep the outline rough here, and precise details will be added as we go along.

Week	Topic	Textbook	Readings/Activities
1.	Course Overview	1–10, 17–21	Selections from Smullyan, “How to Prove Anything,” <i>What is the Name of this Book?</i>
2.	Talking about Arguments	Ch.3	
3.	Analyzing Natural Language	Ch.4, 5	
4.	Sentential Calculus: Translation	Ch.6	
5.	Deduction and Sentential Calculus	Ch.6	Euclid: the Game, (click here)
6.	Sentential Calculus: Proof Theory		Notes on Natural Deduction (Lecture and PDF), Midterm 1 (Oct. 4)
7.	Categorical Logic	Ch.7	
8.	Generalizations and Causes	Ch.8, 10	
9.	Probability Calculus	Ch.11	Vox Video, “The math problem that stumped thousands of mansplainers” (click here)
10.	Utility	Ch.12	Nozick, “Newcomb’s problem and two principles of choice”, Midterm 2 (Nov. 1)

Week	Topic	Textbook	Readings/Activities
11.	Fallacies: Vagueness, Ambiguity	Ch.13, 14	Almossawi, <i>A Book of Bad Arguments</i> , (click here).
12.	Fallacies: Relevance, Vacuity	Ch.15, 16	Search for Arguments!
13.	Refutation	Ch.17	Peer Review Exercises for Arguments in the Wild
14.	THANKSGIVING BREAK		
15.	Psychology and Actual Error		Selections from Kahneman, <i>Thinking Fast, Thinking Slow</i>
16.	Review (one class)		

If you need help outside of class: Students may work together on homework with the understanding that this excludes merely copying others' work. Quizzes and exams will, of course, be individual work. I will not hesitate to refer students who cheat or commit other forms of academic dishonesty to the University Board of Review (<https://www.bucknell.edu/academics/academic-responsibility-support/academic-responsibility>).

I understand that life outside of the classroom can be tough and will have an impact on your ability to learn and do your best. Sometimes it helps to talk to people or look for support, and those resources are available at Bucknell (<https://www.bucknell.edu/life-bucknell/health-wellness-safety/counseling-student-development-center>).

If you have a disability that may have some impact on your work in this class and for which you may require accommodations, please feel free to talk to me as well as submit the Disability Accommodation Request Form or contact the Office of Accessibility Resources at OAR@bucknell.edu, 570-577-1188 or in room 107 Carnegie Building so that such accommodations may be arranged. Please let me know (via email) if you have accommodations you would like to use in this class.