Foundations of Science I

INF 1330 003

Class Details

Credit Hours: 3

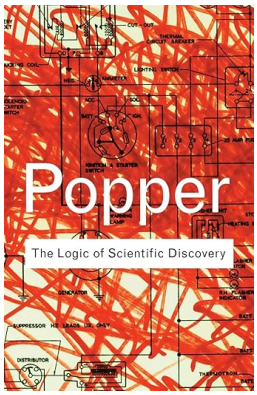
Days Class Meets: MO,TU 3:30pm-4:45pm

Instructor Information

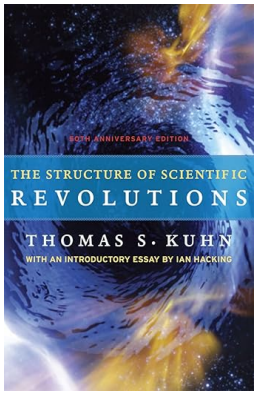
Eliah Overbey
Email: eoverbey@uaustin.org

Recommended Texts

Feynman Lectures
Additional Information:
https://www.feynmanlectures.caltech.edu/

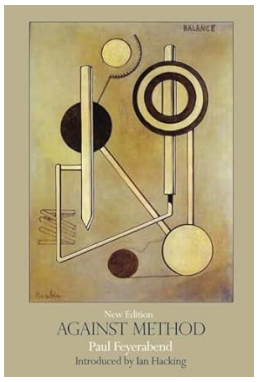


The Logic of Scientific Discovery
ISBN: 9780415278447
Authors: Karl Popper
Additional Information:
Optional (students must choose 2 books).



The Structure of Scientific Revolutions
ISBN: 0226458121
Authors: Thomas Kuhn
Additional Information:
Optional (students must choose 2 books).

The Methodology of Scientific Research Programmes: Volume 1: Philosophical Papers
ISBN: 978-1316979952
Authors: Imre Lakatos
Additional Information:
Optional (students must choose 2 books).



Against Method
ISBN: 1844674428
Authors: Paul Feyerabend
Additional Information:
Optional (students must choose 2 books).

Description

This course is the first part of a two-course sequence designed to explore and understand some of the most important ideas in science. This first course introduces students to a framework for scientific thinking and investigates key ideas in physical and earth sciences. Emphasis will be placed on applications and interdisciplinary connections across areas of study in the course sequence.

Course Outcomes and Objectives

Outcome
Introduce students to different viewpoints on paradigms of scientific progress.

- Explain fundamental principles of scientific thinking.

Outcome
Apply core principles of physics to real-world contexts and practical scenarios.

- Evaluate scientific evidence and arguments critically.

- Explain key concepts associated with mechanical systems.

- Explain key concepts associated with thermodynamic systems.

- Explain key concepts associated with electromagnetism.

- Explain key concepts associated with energy.

- Explain key concepts associated with quantum mechanics/relativity.

Outcome
Engagement with technical lectures delivered by professionals from local Austin companies and organizations.

Grading Policy

- 10% = reading week essay on scientific paradigms
- 30% = technical lecture/reading reflections
- 15% = oral exam in-class practice sessions
- 35% = oral exam (to be scheduled during finals week)

Accessibility Statement

Please review the University Accessibility Statement in the student catalog. Students having special needs should contact the Polaris Center or email Accomodations@uaustin.org.

Disability Support Services: The university will make reasonable accommodations for students with disabilities in compliance with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. The purpose of accommodations is to provide equal access to educational opportunities for eligible students with academic and/or physical disabilities.

Course Requirements

Background in high school algebra and open to reading mathematical equations.

Electronics

Please do not use laptops, iPads, cell phones, or any other electronic devices during class.

Academic Misconduct

Instructors at UATX have the authority to assess possible plagiarism, unauthorized use of artificial intelligence, and other forms of cheating in their courses. Normally, cheating will result in failing the assignment. Students may appeal such decisions to the Disciplinary Council, where they may exercise their right to a public hearing, by writing to the Dean of the Center responsible for the course.

Attendance and Tardiness Policy

Students may miss 10% of classes for any reason, with no excuse needed, and without penalty, i.e., 1, 2, or 3 classes, respectively, in a 1.5, 3, or 4.5 credit course. After that, each additional absence (for any reason) will result in a **2%** final grade penalty. Missing more than 25% of the classes in a course (without medical excuse), including "free" absences, will result in failing the course. Thus a student in a 1.5 credit course will fail if he or she misses 3 classes; a student in a 3 credit course will fail if he or she misses 6 classes; a

student in a 4.5 credit course will fail if he or she misses 8 classes. Being more than 20 minutes late to a class counts as an absence.

Schedule of Class

This class will cover the following schedule of topics:

1. Paradigms of Science

2. Classical Mechanics

3. Thermodynamics

4. Electromagnetism

5. Energy

6. Quantum and Relativity