

Introduction to the Philosophy of Science

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Course Description

You may have wondered, why do we call some theories ‘scientific’, but not others? Do we really know the sun will come up tomorrow? Where do babies come from? To answer these questions, we will tackle classic puzzles and new problems in the philosophy of science. Topics will include the problem of induction, how to distinguish science from pseudoscience, and bias in scientific practice. Readings will include works by authors like Karl Popper, Elizabeth Anderson, and Helen Longino, among others. Students will complete writing assignments that build skills like accuracy, clarity, and coherence. Through writing, students will learn to rigorously present philosophical debates over scientific orthodoxy and practice, and situate their own views within these debates.

Rationale

This is a course in how to write philosophy. Throughout the course you will complete assignments, both in class and at home, that develop philosophical writing skills. Learning to write philosophy requires reading and understanding philosophy. Conversely, reading and understanding philosophy requires learning to reproduce arguments and theories in writing. You will develop these interdependent skills through group work, short in-class assignments, and essays completed in stages.

Writing instruction will be broken into two categories. Some assignments will focus on developing content. To develop the content of your essays, you will learn to identify, reproduce, and analyze the structures of arguments. Other writing assignments will improve your grammar and style.

Learning Outcomes

1. Produce philosophical writing that meets the field of philosophy’s expectations regarding structure, argumentation, and evidence.
2. Produce writing that is based on a careful analysis of the text, implementing logical tools presented early in the semester.
3. Handle secondary sources appropriately, properly citing in MLA format.
4. Develop effective preparatory writing strategies such as flow charts, outlining, drafting, and collaboration.

Evaluation

- *Writing Assignments: 80%*
You will complete five major writing assignments for this course, often in stages. The first

assignment will be short (2–3 pages), and worth 5% of your grade. The second assignment will be a bit longer (3–4 pages), worth 10% of your grade. The third assignment will be worth 15% of your grade. The final two papers will be 5-6 pages in length, and will be worth 25% each.

- *Participation: 20%*

Your participation grade will be determined by the extent to which you are actively engaged in the course. Brief written assignments between essays will count towards your participation grade, as will your contributions to class discussion.

Grading Policies

1. Extensions can be granted on papers, but you need to talk to me a few days in advance. If you do not make arrangements beforehand, late papers will be downgraded by 1/3 letter grade per day.
2. To pass this class, you must complete all five major writing assignments.
3. You can miss two classes without any excuse. After that, missing class without an excuse (e.g., a doctor's note) will lower your participation grade.

The Cornell Writing Centers

The Cornell Writing Centers (WC) provide support for individuals at any stage of the writing process. It is a free resource available to everyone on campus for nearly any kind of writing project: applications, presentations, lab reports, essays, papers, and more. Tutors (trained undergraduate and graduate students) serve as responsive listeners and readers who can address questions about the writing process or about particular pieces of writing. They can also consider questions of confidence, critical reading, analytic thought, and imagination. Writing tutors also have experience working with non-native English speakers. During the academic year, the WC are open Mondays-Thursdays, 3:30–5:30pm (Mann Library & Rockefeller Hall 178) and Sundays-Thursdays, 7:00–10:00pm (Olin library 403; Uris Library 108; Tatkon Center 3343). Writers can schedule appointments or drop-in at a convenient time. For more information or to schedule an appointment, go to: <http://knight.as.cornell.edu/wc>

Notes on Academic Integrity

1. Each student in this course is required to adhere to Cornell's Academic Integrity Code: <http://cuinfo.cornell.edu/aic.cfm>. It is your responsibility to familiarize yourself with the Code, and what constitutes a violation of it. All work submitted must be the student's own, and all sources must be properly cited.
2. Each of the five major assignments will be submitted to Turnitin.com for the detection of plagiarism. Further, all papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of Turnitin.com service is subject to the usage policy posted on the Turnitin.com site.
3. Students are not permitted to buy or sell any course materials, online or otherwise. This includes handouts, paper topics, homework questions, etc. Such behavior constitutes academic misconduct.

Course Materials

Required:

Style: Lessons in Clarity and Grace (12th Edition) by Joseph Williams and Joseph Bizup

All other readings will be available through the Blackboard site. Many will be in the following text, however, so you may want to purchase it:

Optional:

Theory and Reality by Peter Godfrey-Smith

Philosophy of Science: The Central Issues (First Edition) by J. A. Cover and Martin Curd (CC)

Tentative Schedule of Readings

Jan 22: Introduction

No reading

Jan 24: The Problem of Induction

Godfrey-Smith, Chapter 3, Section 3.1

Lipton, "Induction", Sections "Underdetermination" and "Justification" (rest optional)

Essay 1 (Trial Essay) Assigned

Jan 29: Induction, continued

Popper, "The Problem of Induction"

Godfrey-Smith, Chapter 3, section 3.2

Essay 1 final due Wednesday at noon (1–2 pages Graded on Completion)

Jan 31: The New Riddle of Induction

Godfrey-Smith, Chapter 3, section 3.4

Nelson Goodman, *Fact, Fiction, and Forecast*, Chapter 3

Feb 5: Popper's Falsificationism

Karl Popper, "Science: Conjectures and Refutations" (CC)

Godfrey-Smith, Ch 4

Feb 7: Writing Day

Williams and Bizup, "Actions"

Graff and Birkenstein, *They Say/I Say* Excerpt

Feb 12: Science vs. Pseudoscience

Paul R. Thagard, "Why Astrology is a Pseudoscience" (CC)

Optional:

Imre Lakatos, "Science and Pseudoscience" (CC)

Essay 2 Due February 13th at 5pm

Feb 14: Science vs. Pseudoscience

National Academy of Sciences, "Chapter 5: Frequently Asked Questions About Evolution and the Nature of Science"

Michael Ruse, "Creation Science Is Not Science" (CC)

Feb 19: Science vs. Pseudoscience

Larry Laudan, "Commentary: Science as the Bar—Causes for Concern" (CC)

Michael Ruse, "Response to the Commentary: *Pro Judice*" (CC)

Feb 21: Writing Day

Williams and Bizup, "Cohesion and Coherence" (HW assignment)

Essay 3 Drafting

Feb 28: Sex and Sports

Doriane Lambelet Coleman, "Sex, Sport, and Why Track and Field's New Rules on Intersex Athletes Are Essential" (NYT)

Alice Dreger, "Track's Absurd New Rules for Women" (NYT)

Fred Dreier, "Commentary: The complicated case of transgender cyclist Dr. Rachel McKinnon" (VeloNews)

Optional:

Fred Dreier, "Q&A: Dr. Rachel McKinnon, masters track champion and transgender athlete" (VeloNews)

Mar 5: Genetics and Sex Selection

Sarah Richardson, "When Gender Criticism Becomes Standard Scientific Practice"

Essay 3 revision work

Mar 7: Writing Day

Williams and Bizup, "Using Sources"

Mar 12: The Egg and the Sperm

Emily Martin, "The Egg and the Sperm"

Essay 3 due March 13 at 5pm

Mar 14: Feminist philosophy of biology

Kathleen Okruhlik, "Gender and Biological Science" (CC)

Mar 19: Feminist philosophy of biology

Kathleen Okruhlik, "Gender and Biological Science" (CC) (Continue)

Mar 21: Feminist Naturalism

Elizabeth Anderson, "Feminist Epistemology", Section "Feminist Epistemology as a Branch of Naturalized, Social Epistemology"

Mar 26: Multiplying Perspectives

Helen Longino, "Multiplying Subjects and the Diffusion of Power"

Mar 28: Writing Day

Williams and Bizup, "Motivation"
Essay 4 Drafting

April 1-5

Spring Break

Apr 9: Neuroscience and Philosophy

Patricia Churchland, "The Impact of Neuroscience on Philosophy"

Apr 11: Writing Day

Williams, "Concision"
Klinkenborg, "Several Short Sentences About Writing"

Essay 4 due April 15th at 5pm

Apr 16: Neuroscience and Philosophy

Adina Roskies, "Neuroscientific Challenges to Free Will and Responsibility"

Essay 3 revisions due April 17th at 5pm

Apr 18: Writing Day

Please bring a printed version of your 4th essay with only your Cornell ID at the top (not your name)

Williams and Bizup, "Global Coherence"

Apr 23: The Ethics of Genetic Selection

Michael Sandel, "The Case Against Perfection"

Apr 25: The Ethics of Genetic Selection

Julian Savulesco, "Procreative Beneficence: Why We Should Select the Best Children"

Apr 30: The Ethics of Life Extension

Thomas Nagel, "Death"

Borges, "The Immortal"

May 2: The Ethics of Life Extension

Bernard Williams, "The Makropulos Case: Reflections on the Tedium of Immortality"

Essay 5 Workshop

May 7: Wrap Up

Essay 5 editing

Course Evaluations (on-line)

Essay 5 Due May 7 at 5pm (6–7 pages)