THE UNIVERSITY OF CALGARY
Department of Philosophy

PHIL 367 Lec 01 "Science and Philosophy"

"The significance of Copernicus lies precisely in the fact that he broke with an old belief apparently supported by all immediate sensory experience." –Hans Reichenbach

Fall 2008
Location: ST 130
TR 9:30 – 10:45

Instructor: Dr. David Boutillier
Office Hours: TR 10:45 – 11:45
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1 Course Description

This course examines several fundamental philosophical questions about science: Do scientists discover truths and explain phenomena, or do they merely impose imaginative constructions on the evidence? Is there something importantly distinctive about "scientific" knowledge, or is it just one more worldview among others? Is everything relative, or is there always something absolute behind what is relative? Is a scientific revolution a progressive change, leading to a better understanding of the world, or is it just a shift in intellectual fashion? Is the choice of a scientific theory objective, or does it depend on cultural, historical, and subjective factors? And, if subjective factors do play a role, can science still be a search for truth?

We will approach these questions in two ways. First, we will consider contemporary philosophical ideas about the nature of scientific explanation, the relations between scientific theories and evidence, and the structure of scientific revolutions. Then, we will test these ideas against real cases of drastic scientific revolutions, such as those of Copernicus, Galileo, Newton, and Darwin. We will also discuss philosophical problems concerning science and technology that persist in our own time. No previous knowledge of science is presupposed; the case studies will be introduced in an elementary and self-contained way.

2 Course Aims and Objectives

This section of the syllabus sets out the practical outcomes that the course is designed to achieve.

2.1 Aims

This course is designed to provide students with:

1. an awareness of the basic philosophical foundations of contemporary science,
2. an understanding of a number of classic historical developments from the natural sciences,
3. an understanding of the central fundamental principles and concepts of the philosophy of science,
4. a host of critical thinking and problem-solving skills, which are applicable to a wide range of issues,
5. and an examined, critical, and independent attitude toward narrow and simplistic characterisations of scientific reasoning.

2.2 Learning Objectives

By the end of this course, students will be able to:

1. demonstrate an understanding of several major philosophical questions with attention to their historical and conceptual development,
2. understand and interpret philosophical texts, demonstrating their comprehension by their ability to explain them when asked to do so in essays and exams,
3. articulate some of the major problems and responses central to several dominant positions concerning the nature of scientific knowledge,
4. demonstrate the ability to provide reasoned argument in support of their ideas, to assess the assumptions of their opinions, and to provide reasoned evaluations of alternative positions,
5. explain what some of the major approaches are to characterizing science, and why there is disagreement on the matter,
6. evaluate and criticize these approaches in a reasoned way while defending their own point of view,
7. analyse relationships among concepts and claims made by the philosophers whose works are addressed in the course,
8. and to evaluate the strengths and weaknesses among the varying points of view they will encounter.

3 Format and Procedures

This course combines lectures using PowerPoint slides, group-discussion, and the occasional short movie clip. During class, students are expected to pay attention, and to refrain from doing things such as surfing the web, checking their email, or reading the newspaper.

3.1 Class attendance

Students are strongly advised to attend all classes, and to take responsibility for their own learning. Students are expected to arrive on time for class, and are responsible for checking notice boards (including the Blackboard, if necessary) and email communications regularly for information that may include important timetabling or room changes.

3.2 Class participation

Participation in class is essential to the outcome of your learning experience. Effective participation involves having read the assigned readings before class, and constructively contributing to group- and class-discussions, when appropriate, by asking relevant questions and offering considered observations without monopolizing the conversation. It is the quality, and *not* the quantity, of your contributions to discussions that matters.

In-class-discussion involves listening carefully and respectfully to what other students have to say as much as it does providing your own ideas; it is not a debating competition. Philosophical discussion is a cooperative activity in which people work together to arrive at a clearer understanding of the arguments pertaining to a particular topic. Discussion provides an important opportunity for students to exercise the thinking and communication skills that are developed through the study of philosophy. Philosophical thinking skills include: organizing ideas into arguments, interpreting arguments that one is presented with, and appreciating inferential relationships between claims. Philosophical communication skills include: building on points raised by others, articulating relationships between ideas, and expressing connections between what is being talked about and what is found in the text.

4 Course Requirements

4.1 Prerequisites

There are no prerequisites for this course.

4.2 Course readings

4.2.1 Required texts

1. Peter Godfrey-Smith, *Theory and Reality*, U Chicago Press (2003).
2. Thomas S. Kuhn, *The Structure of Scientific Revolutions*, U Chicago Press.
3. A Course Reading Packet.

The textbooks are available in the University Bookstore in MacEwan Hall. The Course Reading Packet will be available, after the beginning of the course, from "Bound & Copied," which is located in the basement of MacEwan Hall.

4.3 Assignments

1. Class Participation 10%
    - Class participation involves participating in class-discussion.
2. First Paper 25%
    - This will be a 4-6 page paper. Papers are due at the beginning of the class on Tues. Oct. 14. If the assignment is handed in after the beginning of the class, then it is late. Topics and additional guidelines will be distributed in advance of the due date. This assignment will focus on comprehending and interpreting specific assigned readings.
3. Second Paper 30%
    - This will be a 5-8 page paper. Papers are due at the beginning of class on Thurs. Dec. 04. Again, topics and additional guidelines will be distributed in advance of the due date. The paper should clearly state and argue for a thesis; merely summarizing assigned readings or lecture notes will not be sufficient. Whereas the focus of the first paper is on an interpretive task, the second paper focuses both on interpreting the text and providing a critical assessment of the argument so interpreted
4. Registrar-scheduled Final Exam 35%
    - The exam will cover the whole course, and will consist of short answer and essay questions on the readings as well as the lectures.

All assignments should be printed, double-spaced, on white (recycled is fine) letter-size paper with 3 cm margins on all sides, in 12 point Times font, with one staple (no paper clips, or binders) in the top left corner.

4.4 Grading Procedures and Policies

4.4.1 Registrar-scheduled Final Examination:

Information about where and when the Final Examination will be held is determined and posted by the Examinations Office.

4.4.2 Policy regarding late assignments:

Assignments handed in late will be penalized by a grade (e.g.: A- to B+) for each day that it is late, unless you can present documentation of a medical *emergency* or other valid reason for why your assignment is late (things like computer problems and nonspecific illness do not count). If you know that you are not going to be able to hand an assignment in on time, email me immediately (this does not include emailing me the night before the paper is due). If you turn in an assignment late, you must give it to me in person or put it in the department drop-box. Note that the drop-boxes are cleared at 4 pm, and that the department closes at 4:30 pm on weekdays and *is closed Saturdays and Sundays*. It is the student's responsibility to keep a copy of each assignment submitted for the class.

4.4.3 Plagiarism

You will find the University policy on plagiarism at the end of the printed version of this outline. Plagiarism is a very serious academic offense. It is *not* limited to copying papers wholesale from the Internet; close paraphrasing of the texts, of the lectures, or of anyone (other than you) without attribution also constitutes plagiarism. Your

assignments should only contain your own formulations. Direct quotes from the texts should be used sparingly, and should be clearly indicated using quotation marks and giving a source reference. If in doubt, consult with me. Plagiarism will result in a failing grade in the course and a report filed with the Dean's office.

4.4.4 Writing Skills Statement

All written assignments will be assessed at least partially on writing skills. Writing skills include not only surface correctness (grammar, punctuation, sentence structure, etc) but also general clarity and organization. Research papers must be properly documented. If you need help with your writing, you may use the Writing Centre. You can visit their website for more details: www.efwr.ucalgary.ca

4.4.5 Grading System

On each assignment you will receive a letter grade reflecting the level of comprehension of the readings and your ability to assess philosophical arguments shown by the work you submit, etc. The meanings of letter grades are defined in the *Calendar*; for written work.

4.4.6 Checking Grades and Reappraisals of Work

University policies for reappraisal of term work and final grades apply (see the *Calendar* section "Reappraisal of Grades and Academic Appeals"). In particular, term work will only be reappraised within 15 days of the date you are advised of your marks. Please keep track of your assignments (make sure to pick them up when they are returned in class or during office hours).

4.4.7 Accommodations for students with disabilities

If you are a student with a disability who may require academic accommodation, it is your responsibility to register with the Disability Resource Centre (220-8237) and discuss your needs with your instructor no later than fourteen (14) days after the start of the course.

4.4.8 Students' Union Representative

The Humanities Representative is Daniel Pagan, MSC 251, humanitiesrep@su.ucalgary.ca or 220-3913.

5 Additional Resources

5.1 Safewalk program

Campus Security will escort individuals day or night -- call 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phone located at most parking lot booths.

6 Tentative Course Schedule

Changes may be made to this schedule depending on the need for review, etc.

Week 1: Introduction and the Nature of Scientific Inquiry (Sept. 7-13)

- ***Readings:*** No assigned readings.

Week 2: Demarcating and Defining Science (Sept. 14-20)]

- ***Readings:*** Godfrey-Smith ("G-S") Ch.01

Week 3: Empiricism and Verification (Sept. 21-27)

- ***Readings:*** G-S Ch.02

Week 4: The Problem of Induction (Sept. 28-Oct. 4)

- ***Readings:*** G-S Ch.03

Week 5: Popperian Falsificationism (Oct. 5-11)

- ***Readings:*** G-S Ch.04

Week 6: Kuhn: Normal Science (Oct.12-18)

- ***Readings:*** Kuhn Ch. 01-05; G-S Ch. 05
- ***Work Due:*** First Paper due at the beginning of class on Tues. Oct. 14

Week 7: Kuhn: Revolutions (Oct.19-25)

- ***Readings:*** Kuhn Ch. 06-08; G-S Ch. 06

Week 8: Theory Change and Progress (Oct.26-Nov.1)

- ***Readings:*** G-S Ch.07

Week 9: The Sociological Turn (Nov. 2-8)

- ***Readings:*** G-S Ch.08

Week 10: Feminism and Science Studies (Nov. 9-15)

- ***Readings:*** G-S Ch.09
- ***Note:*** No class on Tues. Nov. 11

Week 11: Naturalism (Nov. 16-22)

- ***Readings:*** G-S Ch.10-11

Week 12: Scientific Realism and Empiricism (Nov. 23-29)

- ***Readings:*** G-S Ch.12

Week 13: Confirmation Reconsidered (Nov. 30-Dec. 6)

- ***Readings:*** G-S Ch.14
- ***Work Due:*** Second paper due at the beginning of class on Thurs. Dec. 04