PHIL 224: INTRODUCTION TO THE PHILOSOPHY OF SCIENCE

Professor Carlos A. Mariscal
E-mail carlos@unr.edu

Course Description

The aim of this course is to familiarize students with some major issues in the philosophy of science as well as the reasoning skills to discuss science and other topics competently. We will discuss philosophical problems and implications of scientific inquiry, including the demarcation of science, scientific revolutions, scientific values, and the relation of science and society.

There are no prerequisites for this course

Required Reading & Materials

The required text for this course is Peter Godfrey-Smith's *Theory and Reality: An Introduction to the Philosophy of Science*. Fritz Allhoff's *Philosophies of the Sciences* is also suggested, but not required. Previous editions are fine. Any further readings, podcasts, or films will be available on the class website or shown in class.

Students will need to prepare a poster. I will accept taped sheets of paper, but UNR Knowledge Center has a wonderful printing studio well worth exploring.

Evaluation

30% Final Paper
20% Poster Design and Presentation
20% One Midterm Exam
20% Six (6) Argument Reconstructions
10% Class attendance and informed participation

Final Paper

Each paper will be a **strict** 2000-4000 word paper on a topic in the philosophy of science. It is expected to make contact with at least one reading from the semester. Although this is only a 200-level course, I expect you to do outside research and to develop an original thesis. Examples and suggestions will be provided. Only MLA, APA, Chicago, Harvard, or Vancouver styles are acceptable. Google Scholar and many other sources do this for you.

Poster Design and Presentation

You will take the argument from your final paper and represent it visually in a **36" x 48" format**. A rubric, examples, and lecture will be provided.

Short Exam

You will be given a list of questions centered on the class material. You must address some questions of your choice in 300-500 words with careful reference to lectures or readings as well as deductive logic.

Argument Reconstruction

At any point throughout the semester, you should choose an assigned article, read it, and reconstruct a major argument of the article in no more than 250 words. Use your own words and try to make the logical structure clear as much as possible. These ***must be turned in before the class*** discussion.

An argument reconstruction is simply a measure of your understanding of the author's position. You must give their conclusion and the reasons they give for that conclusion. It helps to put it in Standard form (e.g. 1. ***Premise***, 2. If ***Premise 1***, then ***Conclusion***. 3. Therefore, ***Conclusion***). It is *not* a summary, so you should not describe all of the elements of the article, merely the ones that support the author's conclusion. If there are multiple arguments or positions in an article or book chapter, choose a strong one to reconstruct.

Argument reconstructions will be graded in a **three-point** system. A **3** will be given for an accurate, clear, cogent/valid reconstruction of the strongest argument in the article. A **2** will be given to adequate attempts that miss some aspects of the argument. ***1s*** are typically reserved for misunderstanding the assignment. Four or more ***3s*** constitute full marks for this portion of the class.

Please ***think ahead***: many A students have left my class with a C because of lack of foresight. Many C students have failed.

Informed Class Participation

Class is more enjoyable and informative if everyone participates.

Two-thirds of this grade will be based on attendance, which will be sporadically taken four minutes after class time, as well as attention, which will be forfeited if you are on your phone, scrolling on your laptop, or asleep.

If you must be absent for any reason, email me ahead of time. Two absences are fine. Each subsequent absence will cost points.

One third of this grade will be based on speaking up in class, in-person discussions outside of class, or posts to *Canvas/Piazza*.

Grading standards

A 92.5-100 percent	**C+** 77-79.4 percent
A- 89.5-92.4 percent	**C** 72.5-76.9 percent
B+ 87-89.4 percent	**C-** 69.5-72.4 percent
B 82.5-86.9 percent	**D+** 67-69.4 percent
B- 79.5-82.4 percent	**D** 62.5-66.9 percent
D- 59-62.4 percent	**F** 0-58.9 percent

Late Work/Makeup Exams

Students have one (1) no-questions-asked four-day extension to use on a single argument reconstructions. Subsequent extensions will require a note from a mortician. Non-medical extensions on the exam, paper, or poster assignments will face a 10 percent grade penalty.

PHIL 224: INTRODUCTION TO THE PHILOSOPHY OF SCIENCE

Office Hours 1:30-2:30 Mon. & Wed.
Office Jones 103D

Communication

Please use *Canvas* or *Piazza* to contact me/other members of the class for any questions. Failing that, I also respond to email once a week Wednesdays at midnight.

Laptops & Cell Phones

Don't be a jerk.

Signs of jerkness include: looking at your groin and smiling, wearing earphones, and staring at your laptop while your YouTube video of a cat loads.

Research shows paper notetaking produces better recall than digital notetaking. Research also shows jerk-like behaviors affects you **Informed Participation** grade.

Course Learning Outcomes

1) Students will be able to state a thesis about a problem in the philosophy of science, as well as provide evidence and philosophical argument (including replies to counter-arguments) in its defense.
2) Students will be able to interpret at an introductory level the ideas associated with major philosophers and theories in the philosophy of science.
3) Students will be able to distinguish better and worse reasoning, and recognize relevant logical relationships and patterns of inference.
4) Students will be able to show what is at stake in an abstract philosophical debate in the philosophy of science, and indicate how different philosophical positions have different practical and theoretical implications.

Statement on Academic Dishonesty

Each semester, I catch about five percent of my students engaging in academic dishonesty. If you cheat, plagiarize, or otherwise obtain grades under false pretenses, I *will* catch you and burden you with the greatest possible academic penalty. This may include failing the course, referral to the Associate Provost of Academic Planning and Standards, and expulsion. **Ignorance is not an excuse for plagiarism.** Please feel free to contact me or refer to University of Nevada, Reno General Catalog if you are concerned about what constitutes plagiarism.

Tutoring & Writing Center

Your student fees cover usage of the Tutoring Center (784-6801 or www.unr.edu/tutoring-center) and University Writing Center (784-6030 or http://www.unr.edu/writing-center). Evidence of using one or both of these centers for class assignments will count as extra credit in this class.

Academic Disabilities

If you believe you have a disability and would benefit from any accommodations, you may wish to contact the Disability Resource Center (Pennington Student Achievement Center 230) as soon as possible to better ensure that such accommodations can be implemented in a timely fashion.

A Statement on Audio and Video Recording

Everything you say in this class (and probably in most other areas of your life) is likely recorded by one or more other students. Behave accordingly.

PHIL 224: INTRODUCTION TO THE PHILOSOPHY OF SCIENCE

Class Time	9 a.m. Mon./Wed./Fri.
Classroom	265 Edmund J. Cain Hall
Class Website	carlosmariscal.com/224

	Schedule	Date	Reading/Assignment
WHAT IS SCIENCE?	**Introduction**	**Aug. 28**	Syllabus
	Baby Logic | What is Science?	**Aug. 30**	Godfrey-Smith ch. 1, "Introduction,"
	Baby Logic | Induction	**Sept. 1**	Godfrey-Smith ch. 3, "Induction and Confirmation"
	Labor Day	**Sept. 4**	
	Psychological Reduction	**Sept. 6**	n/a
	Baby Logic | Deduction	**Sept. 8**	Godfrey-Smith ch. 4, "Popper: Conjecture and Refutation"
	Baby Logic | The Vienna Circle	**Sept. 11**	Godfrey-Smith ch. 2, "Logic Plus Empiricism"
REVOLUTIONS	**Duhem's Underdetermination**	**Sept. 13**	Duhem, "Physical Theory and Experiment" (Sections 1, 2, 3, 9 & 10)*
	The Web of Belief	**Sept. 15**	Stanford, "Underdetermination of Scientific Theory" (Sections 1 & 2)
	The Structure of Science	**Sept. 18**	Godfrey-Smith ch. 5, "Kuhn and Normal Science"
	Normal Science	**Sept. 20**	Godfrey-Smith ch. 6, "Kuhn and Revolutions"
	Science in Crisis!	**Sept. 22**	High-Phi Nation, "The Ashes of Truth"*
REALISM	**Progressive Research Programs**	**Sept. 25**	Godfrey-Smith ch. 10, "Naturalistic Philosophy in Theory and Practice"
	"Anything Goes"	**Sept. 27**	Godfrey-Smith ch. 7, "Lakatos, Laudan, Feyerabend, and Frameworks"
	No Miracles	**Sept. 29**	Godfrey-Smith ch. 12, "Scientific Realism"
	Pessimistic Meta-Induction	**Oct. 2**	Godfrey-Smith ch. 8, "The Challenge from Sociology of Science"
VALUES	**Values in Science**	**Oct. 4**	Godfrey-Smith, ch. 11, "Naturalism and the Social Structure of Science"
	Inductive Risk	**Oct. 6**	Douglas, "Inductive Risk and Values in Science"*
	Standpoint Epistemology	**Oct. 9**	Godfrey-Smith ch. 9, "Feminism and Science Studies"
	The Sokal Affair	**Oct. 11**	Sokal Packet (please skim, *but not read* "Transgressing the Boundaries...")*
EXPLANATION	**A Muddy Paste**	**Oct. 13**	Godfrey-Smith ch. 15, "Empiricism, Naturalism, and Scientific Realism"
	Scientific Explanation	**Oct. 16**	Godfrey-Smith ch. 13, "Explanation"
	Reductionism	**Oct. 18**	Sober, "The Multiple Realizability Argument Against Reductionism" 1-4 & 6*
	Laws of Nature	**Oct. 20**	Cartwright, "Do the Laws of Physics State the Facts?"* ***Mid-Term Exam***
	Pragmatic Laws	**Oct. 23**	Mitchell, "Dimensions of Scientific Laws"*
SPECIAL SCIENCES	**The Exact Sciences**	**Oct. 25**	Godfrey-Smith ch. 14, "Bayesianism and Modern Theories of Evidence"
	Nevada Day	**Oct. 27**	
	The Physical Sciences	**Oct. 30**	DeWitt, "Philosophy of Physics"
	The Chemical Sciences	**Nov. 1**	Schummer, "Philosophy of Chemistry"
	The Life Sciences	**Nov. 3**	Haber et al., "Philosophy of Biology"*
	The Social Sciences	**Nov. 6**	Little, "Philosophy of Sociology"* **OR** Hausman, "Philosophy of Economics"*
	Multidisciplinary Sciences	**Nov. 8**	Bechtel & Herschbach, "Philosophy of the Cognitive Sciences"
	Veteran's Day	**Nov. 10**	
	Multidisciplinary Sciences	**Nov. 13**	Mariscal et al. "The History and Philosophy of Origins of Life Studies"*
SOCIETY	**Science and Politics**	**Nov. 15**	**Douglas Lecture**
	"Born Secret"	**Nov. 17**	Moreland, "Born Secret"
	Citizen Science	**Nov. 20**	Silvertown, "A New Dawn for Citizen Science"
	The Meaning of Life	**Nov. 22**	Jones, et al., "The Meaning of Life"
	Thanksgiving	**Nov. 24**	
SYSTEMIC BIAS	**Scientific Piracy**	**Nov. 27**	McNull, "My love-hate of Sci-Hub," & Barok et al., "In Solidarity..."
	The Replicability Crisis	**Nov. 29**	High-Phi Nation, "Hackademics II: The Hackers"
	Null and Negative Results	**Dec. 1**	Knight, "Null and Void"
	Poster Day!	**Dec. 4**	***Posters Due***
	Poster Day!	**Dec. 6**	n/a
	Poster Day!	**Dec. 8**	n/a
	Wrap Up	**Dec. 11**	n/a

* indicates available via class website. Other readings are in assigned texts.

RUBRIC FOR STUDENT POSTER PRESENTATIONS

Phil 224: Introduction to the Philosophy of Science *Fall 2017*

Subject Matter and Merit	**1 = Poor | 3 = Satisfactory | 5 = Excellent**
Descriptiveness of title	_____
Introduction (sufficient background provided)	_____
Position well summarized (tied back to objectives)	_____
Originality (novel idea, subject, or approach)	_____
Appropriateness (adequately connected to class material)	_____
Philosophical Merit (adequate to address objectives and cogent position)	_____
TOTAL SCORE FOR THIS CATEGORY (30 possible points)	_____

Poster Style, Organization, and Visuals	**1 = Poor | 3 = Satisfactory | 5 = Excellent**
Organization (logical presentation and progression of ideas)	_____
Flow (logical layout & can follow easily from one location to the next in proper order)	_____
Visual appeal (attractive and balanced)	_____
Legibility (no small font; headings, captions, and text neat, easy to read)	_____
Figures or Illustrations (eye-catching visuals that contribute to subject matter)	_____
Writing clarity (easy to understand, short and direct statements)	_____
Message (easy to quickly gather implications of work)	_____
Volume of material (appropriate amount of information for a poster, poster is 36" x 48")	_____
TOTAL SCORE FOR THIS CATEGORY (40 possible points)	_____

Interaction with poster viewers	**1 = Poor | 5 = Satisfactory | 10 = Excellent**
Can summarize poster thoroughly and succinctly	_____
Answers questions briefly but thoroughly	_____
Understands the importance and the issue	_____
TOTAL SCORE FOR THIS CATEGORY (30 possible points)	_____

TOTAL POINTS FOR ALL CATEGORIES (100 points possible): _____

RUBRIC FOR STUDENT FINAL PAPERS

Phil 224: Introduction to the Philosophy of Science *Fall 2017*

0 = Missing | 2 = Unsatisfactory | 4 = Poor | 6 = Satisfactory | 8 = Very Good | 10 = Excellent

Originality (novel idea, subject, or approach)	_____
Topic Selection (clear thesis, motivated, appropriate size topic, cogent position)	_____
Understanding (skillful jargon use, understand topic, breadth and depth)	_____
Consideration of Counterarguments (strong counterargument presented and addressed)	_____
Conclusion (tied back to objectives)	_____
Correct use of sources (use reliable sources, adequately referenced, interpreted, evaluated, synthesized, questioned)	_____
Integration (synthesize topics within course and in topic/with background knowledge)	_____
Structure and Organization (logical presentation, progression of ideas, each paragraph has purpose, sign posting, clearly organized toward a goal)	_____
Usage (Simple language, clear, fluent, +.5 for writing center)	_____
Grammar and Spelling (free from errors, +.5 for writing center)	_____
TOTAL SCORE FOR THIS CATEGORY (100 points possible)	_____