

Trad 104 - 26 – Fall 2008

Science and Enquiry

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Course Description

Science is generally held in high esteem these days, but why? What's so special about science? Apart from the benefits (and costs!) flowing from its applications, science is valued for the knowledge it has generated. But what kind of knowledge is this, and how has it been generated? Is scientific knowledge certain, probable or merely conjectural? Does science have some special method for arriving at or validating its knowledge claims? And what exactly are the products of scientific knowledge: facts, laws, theories or what?

Science has certainly developed theories that have led to successful predictions and the ability to control natural processes. But do these theories really explain what lies behind our observations, and if so how? Do scientific theories even claim to truly describe aspects of the world we cannot observe? And, come to think of it, which aspects are those, exactly?

Science has changed a lot even since the seventeenth century "scientific revolution" -- a change that seems to have led to progress in our understanding of the world. But this "progress" has often involved the rejection of central principles of earlier theories: so how much confidence should we really have in our current theories?

Course Text

Peter Godfrey-Smith. *Theory and Reality: An Introduction to the Philosophy of Science. Science and Its Conceptual Foundations*. The University of Chicago Press, Chicago, 2003.

Harry Collins and Trevor Pinch. *The Golem: What You Should Know about Science*. Cambridge University Press, Cambridge, second edition, 1998.

Course Administration

The class meets every Tuesday and Thursday 6 – 7:15 in Room PSYCH 306.

Office Hours: M 10:30 – 12 and W 12:30 - 2

Course Requirements

You are required to attend class. If your absence is noted more than four times your grade will be reduced by one letter grade for every two additional absences. No excuses: I'll check!

1. Mid-Term Exam: (30%) *On Thursday October 9.*
2. Term paper (40%) *Due Tuesday, Dec. 2*
3. Final Examination (30%) *On Tuesday Dec. 16, between 8 -10 p.m.*

The latter grade cutoffs will be the standard:

A = 90 – 100%
B = 80 – 89%
C = 70 – 79%
D = 60 – 69%.

Policies

Attendance: Attendance is required. Exams will be excused without penalty only for valid documented absences including: medical conditions, serious emergencies, UA –recognized religious holidays, and situations approved by the Dean of Students.

Class Behavior: You are required to conform to the UA Code of Conduct and to behave appropriately: <http://dos.web.arizona.edu/uapolicies/scc5308abcd.html> Also, please turn off any cell phones or loud electronic devices during class.

Special Needs: Students registered with the S.A.L.T. Center or the Disability Resource Center must submit appropriate documentation to me if they are requesting special accommodations. If you need any special accommodations on the quizzes, I will assist you during class.

Academic Integrity: You should be familiar with and conform to the University of Arizona Code of Academic Integrity. Plagiarism will not be tolerated and students caught plagiarizing will be subject to serious actions.
<http://dos.web.arizona.edu/uapolicies/cai1.html>

Contested Grades: Students who wish to contest a grade on an assignment must submit their request in writing by email directly to me within three days of the date on which the assignment was returned to class. The request must explain the specific points in dispute. Disputes will be resolved within seven days of being filed.

Further Instructions on the Assessments

Papers

You should consult [How to Write a Philosophy Paper](#) (collected by Prof. Lavine) before beginning to write your paper.

The paper should be 5–8-page typed and double-spaced (that is, papers of approximately 1,250–2,000 words, or 6,250–10,000 characters in length). Your papers should each concern one of the assigned topics, presenting the relevant positions in the philosophy of science clearly and briefly and assessing their strengths and weaknesses using examples from the texts. Note that if you get a position wrong, you are unlikely to assess it well. There is rarely only one correct interpretation of anything, but—whatever your interpretation—you must document it by giving page or line references to the passages on which the interpretation is based. Do not use quotations unless the precise wording of a passage is crucial. Explain the views in your own words.

The papers for the course are not primarily research papers. You may do supplementary research if you wish, but the main requirement is that you must show that you have read the relevant texts carefully, thought about them, and made some sense of them. Do not report the views of others. Struggle with the texts on your own.

Page references to the assigned texts should be given in parentheses in the body of a paper. When you consult works other than the assigned texts, list them in a bibliography with additional acknowledgment given to any writer who influenced your thinking. The [Chicago Manual of Style](#) is a useful reference for other matters of style. If you quote from any work, paraphrase it, or your work has been substantially influenced by it, you must note that explicitly—in the case of direct quotation, the use of quotation marks will suffice. Failure to acknowledge sources or to note quotation or paraphrase constitutes plagiarism—intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise, which is the ultimate academic crime—see the Code of Conduct in the [ABOR Policy Manual](#), beginning at 5-301.C.1 Any cheating, fabrication, or plagiarism may result in a failing grade for the work concerned or for the course, at Professor Vakarelov's discretion, and he may recommend additional penalties ranging from making the infraction a permanent part of your academic record to expulsion from the University, in accordance with the [UA Code of Academic Integrity](#).

Midterm

The midterm will consist of two parts: One part will consist of multiple choice questions, the second part will be a short answer question (1-2 pages). I will provide the paper to write the answers. You must use the paper that I will provide. **No Blue book is necessary.**

Final Exam

The final exam will have the same format as the midterm, only longer. The final exam is cumulative, with bias towards the material after the midterm.

Schedule:

Note special dates in **Bold**

(G-S) refers to *Godfrey-Smith*

(C & P) refers to *Collins and Pinch*

| Date | Topic | Readings |
|---------------------------|---|-----------|
| Tuesday , Aug. 26 | First day | |
| Thursday, Aug. 28 | Introduction | Ch. 1 G-S |
| Tuesday , Sept. 02 | Logic + Empiricism | Ch. 2 |
| Thursday, Sept. 04 | <i>Cont.</i> | |
| Tuesday , Sept. 09 | Induction and Confirmation | Ch. 3 |
| Thursday, Sept. 11 | <i>Cont.</i> | |
| Tuesday , Sept. 16 | Popper: Conjecture and Refutation | Ch. 4 |
| Thursday, Sept. 18 | <i>Cont.</i> | |
| Tuesday , Sept. 23 | Kuhn and Normal Science | Ch. 5 |
| Thursday, Sept. 25 | Kuhn and Revolutions | Ch. 6 |
| Tuesday , Sept. 30 | Lakatos, Laudan, Feyarabend, and Frameworks | Ch. 7 |
| Thursday, Oct. 02 | <i>Cont.</i> | |
| Tuesday , Oct. 07 | Review for Midterm | |
| Thursday, Oct. 09 | Midterm Exam | |
| Tuesday , Oct. 14 | The Challenge from Sociology of Science | Ch. 8 |
| Thursday, Oct. 16 | Feminism and Science Studies Note: Oct. 17 is the last day to drop with 'W' | Ch. 9 |
| Tuesday , Oct. 21 | Naturalistic Philosophy in Theory and Practice | Ch. 10 |
| Thursday, Oct. 23 | <i>Cont.</i> | |

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| Tuesday, Oct. 28 | Naturalism and the Social Structure of Science | Ch. 11 |
| Thursday, Oct. 30 | <i>Cont.</i> | |
| Tuesday, Nov. 04 | Scientific Realism | Ch. 12 |
| Thursday, Nov. 06 | <i>Cont.</i> Paper Topics are given out | |
| Tuesday, Nov. 11 | <i>Veterans Day - no classes</i> | |
| Thursday, Nov. 13 | Explanation | Ch. 13 |
| Tuesday, Nov. 18 | <i>Cont.</i> | |
| Thursday, Nov. 20 | Empiricism, Naturalism and Scientific Realism Final Thoughts | Ch. 15 |
| Tuesday, Nov. 25 | The Golem: Intro + Edible Knowledge | <i>Ch. 1 C&P</i> |
| Thursday, Nov. 27 | Thanksgiving weekend – No classes | |
| Tuesday, Dec. 02 | Two experiments that “proved” the theory of relativity Term Papers are Due | <i>Ch. 2</i> |
| Thursday, Dec. 04 | A new window on the universe | <i>Ch. 5</i> |
| Tuesday, Dec. 09 | Review for Final Exam | |
| Tuesday, Dec. 16 | Final Exam, Same Room 8-10 p.m. | |