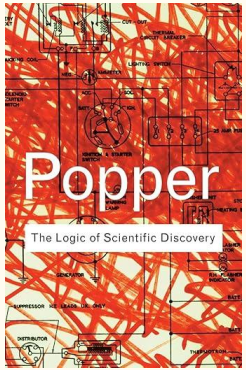
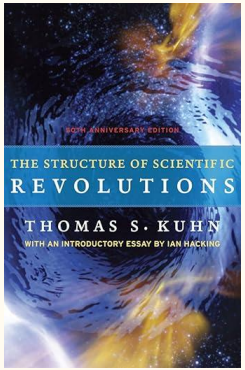
LECTURE V

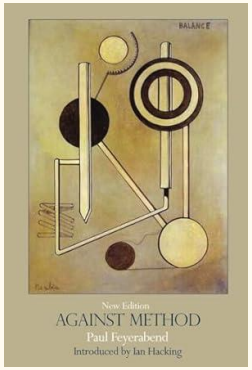
ORAL EXAM PRACTICE
CLASSICAL MECHANICS

Foundations of Science I
Prof. Overbey
4/22/25

CHOOSE 2 FOR READING WEEK







TECHNICAL LECTURE REFLECTIONS

Research Reflection Link

Part 1: Lecture Summary (approx. 300–500 words)

- **Company Overview**: Name, focus area, notable technologies or products.
- **Identify a Specific Project or Innovation**: Choose one technical project (e.g., a rocket engine, solar panel system, MRI scanner, cryogenic storage unit, electric motor, or vacuum-insulated transportation system, etc).
- **Describe the Science Behind It**: What concepts, methods, or problems is the project tackling?
- **Reflect on the Innovation**: What surprised or impressed you? Was anything confusing? Why did you choose this topic?

TECHNICAL LECTURE REFLECTIONS

Research Reflection Link

Part 2: Connection to *The Feynman Lectures on Physics* (approx. 300–500 words)

- **Find a Relevant Chapter** from the *Feynman Lectures* (Volumes I–III) that connects to the physics underlying the company's project.
- **Describe the Connection**: Explain the relevant principle(s), how Feynman describes them, and how they appear in the company's work.
- **Include an Equation or Diagram**: Pick one equation or diagram from the Feynman chapter. Explain:
  - What it means
  - Why it's relevant
  - How it helped you understand the project more clearly

CLASS SCHEDULE

Date	Topic	Students (2 max)
Tue Apr 22	Classical Mechanics	KC
Tue Apr 29	Thermodynamics	PC, MC
Reading Week	–	–
Tue May 13	Electromagnetism	NG, HW
Tue May 19	Energy	GP, LF
Tue May 27	Quantum and Relativity	RN, RJ

CLASS GRADING

Grading

- 15% = reading week essay on scientific paradigms
- 30% = technical lecture/reading reflections
- 20% = oral exam in-class practice sessions
- 35% = oral exam (to be scheduled during finals week)

ORAL EXAM IN-CLASS PRACTICE

- 20% = oral exam in-class practice sessions

- 5% = Instructor evaluation of your answer
- 15% = Your peer evaluations of your classmates answers

ANSWERING A QUESTION

Blueprint

Why does a car need to slow down before taking a sharp curve? (KC)

1) Restate the Question
2) State the Key Concept(s)
3) Present the Relevant Equation(s)
4) Interpret the Result
5) Conclude your answer

PRACTICE STRUCTURE

Presentation Component (4-7 min)
Student will present the answer to their question

- **A whiteboard will be available**
- **Target 4-7 minutes**
- **Use the answer structure from lecture**
- **Class will take notes**

Blueprint

1) Restate the Question
2) State the Key Concept(s)
3) Present the Relevant Equation(s)
4) Interpret the Result
5) Conclude your answer

Peer Review Component (15-20 min)
Student will leave the room and the class will evaluate their answer

- **Similar to the process of scientific peer-review**

Defense Component (10 min max)
Student will re-enter the room and answer questions from the class to defend their answer.

Why does a car need to slow down before taking a sharp curve?

THERMODYNAMICS

Question Options (PC, MC)

1. Why does water boil at a lower temperature on top of a mountain than at sea level? (MC)
2. Why does opening the freezer door ultimately warm up the kitchen instead of cooling it? (PC)
3. Why is coastal weather milder than inland weather at the same latitude?

REMINDERS

- All answers must be based on content from the **Feynman lectures**.
- Equations and concepts outside of the Feynman lectures will **not be accepted**.
- LLMs - such as ChatGPT, Claude, and Perplexity - may steer answers in the wrong direction by pulling from content outside these lectures and should be used with extreme caution.
- HOWEVER, **LLMs are an extremely useful tool for understanding content from the Feynman lectures** that you may find challenging and are highly **encouraged** for that purpose.