

PHIL 3372-04 (82589): PHILOSOPHY OF SCIENCE

Sam Houston State University, Fall 2019

M/W/F 10:00 – 10:50 AM, CHSS 140

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A survey of topics in philosophy of science including the logic of explanations in the physical and social sciences, the relations of science to the realm of values, and a look at the “mind-body problem” (3 credit hours).

Learning Objectives:

1. **Learning fundamental principles, generalizations or theories:** Throughout this course, we will discuss the various approaches to scientific methodology, and the benefits and drawbacks of each.
2. **Learning to apply course material (to improve thinking, problem solving and decisions):** Throughout this course, we will be using the various theories to evaluate scientific discoveries within your chosen field of study.
3. **Learning to analyze and critically evaluate ideas, arguments, and points of view:** The papers are designed to understand and evaluate the various methods to understand and evaluate scientific discoveries.

Required Text: Steven Gimbel, *Exploring the Scientific Method: Cases and Questions*. University of Chicago Press, 2011. ISBN: 978-0-22629-483-4. \$35.

Writing Enhanced: This course satisfies for being listed as “writing enhanced” by providing you the opportunity to write as a means to thinking critically about the material and to receive regular feedback on your writing. You will receive regular feedback from the instructor on your writing, including written, substantive feedback on your reading write-ups throughout the term. You will have a chance to incorporate this and any additional feedback from classmates on the written final exam. Written work will account for 80% of the student's total grade.

Schedule: *The dates and content listed are tentative and subject to change by the whim of the instructor!!*

August 21st	Introduction to Course
August 23rd	Arguments I: The Structure of Arguments
August 26th	Arguments: Deduction and Induction
August 28th	“Deductivism” (pp. 1-4)
August 30th	Aristotle from <i>Posterior Analytics</i> (pp. 5-10)
September 2nd	Labor Day: No Class!
September 4th	Aristotle, from <i>Physics</i> (pp. 11-16)
September 6th	Descartes' from <i>Discourse on Method</i> (pp.17-23)
September 9th	Descartes' from <i>Discourse on Method</i> (pp. 23-29)
September 11th	TBA
September 13th	Discussion of Paper Requirements
September 16th	“Inductivism” (pp. 43-45)
September 18th	Bacon, from <i>Novum Organum</i> (pp. 46-52)
September 20th	Newton from <i>Principia</i> (pp. 53-55)

September 23rd	Mill, from <i>A System of Logic</i> (pp. 56-69)
September 25th	Mill, from <i>A System of Logic</i> (pp. 69-74)
September 27th	TBA
September 30th	"Hypothetico-Deductivism" (pp. 91-93)
October 2nd	Whewell from <i>Novum Organum Renovatum</i> (pp. 94-104)
October 4th	Carnap "Theoretical Procedures in Science" (p. 105)
October 7th	Braithwhite from <i>Scientific Explanation</i> (pp. 106-111)
October 9th	TBA
October 11th	"Paradoxes of Evidence" (pp. 112-115)
October 14th	Hume from <i>Enquiry</i> (pp. 116-126)
October 16th	Goodman, from <i>Fact, Fiction and Forecast</i> (pp.127-130)
October 18th	Hempel, from "Studies in the Logic of Confirmation" (pp. 131-137)
October 21st	"Responses to the Paradoxes of Evidence"
October 23rd	"Falsificationism" (pp. 141-144); Popper, from <i>The Logic of Discovery</i> (pp. 145-154)
October 25th	TBA
October 28th	"Holistic View of Theories" (pp. 171-174)
October 30th	Duhem, from <i>Aim and Structure of Physical Theory</i> (pp. 175-181)
November 1st	Kuhn, from <i>The Structure of Scientific Revolutions</i> (pp. 182-197)
November 4th	Lakatos, from <i>The Methodology of Research Programs</i> (pp. 198-213)
November 6th	TBA
November 8th	"Semantic View of Theories" (pp. 231-234)
November 11th	Spector, "Models and Theories" (pp. 235-255)
November 13th	Black, "Models and Archetypes" (pp. 256-264)
November 15th	Giere, from <i>Explaining Science</i> (pp. 265-269)
November 18th	TBA
November 20th	"Critical Views" (pp. 281-285)
November 22nd	Feyerabend from <i>Against Method</i> (pp. 285-293)
November 25th	Hubbard, "Science, Facts and Feminism" (pp. 294-306)
November 27th-29th	Thanksgiving Holiday: No Class!
December 2nd	Latour, "The Science Wars" (pp. 307-314)
December 4th	TBA
December 6th	Review for Final
December 9th	Final Exam (10:30 AM - 12:30 PM)

Evaluation: After the completion of each of the six modules, a short research paper will be due. Each paper will be based on the case studies in the textbook, using the methodology from the texts discussed in that module to evaluate developments through the history of the science the student chooses. The papers are designed not only to understand the relation between the issues of scientific modeling to issues in the specific field, but also to get you to increasingly develop research skills as we progress. The two (2) lowest grades on these papers will not be counted into your final grade. They will be due approximately one week following the completion of each module. More details will be announced. In addition to that, there will be a cumulative in-class final exam at the end of the course.

The following weighting will be used to calculate your grade:

Papers (best 4 of 6) = 4 x 15% ea. =	60%
Final Exam	20%
Attendance and Participation	20%

Your rounded average of these assignments will determine your grade, based on the following scale: A = 100-89.5; B = 89.4-79.5; C = 79.4-69.5; D = 69.4-59.5; F =59.4-0.

Attendance and Participation: An attendance sheet will be distributed most class days. It is your responsibility to sign-in on the official roll sheet, otherwise you will be considered absent. Your attendance will be judged as a percentage of the number of days that you attend class. Everyone will have three (3) absences that will not count against his or her grade (should you not use these two “freebies,” your grade will be adjusted up accordingly). For example, if I take attendance 22 times in the semester, and you have attended 17 of those meetings, your attendance grade would be a 91% (20/22).

Your participation grade will be a qualitative measure based on your effective in-class participation. For this measure, “effective” participation is a function of the quality—not the quantity—of your participation. In most cases, your participation grade will be no higher than your attendance grade (since, of course, if you're not there you can't participate).

Academic Dishonesty: Students are expected to maintain honesty and integrity in the academic experiences both in and out of the classroom. Please be aware that plagiarized work and any form of academic dishonesty will result in an “F” on the assignment. [SHSU Academic Policy Statement 810213](#) outlines the definition of academic honesty and the related disciplinary procedures.

You should also familiarize yourself of [Academic Policy Statement 900823](#), which outlines the procedures for students to file an academic grievance should you wish to appeal your grade for reasons other than academic dishonesty. Please read over these policies.

Clear-cut cases of plagiarism will be punished according to the following rule of thumb: first offense, you fail the paper; second offense, you fail the class. A paper which is failed for plagiarism will not be eligible to be “dropped” per the above grading policy.

Classroom Conduct: Students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. Cell phones must be turned off before class begins. Students are prohibited from eating in class, using tobacco products, making offensive remarks, reading newspapers, sleeping, talking at inappropriate times, wearing inappropriate clothing, or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in a directive to leave class. Students who are especially disruptive also may be reported to the Dean of Students for disciplinary action in accordance with university policy.

Course Evaluations: In accordance with University policy every student will have an opportunity at a specified date and time near the end of the semester to complete a course evaluation form from the IDEA course evaluation system.

For University policies on **Student Absences on Religious Holy Days**, **Students with Disabilities**, and **Visitors in the Classroom** you may view to the official statements on the SHSU Website, <http://www.shsu.edu/syllabus/>

Expectations, Suggestions and Mandates for an efficient class:

1. Please arrive to class on time and expect to stay the entire duration of the class. If this is an impossibility, please make every attempt to notify me in advance of tardiness or absence.
2. Especially true in philosophy more than most other subjects, diligence is important. Some of the reading will be difficult—since we are looking at excerpts from some of the most profound texts in the history of the world. The difficulty of the subject is indirectly proportional to the amount of work put into the course.
3. Expect to have up to five hours a week of reading and thinking about the material in order to get an "A" for the course. Additionally, for these reasons, attendance is of vital importance. If you do not attend class or keep up with the reading and exercises, do not expect to pass this class!
4. Please come to class prepared (i.e., any reading assigned read, any questions concerning exercises or lectures prepared, etc.)
5. Please be respectful of each other in the class. There will be times when students disagree about a topic discussed in class. This is a didactic process, not a combative one.
6. Due to the great excess of material and limited time in which we must cover ground, please do not create a disruption for those people who are attempting to learn. Disruptions include blurting out answers, name calling, chiding each other, snoring, etc. Laughing at the Instructor's jokes is obviously exempted from this policy. In addition, personal audio devices (except those in use to record lectures) and loud crunching snack foods are prohibited from the classroom.
7. Please feel free to make mistakes. We all will from time to time, even your omniscient instructor.
8. Please feel free to make an appointment to discuss the material you do not understand. Waiting until the last moment in the semester to catch up is not advisable. I am excellent at fixing small problems, but horrendous at fixing large ones. The only difference between small and large problems is time.
9. Have fun! The material is only as dry as you make it out to be. Sharpening one's mind can be an exhilarating process.