

## PHILOSOPHY OF SCIENCE

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### Course Overview

This course will cover a survey of topics in philosophy of science. The course will be broken into five sections dedicated to the following topics: realism and anti-realism, structuralism, causation, explanation, and feminism and science. These sections will introduce students to some of the major topics in philosophy of science and will cover a variety of views on these topics. By the end of the class, students will:

- be able to formalize philosophical arguments into premise-conclusion form, and evaluate the validity and soundness of these arguments.
- have knowledge of some of the major topics in contemporary philosophy of science.
- be able to contribute to rigorous philosophical discussion and clearly present philosophical ideas in written form.

**Texts:** All readings will be made available to students online.

### Assignments

**Summary Papers.** Each student is required to turn in 5 summary papers. Students may only turn in one summary paper per section. These papers should be 2 – 3 pages long, consisting of a short summary of an assigned reading and the student's thoughts/response to that reading. The response portion of the paper should demonstrate that the student has engaged with the reading in a careful and thoughtful way. These papers will be graded on a scale of 0 – 3. Students will receive a **0** if they fail to turn in a summary paper, a **1** if they have failed to accurately summarize and failed to engage with the reading, a **2** if they accurately summarize the reading but do not include a thoughtful response, and a **3** if they accurately summarize and thoughtfully engage with the reading. These papers should be turned in before the class discussion of the assigned reading.

**Quizzes.** There will be 6 quizzes throughout the semester. The first quiz will be a take home quiz on argument forms and will be due the second week of classes. At the end of each section, there will be a section quiz on the readings from that section. These quizzes will occur in class. They will be straightforward and short, consisting of 10-15 questions. These questions will be a mix of true/false and short answers. If a student misses class on

a quiz day then they will have to make up the quiz during office hours within two weeks of the original quiz date.

**Term Paper.** The major assignment for this course is the final paper, which will be due during finals week. This will be a 5-10 page paper that engages with and develops new ideas about one of the topics covered during the semester. This assignment consists of the following four parts:

**Paper Proposal (5pts):** A paper proposal will be due half-way through the semester. This proposal should identify the question the paper will answer and a proposed thesis statement. The proposal should also identify the course readings that the paper will engage with.

**First Draft (10pts):** Two weeks before the end of the semester, students will be required to turn in a first draft of their paper. This will be an opportunity to receive detailed feedback from me and will not be graded in terms of quality.

**Final Draft (75pts):** The final draft of the paper will be due during finals week. The final draft should reflect revisions from the first draft and will be graded in terms of quality.

**Presentation (10pts):** During finals week, there will be no final exam, but students will be expected to give short, 5-10 minutes, presentations on their final papers. In these presentations, students should introduce the main thesis of the paper and summarize their argument for that thesis.

**Grading.** Overall grades for the course will be determined in the following way:

**Final Paper:** 50%

**Summary Papers:** 20%

**Quizzes:** 20%

**Participation:** 10%

The grading scale is as follows:

<b>A</b> 94+	<b>A-</b> 90-93	<b>B+</b> 87-89
<b>B</b> 83-86	<b>B-</b> 80-82	<b>C+</b> 77-79
<b>C</b> 73-76	<b>C-</b> 70-72	<b>D</b> 60-69
<b>F</b> 59-		

**Attendance and Classroom Policies.** Attendance is mandatory and will factor into the participation grade. A large portion of each class will be discussion and so to better the environment for discussion I ask that you do not bring any laptops or technology to class. Each student is expected to be an active participant in discussion.

**Academic Integrity.** Each student is expected to complete their own work for each of the assignments listed above. Any instances of plagiarism will be taken seriously and appropriate action will be taken in accordance with the academic honor code. More information about this honor code can be found at the following website: <https://honorcode.nd.edu/>  
If you have any questions or concerns about the honor code, you should talk to me.

<b>Introduction</b>	
Week 1	Introduction to Argument Forms Introduction to Philosophy of Science
<b>Realism/Anti-Realism</b>	
Week 2	Putnam - "Three Kinds of Scientific Realism" Hacking - "Experimentation and Scientific Realism"
Week 3	Van Fraassen - <i>The Scientific Image</i> , chapter 2 Cartwright - "How the Laws of Physics Lie"
Week 4	Chakravartty - "Semirealism" Section Quiz
<b>Structuralism</b>	
Week 5	Ladyman - "What is Structural Realism" Chakravartty - "The Structuralist Conception of Objects"
Week 6	Brading & Landry - "Scientific Structuralism: Presentation and Representation" French - "Structure as a Weapon of the Realist"
Week 7	Section Quiz
<b>Causation</b>	
Week 7	Woodward - <i>Making Things Happen</i> , chapter 1
Week 8	Salmon - "Causality without Counterfactuals" Cartwright - "Causal Laws and Effective Strategies"
Week 9	Semester Break
Week 10	Chakravartty - "Particles, Causation, and the Metaphysics of Structure" Section Quiz
<b>Explanation</b>	
Week 11	Hempel - "Aspects of Scientific Explanation" Kitcher - "Explanatory Unification and the Causal Structure of the World"
Week 12	Friedman - "Explanation and Scientific Understanding" Potochnik - "Biological Explanation"
Week 13	Section Quiz
<b>Feminism and Science</b>	
Week 13	Longino - "Can there be a Feminist Science?"
Week 14	Bluhm - "Self-Fulfilling Prophecies: The Influence of Gender Stereotypes on Functional Neuroimaging Research on Emotion" Meynell - "Evolutionary Psychology Ethology, and Essentialism (Because What They Don't Know Can Hurt Us)"
Week 15	Wylie - "The Constitution of Archaeological Evidence: Gender Politics and Science" Section Quiz
Finals Week	Student Presentations