Philosophy 341: Philosophy of Science
Fall 2021

Course Information

Time: MW 2:00P–3:15P
Instructor Name: Ge Fang
Email: gfang1@iit.edu
Instructor office: Siegal Hall 235
Office Hours: W 3:30P–5:30P or by appointments
Classroom: Rettaliata 121

Course Description

This course introduces students to the central concerns in general philosophy of science: What is science? What is the scientific method? What is the relation between science and value? We will critically examine the common answers to these questions: that the science is the search for truths, that scientific activities are characterized by a systematic and distinctive method, and that science is value-free. The primary goal of this course is to get students acquainted with the development and structure of philosophy issues surrounding modern science, which are relatively young in the history of philosophy, and the interaction between these new issues to more traditional philosophical ideas in metaphysics, epistemology, and value theories. Along the way, the students are trained to develop philosophical skills in

- Judging whether common claims about science are philosophically controversial .
- Identifying theses and define key terms from philosophical articles.
- Reconstructing important arguments from readings in a charitable way.
- Evaluating arguments written by other authors.
- Constructing valid arguments to support or counter a thesis.
- Writing clear academic essays to communicate philosophical arguments.

Textbook

Many but not all readings may be found in Curd, Cover & Pincock's *Philosophy of Science: The Central Issues*, 2nd edition (CC below). If you don't wish to purchase a copy, I have put it on reserve at Galvin's Library. Other required readings will be uploaded to Blackboard (BB below).

Grading

Best two of three essays: 25% each. Each essay is to be around 1500 word (12pt Arial font, double spacing, standard margins). Requirement for the essay is: Identify one central argument in one or more readings. Clearly state the premises and the conclusion of the argument. Consider

possible objections to this argument and explain why you do or do not find those objections convincing. The essay will be evaluated on 1) the adequate grasp of the issue, the understanding of the argument, the accuracy in interpreting readings, 2) novel insights and creativity, and 3) exposition (grammar, prose, composition). Papers should be submitted via Blackboard. Late papers will drop in final score by one letter grade per day.

Five quizzes: 10% in total. These are surprise quizzes; the dates for the quizzes are not announced beforehand. The final score will be based on the four highest scores, so you can miss one quiz. Quiz questions will be about that lecture's readings. You are expected to have done the readings for each lecture before class, so that during the class we can discuss the parts of the readings that puzzle you. Quiz questions are designed so that you can easily answer them as long as you have done the reading.

One exam (30%): The final exam will be a cumulative essay exam. You will have a choice of two out of three essay questions, all of which probe basic concepts of the course.

Attendance (10%): Attendance and participation determine 10% of your grade. Please attend our meetings and participate our discussion. You can miss four classes, no question asked. I recommend that you save this quota in case you need to miss class due to family, sickness, religion, and other emergencies. After four absences, every further absence will count against the final grade. **Attendance keeping mechanism**: People don't usually change their seat during the semester. I will keep a seating map that shows where you sit from the very first lecture, and for every subsequent lecture I will put lecture notes on all "registered" seats before class. Every copy of lecture notes not collected by the end of class will mark an absence. Please don't try to collect notes for others as it will be painfully obvious. To still allow some flexibility in changing seat, I will keep a google sheet of the current seating. You can always modify the google sheet to change your seat to another unoccupied space.

Laptop policy

Laptops and electric devices are not allowed, unless I have assigned some reading not in the textbook, or you have convinced me of some other legitimate reason to use your device. The use of laptops or other electric devices has four potential purposes: (1) taking notes, (2) referring to the reading, (3) doing relevant online research to the current topic, and (4) entertainment. In our class, however, (1) there is no need to take notes of lecture content because I will distribute my notes. If you usually take notes to keep you focused, changing to pen-and-paper note-taking will serve the same purpose. (2) For most lectures, the reading can be found in our textbook. (3) Doing good research requires much more time than allowed in a classroom setting. And (4) is not a legitimate purpose.

Course Schedule (tentative)

Topic 1: Demarcation

8/23 M: Introduction & Logical empiricism.

8/25 W: Popper, "Science: Conjectures and Refutations" (CC 3); Kuhn, "Logic of Discovery or Psychology of Research?" (CC 11)

8/30 M: Lakatos, “Science and Pseudoscience” (CC 20); Thagard, “Why astrology is a pseudoscience” (CC 27)

9/1 W: Ruse, “Creation science is not science” (CC 37); Laudan, “Science at the Bar" (CC 47)

9/6 M: Labor day. No class.

9/8 W: Cleland, “Methodological and Epistemic Differences Between Historical Science and Experimental Science” (BB)

Topic 2: Induction & Confirmation

9/13 M: Lipton, “Induction” (CC 390); Hempel, “Studies in the logic of confirmation (I.)” section 3–5 (excluding 5.11, 5.12, 5.2), (BB, pp. 9–15)

9/15 W: Popper, “The Problem of Induction” (CC 406); Salmon, “Rational Prediction” (CC 412);

9/20 M: Hempel, “Studies in the logic of confirmation (II.)”, section 8 (pp. 102-107) (BB); Salmon, “Confirmation and Relevance”, section 1–3 (pp. 5–17) (BB)

9/22 W: Underdetermination. (CC 333–358)

Paper 1 due on 9/24, 23:59pm (Fri)

Topic 3: History and The Advance of Relativism

9/27 M: Kuhn, “The Nature and Necessity of Scientific Revolutions” (CC 79)

9/29 W: Kuhn, “Objectivity, Value Judgement, and Theory Choice”(CC 94)

10/4 M: Laudan, “Kuhn’s Critique of Methodology” (CC 131)

10/6 W: Longino, “Values and Objectivity” (CC 144)

10/11 M: Fall break day. No class.

Topic 2 cont’d: Induction & Confirmation, new approach

10/13 W: Salmon, “Rationality and Objectivity in Science or Tom Kuhn Meets Tom Byes” (CC 518)

10/18 M: Mayo, “A Critique of Salmon’s Bayesian Way” (CC 550)

Topic 4: Explanation

10/20 W: Hempel, “Two Basic Types of Scientific Explanation” & “The Thesis of Structural identity” (CC 657, 667)

10/25 M: Railton, “A Deductive-Nomological Model of Probabilistic Explanation” (CC 691)

10/27 W: Kitcher, “Explanatory Unification” (CC 711)

Paper 2 due on 10/29, 23:59pm (Fri)

Topic 5: Intertheoretic Reduction

11/1 M: Nagel, “Issues in the Logic of Reductive Explanations” (CC 911)

11/3 W: Fodor, “Special Sciences (or: The Disunity of Science as a Working Hypothesis)” (CC 954)

Topic 6: Natural Kind & Race

11/8 M: Hacking, “A Tradition of Natural kind” (BB)

11/10 W: Sober, “Evolution, Population Thinking, and Essentialism” (BB)

11/15 M: Boyd, “Homeostatis, Species, and Higher Taxa” (BB)

11/17 W: Kitcher, “Some Puzzles about Species” (BB)

11/22 M: Andreassen, “A New Perspective on the Race Debate” (BB)

11/24 W: Thanksgiving. No class.

11/29 M: TBD

12/1 W: TBD

Final Paper due on 12/3, 23:59pm (Fri)

12/6-13: Exam week. Exam time and place TBD.

Academic Honesty

Students are bound by the IIT policy on academic integrity in all aspects of this course. One of the most common violations of academic integrity is plagiarism. Plagiarism includes, but is not limited to, copying someone else’s exact words, paraphrasing their sentences, or summarizing their thoughts or ideas, without giving credit to the original author. Here is a web resource on when to cite:

http://tigger.uic.edu/~edelberg/crediting_others/index.htm

Disability

Students with disabilities may request accommodations to ensure equal access and equal academic opportunities. Requests for accommodation are coordinated through Center for Disability Resources. The Center for Disability Resources is located in Suite 3F3-1, 10 W 35th St. You can also call them at 312-567-5744 or email them at disabilities@iit.edu. Should accessibility issues arise, be sure to reach out to your instructor about your Accommodation Plan.