

# PHL 372w (01): Philosophy of Science

Fall 2008      Neisser  
MWF 11:00-11:50      AB4 301

Office: AB4 403

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Hours: 3:15 – 4:45 MW & by appointment

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This course is a survey of topics in philosophy of science including the logic of explanations in both the physical and social sciences, and the relations of science to the realm of values. Towards the end of the semester the course will focus on contemporary neuroscience.

**OBJECTIVES:** (1) Students will demonstrate an understanding of a variety of views about the nature of science; (2) Students will demonstrate an understanding of some of the conceptual issues raised in particular areas of science; (3) Students will demonstrate the development of their own views on the matters discussed.

## **Texts:**

*Theory and Reality: An introduction to the philosophy of science* By Peter Godfrey-Smith

*Defining Right and Wrong in Brain Science: Essential Readings in Neuroethics*      Walter Glannon, (Editor)

Plus various handouts

## **Grading:**

**Exams:** There will be **four** take home essay exams, **each** worth **18%** of the overall grade.

**Analytic Reading Notes:** **20%** overall.

You must complete **10 Analyzer** assignments, **each** worth **2%** of the overall grade. Analytic Reading Notes will be graded on a check/fail basis. To receive credit, you *must* submit a completed assignment online to the Blackboard site *before* the class period for which the reading is assigned. In addition, you *must attend class that day*. If you submit an *Analyzer* but do not come to class, you will not receive credit. Incomplete, late, or otherwise unsatisfactory submissions will not be given credit. In addition, you may complete up to **5 extra credit Analyzers**, each for an extra 2% (thus, up to 10% extra credit overall). Note that there are a limited number of opportunities to submit the *Analyzers*, as indicated in the schedule below (basically, these are the readings that are from argumentative primary sources). The *Analyzer* template for the structured reading notes is available on the course Blackboard site under 'Assignments.'

**Participation and preparation:** **8%** Students are expected to come to class prepared. Obviously, the first requirement for participation is showing up for class. Absences will result in a reduced participation score. Participation and preparation also requires that you read the assignments and are ready to discuss them (hint: an excellent method for preparation is to complete the *analytic reading notes!*). To earn participation credit, you must actively engage the material, the instructor, and your classmates *during class*.

Attendance: In accordance with university policy, attendance will be taken at every class. **Undocumented absences will be penalized by a reduced grade for class participation.** If you decide to drop the course, you must inform the registrar. If you simply stop coming to class, you will *not* be automatically dropped from the role. Unless you drop the course, you will end up receiving an F.

**Schedule:**

8/25: Introduction: Why philosophy of science?

8/27: Some further background

Read: *Theory & Reality* Chapter 1, pp.1-13

8/29: A sketch of the Scientific Revolution

Read: *Theory & Reality* Chapter 1, pp.13-18

9/1: Labor Day. No Class

9/3: Galileo's discoveries with the telescope

Read: Galileo, *The Starry Messenger* handout

9/5: Central ideas of Logical Empiricism

Read: *Theory & Reality* Chapter 2, pp.19-30

9/8: Problems of Logical Empiricism

Read: *Theory & Reality* Chapter 2, pp.30-38

9/10: The classical problem of induction

Read: *Theory & Reality* Chapter 3, pp.39-50

9/12: Russell on induction

Read: Russell, 'On induction' handout  
*Analyzer reading*

9/15: The new riddle of induction

Read: *Theory & Reality* Chapter 4, pp.50-56

9/17: Falsificationism according to Popper

Read: Popper, 'Science: Conjectures and refutations' handout  
*Analyzer reading*

9/19: Falsificationism and its problems

Read: *Theory & Reality* Chapter 4, pp.57-74

9/22: Demarcation after falsificationism

Read: Thagard, 'Why astrology is a pseudoscience' handout  
*Analyzer reading*

9/24: Review and discussion     **Exam One Assigned**

9/26: The idea of a scientific paradigm and 'normal science'

Read: *Theory & Reality* Chapter 5, pp.75-86

9/29: Revolutionary science

Read: *Theory & Reality* Chapter 6, pp.87-101

**Exam One Due**

10/1: Kuhn on rationality and progress

Read: Kuhn, 'Objectivity, value judgment, and theory choice' Handout  
*Analyzer reading*

10/3: After Kuhn: Lakatos, Laudan, Feyerabend

Read: *Theory & Reality* Chapter 7, pp.102-121

10/6: Sociology of science

Read: *Theory & Reality* Chapter 8, pp.122-135

10/8: On Big Bio, Steve Venter and the human genome project

Read: Shapin, 'I'm a surfer' Handout

10/10: Some political aspects of scientific theory and practice

Read: *Theory & Reality* Chapter 9, pp.136-148

10/13: Naturalism in philosophy and in science

Read: *Theory & Reality* Chapter 10, pp.149-162

10/15: Scientific realism

Read: *Theory & Reality* Chapter 12, pp.173-181

10/17: Constructivism

Read: *Theory & Reality* Chapter 12, pp.181-189

10/20: Scientific explanation, covering laws, and causal mechanisms

Read: *Theory & Reality* Chapter 13, pp.191-200

10/22: Review and discussion of Godfrey-Smith's philosophy of science

Read: *Theory & Reality* Chapter 15, pp.219-231

**Exam Two Assigned**

10/24: Introducing neuroethics

Read: Safire, 'Visions for a new field of *Neuroethics*' in *DRWBS* pp7-11  
Roskies, 'Neuroethics for the new millenium' in *DRWBS* pp12-18  
Kennedy, 'Neuroscience and neuroethics' in *DRWBS* pp58-50

10/27: Ethical implications of new technology

Read: Farah & Wolpe, 'Monitoring & manipulating brain function: New neuroscience technologies and their ethical implications' in *DRWBS* pp37-57

**Exam Two Due**

10/29: On the neural basis of moral behavior

Read: Damasio, 'The neural basis of social behavior' in *DRWBS* pp175-178  
Churchland, 'Neuroscience: Reflections on the neural basis of morality' in *DRWBS* pp179-182

10/31: Neuroscience and human freedom

Read: Gazzaniga, 'My brain made me do it' in *DRWBS* pp183-194  
*Analyzer reading*

11/3: Biological causes and legal responsibility

Read: Morse, 'New neuroscience, old problems' in *DRWBS* pp195-205  
*Analyzer reading*

11/5: Voluntary acts and the law

Read: Smith, 'Human action, neuroscience and the law' Handout  
*Analyzer reading*

11/7: Moral virtue and the brain

Read: Casebeer, 'Moral cognition and its neural constituents' in *DRWBS* pp206-220  
*Analyzer reading*

11/10: A neuroscience of moral intuitions?

Read: Greene, 'From neural *is* to moral *ought*: What are the moral implications of neuroscientific moral psychology?' in *DRWBS* pp221-229  
*Analyzer reading*

11/12: Prozac

Read: Cornwell, 'The Prozac story' Handout  
*Analyzer reading*

11/14: Review and discussion

**Exam Three Assigned**

11/17: Memory

Read: Glannon, 'Psychopharmacology and memory' in *DRWBS* pp258-270  
*Analyzer reading*

11/19: Enhancement: For and against

Read: Caplan & McHugh, 'Shall we enhance? A debate' in *DRWBS* pp271-288  
**Exam Three Due**

11/21: Cosmetic psychopharmacology?

Read: Chatterjee, 'The promise and predicament of cosmetic neurology' in *DRWBS* pp302-311

*Analyzer reading*

11/24: Marketing mother's little helpers

Read: Healy, 'Psychopharmacology at the interface between the market and the new biology' Handout

*Analyzer reading*

11/26 – 11/28: Thanksgiving. No class.

12/1: Medicating schoolchildren

Read: Cooper, 'Education in the age of Ritalin' Handout

*Analyzer reading*

12/3: Brain death

Read: McKhann, 'Brain death in the age of heroic medicine' in *DRWBS* pp319-329

*Analyzer reading*

12/5: Revising ideas about severe brain trauma

Read: Schiff & Fins, 'Hope for "comatose" patients' in *DRWBS* pp344-359

*Analyzer reading*

12/8: A neuroscientist's perspective

Read: Rose, 'Ethics in a neuroscientific world' in *DRWBS* pp369-377

*Analyzer reading*

12/10: Review and discussion

**Exam Four Assigned**

## **Policies:**

### (1) ACADEMIC DISHONESTY:

All 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. See University Academic Policy Statement 810213. **Electronic and online resources including turnitin.com may be used in this course to detect academic dishonesty. All student work may be subject to these and other detection systems.**

### (2) CLASSROOM RULES OF CONDUCT:

Students must refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. **This means:** (1) Do not surf the web during class. (2) Cellular phones, pagers, and music players must be turned off and earphones removed before class begins. (3) Do not make offensive remarks, read the newspapers, talk at inappropriate times,

use tobacco, or engage in any other form of distraction. Inappropriate behavior in the classroom will result in a directive to leave class. In accordance with university policy, students who are especially disruptive also may be reported to the Dean of Students for disciplinary action.

**(3) VISITORS IN THE CLASSROOM:**

Unannounced visitors to class must present a current, official SHSU identification card to be permitted in the classroom. They must not present a disruption to the class by their attendance. If the visitor is not a registered student, it is at the instructor's discretion whether or not he/she will be allowed to remain.

**(4) STUDENT ABSENCES ON RELIGIOUS HOLY DAYS:**

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 religious holy days as: "a holy day observed by a religion whose places of worship are exempt from property taxation under Section 11.20, Tax Code...." 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 notify the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed.

**(5) NOTICE TO PERSONS WITH A DISABILITY:**

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 are expected to visit with the Office of Services for Students with Disabilities located in the Counseling Center. 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 the student has a disability that may affect adversely their work in this class, then he or she needs to register with the SHSU Counseling Center and to talk with the instructor about how they can best be helped. All disclosures of disabilities will be kept strictly confidential. NOTE: no accommodation can be made until the student registers with the Counseling Center. There will be no retroactive accommodations.