SCIENCE, PSEUDO- SCIENCE AND SUBJECTIVITY
PHIL 242 CS-01, MWF 10:00-10:50, GH 143

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Texts: Schick & Vaughn, *How to Think about Weird Things* (TWT): 6th ed.
         Skyrms, *Choice & Chance* (CC): 4th ed.
         A collection of articles (CA) & notes will be on electronic reserve (CA) in our library:
         The latter consists of selected readings from Collins, Gould, Lakatos, Kuhn, Popper, Thagard, and others.

This course begins with a question, "How do we know what we know?" To answer this question, we closely study reasoning that usually underlies our knowledge claims. Scientific reasoning is a type of reasoning that follows certain rules. I will discuss three types of reasoning: (i) deductive reasoning, (ii) non-deductive reasoning, and (iii) decision-theoretic reasoning. I will mainly focus on deductive reasoning. Some non-deductive reasoning I will cover involves the tools of probabilistic reasoning and causal reasoning. After familiarizing the student with basic techniques of reasoning, I address some broader questions like, "Is there a demarcation between science and non-science?", "Is science subjective?", and "Is there a good argument for believing in the fine tuning hypothesis of the universe? Among other topics, I would like to investigate are, the scientific status of holistic medicine, astrology, the conspiracy theory behind the September 11 attack, and many more.

Syllabus and readings:

Introduction: no readings for the first day of the class. There will be an initial discussion of scientific reasoning.

 1. How do we know what we know? What is knowledge? (See TWT, pp. 62-91)

2. A first course on scientific reasoning:

> I.   Three types of reasoning (Class notes, CC: II & TWT, pp.33-57 & class notes in CA). First Quiz: (5 points)
> II. Deductive logic, how to construct truth-tables to check deductive validity of an argument. (CC: I) #Ist HW (for practice: No credit) & 2nd quiz (10 points)
> III. Problems of inductive logic, Probability, causality and Simpson's paradox (CC: pp. 226- 29 & CC: pp.134-6 & class notes)

3. Science and meta-theories of science

I.   Several meta-theories of science: (a) inductive account, (b) hypothetico-deductive account, (c) confirmational accounts, and (d) falsification account.

II.   Popper's falsification account of science (See experts from Popper in CA & TWT: pp. 172-174).

     (i)   First paper assignment: Discuss the scientific status of holistic medicine from the standpoint of Popper's falsification account. (10 points).

     (ii)   Second paper assignment: Astrology & its scientific status: (10 points). A critique of Popper's criterion: (See experts from Lakatos in CA):

     (iii)   A further critique of Popper's criterion: (See experts from Thagard in CA): Revisiting questions about astrology. (See also TWT: pp. 84-91)

     (iv)   Creationism, the theory of evolution and the falsification criterion (See an expert from Gould in CA & see also TWT: pp.181-191.)

     (v)   Features of a good scientific theory & the theory of evolution. (See TWT: pp. 171-181).

III.   Revisiting the rest of the meta-theories of science:

     (i)   A critique of hypothetico- deductive account (HD): (see TWT: p.160-166).

     (ii)   Theories of Confirmation (class notes/handouts)

     (iii)   Third paper topic (to be assigned):(10 points)

4. Science & subjectivity:

     (i)   Kuhn (See excerpts from Kuhn in CA)

     (ii)   An evaluation of Kuhn (TWT: pp. 306-312)

     (iii)   You can also choose/suggest your own topic as your fourth paper. But, you need to check it with me before the Thanksgiving.

5. God, the fine-tuning hypothesis and scientific reasoning:

     i) The fine-tuning hypothesis & God (See experts from Collins in CA & see also TWT: pp. 191-196.)

     (ii) Discussion & evaluation of the argument(s) for the fine-tuning hypothesis.

    Two websites information:

     i.   http://www.scholarsfor911truth.org (Conspiracy theory behind the September 9/11 attack)

     ii.   http://www.holisticmedicine.org/about_principles.shtml (Holistic medicine)

Required work for students:

Attendance is a must.

Two short quizzes: 1st quiz: 5 & 2nd quiz: 10: Two quizzes: 5 + 10 = 15

Four two-page short papers: 10 + 10 + 10+10+10 = 40.

We will have only <u>one</u> examination for the entire course due on Friday 9th December, 2011, i.e., on the last day of our class. It will cover entire course materials (except two quizzes). It will be graded harshly than any other parts of the course. Please take this exam very seriously. Exam: 30. Finally, class participation & attendance: 15