

PHIL 2810/STS 2831: Introduction to Philosophy of Science

Fall 2013

TTh 9:05-9:55 Goldwin Smith 158, plus discussion section

Professor North (north@cornell.edu)

TA Marta Heckel (mah437@cornell.edu)

We will discuss some central questions about the nature of scientific theory and practice. What makes a discipline a science? Does science discover the objective truth about the world? How, and why, do scientific theories change over time? To what extent do observation and experiment determine which theories we accept? What is a good scientific explanation? What are laws of nature? Does physics have a special status compared to other sciences?

Readings

Philosophy of Science: The Central Issues, second edition; Martin Curd, J. A. Cover, Christopher Pincock, eds. W. W. Norton.

Readings not in this book will be available online or handed out in class.

Requirements and grading

Two midterm exams and one cumulative final exam, all in-class. Each midterm will count for 25% of your final grade and the final will count for 40% of your grade. The exams will comprise short-answer questions (a few paragraphs each). Study questions will be handed out in advance; exam questions will be taken from these study questions. The first midterm will be in class on Tuesday, October 8. The second midterm will be in class on Tuesday, November 19. The final is on Thursday, December 19 at 2:00 pm.

Attendance at lectures and discussion sections is mandatory. Attendance and participation in lectures and sections will count for 10% of your final grade. Participation in class discussion can only help your grade; lack of participation won't hurt your grade. Poor attendance can lower your grade. If you miss a class, it is *your responsibility* to get the notes and any relevant announcements from a classmate.

Academic integrity

Each student in this course is expected to abide by the Cornell University Code of Academic Integrity. Any work submitted by a student in this course for academic credit will be the student's own work. For this course, collaboration is allowed in discussing study questions for exams; answers on exams in class must be your own.

Discussion sections

Monday 11:15-12:05 Goldwin Smith G22

Wednesday 3:25-4:15 Goldwin Smith 158

Office hours

Marta Heckel: Monday 1:00-2:00pm, Goldwin Smith 223

Professor North: Tuesday 10:00-11:00 am, Goldwin Smith 235

Schedule

Details are subject to change during the semester. Readings are listed next to the date they will be discussed. Page numbers refer to the textbook.

What is science?

Aug. 29: Introduction; Popper, "Science: Conjectures and Refutations," 3-10

Sept. 3: continue with Popper

Sept. 5: Kuhn, "Logic of Discovery or Psychology of Research?," 11-19 and Lakatos, "Science and Pseudoscience," 20-26

Sept. 10: continue with Lakatos and general question of demarcation

Rationality, objectivity, and values in science

Sept. 12: Kuhn, "The Nature and Necessity of Scientific Revolutions," 79-93

Sept. 17: Kuhn, "Objectivity, Value Judgment, and Theory Choice," 94-110

Sept 19: Longino, "Values and Objectivity," 144-164 and Okruhlik, "Gender and the Biological Sciences," 165-180

Holism and underdetermination

Sept. 24: Duhem, "Physical Theory and Experiment," 227-249

Sept. 26: Quine, "Two Dogmas of Empiricism," 250-270

Induction, prediction, and confirmation; ravens and grue

Oct. 1: Lipton, "Induction," 390-405

Oct. 3: Popper, "The Problem of Induction," 406-411 and Salmon, "Rational Prediction," 412-423

Oct. 8: MIDTERM EXAM

You already know the date, so plan ahead. No excuses or postponements.

The exam will cover all of the above material.

Oct. 10: Hempel, "Criteria of Confirmation and Acceptability," 424-438

Oct. 17: Goodman, "The New Riddle of Induction," 451-455

Optional: Hesse, "Ramifications of 'Grue'," available through JSTOR:

<http://www.jstor.org.proxy.library.cornell.edu/stable/pdfplus/686715.pdf?acceptTC=true>

Bayesian confirmation, replies to ravens and grue

Oct. 22: Salmon, "Rationality and Objectivity in Science *or* Tom Kuhn Meets Tom Bayes," 518–549 and section 5.1 of the textbook commentary, "Bayes for Beginners," 597–605

Oct. 24: same reading as above

Scientific explanation

Oct. 29: Carnap, "The Value of Laws: Explanation and Prediction," 651–656

Oct. 31: Hempel, "Two Basic Types of Scientific Explanation," 657–666 and "The Thesis of Structural Identity," 667–676

Nov. 5: Kitcher, "Explanatory Unification," 711–734

Laws of nature

Nov. 7: Ayer, "What is a Law of Nature?," 816–832

Nov. 12: Dretske, "Laws of Nature," 833–852

Nov. 14: Cartwright, "Do the Laws of Physics State the Facts?," 871–882

Nov. 19: MIDTERM EXAM

You already know the date, so plan ahead. No excuses or postponements.
The exam will cover all of the material since the last midterm.

Realism and instrumentalism

Nov. 21: Maxwell, "The Ontological Status of Theoretical Entities," 1049–1059

Nov. 26: Van Fraassen, "Arguments Concerning Scientific Realism," 1060–1082

Intertheoretic reduction

Dec. 3: Nagel, "Issues in the Logic of Reductive Explanations," 911–926

Dec. 5: Fodor, "Special Sciences (or: The Disunity of Science as a Working Hypothesis)," 954–969

Final exam: December 19, 2:00 pm

Mark your calendars now and plan ahead. No excuses or postponements.
The exam will be cumulative, covering all the material from the semester.