P105: Critical Reasoning

Indiana University, Bloomington, Spring 2026

Contact Information

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Office Hours: Tuesdays and Thursdays 11:00am–12:00pm

Teaching Assistants

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Course Meetings

Time: Tuesdays and Thursdays, 5:30–6:20pm
Location: Ballantine Hall, Room 110

Course Description

In this course, we will attempt to equip ourselves with the tools we need to *reason well*. To do this, we'll draw from several areas: cognitive psychology, behavioral economics, philosophy, logic, probability theory, and decision theory (among others). We will consider empirical evidence about "heuristics and biases"—spontaneous judgments that can be predictably irrational. And we will study what good deductive, probabilistic, and practical reasoning looks like. In particular, we're going to try to develop effective reasoning skills that have clear applications in your personal and professional lives.

The course is open to students from all areas of the University interested in improving their reasoning ability and their ability to construct and recognize compelling arguments. These skills may be helpful in a wide variety of university subjects and extra-academic pursuits.

Materials

Our readings will be drawn largely from the following books:

- Daniel Kahneman, *Thinking Fast and Slow*
- P.D. Magnus et al., *forallx*
- Ian Hacking, *An Introduction to Probability and Inductive Logic*
- Hans Rosling, *Factulness*
- Jonathan Haidt, *The Righteous Mind*

The Book by Magnus et al. is open access and thus is available freely online (hence the hyperlink). I will put the chapters from the Hacking book and the Haidt book online. However, on the book by Kahneman and the book by Rosling: you should pick yourself up copies of these, either by purchasing them or by getting them from the library. In fact, I'd highly encourage you to read these books cover to cover—they have many additional lessons and insights related to the material we'll talk about in the course, but which we won't have time to cover.

Grading

- Problem Sets: 25%
- In-class Quizzes: 10%
- Midterm Exam: 25%
- Final Exam: 35% (in class, on the last day)
- Participation and Attendance: 5%

Problem Sets

There will be eight problem sets in this course. These will be assigned on an approximately weekly basis, and you will generally have one week to complete them.

Quizzes, Participation, and Attendance

15% of your grade in this class will come from quizzes, attendance, and participation. The participation and attendance portion of your grade (5%) will be come exclusively from your participation and attendance *in discussion sections*. Meanwhile, your quiz grade (10%) will be determined by pop quizzes that are given *in lectures*. I will give no warning about when these quizzes will take place. However, they will be short (5-10mins) and are intended to be easy—if you've done the relevant readings and paid attention in class, then you should find them to be no problem. Really, they're only there to encourage you to attend lectures. For this reason, **there will**

be no make-up quizzes of any kind, unless you have a *very* **good excuse (e.g., illness** *accompanied by a doctor's note*)**.** If you miss one, you miss one.

Exams

There will be two exams in this course: one midterm and a final. (Note that the final exam will be "midterm style", and thus will be administered in class, on the last day.) The first midterm will cover the material from Weeks 1 to 8; and the final exam will be cumulative: it will cover material from all parts of the course. That said, I will weight the final more heavily towards material covered later in the course.

Lateness Policy

You will be given a total of five "late days" in this class, which you can use for submitting your problem sets. That is, if you submit a problem set after the deadline, but within 24 hours, that counts as one of your late days; and you get five of those total. (Note: if a problem set is due at 12am, and you submit it at 12:01am, that counts as one of your late days.) Once your late days are used up, **we will not grant extensions on problem sets, unless you have a very good excuse**.

Honor Code

Although it should go without saying: don't cheat on your homeworks. I promote and expect honesty and fairness in all academic matters. All cases of academic misconduct will be referred to the Office of the Dean of Students. Anyone found responsible for misconduct will receive a grade of F for the course, in addition to any sanction from the College. For more information, including examples of academic misconduct and potential sanctions, please see here.

Technology

With two exceptions, laptops, phones, and other electronic devices are not permitted to be used during lecture. The first exception is if you're going to take notes *by hand* on a device like an iPad or a reMarkable. That's allowed. The other exception is if you have a disability that necessitates using a computer, or some other electronic device. Obviously, if that's the case, then I'm happy to accommodate you. But if this is so, please speak to me about it as early as you can.

Communication

If you have a question about course mechanics or housekeeping, please do the following.

- First, check the syllabus.
- Then, if you haven't found your answer, please email your Assistant in Instruction (AI).

Please try not to email either me (Prof McNamara) or your AI with questions about course content—that's what sections and office hours are for. We can provide more thorough answers

in section/office hours. Plus, discussing your questions in the presence of other students is often helpful, both for you and for them.

Finally, if you email either anyone involved in the instruction of this course on a weekday, then we will endeavor to answer you within 24 hours. The exception to this rule is if you email on a Friday: then, we will try to answer by the end of the day the following Monday. Please do not repeat email us unless you haven't heard back from us within these time-frames.

Disabilities

The Americans with Disabilities Act is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Students who require academic accommodations can work with AES (Academic Education Services) to arrange for (among other things) assistive technology or academic coaching. Many students don't receive adequate diagnoses, or discover only late in their academic careers that they have access to academic accommodations. Thus, if you even *suspect* that you might need such accommodations, it's worth reaching out early on.

For reasons of privacy and consistency, I ask that you start with AES; in particular, see here for further details. However, please know that whether or not you are able to arrange formal accommodations, I am committed to working with you to ensure that you are able to participate fully in this course. Just speak to me about your needs, as soon as you can.

Mental Health and "Ghosting"

In the past, I've had students who stop coming to class or section, and stop handing in assignments, partway through the term. This is usually because the student is overwhelmed with work, facing a difficult personal situation, or struggling with a mental health issue. If you find yourself confronted with any of these issues (or a similar one), then I strongly encourage you to talk to the university's counseling service as soon as you can: see here for contact information. They are professionals and they care very much about your well-being. I also encourage you to communicate with me or your AI about any missing homeworks, etc. We're not mental health professionals, but we care about your well-being, and can better help you manage your assignments if we know what's going on as it's happening, instead of being informed of any issues shortly before (or after) the end of term.

Schedule

Week 1: Biases and Heuristics

1/13: Reading: None (introductory lecture)

1/15: Reading: Kahneman, *Thinking Fast and Slow*, Chs. 1-3

Week 2: Biases and Heuristics

1/20: Reading: Kahneman, *Thinking Fast and Slow*, Chs. 7-9

1/22: Reading: Kahneman, *Thinking Fast and Slow*, Chs. 11-12

Week 3: Biases and Heuristics

1/27: Reading: Kahneman, *Thinking Fast and Slow*, Chs. 13-15

1/29: No class!! Prof McNamara away!!

Week 4: Propositional Logic

2/3: Reading: Magnus, *forallx*, Chs. 1, 4-5

2/5: Reading: Magnus, *forallx*, Chs. 6-7

Week 5: Propositional Logic

2/10: Reading: Magnus, *forallx*, Chs. 9-11

2/12: Reading: Magnus, *forallx*, Ch. 12

Week 6: Predicate Logic

2/17: Reading: Magnus, *forallx*, Chs. 23-24

2/19: No class!! Calum away!!

Week 7: Predicate Logic, Fallacies, The Limits of Deductive Logic

2/24: No reading (lecture notes)

2/26: No reading (lecture notes)

Week 8: Probability Theory

3/10: Reading: Hacking, *Probability and Inductive Logic*, Chs. 1-3

3/12: Reading: Hacking, *Probability and Inductive Logic*, Chs. 4-6

Week 9: Review and First Midterm

3/3: Review session; no reading

3/5: Midterm Exam!!

Week 10: Spring Break

3/16: No class; Spring break!!

3/18: No class; Spring break!!

Week 11: Probability

3/24: Reading: Hacking, *Probability and Inductive Logic*, Chs. 1-3

3/26: Reading: Hacking, *Probability and Inductive Logic*, Chs. 4-5

Week 12: Probability

3/31: Reading: Hacking, *Probability and Inductive Logic*, Chs. 6-7

4/2: Reading: Hacking, *Probability and Inductive Logic*, Chs. 11-13

Week 13: Statistical Reasoning

4/7: Reading: Rosling, *Factfulness*, Chs. 1-5

4/9: Reading: Rosling, *Factfulness*, Chs. 6-10

Week 14: Decision Theory

4/14: Reading: Hacking, *Probability and Inductive Logic*, Chs. 8-9

4/16: Reading: Hacking, *Probability and Inductive Logic*, Chs. 10; Bostrom, "Pascal's Mugging"

Week 15: Politics and Polarization

4/21: Reading: Haidt, *The Righteous Mind*, Ch. 10

4/23: Reading: Haidt, *The Righteous Mind*, Ch. 12

Week 16: Review and Final Exam

4/28: Review

4/30: Final exam (in class)!!