SP 14 730: 225 Introduction to Philosophy of Science

Class schedule: M,W 1:10-2:30 pm, CA-A4

Instructor: Anna Ijjas, aijjas@princeton.edu

General description:

What is science? What are scientific theories? What is the scientific method, if there is any? Do scientific theories give literally true accounts of the world as it is, or are they just convenient tools for making predictions and developing technology? How are scientific theories confirmed or falsified? What makes science successful? Does scientific knowledge progressively grow in a linear fashion or is its evolution dominated by radical revolutions? What is the relation between science and metaphysics? These and similar questions will be studied in the first part of this class. In the second part, we will be more specific and discuss issues in the philosophy of physics, in particular the philosophy of time and other issues in philosophy of cosmology.

Required texts:

- Peter Godfrey-Smith, Theory and Reality: An Introduction to the Philosophy of Science, The University of Chicago Press, 2003.
- There are additional sources for readings in this class. Links to them will be available on the course web page by Late December.
- URL: https://sakai.rutgers.edu/portal/site/f4b6b61e-dd06-4712-bddc-520be896799e

Assignments and Grading:

The grade for this course will be determined by the total points a student earns from the four types of evaluation indicated below.

1. **Preparation and Class Attendance** **10%**
   You are expected to read all of the assigned material. You are also expected to ask questions during the lectures and participate in in-class activities. **Missing more than two classes will affect your grade.** It is your responsibility to keep up with any work you miss.

2. **Quizzes** **20%**
   There will be four short quizzes during the term, each worth 5 points. They will be announced in class one meeting before they will be held. No make-up quizzes will be given.

3. **Short paper** **30%**
   There will be a take-home midterm paper **due in PDF format via email on March 12, 2014, 1pm**. Your short paper must be on an issue in general philosophy of science that we discussed in class. You must have your short paper topic approved by February 10, 2014. Your paper must be 3 pages single-spaced, justified, and in Times New Roman font (size 12), with one inch margins. The paper must be documented in the University of Chicago manual style and should include a bibliography.

4. **Long paper** **40%**
   There will be a take-home final paper **due in PDF format via email on May 6, 2014, 1pm**. This longer paper will give you an opportunity to explore in detail a part of the course which has particularly interested you (– it must be different from the topic you wrote your short paper on). You must have your final paper topic approved by March 31. Your paper must be 7 to 10 pages single spaced, justified, and in Times New Roman font (size 12), with one inch margins. The paper must be documented in the University of Chicago manual style and should include a bibliography.

How to do well in this course: Come to class prepared. Being prepared means that you have completed the assigned readings, thought carefully about them, and have begun to formulate questions concerning the issues they raise. Participate actively in class; ask questions in our discussions, and respond to each other's questions. These class experiences, in which you will have to clearly explain yourselves to each other, will be invaluable when you come to complete your written assignments. I expect a high level of argumentative clarity in your papers, which means you should anticipate, articulate, and respond to objections that your reader might have to your view.

Tentative Schedule:

Part I: General issues in Philosophy of Science

Week 0 [Jan 22]	Introduction, administration
Week 1 [Jan 27, 29]	Knowledge I
Week 2 [Feb 3, 5]	Knowledge II
Week 3 [Feb 10, 12]	Scientific concepts
Week 4 [Feb 17, 19]	Demarcation problem: what is the difference between science and pseudo-science? (Popper's falsificationism)
Week 5 [Feb 24, 26]	Critique of Popper (Kuhn, Lakatos , Feyerabend)
Week 6 [March 3, 5]	Durham-Quine-Thesis
Week 7 [March 10, 12]	Science and Metaphysics

March 15-23: Spring break

Part II: Issues in Philosophy of Cosmology – Philosophy of Time

Week 8 [March 24, 26]	Theories in Philosophy of Time I
Week 9 [March 31, April 2]	Theories in Philosophy of Time II

Week 10 [April 7, 9] Special Relativity and Absolute Time

Week 11 [April 14,16] Entropy and the arrow of time

Part III: Other issues in Philosophy of Cosmology

Week 12 [April 21, 23] Inflationary cosmology and the multiverse problem

Week 13 [April 28, 30] Alternative cosmologies