PHIL_OX 125 03J

Introduction to Philosophy of Science

Spring 2013 *TTh 3:30-5:10* *Humanities Hall 201*

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Office Hours: W 2-4, and by appointment. (I'm willing to meet anytime I can. Email me to set up a time.)

Course Description

This class is an introduction to the philosophy of science. Science is a central feature of modern society. It has attained its centrality because it is a remarkably efficient producer of knowledge and control of the natural world. Yet, what is science? How does it work? Why is it successful? These are questions philosophers of science seek to answer, and the answers are important for scientific practice and policy. In this class, we will discuss major issues in the philosophy of science. We will also introduce well-known figures, such as Carnap, Popper, Kuhn, and Quine, and their answers to the above questions. Readings will primarily be classic articles and texts in the field. The aim will be to provide a familiarity with important topics in philosophy of science and prepare interested students for future work both in philosophy and in science.

Course Objectives

Students should gain a basic sensibility to good and bad argumentation. They should be able to identify the parts of arguments they encounter, as well as the ability to analyze arguments to specify their strengths and weaknesses. They should develop the reading, verbal, and writing skills needed to recognize and construct coherent and persuasive arguments. Students should also acquire a basic understanding of the important issues of interest to contemporary philosophers of science.

Text

There are two textbook for this course:

Alex Rosenberg, *Philosophy of Science: A Contemporary Introduction*. 3rd ed. (Routledge, 2012)

Martin Curd, J. A. Cover, Christopher Pincock (eds.), *Philosophy of Science: The Central Issues*. 2nd ed. (W. W. Norton & Co., 2013)

These texts should be available at the Oxford College Bookstore. Additional material will be made available via Blackboard. Please make sure you have signed onto the course.

Policies

All policies here outlined are subject to change at the instructor's discretion.

Class Organization

Class meetings will consist primarily of guided discussions concerning the assigned reading. As noted below, students are expected to engage the discussion meaningfully.

One aim of this class is to teach the ability to argue convincingly. Stating your point of view loudly, assertively, or simply rudely is *not* equivalent to a convincing argument. Nor are insults, condescension, or *ad hominem* attacks legitimate refutations of another's position. In the course of discussion, try to keep your own statements modest while remaining sensitive and attentive to what others have to say. Effective response to criticism is an essential feature of good philosophy. Feel free to speak your mind, but allow others the same privilege.

Attendance

I will not record attendance in this class. However, I will pay attention to your participation, and it will play a part in your final grade. Missing one or two classes will not be a problem, but missing three or four will be trouble. Besides, you will not gain much from the (rather dense) readings if you do not attend class.

You do not need to alert me to absences. However, if you do miss a class, you are responsible for the material covered. Make sure to do the assigned reading and ask a classmate for a summary of the discussion and notes. If you have any further questions, you are welcome to ask me.

Readings

Special care has been taken to prevent the assigned reading from becoming onerous. In the ebb and flow of college life, it may nevertheless become difficult to stay on top of the reading. Also, note that some sessions require more reading than others. As a result, it is imperative that students *plan ahead*. Read ahead when you have the opportunity, so that you do not have to read too much when more is assigned or when you are otherwise occupied.

Be aware that reading philosophy is more difficult and time-consuming than reading for other contexts. Reading difficult and unappealing texts is an important skill that will be useful in any future work you do, and you will find the class much more and useful if you do the reading. We will discuss how to read philosophy in class.

In any case, you are expected to come to class prepared to discuss the assigned texts. That means reading and comprehending the material to the point that *you can ask meaningful questions*. Asking for a summary of the reading is not a meaningful question. Rather, you should be able to, for instance, point to a specific passage and ask what is happening therein. At the very least, you should understand the thesis of the text, and the argument(s) in its favor.

Electronics

The use of computers and other electronic devices (iPads, cellphones, etc.) in class has a tendency to distract attention and interfere with classroom discussion, even for those not actively using

them. They are *not to be used in class*, except when necessary for a presentation (or for some other compelling purpose).

Assignments

Class Discussion

Students will be called on (randomly) to initiate discussion regarding an assigned text. Students will be expected to briefly summarize the position stated in the reading and to propose questions for group discussion.

Exams

Two midterms and a final will be administered in this course. More detail will be provided.

Evaluation

Evaluation in this class will be based on overall performance. Students should therefore strive to perform well in all aspects of the class. That said, a *rough* guide to the consideration given to each component is 20% for class participation, 10% for the class discussion, 20% for each midterm, and 30% for the final exam.

Honor Code

The Honor Code is in effect in this class, as it is in all classes at Oxford College. Academic and personal integrity are serious matters, and will be treated as such in this course. The instructor and students alike are responsible for upholding both the spirit and the letter of the Code. Students must understand its content—especially regarding academic honesty and integrity—and should clarify any questions they might have. All students are also expected to act with civility, personal integrity; respect other students' dignity, rights, and property, including their intellectual property; and help create and maintain an environment in which all can succeed through the fruits of their own efforts. Details about the Honor Code are available online: http://oxford.emory.edu/audiences/current_students/Academic/academic-success/student-honor-code/index.dot.

Philosophy is a collaborative enterprise. Ideas are best developed in discourse where criticism and suggestions are freely exchanged. You should not interpret the honor code to impact your ability to work together, and you are encouraged to do so. However, anything represented as your own work must be your own, with the remainder of submitted material properly attributed to its source(s).

Accommodations

Students requiring special accommodations should contact the Oxford College Office of Access and Disability Resources at (770) 784-8415 to register. This includes medical accommodations for temporary illnesses.

Assessment

Student work submitted as part of this course may be reviewed by Oxford College and Emory College faculty and staff for the purposes of improving instruction and enhancing Emory education.

Final Note

As much as I find it distasteful (for the very reasons I am about to cite), my time at Oxford has indicated the necessity of the following.

This is *college*. This institution provides resources, including professors and your fellow students, that you can use to edify and prepare yourself for your future. However, students are presumed to be adults, with responsibility for their own behavior and education. The resources provided will not come to you. You must seek them out and employ them to your own advantage. Do the reading. Write and re-write drafts of your papers. Use office hours. Use the writing center. Ask for help where and when you need it. If you get a bad grade, figure out where you were mistaken and work hard to improve. I am always willing to offer help, if you are prepared to seek it. On the other hand, if you fail to meet expectations, I am not going to chase after you. I will simply evaluate your performance accordingly.

College is the transition to independent and professional life. It is the opportunity to become the person you want to be. Treat each other with respect and act in a way that demands it. Among other things, this means addressing each other appropriately—for your instructors, 'Professor' or 'Doctor'. Value your own time and that of others.

You can benefit tremendously from this course, from each other, and from Oxford, but your seriousness, commitment, and effort are required.

Schedule

The schedule is subject to change. I anticipate falling behind, in which case students are still responsible for keeping up with the reading in line with class discussion. (Bb) indicates material on Blackboard.

Date	Class	Assignment
January 15	Welcome and Introduction: Content and Methods	Reading philosophy websites (Bb)
January 17	What is Science?	Rosenberg, chs. 1 and 2 Michael Ruse, "Creation-Science Is Not Science." Larry Laudan, "Commentary: Science at the Bar – Causes for Concern." Michael Ruse, "Response to the Commentary: *Pro Judice*."
January 22-24	What Science Is: The Demarcation Problem	A. J. Ayer, "The Elimination of Metaphysics." (Bb) Karl Popper, "Science: Conjectures and Refutations." Imre Lakatos, "Science and Pseudoscience." Larry Laudan, "The Demise of the Demarcation Problem." (Bb)
January 29-31	How Science Works: Models of Explanation	Rosenberg, chs. 3 and 7 Carl Hempel, "Two Basic Types of Scientific Explanation." Carl Hempel, "Inductive-Statistical Explanation." Wes Salmon, "Four Decades of Scientific Explanation." (Bb) Bas van Fraassen, *The Scientific Image* (excerpts). (Bb)
February 5-7	What Makes Science and What Science Makes: Laws of Nature	Rosenberg, ch. 4 A. J. Ayer, "What is a Law of Nature?" Fred Dretske, "Laws of Nature." Nancy Cartwright, "Do the Laws of Physics State the Facts?"
February 12-14	How Science Also Works: Alternative Models of Explanation	Rosenberg, ch. 5 Philip Kitcher, "Explanatory Unification." Paul Humphreys, "Scientific Explanation: The Causes, Some of the Causes, and Nothing but the Causes." (Bb)
February 19-21	Where Science Comes From: Induction	Rosenberg, chs. 9 and 10 Peter Lipton, "Induction." Karl Popper, "The Problem of Induction." Wes Salmon, "Rational Prediction." Nelson Goodman, "The New Riddle of Induction."
February 26	**Midterm Exam**	
February 28-March 7	Where Science Comes From: Evidence, Observation, and Underdetermination	N. R. Hanson, "Observation" (From *Patterns of Discovery*). (Bb) Pierre Duhem, "Physical Theory and Experiment." W. V. Quine, "Two Dogmas of Empiricism."

		Donald Gillies, "The Duhem Thesis and the Quine Thesis." Larry Laudan, "Demystifying Underdetermination."
March 12-14	**SPRING BREAK**	
March 19-21	Where Science Meets the World: Prediction and Confirmation	Peter Achinstein, "Explanation v. Prediction: Which Carries More Weight?" Wes Salmon, "Rationality and Objectivity in Science *or* Tom Kuhn Meets Tom Bayes." Deborah Mayo, "A Critique of Salmon's Bayesian Way." Clark Glymour, "Why I Am Not A Bayesian." (Bb) Paul Horwich, "Therapeutic Bayesianism."
March 26-28	What Science Says: Realism and Anti-Realism	Rosenberg, ch. 8 Grover Maxwell, "The Ontological Status of Theoretical Entities." Bas van Fraassen, "Arguments Concerning Scientific Realism." Larry Laudan, "A Confutation of Convergent Realism." Ian Hacking, "Experimentation and Scientific Realism." Arthur Fine, "The Natural Ontological Attitude."
April 2 and 9	How Science Fits Together: Reduction	Rosenberg, ch. 6 Hilary Putnam and Paul Oppenheim, "The Unity of Science as a Working Hypothesis." (Bb) Ernest Nagel, "Issues in the Logic of Reductive Explanations." Paul Feyerabend, "How to Be a Good Empiricist – A Plea for Tolerance in Matters Epistemological." Philip Kitcher, "1953 and All That: A Tale of Two Sciences."
April 4	**CLASS CANCELLED**	
April 11	**Midterm Exam**	
April 16-18	What Science Says: Models and Representations	Rosenberg, ch. 9 James Bogen and James Woodward, "Saving the Phenomena." (Bb) Carl Hempel, *Aspects of Scientific Explanation* (excerpts). (Bb) Bas van Fraassen, *The Scientific Image* (excerpts). Ronald Giere, "How Models Are Used to Represent Reality." (Bb)
April 23	Science's Place in the World: Objectivity and Values	Rosenberg, chs. 12 and 13 Thomas Kuhn, "The Nature and Necessity of Scientific Revolutions." Thomas Kuhn, "Objectivity, Value Judgment, and Theory Choice." Quine, "Posits and Reality." (Bb) Ernan McMullin, "Rationality and Paradigm Change in Science."

		Helen Longino, "Values and Objectivity."
April 25	Science in the Marketplace	Rosenberg, ch. 14 Readings on climate change (Bb)
May 3 9am-12pm	**Final Exam**	