

Science, Inquiry, and Truth · Phil 209A

Prof. Jeffrey Dunn

Fall 2010
Tu, Th 7:00 - 8:30
JSC 111
DePauw University

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Description

Science appears to be an extremely successful way of finding out about the world. But what is distinctive about science and why has it had this success? In this class we will investigate this important question. We will begin our investigation with Logical Positivism, a very influential account of what is distinctive about science, made popular in the early 20th Century. We will then consider two specific issues concerning the relationship between scientific inquiry and truth. First, we will investigate the nature of scientific inquiry itself: how does observation of particular facts enable us to learn general truths about the world? Second, we will investigate the assumption that scientific inquiry does enable us to learn truths about the world. Some have challenged this idea. In addressing these issues, we will read important work by Hume, Ayer, Popper, Hempel, Goodman, and Kuhn, among others.

Books

Language, Truth, and Logic (2nd Edition), A. J. Ayer, Dover. (Abbreviated 'LTL')

Philosophy of Natural Science, Carl Hempel, Pearson. (Abbreviated 'PNS')

The Structure of Scientific Revolutions, Thomas Kuhn, University of Chicago Press. (Abbreviated 'Structure')

(The books above are available at the University Bookstore.)

Coursepack (abbreviated 'CP') available at <http://www.xanedu.com/login.shtml?PackId=326161>

Course Requirements

Take-Home Exams

There are three take-home exams:

Exam 1: Due 9/23

Exam 2: Due 11/4

Exam 3: Due 12/17

Late take-home exams will not be accepted. A late exam prevents me from discussing the exam in class, which is unfair to other students who have turned in their exam on-time.

Paper Assignment

Your final paper should be 1,500 - 2,000 words and is due on 12/10. There are three main parts to this assignment.

1. Selecting a topic and at least one outside reading to do for this topic: Due 10/26
2. Compose a first draft of your paper: Due 11/23
3. Respond to comments and compose final draft of your paper: Due 12/10

Please turn in your paper on time. All late papers will be penalized.

To give you an idea of what is expected, below are two examples of the kind of structure that would be appropriate for your paper. (For more detailed examples, I will be handing out a separate sheet specifically about the essay.)

Example 1:

1. Present a view discussed in class.
2. Present an objection to that view.
3. Consider possible replies to the objection.
4. Evaluate the replies and offer an assessment.

Example 2:

1. Present a key argument from a paper that you selected in the area of your topic.
2. Explain this argument, defining all technical terms, and providing the best possible reasons in favor of each premise of the argument.
3. Evaluate the argument, explaining how someone could criticize it.

* I strongly recommend that you take advantage of the Writing Center in the Academic Resource Center, located in 115 Asbury. After scheduling an appointment, you will have the chance to meet with a trained tutor who will read your work and offer feedback. This is a great way to improve your writing, however, slots can fill up quickly, so please plan ahead and take advantage of this great resource.

Group Project

For the group project, you and your group members will research one example from the history of science. The example should concern a famous experiment or discovery that confirmed or refuted some view or theory. A good resource for finding examples is:

Great Scientific Experiments, Rom Harré, OUP.

This book will be on reserve in the library.

For the assignment your group must turn in a report. Your report should first describe the example you selected. Each group will be assigned one theory of confirmation that we discussed in class. Your report must then describe how the theory of confirmation you were assigned would explain your example. Your report should conclude by explaining if any other theory of confirmation does a better job with your example.

The group project is due 11/16.

Other Requirements

You should keep up with the readings, attend class, and participate in discussions. To facilitate this there will be occasional short reading quizzes and in-class assignments. Consistent with university policy, you may be dropped from the class if absences are too frequent.

You should also make arrangements to meet with me if you are falling behind or are confused about something.

Things You Can Expect From Me

I will give clear and prompt feedback on your work.

I will assist you in choosing a paper topic, and an example for the group assignment.

I will be available for extra help as needed.

Grading

Take-Home Exams (3): 57% (19% each)

Paper Assignment: 25% (first draft must be submitted on-time for full credit)

Participation/Quizzes/In-Class Work 8%

Group Assignment: 10%

Special Considerations

DePauw University is committed to providing equal access to academic programs and university-administered activities and reasonable modifications/accommodations to students with disabilities in compliance with the Americans with Disabilities Act (ADA) of 1990, as amended in 2008. Any student needing special accommodations due to a disability should contact the Coordinator of Student Disability Services, Pam Roberts, 302 Harrison Hall or call (765) 658-6267. It is the responsibility of each student to discuss implementation of approved modifications/accommodations with each faculty member and/or staff member within one week of the date of receiving a modification/accommodation approval memo or within the first two weeks of the academic semester.

Academic Integrity

Academic integrity is very important, and violations are serious offenses, which I take very seriously. There is a clear Academic Integrity Policy that can be found here:

<http://www.depauw.edu/univ/handbooks/dpuhandbooks.asp?ID=101parentid=100>

It is your responsibility to read the university policy. If you are unclear about what constitutes a violation of academic integrity, it is your responsibility to contact me with any questions so that you are clear about it. Ignorance is not an excuse. The *minimum* penalty for violations of Academic Integrity is a 0 on the relevant assignment and a further reduction in your overall grade.

Tentative Reading Schedule

Logical Positivism		
Date	Topic	Reading
8/26	Introduction	–
8/31	Verificationism	Ayer, <i>LTL</i> Ch. 1
9/2		Ayer, <i>LTL</i> Ch. 1 Hempel, <i>PNS</i> Ch. 7
9/7	Operationalism	Hempel, <i>PNS</i> Ch. 7 Recommended: Borges, “Funes the Memoriosus” Optional: “Symposium on Operationalism” (on Moodle)
9/9	Positivism & Math	Ayer, <i>LTL</i> Ch. 4
9/14	Positivism & Science	Ayer, <i>LTL</i> Ch. 5 Fowler, “Special Relativity” (online)
9/16	Explanation	Hempel, <i>PNS</i> Ch. 5 Take-Home Exam 1 Assigned
Induction and Confirmation		
9/21	Hume’s Problem	Hume, Section IV (<i>CP</i>)
9/23		Skyrms, “The Traditional Problem of Induction” (<i>CP</i>) Take-Home Exam 1 Due
9/28		Skyrms, “The Traditional Problem of Induction” (<i>CP</i>)
9/30	The Descriptive Problem: Ravens	Hempel, “Studies in the Logic of Confirmation” (<i>CP</i>)
10/5	The Descriptive Problem: Grue	Goodman, “The New Riddle of Induction” (<i>CP</i>) Skyrms, “The Goodman Paradox. . .”
10/7	Popper on Confirmation	Popper, “Logic of Scientific Discovery” (on Moodle) Salmon, “Rational Prediction” (<i>CP</i>)
10/12	Hempel on Confirmation	Hempel, <i>PNS</i> Ch 2.1-2.2, Ch 3
10/14		Hempel, <i>PNS</i> Ch 2.3
10/26	Inference to the Best Explanation	Lipton, “Inference to the Best Explanation” (<i>CP</i>) Deadline for Paper Topic
10/28	Basic Bayesianism	Handout (on Moodle) Sober, “The Surprise Principle” (on Moodle) Take-Home Exam 2 Assigned
11/2	Discussion about Paper	Write Up Paper Ideas

Kuhn's Challenge to Scientific Method		
11/4	Paradigms	Kuhn, <i>Structure</i> Ch 1-5 Take-Home Exam 2 Due Group Project Assigned
11/9	Scientific Crisis	Kuhn, <i>Structure</i> Ch 6-7
11/11	Incommensurability	Kuhn, <i>Structure</i> Ch 8-9
11/16	Scientific Revolutions	Kuhn, <i>Structure</i> Ch 10, 12 Group Project Due
11/18	Against Method	Feyerabend, <i>Against Method</i> Ch 1-3 (on Moodle)
11/23	Critique of Kuhn	McMullin, "Rationality and Paradigm Change..." (CP) First Draft of Paper Due
Demarcation: Science and Pseudoscience		
11/30	General Demarcation	Popper, "Science: Conjectures and Refutations" (on Moodle) Lakatos, "Science and Pseudoscience" (CP) Godfrey-Smith, excerpt (on Moodle)
12/2	Evolution/Intelligent Design	Ruse, "Creation Science is not Science" (CP) Laudan, "Science at the Bar..." (CP) Ruse, "Response: Pro Judice" (CP)
12/7	Parapsychology & Astrology	Flew, "Parapsychology: Science or Pseudoscience" (on Moodle) Thagard, "Why Astrology is a Pseudoscience" (on Moodle)
12/9	Wrap-Up	– Take-Home Exam 3 Assigned
12/10		Final Paper Due
12/17		Take-Home Exam 3 Due