

PHIL 4: Logic I — Syllabus

Professor Bernhard Nickel

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1 Course Overview and Goals

This is an introduction to logic. More specifically, it's an introduction to a set of tools that have been developed over several thousand years, starting with the ancient Greeks, to analyze arguments that we encounter in everyday contexts, but especially in the practice of philosophy.

When we speak of arguments in this setting, we do not mean "fights," as in "two people had an argument." Arguments in philosophy aren't things we have, they are things we make, and making argument is a matter of providing reasons for claims. We are making an argument when we answer the question "why is this true?" and adducing evidence. Arguments are the stock and trade of philosophy, because it deals with very abstract questions that require us to connect widely disparate ideas. That can only happen by making arguments.

The natural languages in which we speak, the ones that we learn simply by being exposed to our first language at an early age, are a wonderful and highly flexible tool. They allow speakers to do very many different things, and because they have so many different uses, they are very complex. The logical tools that we'll study and practice using in this course are purpose-built models of our natural language that allow us to focus on certain key aspects of arguments. Think of them on analogy with frictionless planes in physics or billiard ball models of molecules in chemistry. These models strip away a lot of the complexity in a situation to make one very particular aspect more tractable and easier to investigate. Logical languages do exactly the same thing, and have exactly the same status. They are not better or improved versions of English. They are not arcane mysteries for the initiated. They're just tools.

In studying these systems, we will focus on using them to understand arguments better, to get better at making them ourselves, and to take a few looks at how thinking about the differences between natural and artificial languages can get us to a deeper understanding of natural languages.

Most of this course, then, will be taken up with problem sets on logic and arguments, with occasional readings and discussions of some philosophical issues they raise.

1.1 Target Audience and Prerequisites

This course is an introduction to logic for students who have no background in either logic, math, or computer science. This course is a relatively new addition to the curriculum in the philosophy department. I taught it for the first time in the Fall of 2023, designed specifically to help students without background get the basic tools. Take a look at [the evaluations from that semester](#) to see whether the course succeeded.

Students who take this class can use logical machinery to analyze their own and others' writings, they'll be in a position to take the more advanced courses in logic offered in the department if they so choose, and they'll be able to follow discussions in many philosophical areas where logical tools have become part of the *lingua franca*, such as philosophy of language, philosophy of mind, and metaphysics.

As such, the course doesn't cover a huge amount of material, and instead emphasizes mastery of a more limited amount.

For students with more background in logic, mathematics, or computer science, the philosophy department offers more advanced courses that may be a better fit. These higher-level logic courses do not have formal pre-requisites, so a student who wants to start with a more challenging course can do so.

2 My Approach to the Class

Logic is a tool. Tools are something you learn how to use, and as such, a course in logic, especially a first course, is a *skill-building* class. Students really only “get it” when they have a lot of practice. Consider, after all, learning a new skill like riding a bike. You definitely don’t learn just by watching someone else do it. Nor have you learned to ride a bike the first time you managed to have both feet off the ground and kept the bike upright in a more or less straight line for 10ft. You knew how to ride a bike once you practiced it enough so that you could confidently navigate traffic and didn’t have to think about the basics of staying upright anymore.

I will provide a lot of explanations and examples, but this course is a lot of work. In each unit, the work gets easier as you do more of it, just as riding a bike gets easier as you get better at it. I will ask you to do a lot of exercises.

Doing well at logic requires a certain mindset. There’s a particular way in which you need to check your intelligence and smarts at the door when you walk into a logic classroom. Of course, there are other aspects of your wits that you very much need to keep about you. We’ll spend some time being very self-aware of just what the mind-set of logic requires. When I first learned logic, I didn’t realize this fact for a long time and struggled a lot. I hope to help you avoid this.

Because the course is about skill-development, and because different students stumble at different points, the course is designed around the idea that students will get stuck, try their best to get themselves unstuck *for a brief time*, and then ask for help. Trying to anticipate every question a student could possibly have and answering every question is unhelpful, I think, because it would throw too much material at the student. Indeed, the whole point of being in a class together with others, including teachers, is so that you can connect with me about the work and benefit from my help at exactly the point that you need it. That means that **I rely on you, and expect you, to actively reach out to the teaching staff for help**. In short, I expect you to take an active role in your learning. This won’t work if you take a fundamentally passive role.

3 Expectations You Can Have of Us

- You can expect that we treat you and your time with respect. All of the things we ask you to do in the course are there for a purpose. We aren’t wasting your time.
- If you ask a question, we’ll take it seriously, do our best to answer it, and we’ll be available for follow-ups.
- We’ll work to make it easier for you to build an academic community.

4 Required Course Materials

All of the course materials are provided, free of charge, through the website. That includes the textbook, any additional readings, as well as other online resources.

The textbook is *forall x: Calgary*. You’ll find it on the Course Documents page of the Canvas site.

We’ll make heavy use of [Carnap](#). This is an automated logic checker which you can use to check your work on many assignments. It’s integrated with Canvas and accessible through the course website.

5 Collaboration, Electronics, AI, and the Honor Code

5.1 Collaboration

We strongly encourage *limited collaboration* during class and on problem sets. Here's what that means.

Collaboration: Forming study groups is an incredibly powerful tool to accelerate your progress through the class, and thus it's a big time saver. A good resource on study groups, and how to make them work for you, is here: [Study Groups](#). That's the "collaboration" part of the first sentence.

Limited: Here's the "limited" part: every student must write up and submit the work themselves. So it's fine for students to, for example, construct a proof together and write it out on paper, or on a blackboard or whiteboard if you meet in a classroom on campus. But once that's done, you should throw away what you did as a group, and then reconstruct the proof on your own before submitting it. That also means that you shouldn't take a picture of what's on the board and then just copy it down mindlessly.

All of the in-class exams must be taken completely independently.

5.2 Electronics

A lot of the materials for this course are online, including Carnap, and I will ask you to do some in-class exercises where you may need to refer to the textbook or the software for the course. I also recognize that a lot of students use tablets to take handwritten notes, and this can be a very useful tool to keep your notes organized. For that reason, I allow any and all electronic devices.

However, you may only use electronic devices to access the course materials during class meetings. If a student uses electronics for anything other than class purposes, such as email, mindless consumption of internet content, shopping, and the like, I reserve the right to ask the student to leave that class session. They may return the following session. One reason for this policy is that when students use computers for other than class work, they negatively affect their classmates, not just themselves.

- [Sana, Weston, and Cespeda, "Laptop multitasking hinders classroom learning for both users and nearby peers"](#).

Use an internet blocker that blocks websites and apps to help yourself focus.

5.3 AI, including ChatGPT

We are all still coming to terms with the new artificial intelligence tools that are becoming widely available. In this course, you may not use any AI resources, including ChatGPT, for any part of the assignments. The only exception is the Carnap proof checking software that is part of the course. I expect you to adhere to this rule, even if I cannot check your compliance easily. Which brings us to:

5.4 Honor Code

We expect you to conform to the College's Honor Code as you complete the work for this class.

Honor, in this context, is a matter of what you do even when no one is looking. Completing the work within the parameters of the course is precisely that, a matter of your personal honor.

6 Required Work and Grading

Your course grade is determined based on the following components:

- Problem sets: 9 p-sets, total of 70% of final grade.
- Midterm Exams: 2 midterms, each worth 10%, total of 20% of final grade.
- Final Exam: worth 10% of final grade.
- In-class practice exercises: See below.

6.1 Problem Sets

Problem sets are weekly during most weeks. A preview of the problem set will be released on Mondays, and the final problem set will be released on Wednesday shortly after class ends. The reason for this two stage approach is that I want to make sure that I only ask about material on the problem sets that we've actually covered in class, and so if it turns out that the class benefits from going over some material more slowly than I anticipated, I want to have the flexibility to reduce the amount of material covered in the p-set.

I will assign 10 P-sets, but only your top 9 scores will count. In other words, you can drop your lowest p-set grade.

6.2 Midterm and Final Exams

There will be two midterms and a final exam. The midterms will be at roughly the $\frac{1}{3}$ and $\frac{2}{3}$ mark of the course, and cover the corresponding thirds. The final will cover the technical material from the final third of the course, as well as conceptual material from the course as a whole. I will distribute study guides in advance of these tests, as well as specific descriptions of the format.

6.3 In-class practice exercises

There will be in-class exercises so that you can take an initial stab at working with material newly covered in that class. These exercises are graded on a complete/incomplete basis. The point of the in-class exercises is to give you a sense of what you already understand, and to prompt questions, since the only way to tell whether you understand the material is to try and apply it to problems. (Simply sitting there and asking yourself: "Do I understand this" will not give you the same insight.) Since you'll work on these in-class exercises with your peers, they also give you the chance to explain material to others, and check whether your explanations make sense to them. So they're a crucial element of how you'll master the material. Finally, we'll also use the in-class exercises to make sure that the online platforms like Carnap work for everyone.

The in-class practice exercises contribute to the final grade in a different way from the problem sets and the exams. Completion of the in-class exercises impose a cap on how good the grade is that you can achieve in this course.

- If you miss 0 in class exercises, your final grade will be bumped up slightly: .15 of a grade on the 4.0 GPA scale. That's about half the distance from a straight B to a B+.
- If you miss 1 or 2 in class exercise, the grade you achieve on the other course components will remain as is.
- If you miss 3 or 4 in class exercises, your grade in the course can be no better than an A-.

- If you miss 5 or 6 in class exercises, your grade in the course can be no better than a B+.
- If you miss 7 or more in class exercises, your grade in the course can be no better than a B.

Note: there will be an in-class exercise on the first day of classes, but that won't count for the purposes of this part of your final grade. There are no in-class exercises on days when there's a midterm. So if you miss 7 in-class exercises, that means you've missed a third of the whole course.

For example: a student who answers every problem set question correctly and submits all problem sets on time, and receives maximum scores on the midterms and finals, stands to earn an A for the course. However, if that student has missed 7 or more in-class exercises, that student's grade will be a B.

Note: If a student can score perfectly on all of the problem sets and on the exams, even without coming to class, then this course is probably not a good fit for that student since it's too easy for them, and they would do better taking a more challenging class.

6.4 Lateness Policy

Problem sets are due as posted on Canvas. Every student can submit two problem sets each 24 hours later than originally posted without penalty. This is to give students a bit of flexibility should something unforeseen happen in the run-up to a problem set's due date.

Please note that these extensions cannot be combined to submit a single problem set 48 hours late.

In addition, we'll drop the lowest grade on your problem sets, so you can miss one problem set outright without it negatively affecting your grade. However, once you've used up your quota of late days, all late problem sets count as missed.

This policy reflects the fact that in order to succeed in this course, you need to keep up with the work. It's also important that we be able to distribute answer keys to the assignments in a timely fashion.

If you miss a class due to illness, please get a note from HUHS or your Resident Dean telling me. In case of such illness, I will simply disregard the affected in-class exercises, and I'll work with you on how to deal with the affected p-sets.

If you don't think that you can commit to doing regular work, on time, do not take this course.

7 Key Dates

Here are the dates for the Assessments, Problem Sets and Midterms. The Final will be scheduled by the registrar.

7.1 Problem Sets

Most of the problem sets will be released in preview form on Mondays, and in final form on Wednesdays. That way, I can be sure that the problem sets only cover material that we actually covered in class. Problem sets will be due almost every Monday at the start of class with a few exceptions to take into account holidays and midterms.

Problem Set #1	Mon, 09/16
Problem Set #2	Mon, 09/23
Problem Set #3	Mon, 09/30
Problem Set #4	Mon, 10/07
Problem Set #5	Mon, 10/21
Problem Set #6	Mon, 10/28
Problem Set #7	Mon, 11/04
Problem Set #8	Mon, 11/18
Problem Set #9	Mon, 11/25
Problem Set #10	Fri, 12/06

7.2 Midterms

- Monday, October 07
- Wednesday, November 06

7.3 Schedule of Readings, etc.

Since the course is centered around student learning, I want to retain some flexibility in the pace at which we go through the materials. I'll post reading assignments and the like well in advance of when they are due through Canvas.

8 Getting the Most out of This Class

- Come to the group study sessions to work on P-sets.
- Form study groups (We will help you do this).
- Take notes in class, by hand, be it on a tablet or a notebook. There are a lot of symbols and graphical things in this course that are a pain to type.
- Chat with me or other members of the staff after class.
- Ask questions about the material on the discussion boards.
- Form study groups!

9 Support

We fully expect students to find some of the material challenging. If it weren't challenging, you wouldn't be growing. But it's important that students do not beat their heads against a wall if they just can't make progress on a problem or concept. If you've made an effort to get it, it's appropriate and desirable to ask for help.

Talk to your peers in your study groups. Connect to me or one of the TFs in office hours. Bring up a question during the study sessions. Post a question on the Canvas Message Board and have it answered there by one of your peers or a member of the staff.

In my experience, almost all students wait too long before asking for help so that they're able to take the next step. If you're considering asking for help but you're unsure whether you should wait a while, you should go ahead.

I suspect that many students are hesitant to ask for help on work outside of class—i.e., during office hours and such—because they worry about being a burden. Professors are busy, and the student doesn't want to impose. I understand that mindset, but I'd like you to offer you a different way of looking at things. Access to the teaching staff in office hours and the like is something that you are *entitled to*, just as you are entitled to attend lectures and study sessions. Just as you don't think you're a burden on my time by attending lecture, I would like you to also think that you're not a burden on my time by coming to my office hours. It's the opposite: you're making use of a resource you're entitled to, it's my job to provide this kind of access, and on top of that, I enjoy it. I really like seeing students in office hours.

So: if you come to office hours, you're not imposing. Seriously.

9.1 Getting to Office Hours

The members of the teaching staff will post their office hours on the course website at the start of term. These are “drop-in” hours, where you can just show up. Feel free to come alone or in groups.

In addition, we fully expect to schedule office hours outside of the regularly set ones. We know that lots of students have lots of different commitments, and so we just won't be able to pick times for the regularly scheduled hours that every student can make.

If that happens to you, you can contact us through a form on the Canvas site. Whoever on our staff is available will find a time to chat, and you can also request particular staff members.

10 Course Accessibility

The College is committed to providing an accessible academic community. I am fully in support of this policy. The Disability Access Office (formerly known as the Accessible Education Office) offers a variety of accommodations and services to students who need them. Please visit <https://aeo.fas.harvard.edu> for more information.

Let me just say this again, because it matters: I really am committed to making this course accessible for all students. I understand that this may require providing the material in special formats, etc., and I will do so if given enough advance notice. I'll also have conversations with any students who might need accommodations to make sure that the course works for them. So please be sure to reach out to me as early as possible.

Please note that I cannot offer any accommodations without approval from the AEO. This ensures that a qualified person makes a determination about what an appropriate accommodation is. It also protects the student's privacy, since I need not know the basis for the accommodation, only its terms, such as time-and-a-half on exams, etc.