Philosophy of Science
Phil 212

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Meeting Times: 9:20:10:20 MWF
Meeting Room: Miller Board Room
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Course Description:

We moderns, raised as we are in an age of science, take it for granted that it is the pinnacle of epistemological methodologies. And why not, just look at the technological wonders that have developed from our scientific endeavors: medical devices that can save and prolong life; farming machines that substantially increase the agricultural productive power of humans; labor saving machines (including the PC that this syllabus was constructed on); and a grasp of reality that would make our predecessors blush with envy. Given all of this, have we not a right to be proud of our scientific achievements?

This class will examine two features of modern science that scientist often overlook: historical development and the question of methodological criteria for demarcation. We will accomplish this by looking at two works of the 20th century that have been most influential on our understanding of science: *Conjectures and Refutations* by Karl Popper, and *The Structure of Scientific Revolutions*, by Thomas Kuhn. Both Popper and Kuhn have changed the way we look at science, and these two works will serve as our guides to modern science.

We will begin by examining Popper's historical perspective on the development of science, looking at the way in which science is an epistemological endeavor, with its roots sunk deep in philosophic history. Then we will look at Popper's criteria for distinguishing science from pseudo-science, a criteria based on his realization that appropriate scientific experimentation is defined as the attempt to falsify a position. This will begin with an examination of the transitional period that established the move from a mythological foundation for understanding reality, to the reasoned approach to existence that defines modern science. We will focus on historical development to help us grasp the developmental nature of this human artifact, and end with an understanding of the title of the work and why it is *conjectures* and *refutations* that are significant for Popper..

After Popper we will look at one of the most influential works in the field of History and Philosophy of Science, and that is Thomas Kuhn's work *The Structure of Scientific Revolution*. This work redefined the way in which we look at scientific development and established the modern concern with *paradigms*, and *paradigmatic science*, that has become the hall mark of the

field. The student will learn what it is to have a *paradigm*; what science is like before it has developed an accepted paradigm; how it progresses after it has one; and most importantly, how revolutions in science are brought about that inevitably lead to a change in *paradigm*, an overthrow of an accepted model and the instantiation of a new conceptualization of reality.

Required Texts:

Conjecture and Refutations: The Growth of Scientific Knowledge, by Karl Popper, Routledge, 2002.
The Structure of Scientific Revolutions, by Thomas Kuhn, University of Chicago Press, 1996.

Course Expectations:

1. Assignments:

Everyone will be required to keep abreast with the reading material. As much of this material will be new to the student I expect that you set aside time to read the material, and maybe even read it more than once. I am a believer in dialogue as the best educational tool, dialogue between student and professor, but this is only possible if everyone keeps abreast with the reading assignments. Your ability to follow and contribute to classroom discussion will be improved if you complete all reading assignments prior to the class in which we are going to discuss them. To facilitate this process everyone will be required to come to class with questions regarding the reading assignment for that class.

2. Attendance:

Consistency of attendance is central to the educational process and my experience in the past has shown that students who attend on a regular basis do much better than those who do not. Yet, I look at you as young adults, hence responsible for your own actions, to that end there is no attendance requirement, but know that students who attend on a regular basis tend to do better on the graded assignments.

3. Exams and paper:

Grading will be determined through 3 short papers and a final research paper. The short papers will be an opportunity for you to comment on the material that was covered in a 1/3 of the course, each will involve a specific question, and each will be worth 20% of your final grade.

Your research paper will be between 7-15 typed pages in length on a philosophical issue within the sciences connected with our authors and that interests you (40% of your final grade). As with any research paper you are to have outside references and it is to be properly formatted and constructed. More will follow on the research paper; its requirements; and its submission.

Academic integrity is an issue that I take very seriously. Philosophy papers often rely on other sources for information and substantiation of a position; hence you must be very careful to properly cite your use of a passage or thought derived from someone else. For information on plagiarism see the College Catalogue, or a good writing guidebook such as Diana Hacker's *Rules for Writers*. Also, remember that the Internet has made it both easy to find information, as well as to check for sources. Do not think that because you found information at some obscure WEB site that there is no need to reference the material. One final point, your papers will be submitted to **turnitin.com**, a subscription site that is both a learning tool and a source for checking for plagiarism.

4. Classroom expectations:

First, it is desirable that a certain demeanor be maintained in the classroom. Please refrain from holding conversations during the class with other members of the course. This is disturbing for both your fellow students and myself, and distracts from the academic environment. If you have a question about the material ask me, not your classmate, as chances are that others also have the same issue.

Use of cell-phones in class will not be tolerated. As I have aged I have become more curmudgeonly in regards to this as they tend to be a disturbance and distraction not only to the user, but to all in the classroom. So all cell-phones **must be turned off** during class, no exceptions.

Office hours: My office is a cubicle in McKelvey and not very conducive for meeting with students. If you need to talk to me, for any reason, either see me after class, phone me, or e-mail me and we will set up a time and place. My e-mail is goldbedw@westminster.edu and my phone extension is 7153. If you are having any difficulty or would just like to converse on philosophical issues please feel free to contact me.

Tentative Chronology

week	assignment
1	Opening remarks. Brian Cox video.
2	Popper, Introduction.
3	Popper, Chapters 1-3
4	Popper, Chapter 4-6, (130-206): ***First Short Paper***
5	Popper, Chapter 7-9
6	Popper, Chapter 10-12
7	Popper, Chapter 13-15
8	Popper, Chapter 16-18
9	Popper, Chapter 19-20 ***Second Short Paper***
10	Kuhn, Chapters 1-2
11	Kuhn, Chapters 3-4
12	Kuhn, Chapters 5-6
13	Kuhn, Chapters 7-8 ***Research Paper due***
14	Kuhn, Chapters 9-10
15	Kuhn, Chapters 11-13 ***Third Short Paper***