

PHIL 3372-03 (41013): PHILOSOPHY OF SCIENCE

Sam Houston State University, Summer 2019

M/T/W/R/F 12:00 – 1:50 PM, CHSS 242A

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Office Hours: M/T/W/R/F 11-11:50 AM & by appointment
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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.”

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!!*

July 2nd	Introduction to Course The Structure of Arguments/Deduction and Induction
July 3rd	“Deductivism” (pp. 1-4) Aristotle, <i>Prior Analytics</i> I, 1-4 (pp. 5-10) and <i>Physics</i> II, 1-3 (pp. 11-16) Descartes from <i>Discourse on Method</i> (pp.17-29) Paper #1 due (July 7th)
July 4th-5th	Independence Day Holiday: No Class!
July 8th	“Inductivism” (pp. 43-45) Bacon, from <i>Novum Organum</i> (pp. 46-52) Newton from <i>Principia</i> (pp. 53-55)
July 9th	Mill, from <i>A System of Logic</i> (pp. 56-74)
July 10th	“Hypothetico-Deductivism” (pp. 91-93) Whewell from <i>Novum Organum Renovatum</i> (pp. 94-104)
July 11th	Carnap “Theoretical Procedures in Science” (p. 105) Lecture on the Logic of Confirmation
July 12th	Braithwhite from <i>Scientific Explanation</i> (pp. 106-111) Paper #2 due

July 15th	"Paradoxes of Evidence" (pp. 112-115) Hume from <i>Enquiry</i> (pp. 116-126)
July 16th	Goodman, from <i>Fact, Fiction and Forecast</i> (pp.127-130) Hempel, from "Studies in the Logic of Confirmation" (pp. 131-137)
July 17th	"Falsificationism" (pp. 141-144) Popper, from <i>The Logic of Discovery</i> (pp. 145-154)
July 18th	TBA
July 19th	"Holistic View of Theories" (pp. 171-174) Paper #3 due
July 22nd	Duhem, from <i>Aim and Structure of Physical Theory</i> (pp. 175-181) Kuhn, from <i>The Structure of Scientific Revolutions</i> (pp. 182-197)
July 23rd	Lakatos, from <i>The Methodology of Research Programs</i> (pp. 198-213)
July 24th	Analogies lecture
July 25th	"Semantic View of Theories" (pp. 231-234) Spector, "Models and Theories" (pp. 235-255)
July 26th	Black, "Models and Archetypes" (pp. 256-264) Giere, from <i>Explaining Science</i> (pp. 265-269) Paper #4 due
July 29th	Feyerabend from <i>Against Method</i> (pp. 285-293)
July 30th	Hubbard, "Science, Facts and Feminism" (pp. 294-306)
July 31st	Latour, "The Science Wars" (pp. 307-314) Paper #5 due
August 1st	Final Exam

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 lowest grade on these papers will not be counted into your final grade. They will be due at the end of each 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 scheduled for Thursday August 1st.

The following weighting will be used to calculate your grade:

Papers (best 4 of 5) = 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 one (1) absence that will not count against his or her grade (should you not use this "freebie," your grade will be adjusted up accordingly). For example, if I take attendance 21 times in the semester, and you have attended 19 of those meetings, your attendance grade would be a 95% (19/20).

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).

Disability Policy: It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail disability@shsu.edu). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities. For a complete listing of the university policy, see: <http://www.shsu.edu/dotAsset/7ff819c3-39f3-491d-b688-db5a330ced92.pdf>

Academic Dishonesty: In accordance with the University's Academic Policy Statement 810213, all students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion, and the abuse of resource materials. The policy can be read here: <https://www.shsu.edu/dept/academic-affairs/documents/aps/students/810213%20Procedures%20in%20Cases%20of%20Academic%20Dishonesty-180504.pdf>

Classroom Conduct: Students are expected to assist in maintaining a classroom environment that is conducive to learning. Students therefore must refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. Cellular phones, pagers, and music players (for example, iPod-type devices) must be turned off and earphones removed before class begins. Students are prohibited from using tobacco products, making offensive remarks, reading newspapers, talking at inappropriate times, 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. The policy can be read here: <https://netreg.shsu.edu/mirror/codeofconduct.html>.

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.

Visitor Policy: Only registered students may attend class. Exceptions can be made on a case-by-case basis by the professor. In all cases, visitors must not present a disruption to the class by their attendance. Students wishing to audit a class must apply to do so through the Registrar's Office.

Student Absence on Religious Holidays: Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. Section 51.911 (a) (2) defines a religious holy day as: “a holy day observed by a religion whose places of worship are exempt from property taxation under Section 11.20....” A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence.

University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed. For a complete listing of the university policy, see: <http://www.shsu.edu/dept/academic-affairs/documents/aps/students/861001.pdf>

Q-Drops: A Q-drop is a drop made after the last date for tuition refunds (12th class day for fall/spring; 4th class day for summer) but before the date for which a drop would result in the grade of 'F' as published in the Academic Calendar. Students will be allowed no more than five Q-drops during their academic career at Sam Houston State University. Classes that are dropped prior to the Q-drop date will not count toward the limit. Students who have used their limit of five Q-drops will need to petition their respective dean to drop a class. If the dean refuses to grant permission to drop a class, a student will be required to remain in the class. This limit took effect with the start of the fall 2004 semester. Any drops accumulated prior to the fall 2004 semester will not be included in the five Q-drop limit, nor will Q-drops from other universities.

Use of Cell Phones: Telephones and pagers or similar devices have become increasingly a part of everyday life. In the academic classroom, however, during class these devices can be a serious distraction and during tests they can be a serious problem. The technology is constantly changing and evolving. So, the present policy does not specify particular devices or device types. Rather, the policy applies to any device that performs the function of a telephone or pager.

The use by students of cell phones or any device that performs these functions during class-time is prohibited unless specifically permitted by the instructor. All such devices should be turned off or put in a silent or vibrate mode and should not be visible during class. At no time should students answer a call or text during class or leave the classroom to answer a call or page. Failure to comply with this policy could result in expulsion from the classroom or with three or more offenses, failure of the course.

Any use of a cell phone or any device that performs these functions during a test period is prohibited. These devices should not be present during a test or should be stored securely in such a way that they cannot be seen or used by the student. Even the visible presence of such a device during the test period will result in a zero for that test. Use of these devices during a test is considered de facto evidence of cheating and could result in a charge of academic dishonesty (see pages 36-38 of the student code of conduct at the following link): <http://www.shsu.edu/students/guide/StudentGuidelines20132016.pdf>.

If there is an emergency situation for a student, that student should inform the instructor and place himself/herself in a seat near the door where an exit for a phone call would be only minimally disruptive. Other arrangements for handling potential emergency situations may be granted at the discretion of the instructor.

Expectations, Suggestions and Mandates for an efficient class:

1. This is an intensive four-week summer class. The course will cover about the same material as a regular 15-week course. As a consequence, you should expect to work daily. There will be reading to be done every day, and a paper due per week. Prepare yourself for that reality.
2. Please arrive to class on time and expect to stay the entire duration of the class. If this is an impossibility, please make an attempt to notify me in advance of tardiness or absence.
3. 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. Expect to have up to fifteen 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 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.