מכון ויצמן למדע
WEIZMANN INSTITUTE OF SCIENCE

Philosophy of Science

2 Credits, Fall Semester (2015-2016)

Dr. Boaz Miller

Office Hours: By appointment via email boaz.miller@gmail.com

Course Description

The course deals with fundamental questions in philosophy of science. We will examine how the philosophy of science has reformulated basic questions and debates in Western philosophy, and how it has addressed them using the means at its disposal. Among the questions we will discuss are: Is there scientific rationality, and how is it to be conceptualized? What does it mean that science is a social enterprise? As time progresses, does science approximate the truth, at least in some cases? What are the ways in which science represents the world? The course readings consist of classical and contemporary sources.

Requirements

- attendance
- regular reading
- participation in class discussion
- one 15 minutes long class presentation of the required readings
- take-home exam

Grade Breakdown

- 15% class presentation
- 85% take-home exam
- Up to 5% bonus for meaningful participation in class discussion

Learning Outcomes

Upon successful completion of this course students should be able to:

- manifest familiarity with key issues and debates in philosophy of science;
- develop a philosophical critical stance toward scientific theories and practices.

Course Plan and Assigned Readings

1. **Introduction and Course Overview**

2. **Logical Empiricism**

   Brown, James R. 2001. *Who Rules in Science: An Opinionated to the Wars*, pp. 47-58. Cambridge MA: Harvard University Press.

   Ayer, A. J. 1946/1971. *Language, Truth and Logic*, 2nd ed. Ch. 1: The Elimination of Metaphysics, 45-61; Ch. 4: The A Priori, 96-115. London: Penguin.

3. **The Problem of Induction**

Hume, David. 1748. *An Enquiry Concerning Human Understanding*. Section IV: Sceptical Doubts Concerning the Operations of the Understanding; Section V. Sceptical Solution of these Doubts. Available at http://www.gutenberg.org/files/9662/9662-h/9662-h.htm#section4.

(יום, דיוויד. 1748/2008. **מחקר בדבר בינת האדם**. פרק ד׳: פקפוקים ספקניים בדבר דרכיה של הבינה; פרק ה׳: פתרון ספקני של הפקפוקים הללו, 80-51. תרגום: גיא אלגת. תל אביב: רסלינג.)

4. **Popper's Critical Rationalism**

Popper, Karl R. 1963. Science: Conjectures and Refutations. In *Conjectures and Refutations: The Growth of Scientific Knowledge*, 33-58. London: Routledge.

(פופר, קרל ר. 1963/1977. מדע: השערות והפרכות. בתוך **ספר מקורות: פילוסופיה של המדע**, עורכים גד פרוידנטל ושמעונה גינצבורג, 23-1. תל אביב: האוניברסיטה הפתוחה.)

5. **Underdetermination of Theory by Evidence**

Lakatos, Imre. 1968-1969. Criticism and the Methodology of Scientific Research Programmes. *Proceedings of the Aristotelian Society* 69: 149-186.

6. **Thomas Kuhn's Structure of Scientific Revolutions**

Kuhn, Thomas S. 1970. *The Structure of Scientific Revolutions*, 2nd ed. Chicago: University of Chicago Press.

(קון, תומאס ס. 1961/1977. **המבנה של מהפכות מדעיות**. תרגום: יהודה מלצר. תל אביב: מפעלים אוניברסיטאיים.)

7. **Kuhn on the Rationality of Science**

Anonymous. 1997. You Can't Follow the Science Wars Without a Battle Map. *The Economist* (Dec 11). Available at http://www.economist.com/node/109188.

Kuhn, Thomas S. 1977. Objectivity, Value Judgment, and Theory Choice. In *The Essential Tension: Selected Studies in Scientific Tradition and Change*, 102-118. Chicago: University of Chicago Press.

8. **Feminist Criticism of Science**

Martin, Emily. 1991. The Egg and the Sperm: How Science Has Constructed a Romance Based on Stereotypical Male-Female Roles. *Signs* 16(3): 485-501.

Okruhlik, Kathleen. 1998. Gender and the Biological Sciences, in *Philosophy of Science: The Central Issues*, edited by M. Curd and J. A. Cover, 192-207. New York: Norton.

9. **Critical Contextual Empiricism**

Longino, Helen. 1992. Essential Tensions – Phase Two: Feminist, Philosophical, and Social Studies of Science. In *The Social Dimensions of Science*, ed. Ernan McMullin, 198-216. Notre Dame: University of Notre Dame Press.

Goldman, Alvin I. 2002. Knowledge and Social Norms. *Science* 296 (June 21): 2148-2149.

10. **Science, Social Values, and the Argument from Inductive Risk**

Douglas, Heather. 2000. Inductive Risk and Values in Science. *Philosophy of Science* 67(4): 559-579.

11. **Scientific Realism: Does Science Tell the Truth?**

Psillos, Sthathis. 2006. Scientific Realism. In *Encyclopedia of Philosophy*, 2nd ed., Vol. 8, ed. D. M. Borchert, 688-694. Detroit: Macmillan.

12. **The Pessimistic Induction on Past Scientific Failures**

Lehoux, Daryn. 2012. *What Did the Romans Know?* Ch. 6: The Trouble with Taxa, 133-154; Ch. 9: Of Miracles and Mistaken Theories, 200-223. Chicago: University of Chicago Press.

13. **Structural Realism**

Ladyman, James. 2011. Structural Realism versus Standard Scientific Realism: The Case of Phlogiston and Dephlogisticated Air. *Synthese* 180(2): 87-101