

Learning to Think Logically

A Self-Study Path for Practical Reasoning

Tailored for someone who wants to evaluate their own arguments rigorously

What This Path Is For

You want to be able to take a messy tangle of thoughts, lay them out as explicit arguments, and then evaluate those arguments with precision. This is a learnable skill. Philosophers call it logical analysis, and it has a clear curriculum.

This path is designed around how you already seem to learn: by writing out your own arguments and testing them. The reading is in service of the doing, not the other way around.

Time estimate: 8–12 weeks at a comfortable pace (a few hours per week). You'll be noticeably better within the first 2–3 weeks.

Phase 1: The Foundations (Weeks 1–3)

Goal: Learn to spot the skeleton of any argument

Core concepts to learn:

- Premises vs. conclusions — what counts as each, and how to identify them in natural language
- Validity vs. soundness — the most important distinction in all of logic
- Deductive vs. inductive arguments — two fundamentally different kinds of reasoning
- Common informal fallacies — the recurring errors that trip up even smart thinkers

Why validity vs. soundness matters for you specifically

In your manifesto, your Argument 1 has a validity problem (the conclusion doesn't follow from the premises) and possibly a soundness problem (the premises may not be true). These are two separate diagnoses that require separate tools. Learning to distinguish them will immediately clarify your thinking.

What to read

Primary text: *forall x: Calgary* by P.D. Magnus, Tim Button, Aaron Thomas-Bolduc & Richard Zach. This is a free, open-source logic textbook used in university courses worldwide. Available as a free PDF from forallx.openlogicproject.org. Read Part I (Key Notions) carefully. This covers arguments, validity, soundness, and the basic concepts.

Supplementary: *Introduction to Logic and Critical Thinking* by Matthew Van Cleave — another free textbook (available via the Open Textbook Library). Chapters 1–4 cover argument identification and informal fallacies in a very accessible way. Good if you want more real-world examples.

Practice exercise (do this in week 1)

Take your manifesto's Argument 1 and do the following:

1. Write out every premise explicitly, including any hidden premises
2. Ask: if all these premises were true, would the conclusion have to be true?
3. If not, identify what's missing — what additional premise would make it valid?
4. Then ask: is that additional premise actually true?

This four-step process — reconstruct, check validity, identify gaps, check soundness — is the core workflow you're learning. Everything else builds on it.

Phase 2: The Logical Language (Weeks 3–6)

Goal: Learn to translate arguments into symbolic form

This is where things get properly rigorous. You'll learn propositional logic — a formal language for representing the logical structure of arguments using symbols. This isn't just academic; it forces you to be precise about what you're actually claiming.

Core concepts to learn:

- Logical connectives: AND (\wedge), OR (\vee), NOT (\neg), IF-THEN (\rightarrow), IF AND ONLY IF (\leftrightarrow)
- Translating English sentences into symbolic form
- Truth tables — a mechanical method for checking whether an argument is valid
- Tautologies, contradictions, and contingent statements

Why this matters for you

Your manifesto mixes “can” statements with “should” statements without noticing. In symbolic logic, this gap becomes visible immediately because you have to represent each word precisely. The is-ought gap (Hume's guillotine) becomes something you can literally see in the symbols.

What to read

forall x: Calgary, Parts II–IV (covering Truth-Functional Logic: syntax, semantics, and natural deduction). Work through the exercises — they're essential, not optional.

Online tool: Use Carnap (carnap.io) — a free, interactive logic teaching platform that supports the notation in forall x. It will check your proofs and exercises automatically.

Practice exercise

Translate your own arguments from the manifesto into symbolic form. For example, Argument 1 might look something like:

$P \rightarrow Q$ (If I can discover first principles, then I can use them for decisions)
 P (I can discover first principles)
 $\therefore R$ (I should discover first principles)

Written symbolically, it becomes glaringly obvious that R has nothing to do with P or Q . That's the power of formalisation.

Phase 3: Predicate Logic & Argument Reconstruction (Weeks 6–9)

Goal: Handle more complex arguments with nuance

Propositional logic treats sentences as atomic units. Predicate logic lets you look inside them — at the subjects, predicates, and quantifiers (“all”, “some”, “none”). This is where you start being able to handle the complexity of real-world reasoning.

Core concepts:

- Predicates and quantifiers (\forall for “for all”, \exists for “there exists”)
- Translating complex English claims into predicate logic
- Natural deduction proofs in predicate logic

What to read

forall x: Calgary, Parts V–VII (First-Order Logic).

Supplementary: At this stage, you might enjoy reading some actual philosophical arguments that use this toolkit. A good accessible example is Bertrand Russell's *The Problems of Philosophy* (free online via Project Gutenberg). Russell writes with beautiful logical clarity, and you'll start recognising the structures you've been learning.

Phase 4: Applied Reasoning & Ongoing Practice (Weeks 9+)

Goal: Make this a habit, not just a course

By this point you'll have the formal tools. The challenge becomes applying them fluently to your actual thinking. This is the phase that never really ends.

Things to explore:

- **Informal fallacies in depth** — now that you understand formal validity, informal fallacies become much clearer. Study the major categories: fallacies of relevance (ad hominem, straw man, appeal to authority), fallacies of ambiguity (equivocation), and fallacies of presumption (begging the question, false dilemma).
- **Argument mapping** — a visual method for laying out complex arguments. Tools like MindMup or even hand-drawn diagrams can help you see the structure of a multi-step argument. This connects nicely to the flowchart thinking you're already doing in your manifesto.
- **Steel-manning** — the practice of making the strongest possible version of an argument before critiquing it. This is arguably the most important critical thinking habit. If you can defeat the strongest version, you've really defeated the idea.

Recommended wider reading

- *Thinking, Fast and Slow* by Daniel Kahneman — not logic per se, but brilliant on the cognitive biases that distort reasoning
- *The Uses of Argument* by Stephen Toulmin — a model of argument that's more practical than formal logic for everyday reasoning, and complements it well
- *Being Logical: A Guide to Good Thinking* by D.Q. McNerny — short, clear, practical

Quick Reference: Key Distinctions to Internalise

Distinction	Left Side	Right Side
Valid vs. Sound	Valid = conclusion follows from premises (even if premises are false)	Sound = valid AND all premises are actually true
Deductive vs. Inductive	Deductive = if premises are true, conclusion MUST be true	Inductive = if premises are true, conclusion is PROBABLY true
Necessary vs. Sufficient	Necessary = without it, the conclusion can't hold	Sufficient = with it alone, the conclusion must hold
Is vs. Ought	Descriptive claims about how things are ("I can do X")	Normative claims about how things should be ("I should do X")
Formal vs. Informal Fallacy	Formal = error in the logical structure itself	Informal = error in the content, language, or relevance of premises

Worked Example: Your Manifesto's Argument 1, Done Properly

Step 1: Reconstruct with hidden premises made explicit

Original:

- P1: I can discover personal first principles.
- P2: I can use these to make decisions.
- ∴ I should discover my personal first principles.

Reconstructed with hidden premise:

- P1: I can discover personal first principles.
- P2: I can use these to make decisions.
- P3 (hidden): If I can do something that would help me make decisions, I should do it.
- ∴ I should discover my personal first principles.

Step 2: Check validity

With P3 added, the argument is now valid — the conclusion follows from the premises. The original version was invalid because it tried to derive "should" from "can" without any normative bridge.

Step 3: Check soundness (are the premises true?)

- **P1** — Can you actually discover personal first principles? This is an empirical question. Your manifesto suggests you're sceptical, which is a legitimate challenge to this premise.
- **P2** — Can you use them to make decisions? Plausible, but only if P1 is true and the principles are action-guiding.
- **P3** — This is the crucial hidden premise. It's too strong as stated — there are many things you CAN do that you shouldn't (you can eat only crisps, you can stay up all night). A better version might be: "If I can do something that would significantly improve my decision-making, and the cost is reasonable, I should do it." But now we'd need to evaluate whether the cost IS reasonable.

Step 4: Consider the counter-argument

Your alternative position (orient around aliveness/chanda instead) could be formalised as:

P1: I have a reliable felt sense of aliveness (chanda) that indicates what's good for me.

P2: Following this signal is simpler and equally effective as maintaining explicit first principles.

P3: Simpler and equally effective approaches are preferable.

∴ I should orient around aliveness rather than explicit first principles.

This is a valid argument. The interesting questions are now about soundness: Is your felt sense actually reliable? Are there edge cases where it misleads? Is it really equally effective, or does it trade rigour for simplicity? These are the questions worth investigating.

A Note on Wittgenstein

You mentioned Wittgenstein's Tractatus as an example of someone doing logic "correctly." I'd gently push back on that aspiration for now. Wittgenstein was doing something very specific and advanced — trying to determine the limits of what can be said meaningfully, which is a question in the philosophy of logic rather than logic itself. The Tractatus is also famously obscure and has been interpreted in wildly different ways for a century.

What you actually want — the ability to lay out arguments clearly and evaluate them rigorously — is much closer to what an analytic philosopher like Bertrand Russell does. Russell is clear where Wittgenstein is cryptic, systematic where Wittgenstein is aphoristic. If you want a model of someone thinking logically about real questions, Russell is your person. The Tractatus can come later, once you have the foundations.