Moravian College
PHILOSOPHY OF SCIENCE
PHIL 313

Instructor: Dr. Bernie Cantens
Office: Zinzendorf 203
Classroom: PPHAC 103
Phone/E-Mail: (610) 861-1589/ bcantens@moravian.edu
Web Page: http://berniephilosophy.com/
Office Hours: T TH 1:00 PM – 2:00 PM

Text

Science and Philosophy in the West. Jeffrey C. Leon. Upper Saddle River, New Jersey: Prentice Hall, 1999.

Course Description

A study of what is science, how it works, what distinguishes it from other disciplines, and what is the nature and value of scientific inquiry and scientific theories. *Spring, Alternate Years, Prerequisites: PHIL 120 Introduction to Philosophy or consent of instructor, Cantens.*

Student Learning Outcome

The following outcomes are expected of students who complete this course:
1)- Understand the nature of science, scientific inquiry and scientific methodology.
2)- Recognize the traditional problems and recent developments in the philosophy of science.
3)- Identify, within a historical framework, the fundamental changes in the nature of science and scientific inquiry
4)- Evaluate the nature of scientific evidence and its relation to epistemological issues in philosophy
5)- Evaluate the development of science and its relation to nature and reality (i.e., metaphysics).

Assessment

2 Papers
Students will complete a philosophical reflection paper of approximately 10 pages on a topic directly related to this course. The students will be graded according to four criteria: (1) Whether the introduction has a clear and explicit thesis and organized developing statements; (2) Whether the paper is well organized and demonstrates a logical flow of ideas; (3) Whether there are well constructed and developed arguments and/or well developed critical explanations of philosophical problems and solutions; and (4) Whether the writing skills, such as word use, sentence structure, grammar, and punctuation are correct.

Learning Methods

Multimedia This course will combine traditional classroom lecturing with multimedia presentations. Every lecture will be supplemented with power point presentations and internet information. All course materials, such as syllabus, review questions, term paper information,

etc., are posted on my web site http://berniephilosophy.com site. This will give students direct access to most of the materials at their convenience.

Class Dynamic Class participation is worth 20% of the total grade. Questions and class discussions are encouraged as an effective vehicle to motivate the students' interest in the subject matter. *If there are few questions and little discussion taking place in the classroom, the professor reserves the right to choose individual students to answer questions or give their view and arguments on a particular issue.* Therefore, careful daily reading of the text and handouts is essential for success in this course.

Attendance Policy:
Attendance is mandatory. Students will lose 1 point for every unexcused absence up to a possible 5 points. Students can make up lost points in unexcused absences by actively participating in class discussions. Unexcused absences included only the following: (1) sickness with a doctors' note, (2) death in the family, or (3) some other extraordinary event.

Academic Dishonesty Policy
See Student Handbook pp. 32 – 38

Student Behavior:
See Student Handbook pp. 38 – 40

Course Requirements
Reading of required text on a daily basis is essential to succeed in this course. Students are expected to be ready for class. This means that he or she should read the assigned chapters before the professor introduces them. Class participation, note taking, and discussion are highly encouraged. The study of philosophy does not only consist of memorization; students must also read analytically and reflect critically on the reading. When studying difficult material, it is often necessary to read it several times before a proper understanding is achieved. Do not be disappointed if you do not understand a philosophical text on your first reading.

Grading/Measures of evaluations:
Paper 1: 40%
Paper 2: 40%
Class Participation: 20%

A=100-93; A- =92-90; B+=89-87; B=86-84; B-=83-80; C+=79-77; C=76-74; C-73-70; D=69-60; F=<59

PROGRAM AND READING ASSIGNMENTS
Lists of Readings, assignments, Exams and Dates:

Week 1	Ancient Dialogue pp. 3-23.

Week 2	Greek and Medieval Aristotelian Science pp. 24-48
Week 3	The 17th Century Revolution of Physical Science pp. 49-81.
Week 4	17th and 18th Century Transformations in Metaphysics pp. 82-114.
Week 5	Modern Views of Scientific Method pp. 115-130.
Week 6	Modern transformation in Biology and Medicine pp. 131-144.
Monday, February 22, 2010	**Paper Due**
Week 7	The Refinement and Evolution of Mechanical Physics pp. 145-162.
	SPRING BREAK
Week 8	Science and the Obsolescence of Metaphysics and Religion pp. 163-183.
Week 9	Some 20th Century developments in Physical Science: Relativity pp. 229-256. (Handout)
Week 10	Some 20th Century developments in Physical Science: Quantum Theory pp. 229-256. (Handout)
Week 11	Some 20th Century developments in Physical Science: Interpretations of Quantum Theory (Handout)
Week 12	Some 20th Century developments in Physical Science: Chaos Theory (Handout)
Week 13	20th Century Views on Scientific Method pp. 257-299.
Week 14	Science and Philosophy at the Turn of the Millennium pp. 300-326.

Week 15	Review
Monday, May 3, 2010	**Paper Due**

Other Readings:

Curd, Martin and Cover, J.A. *Philosophy of Science: The Central Issues.* W.W. Norton and Company, 1998.

Dawkins, Richard. *The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe without Design,* Reissue. New York: W.W. Norton & Co., 1996.

Dennett, Daniel C. *Darwin's Dangerous Idea: Evolution and the Meanings of Life.* Reprint Edition. New York: Simon and Schuster, 1996.

Flanagan, Owen J. *The Science of the Mind*, 2nd Ed. Cambridge: MIT Press, 1991.

Gilles, Donald. *Philosophy of Science In The Twentieth Century: Four Central Themes* Blackwell Publishers, Oxford, England 1993.

Hacking, Ian. *Representing and Intervening: Introductory Topics in the Philosophy of Natural Science.* Cambridge: Cambridge University Press, 1983.

Hepel, Carl G. *Philosophy of Natural Science.* Upper Saddle River, NJ: Prentice Hall, 1966.

Kuhn, Thomas S. *The Structure of Scientific Revolutions*, 3rd Edition. Chicago: University of Chicago Press, 1996.

Lewontin, R.C. *Biology as Ideology: The Doctrine of DNA.* Harper Collins, 1991.

---. *The Triple Helix: Gene, Organism, and Environment.* Cambridge, MA: Harvard University Press, 2001.

Newton-Smith, W.H., ed. *A Companion to the Philosophy of Science.* Blackwell Companions to Philosophy. Malden, MA: Blackwell Publishing, 2001.

Papineau, David, Ed. *The Philosophy of Science*. Oxford: Oxford University Press, 1996.

Reichenbach, Hans. *From Copernicus to Einstein.* New York: Dover Publications, 1980.

Sartori, Leo. *Understanding Relativity: A Simplified Approach to Einstein's Theories.* Berkeley, CA: University of California Press, 1995.

Solman, Merrilee et. al. *Introduction to the Philosophy of Science.* Prentice Hall, Englewood Cliffs, New Jersey 1992.