

# Science and Pseudoscience

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**Portland State University**  
**PHL 306U**

What is wanted is not the will to believe, but the wish to find out, which is the exact opposite.  
Bertrand Russell

That which can be asserted without proof can be dismissed without proof.  
Christopher Hitchens

Feeling better is not actually being better. Heroin also makes people feel better, but I wouldn't recommend using heroin. James Randi

## Course Syllabus

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<b>Course Title:</b>	Science and Pseudoscience
<b>Required Texts:</b>	There are no required texts for this class. A portable drive (2-gig) is required. The price varies from \$7 to \$25
<b>Professor's Name:</b>	Dr. Peter Boghossian (Please call me "Pete")
<b>Class Location:</b>	
<b>Days/Times:</b>	
<b>Email address:</b>	
<b>Office hours:</b>	NH 451V

### **Professor's Bio**

Peter's primary research areas revolve around critical thinking and moral reasoning. His doctoral research studies, funded by the State of Oregon and supported by the Oregon Department of Corrections, consisted of using the Socratic method to help prison inmates to increase their critical thinking and moral reasoning abilities and to increase their desistance to criminal behavior. Peter's peer-reviewed publications can be found in *Diálogos*, *Education Policy Analysis Archives*, *The Clearing House: Educational Research Controversy and Practices*, *The Radical Academy*; *Offender Programs Report*, *Teaching Philosophy*, *Corrections Today*, *Informal Logic*, *Journal of Philosophy of Education*, *Educational Philosophy and Theory*, and the *Journal of Correctional Education*.

Peter was a councilman for the State of Oregon (LSTA), an advisor to *Sockeye Magazine* and *The Weekly Alibi*, wrote national philosophy curricula for the University of Phoenix and was a research fellow for the National Center for Teaching and Learning. Currently, he is the Chairman of the Prison Advisory Committee for Columbia River Correctional Institution, teaches philosophy, critical thinking, ethics and science vs. pseudoscience at Portland State University, serves on the board of directors of various non-profits and has a philosophical counseling practice.

### **Course Description**

An examination of basic issues in philosophy of science through an analysis of creation "science," faith healing, UFO abduction stories, and other pseudoscience. Some of the questions addressed: What distinguishes science from pseudoscience? Why does evidence matter? Must we invoke the supernatural to explain certain aspects of reality?

### **OBJECTIVES**

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- Develop a healthy skepticism.
- Formulate beliefs on the basis of reason and evidence.
- Improve your critical thinking skills.
- Design experiments to test (pseudoscientific) claims.
- Develop tools to discern reality from "makebelieveland".

### ***Point Values for Course Assignments***

<b><i>ASSIGNMENT</i></b>	<b><i>DATE</i></b>	<b><i>POINTS</i></b>
Class Participation, including presentation	All	20
Midterm Exam		35
Presentation** or extra question on the final		10
Final Exam		35

\*\*Presentations are pass/no pass. If you pass you receive the full 10 points. If you fail you receive zero points.

### **Policies and Procedures**

- Please try your best not to be late.
- If you have a disability inform me *before* the first assignment is due. If tests need to be given at PSU's testing center, please let me know ASAP.
- I only accept five students over the class cap.
- I am teaching three classes this term. Please take only one of my classes *per term*.
- *You are responsible for signing the attendance sheet. If you don't sign the sheet then you will not get credit for attending class.*
- After each class I write 1-2 multiple-choice questions. You are also welcomed to submit multiple-choice questions that may appear on the midterm and/or final exam. If you choose to do so, please email me the questions with "Sci and Pseudo MC" in the subject header.

### ***Academic Honesty***

Academic honesty is highly valued at Portland State University. The consequences of academic dishonesty can include removal from the University.

### ***Controversial Issues***

*I hope to challenge you, and to help you question "givens," but I do so in good faith and in the spirit of academic and intellectual integrity and honesty. We will be discussing and analyzing controversial and potentially stressful issues (e.g., intelligent design, 9/11, atheism). We may also take aim at traditional, established orthodoxies, like sustainability. If you are easily offended then this is not the class for you--please drop this class and sign up for another section.*

### ***Presentations***

- Presentations will begin the third week of class.
- In your presentation you will summarize and analyze a chapter from the text. Presentations correspond to that week's reading.
- You will present for five minutes and then field questions for five minutes. You are responsible to adhering to the time limit.
- You are welcomed to do a team presentation.
- Signups are "first-come, first-served".
  - You will only know the week, not the day, of your presentation. Please prepare as if you were presenting on the first day of the week.
- *If you do not (or choose not to) present then you must answer an extra essay question on the final. If you do not present, and do not answer the extra essay question, then you will receive zero points out of ten.*

- During our 10-minute break, please get set up (including loading onto the computer what you need) so that when we come back from break we can begin immediately.

### WEEKS, DATES, PRESENTATION TOPICS\*

	<u>Presentations and Weekly Readings</u>
Week 1	No Presentations
Week 2	No Presentations
Week 3	A-C
Week 4	D-F
Week 5	G-I
Week 6	J-L
Week 7	M-N
Week 8	O-P
Week 9	Q-S
Week 10	T-Z

\*All letters refer to The Skeptics Dictionary, Topical Index: Junk Science and Pseudoscience. Available: <http://www.skeptdic.com/tijunk.html>

#### WEEK 1

*Introduction*

Psychic Intro

Syllabus review

What's the harm?

ASSIGNMENT:

- Buy and bring in a 2-gig thumb drive to the second and third classes.
  - If you have a laptop please bring it to the second and third class.
- Read: <http://www.skeptdic.com/pseudosc.html>
  - On the thumb drive as "pseudoscience defined" (not formatted)
- Read the syllabus very carefully.

#### WEEK 2

Reasons, Belief and Evidence (time permitting)

David Blaine TED talk

The Scientific Method

Designing Studies

Doxastic volunteerism

Million Dollar Video Series (on the thumb drive)

ASSIGNMENT:

- Skim <http://www.skeptdic.com/tijunk.html>
- **Presentation signups**
  - **Presentations must match the week's reading, e.g., if you present next week you need to present on one subject in A-C**
- Read doxastic volunteerism.pdf on your thumb drive
  - Suggested reading: doxastic volunteerism 2.doc on your thumb drive

#### WEEK 3

Continue from last week (focus on Designing Studies and the Scientific Method)

Psychic trick: blindfolding

ASSIGNMENT:

- **Presentations begin**

**WEEK 4**

Continue from Week 2

Derren Brown: The Science of Scams

The biological basis of belief

Pinker, "The Moral Instinct" (TED talk, time permitting)

Dawkins, "The Enemies of Reason" (and/or "'Queer' Universe" TED talk, time permitting)

Shermer, "Why People Believe Weird Things" TED talk

Diane Benscoter TED talk (time permitting)

(Optional) If you want to learn how to do the psychic trick of seeing through a blindfold, please bring in something to cover your eyes, a scissors and sticky (non-electrical) tape.

(Time Permitting: Daniel Dennett on consciousness, Jim Fallon on murderers, Wade Davis "The Worldwide Web of Belief and Ritual")

**WEEK 5**

Michael Specter TED talk

Kuhn and Feyerabend

Looch (time permitting)

Exam review

Exam (second class of the week)

ASSIGNMENT:

- Read <http://plato.stanford.edu/entries/thomas-kuhn/> and <http://plato.stanford.edu/entries/incommensurability/>
- Bring specific questions to the exam review

**WEEK 6**

David Deutsch TED talk

Beau Lotto TED talk (optional)

Sam Harris TED talk (Can Science Determine Human Values?)

Al Seckel TED talk (optional)

ASSIGNMENT:

- Watch this video in its entirety:  
[http://fora.tv/2010/11/10/Sam\\_Harris\\_Can\\_Science\\_Determine\\_Human\\_Values](http://fora.tv/2010/11/10/Sam_Harris_Can_Science_Determine_Human_Values)

**WEEK 7**

The Amazing Randi

"Gazing"

Martial Arts guest lecture (date subject to change)

**WEEK 8**

God, faith, religion, critical thinking and pseudoscience

Ray Comfort and Bananas

Scientology (time permitting)

Faith Healing

Faith

Dan Dennett and "Belief in Belief"

ASSIGNMENT:

- If we do not watch in class, then watch: <http://video.google.com/videoplay?docid=-6812164614976718979#>
- Read “Preachers who are not believers” on the thumb drive

**WEEK 9**

Ethics and Testing

Kary Mullis “Celebrates the Experiment” (optional)

The Narcotic Farm guest lecture (date subject to change)

[We may have an optional presentation for one hour of class, depending on student interest: How to get into graduate school and how to publish in a peer-reviewed journal. If this is of interest then please let me know.]

**WEEK 10**

Brondo: “It’s what plants crave”

Student Choice

Voice your superstition!

Test Review

ASSIGNMENT:

- Study for the final.
- Bring in any questions you may have about the final.

**American Philosophical Association’s definition of critical thinking and the ideal critical thinker:**

We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. CT is essential as a tool of inquiry. As such, CT is a liberating force in education and a powerful resource in one’s personal and civic life...

The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focuses in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit. Thus, educating good critical thinkers means working toward this ideal. It combines developing CT skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society.

Six core elements:

1. Interpretation: comprehend and express meaning or significance
2. Analysis: identify the intended and actual inferential relationships
3. Evaluation: assess logical strength
4. Inference: draw reasonable conclusions
5. Explanation: state the results and justify one’s reasoning
6. Self-regulation: monitor one’s cognitive activities