Philosophy 60: Philosophy of Science
Draft syllabus

Spring Quarter, 2006
MW 9:30-10:45
Rm: 50-52

Helen Longino
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OH: MW 11-noon
and by appointment

Course Description:

This course is concerned with the nature of scientific inquiry. Following on the Scientific Revolution of the 16th and 17th centuries, a powerful system of natural knowledge developed in the West, seemingly unlocking the secrets of the universe. Philosophers have tried to understand this body of knowledge, asking how it differs from other ways of trying to understand our experience, whether it reflects universal rationality or particular cultural concerns, whether it offers understanding of nature or only control of (some) natural processes. In mid 20th Century, a prevailing philosophical consensus regarding the uniqueness, rationality, and objectivity of the sciences was shattered by Thomas Kuhn's historical investigations of scientific change. We shall read and discuss work responding to Kuhn's challenge on such topics as scientific objectivity, the role of values in the sciences, the character of scientific observation and reasoning, scientific explanation, the nature of scientific laws. At the end of the quarter, we will see how philosophical analysis can be applied to controversial social issues involving the sciences, for example the debates over the teaching of evolution, and the role of science in supporting or challenging ideas of racial and gender difference.

The course is intended for undergraduate students: primarily philosophy majors interested in human knowledge of the natural world, students entering the history and philosophy of science and technology major, and science majors interested in exploring philosophical questions inspired by the sciences.

Class time will be divided between lecture and discussion. I will introduce the various topics we cover and outline the positions articulated in the readings. Students will be expected to have read and prepared questions for discussion about the readings assigned for the week. There will be four take-home exams, each counting for 20% of the final grade. The remaining 20% will be based on attendance and class participation.

Text

The text for the class is the anthology, *Philosophy of Science: The Central Issues*, edited by Martin Curd and J.A. Cover (W.W. Norton and Company, 1998). All readings are in the anthology, except where indicated. The editors, Curd and Cover, have also written essays discussing the readings at the end of each section. These are highly recommended. Any assigned readings not in the anthology will be available on CourseWork.

Schedule:

April 5: Introduction

April 10-12: Can science be defined? Science vs. Pseudoscience

Popper: "Science: Conjectures and Refutations" pp. 3-10
Kuhn, "Logic of Discovery or Psychology of Research?" pp. 11-19
Lakatos, "Science and Pseudoscience" pp. 20-26
Thagard, "Why Astrology is a Pseudoscience" pp. 27-38
Rec'd: C&C pp. 1-2; 63-74

April 17-19: Rationality, Objectivity, and Values I

Kuhn, "The Nature and Necessity of Scientific Revolutions" pp.86-101
Kuhn, "Objectivity, Value Judgment, and Theory Choice" pp. 102-118
McMullin, "Rationality and Paradigm Change in Science" pp. 119-138
Rec'd: C&C pp. 83-85; 211-234

April 24-26: Rationality, Objectivity, and Values II

Duhem, "Physical Theory and Experiment" pp. 257-279
Longino, "Values and Objectivity" pp. 170-191
Rec'd: C&C pp. 355-365; 239-245

May 1-3: Scientific Explanation I

**First takehome exam due
Carnap, "The Value of Laws: Explanation and Prediction" pp. 678-684
Hempel, "Two Basic Types of Scientific Explanation" pp. 685-694
Rec'd: C&C pp. 675-677; 667-783

May 8-10: Scientific Explanation II

Dretske, "Laws of Nature" pp. 826-845
Cartwright, "Do the Laws of Physics State the Facts?" pp. 865-877
Rec'd: C&C pp. 805-807; 879-883; 885-889; 896-901

May15-17: Empiricism and Realism I

**Second takehome exam due
Carnap or Hempel: Coursework
Maxwell: "The Ontological Status of Theoretical Entities" pp. 1052-1063
Van Fraassen, "Arguments concerning Scientific Realism" pp. 1064-1087
Rec'd: C&C pp. 1049-1051; 1227-1228; 1229-1240

May 22-24: Empiricism and Realism II

Hacking: "Experimentation and Scientific Realism" pp. 1153-1168
Fine, "The Natural Ontological Attitude" pp. 1189-1208
Rec'd: C&C pp. 1261-1272

May 31: Science on Trial I

**Third takehome exam due
Ruse, "Creation Science is Not Science" pp. 38-47
Laudan, "Commentary: Science at the Bar—Causes for Concern" pp. 48-53
Ruse, "Response to the Commentary: *Pro Judice*" pp. 54-61
Rec'd: C&C pp. 74-78

June: 5-7: Science on Trial II

Okruhlik, "Gender and the Biological Sciences" pp. 192-209
Rec'd. C&C pp. 245-249

Additional Readings to be Announced

Exam Week: 4th takehome exam due