

Logic and Critical Thinking

PHIL 3113, 3 credits

Fall 2026

Tue, Thu 12:30 p.m. – 1:45 p.m., Engineering Science and Mechanics 202

Instructor: Hernán Medina-Botero

Email: hbotero3@gatech.edu

Office Hours: Tuesday and Thursday, 2:15-3:15 p.m., DM Smith 112. If you need to come to office hours but these times don't work for you, please send me an email proposing two or three different times and we will arrange an alternative Zoom meeting.

General Information

Course Description:

We all want to think right about the world around us, and act accordingly (we try to avoid acting from misleading information or faulty reasoning processes all the time!). Critically thinking is one way of doing this, and this course aims to provide you with tools to better think about any issue.

In this course, you will learn both about how our brains process information, and how to better evaluate that information. More specifically, you will learn to identify ways of thinking that are reliably misleading, which is a first step to overcome these thinking pitfalls. But you will also learn some strategies to think better. In particular, you will acquire tools to assess evidence and arguments, and to adjust your beliefs accordingly.

Course Goals and Learning Outcomes:

Upon successful completion of this course, students will be able to

- identify and avoid a range of biases that distort our thinking,
- assess the strength of an argument by examining its logical structure,
- evaluate the validity of arguments using truth tables,
- use natural deduction to construct proofs in propositional logic,
- determine whether a fact is evidence for a hypothesis or independent of it and assess the strength of a piece of evidence,
- use the updating rule to determine the probability of a hypothesis given some evidence,
- evaluate generalizations and causal arguments.

This is a Core IMPACTS course that is part of the Humanities area.

Core IMPACTS refers to the core curriculum, which provides students with essential knowledge in foundational academic areas. This course will help master course content, and support students' broad academic and career goals.

This course should direct students toward a broad Orienting Question:

- How do I interpret the human experience through creative, linguistic and philosophical works?

Completion of this course should enable students to meet the following Learning Outcome:

- Students will effectively analyze and interpret the meaning, cultural significance and ethical implications of literary/philosophical texts or of works in the visual/performing arts.

Course content, activities and exercises in this course should help students develop the following Career-Ready Competencies:

- Ethical Reasoning
- Information Literacy
- Intercultural Competence

Course Materials

Textbook:

We will be using an online textbook for this course, available only on the Top Hat platform:

- Manley, D. (2022). *Reason Better: An Interdisciplinary Guide to Critical Thinking*. Top Hat.

In order to buy a copy of the book, you'll first need to create an account on Top Hat. To do that, please go to <https://app.tophat.com/e/790084>. If prompted, the course code is 790084.

There is a second textbook we will use, freely available online:

- DeLancey, C. (2017). *A Concise Introduction to Logic*. Open SUNY Textbooks.

[Here](#) you can find links to either download the book or read it online.

Course Website:

The course website is on Canvas. Canvas is our main interaction place. Any relevant and available content (video links, papers, journal pieces, etc.) will be posted there. News and changes to the syllabus or the course format will be also announced there. Make sure you visit the canvas site regularly (at least once some hours before class).

Course Requirements and Grading

Assignment	Grade Weight	Grading Scale
Exam 1	15%	A 90 - 100%
Exam 2	15%	B 80 - 89%
Exam 3	20%	C 70 - 79%
Quizzes	15%	D 60 - 69%
Top Hat Homework	10%	F below 60%
Participation	15%	
Discussion/Logic Lab Leadership	10%	

Extra Credit Opportunities

I will offer a couple of opportunities for extra credit: You can submit what colleague Anna Edmonds calls a **Metacoglog**. There will be two opportunities to do this: one by week 3, and one by week 9. Details will be in the respective weekly modules in Canvas. Max credit for each metacoglog is 3.5% to be added to the final grade.

According to policy, grades at Georgia Tech are interpreted as follows:

- A Excellent (4 quality points per credit hour)
- B Good (3 quality points per credit hour)
- C Satisfactory (2 quality points per credit hour)

- D Passing (1 quality point per credit hour)
- F Failure (0 quality points per credit hour)

Description of Graded Components:

- **Participation:** The point of ‘participation’ is that you are an active part of the course, that you contribute something to it; as such, there are different ways of contributing. The most obvious one, by speaking up during class. In this case, participation is graded according to the frequency of class comments/questions, and their relevance to the class. If you have a hard time speaking in public, this could be an opportunity to try and speak more often and engage in the conversations with me and classmates. But I also respect those of you that for any reason prefer not to. If this is your case, you can earn participation points by doing things like sharing relevant content with the class—videos, papers, journal articles, any other digital resource, for example—just email me so I can share it during class hours or in Canvas! ***Feel free to propose and discuss with me any other participation activities that come to mind.***

A good rule of thumb is to participate (by doing any of the things mentioned above, or one that you propose) at least once a week (this will guarantee you full credit). *Keep in mind that you cannot get participation points if you are regularly absent from class. Just as there is no way of speaking up during class if you do not attend class, no alternative activity will grant you participation credit if you do it without attending class.*

- **Weekly Quizzes (Canvas):** Each week, you will answer a quiz about all or some of the material covered during the week. Quiz format will consist of objective questions (multiple-choice, true/false, fill in the blank, or a mathematical problem). Weekly quizzes will be due Monday at 11:59 p.m.
- **Top Hat Homework:** Homework questions are embedded in your *Reason Better* text on Top Hat. The homework for each chapter must be completed by the Monday (11:59 p.m.) following the day we finish covering the chapter.
- **Discussion/Logic Lab Leadership:** Students will either lead a discussion on a selected chapter from the textbook or lead one of the sessions on formal logic.
 - (i) **Discussion leaders** will motivate participation in the discussion by bringing questions on the topics covered in the assigned reading(s), examples for analysis, relations they find between class topics, or between class topics and their daily lives, interests, etc. Discussions will be held on the day we finish covering a chapter from Manley’s textbook, in the last 30 minutes (approx.) of class. Discussion leaders have the responsibility of conducting the discussions in a fruitful and enriching way. They might choose to work as a group or work individually. Bringing slides is recommended; you can also use audio, video content, create a debate between discussion leaders, etc. In any case, the *leading discussion* grade will be individual and will assess the level of preparation for the discussion and how effective the discussion is (i.e., how much participation from classmates it provokes and the quality of the discussion). **(Please notice that *leading a discussion* and *participation* are different grades.)**
 - (ii) During Unit 2 on Propositional Logic, **Logic lab leaders** will bring up a set of exercises that they consider relevant to better understand the topics covered during each class session. They will explain why each exercise is relevant in this regard or challenging and will offer guidance on how they approached the exercise. Exercises can come directly from the assigned textbook or from other sources.

- Exams: There will be three exams in the course, the third of which is a cumulative final exam covering all of the course material.

Weekly Schedule

	Dates Day		Required Reading(s) / Activities	Unit
Week 1	Aug 25-27	Tue	Introduction	Unit 1 – Cognitive Processes and Deductive Arguments
		Thu	Chapter 1: Reasoning	
Week 2	Sep 1-3	Tue	Chapter 1: Reasoning	
		Thu	Chapter 2: Mindset	
Week 3	Sep 7-10	Mon	DUE: Quiz 1 – Chapter 1 Homework	
		Tue	Chapter 2: Mindset Discussion 1	
		Thu	Chapter 3: Clarity	
Week 4	Sep 14-17	Mon	DUE: Quiz 2 – Chapter 2 Homework	
		Tue	Chapter 3: Clarity Discussion 2	
		Thu	Chapter 4: Entailment	
Week 5	Sep 21-24	Mon	DUE: Quiz 3 – Chapter 3 Homework	
		Tue	Chapter 4: Entailment Discussion 3	
		Thu	Review (Ch1-Ch4)	
Week 6	Sep 28 – Oct 1	Mon	DUE: Quiz 4 – Chapter 4 Homework	Unit 2 – Propositional Logic
		Tue	EXAM 1	
		Thu	Chapters 1-2 from <i>A Concise Introduction to Logic</i> by Craig DeLancey, available here Logic Lab 1	
Week 7	Oct 6-8	Tue	Recess [NO CLASS]	
		Thu	Chapter 3 from <i>A Concise Introduction to Logic</i> by Craig DeLancey, available here Logic Lab 2	
Week 8	Oct 12-15	Mon	DUE: Quiz 5	
		Tue	Chapter 4 from <i>A Concise Introduction to Logic</i> by Craig DeLancey, available here Logic Lab 3	
		Thu	Chapters 5-6 from <i>A Concise Introduction to Logic</i> by Craig DeLancey, available here	

			Logic Lab 4	
Week 9	Oct 19-22	Mon	DUE: Quiz 6	
		Tue	Chapters 7-8 from <i>A Concise Introduction to Logic</i> by Craig DeLancey, available here Logic Lab 5	
		Thu	Chapters 9-10 from <i>A Concise Introduction to Logic</i> by Craig DeLancey, available here Logic Lab 6	
Week 10	Oct 26-29	Mon	DUE: Quiz 7	
		Tue	Review Formal Logic	
		Thu	EXAM 2	
Week 11	Nov 3-5	Tue	Chapter 5: Evidence	
		Thu	Discussion 4	
Week 12	Nov 9-12	Mon	DUE: Quiz 8 – Chapter 5 Homework	Unit 3 – Decision- making and Reasoning Pitfalls
		Tue	Chapter 6: Generalizations	
		Thu	Discussion 5	
Week 13	Nov 16-19	Mon	DUE: Quiz 9 – Chapter 6 Homework	
		Tue	Chapter 7: Causes	
		Thu	Discussion 6	
Week 14		Mon	DUE: Quiz 10 – Chapter 7 Homework	
			Thanksgiving	
Week 15	Dec 1-3	Tue	Chapter 8: Updating	
		Thu	Discussion 7	
Week 16	Dec 7-8	Mon	DUE: Quiz 11 – Chapter 8 Homework	
		Tue	Review Chapters 5-8	
Final Exami- nations			EXAM 3	

Course Expectations and Guidelines

Attendance, Participation, Late Assignments, and Missed Work

You are expected to attend class regularly. Notice that there is a participation grade in the course, and it is impossible to get full participation credit without regularly attending class. It is your responsibility to attend exams, and complete assignments by the established due date. *If you experience or anticipate circumstances that affect your ability to complete an assignment, please contact me at least 2 days in advance of the due date so we can work on a solution.* Assignments (including exams) will not be accepted past the due date,

unless prior arrangements have been made. Please review Georgia Tech's general rules on Attendance and Missed Work [here](#).

Health and Safety

If you are experiencing symptoms of a respiratory illness, it is a good idea to refrain from coming to campus. Keeping each other safe is a shared responsibility. I encourage you to follow the recommendations issued by the CDC (<https://www.cdc.gov/respiratory-viruses/prevention/precautions-when-sick.html>).

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please visit <http://www.catalog.gatech.edu/policies/honor-code/> or <http://www.catalog.gatech.edu/rules/18/>.

Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Generative AI

AI is changing the world quickly. It is impressive what different Large Language Models (LLMs) can do, and it is very tempting to use them for various daily tasks; these models are faster than us, have access to more information than we can process, and even produce text in a tone that sounds strikingly human.

Given this, it can be tempting to use AI models to complete your coursework. I encourage you to use these models to help you in this course if you feel the need to use them (for example, because you are still unclear about a concept and you want feedback on what you are missing). That being said, using them to *help* you and using them to *complete* your assignments are two very different things. The latter is a form of academic misconduct! You do not need AI to do well in this course, and you will get more out of it if you do not rely on AI too much.

Let me say a bit more about this last point. There are multiple abilities that we, as humans, need in order to relate to each other and to navigate the world in a meaningful way. For example, you are better off when you know how to read and write. Similarly, you are better off having a basic command of math. These abilities require practice. Thinking is just the same. You are better off when you can do your own reasoning, and you get better at it by practicing. This is what this course wants you to do: become better at reasoning.

If you have AI complete your work (summarize readings for you, take notes, answer a quiz, etc.), you are commissioning it to do a basic task that it would be better for you to fully command before giving it up. In fact, what will likely happen in the long run is that you decommission your own thinking. (In debates about the ethics of artificial intelligence, the concern is that you are more vulnerable to *deskilling* over time—the process by which you lose important skills due to lack of experience and practice.) Just as you probably would not be OK saying “I actually do not want to learn to read, since AI can do it for me,” you should be troubled by the idea of having AI doing your own thinking tasks.

This course is an opportunity to slow down and consciously use your thinking abilities, your reflective powers. We do not have that opportunity very often in this fast-paced world. Use AI wisely, as an aid when needed, and use this course as a space to work on your own critical abilities.

** Most of this statement on Generative AI (the parts I largely agree with) is taken from a similar statement by Tyler Cook.*

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or <http://disabilityservices.gatech.edu/>, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See <http://www.catalog.gatech.edu/rules/22/> for an articulation of some basic expectation that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

No Discrimination

The Ivan Allen College of Liberal Arts supports the Georgia Institute of Technology's commitment to creating a campus free of discrimination on the basis of race, color, religion, sex, national origin, age, disability, sexual orientation, gender identity, or veteran status. We further affirm the importance of cultivating an intellectual climate that allows us to better understand the similarities and differences of those who constitute the Georgia Tech community, as well as the necessity of working against inequalities that may also manifest here as they do in the broader society

Student Resources

Here is a great reference list with the wide array of resources that Georgia Tech offers, visit <https://students.gatech.edu/student-resource-guide>.