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Introduction to Philosophy of Science

Description: Science is taken to be one of the most important ways in which we can come to understand our reality. Yet the connection between scientific theory, practice, and truth is more complex than one may initially be led to believe. The aim of Philosophy of Science is to explore the nature of science, including its theories, methods, and practitioners, in order to better understand how science can be used as a method of obtaining knowledge. In this course, we will survey some of the most pressing issues in Philosophy of Science, including: how can we distinguish science from pseudoscience? What is the connection between scientific theories and reality? How should we understand scientific progress? Should values play any role in scientific practice?

Assignments:

- **The Vinland Map Exercise** (The Vinland Map Exercise - PLATO - Philosophy Learning and Teaching Organization) (in-class activity) – Through the process of attempting to discern the authenticity of the Vinland Map, answer questions about the relationship between science and pseudoscience, theory and reality, facts and fiction.
- **Short evaluative essay** (3-4 pgs.) – Choose from three prompts.
- **Create a model** – Create a model based on one of the provided systems. Answer a series of questions about the process of idealization.
- **Final essay** (5-7 pgs.) – Choose from 5 prompts or decide on your own final topic (which must be approved by me!)

Required Texts – *Theory and Reality* (2003) – Peter Godfrey-Smith (PGS)

Week 1: Introduction

- Lucie Laplane et al. – "Why Science Needs Philosophy"
- PGS – "Introduction" in *Theory and Reality*

Week 2: How Do We Obtain Knowledge about the World?

- PGS – "Logic Plus Empiricism" in *Theory and Reality*
- A.J. Ayer – excerpts from *Language, Truth, and Logic*
- Willard V.O. Quine – "Two Dogmas of Empiricism"

Week 3: What Counts as Science?

- PGS – "Popper: Conjecture and Refutation"
- Karl Popper – excerpts from *The Logic of Scientific Discovery*

- Philip Kitcher – "Believing Where We Cannot Prove"

Week 4: Objectivity and Truth: What is Science Aiming at?

- PGS – "Scientific Realism" from *Theory and Reality*
- Bas van Fraassen - "Arguments Concerning Scientific Realism"
- Nancy Cartwright – "The Truth Doesn't Explain Much"

Week 5: The "Why" Question: Science and Explanation

- PGS – "Explanation" in *Theory and Reality*
- Michael Friedman – "Explanation and Scientific Understanding"
- Alisa Bokulich – "Distinguishing Explanatory from Nonexplanatory Fictions"
- Alan Garfinkel – "Explanatory Relativity"

Week 6: Scientific Puzzles and Practice

- Carl Hempel – excerpts from *Aspects of Scientific Explanation*
- PGS – "Induction and Confirmation" in *Theory and Reality*
- PGS – "Naturalistic Philosophy in Theory and Practice" in *Theory and Reality*
- Jerry Fodor – "Observation Reconsidered"

Week 7: Science and Idealization

- Angela Potochnik – excerpts from *Idealization and the Aims of Science*
- Michael Weisberg – excerpts from *Simulation and Similarity*
- Mary Morgan and Margaret Morrison – "Models as Mediating Instruments"

Week 8: Paradigms and Revolutions

- PGS – "Kuhn and Normal Science" in *Theory and Reality*
- PGS – "Kuhn and Revolutions" in *Theory and Reality*
- Thomas Kuhn – excerpts from *The Structure of Scientific Revolutions*

Week 9: Objectivity and Scientific Communities

- Heather Douglas – "Objectivity in Science"
- Helen Longino – "Values and Objectivity"
- Miriam Soloman – "Norms of Epistemic Diversity"
- **Optional:** PGS – "Naturalism and the Social Structure of Science" in *Theory and Reality*

Week 10: Science and Feminism

- PGS – "Feminism and Science Studies" in *Theory and Reality*
- Janet Kourany – excerpts from *The Gender of Science*
- Evelyn Fox Keller and Helen Longino – excerpts from *Feminism and Science*

Week 11: Should Science be Value-free?

- Robert Merton – "The Normative Structure of Science"
- Heather Douglas – "Origins of the Value-free Ideal for Science" from *Science, Policy, and the Value-Free Ideal*
- Heather Douglas – "The Structure of Values in Science" from *Science, Policy, and the Value-Free Ideal*

Week 12: Science and Doubt

- Naomi Oreskes – excerpts from *Merchants of Doubt*
- Brigitte Huber et al. – "Fostering Public Trust in Science: The Role of Social Media"