

# Critical Thinking — Workbook

This workbook is your active companion to the Critical Thinking course. Each section pairs with a course module and gives you exercises, worksheets, and checklists to practise the frameworks on real decisions and arguments from your own professional context. Complete each section after finishing the corresponding module — the skills compound when applied immediately.

## Foundations of Analytical Reasoning

Practise identifying argument structure, testing validity and soundness, and distinguishing inductive from deductive reasoning in real-world examples.

### Exercise: Argument Anatomy Dissection

Choose one argument from a recent work email, news article, or meeting you attended. Write out the full text (or a summary), then break it into its components using the questions below.

- State the conclusion in one sentence. What is the speaker or writer actually trying to get you to accept?  
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- List every premise explicitly stated in the argument. Are there any implied premises the argument depends on but never states?  
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- Is the argument deductive (conclusion must follow) or inductive (conclusion probably follows)? What tells you which it is?  
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- Apply the validity test: if all premises were true, could the conclusion still be false? If yes, identify the logical gap.  
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### Worksheet: Validity and Soundness Tracker

Analyse three arguments from your professional or personal life this week — one from a meeting or conversation, one from a written document, one from a news or media source. Record each below. Argument source and date

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Conclusion (one sentence)

\_\_\_\_\_

Premises listed (number each)

\_\_\_\_\_

Valid? (Yes / No / Partially) — explain why

\_\_\_\_\_

Sound? (Yes / No / Partially) — identify any false premises

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Deductive or inductive? Strength rating (weak / moderate / strong)

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What additional evidence or premises would make this argument stronger?

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## Checklist: Analytical Reasoning Habits Checklist

- [ ] Before accepting any claim, identify the conclusion separately from the supporting premises
- [ ] Ask whether the argument is deductive or inductive before evaluating its strength
- [ ] Test validity: if all premises were true, could the conclusion still be false?
- [ ] Test soundness: are the premises actually true or at least defensible?
- [ ] Identify any implied premises the argument relies on without stating
- [ ] Ask what single piece of evidence would most change your assessment of the argument
- [ ] Practise writing one syllogism per day from an argument you encounter at work

## Cognitive Biases and How to Counter Them

Map your own bias patterns, apply the pre-mortem technique to a live decision, and start a decision journal.

### Exercise: Personal Bias Audit

Reflect on a significant decision you made in the past 6 months — one where you had incomplete information. Answer the questions below as honestly as possible. The goal is pattern recognition, not self-criticism.

- Which of the five bias families (availability, confirmation, anchoring, sunk cost, Dunning-Kruger) most likely influenced this decision? Describe one specific moment where you notice it operating.

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- What disconfirming evidence was available at the time that you underweighted or ignored? Why did you discount it?

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- If you had applied the outside view (reference class forecasting) — what base rate would have been relevant, and how would it have changed your estimate?

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- What debiasing technique (pre-mortem, steel-man, consider-the-opposite) would have helped most, and what would the output have looked like?

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## Worksheet: Decision Journal Entry Template

Use this template every time you make a significant professional decision. Record it within 24 hours. Schedule a review 3 and 12 months later.

Date of decision

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Decision summary (one sentence: I decided to...)

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Context: what triggered this decision?

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Options considered (list all, not just the chosen one)

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Option chosen and primary rationale

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Key evidence relied on and its quality rating (anecdote / expert opinion / data / study)

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Disconfirming evidence considered and why it was discounted

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Confidence level 0-100% in the expected outcome

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Expected outcome in 3 months

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Expected outcome in 12 months

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Emotions present at time of decision

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3-month review: what actually happened? Where was the reasoning wrong?

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### Checklist: Pre-Decision Debiasing Protocol

- Run a pre-mortem: write the failure story before committing
- Apply consider-the-opposite: write one paragraph arguing against your position
- Check for anchoring: what was the first number or option you encountered, and are you still anchored to it?
- Check for sunk cost: would you make this same decision starting fresh with zero prior investment?
- Apply the outside view: what is the base rate for this type of decision turning out well?
- Steel-man the strongest objection and address it explicitly in your rationale
- Record your confidence level before the decision so you can track calibration over time

## Evaluating Evidence and Spotting Fallacies

Practise scoring evidence quality, identifying logical fallacies in real texts, and applying the correlation-causation distinction to a live dataset or claim.

### Exercise: Fallacy Hunt: Live Text Analysis

Find a public article, opinion piece, social media post, or business report (at least 300 words) that makes a substantive argument. Paste or note the source. Identify as many of the 15 named fallacies as you can find.

- List each fallacy you find. For each: name the fallacy, quote the sentence(s) where it appears, and explain in one sentence why it qualifies.

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- Identify the single most damaging fallacy in the piece — the one that most undermines the central claim. Why is it the most consequential?

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- Rewrite the weakest paragraph from the original so it no longer commits any of the fallacies while preserving the author's intended point.

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- Rate the overall argument quality on a 1-10 scale and justify your rating using specific criteria from the course.
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### Worksheet: Evidence Quality Scoring Sheet

Use this sheet to evaluate up to five pieces of evidence for an argument you are currently working on or recently encountered. Rate each criterion 1 (poor) to 5 (strong).

Evidence item description (brief quote or summary)

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Source name and date

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Evidence hierarchy level (1=meta-analysis to 5=anecdote)

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Authority score (1-5) — notes

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Accuracy score (1-5) — notes

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Purpose/bias score (1-5) — notes

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Currency score (1-5) — notes

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Coverage score (1-5) — notes

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Overall quality rating (blank — calculate your own total)

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Keep, qualify, or discard this evidence?

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### Checklist: Correlation and Causation Review Checklist

- Identify which variable came first in time (temporality check)
- State the proposed causal mechanism explicitly — how would A produce B?
- Check for dose-response: does more A produce more B proportionally?
- Identify at least one plausible confounding variable that could explain the association independently
- Check whether the association has been replicated in at least one independent dataset
- Apply the base rate check: what percentage of similar cases show this association?
- Ask whether the claimed cause is sufficient, necessary, or merely one contributing factor

## Argumentation Frameworks and Professional Application

Build a complete Toulmin argument brief for a real professional claim, practise Socratic questioning in a live conversation, and assemble your full critical thinking toolkit.

### Exercise: Toulmin Brief Construction

Choose a real recommendation, proposal, or position you need to argue in the next 30 days. Build a full Toulmin argument brief using the six components. The brief should be readable in under 5 minutes.

- Write the claim as a single declarative sentence. Then write the Toulmin warrant explicitly: If [your data], then [your claim] because [rule or principle]. Is the warrant defensible on its own?

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- List your three strongest pieces of evidence (data/grounds). For each, rate the evidence quality using the five-criterion framework from Module 3.

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- Write the steel-man counter-argument in its strongest possible form. Then write the rebuttal: why does your evidence still outweigh this objection?

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- State your qualifier: is this claim certain, highly probable, probable, or merely plausible? What conditions would change your conclusion?

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### Worksheet: Socratic Questioning Log

In your next significant team meeting or one-on-one, use at least three Socratic question types. Log each question you asked and the response it generated.

Meeting or conversation date and context

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Question type used (clarification / assumptions / evidence / perspectives / implications / meta-question)

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The exact question asked

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Response received (brief summary)

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What assumption or gap the question revealed

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How the conversation shifted after the question

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Next Socratic question you could ask based on the response

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### Checklist: Full Argument Review Checklist — Before Submitting or Presenting

- The claim is stated as a clear declarative sentence — no hedge words in the headline
- The Toulmin warrant is written out explicitly and is defensible independently
- At least two independent pieces of evidence are cited with source and date
- Evidence quality has been rated — anecdote is labelled as such
- The strongest counter-argument is addressed in steel-man form, not a weak version
- All PEEL paragraphs contain point, evidence, explanation, and link
- Confidence level and key conditions for revision are stated explicitly
- A bias check has been run: confirmation bias, anchoring, and availability heuristic reviewed
- The argument has been read aloud once to catch implicit warrants and missing explanations
- A trusted colleague has been asked to identify the weakest link before final submission

### Your Action Plan

1. This week: dissect one real argument per day using the premise-conclusion-validity-soundness framework for 7 consecutive days
2. This week: start a decision journal — record your first entry within 24 hours of your next significant professional decision
3. Within 14 days: run a pre-mortem on one active project or pending decision with your team
4. Within 14 days: complete the Fallacy Hunt exercise using a public article in your professional field
5. Within 30 days: build a full Toulmin argument brief for a real recommendation you need to make
6. Within 30 days: conduct at least one Socratic questioning conversation and log the responses
7. Ongoing weekly: review one past decision journal entry and compare predicted to actual outcome
8. Ongoing monthly: identify one recurring bias pattern from your decision journal and design a structural counter-measure
9. Ongoing: apply the five-criterion evidence scoring sheet to any external report or study you act on
10. Quarterly: share one argument brief with a peer for adversarial review — request they find the weakest link









