

PHIL 340 Philosophy of Science
Fall 2025
T/Th 9:35-11:15

Instructor: Nathaniel Greely ngreely@callutheran.edu
Office Hours: T/Th 8:30am – 9:30am

Course Description:

This course is an introductory survey of topics in Philosophy of Science. The topics covered will include the logical structure of scientific discovery, the nature of scientific explanation, accounts of the laws of nature, the debate between scientific realism and anti-realism, and the nature of theory change and theoretic reduction. No previous knowledge of philosophy, logic, or science is required or assumed, though contributions from students with previous training in various disciplines is welcome.

Learning Outcomes:

Students should be able to demonstrate their understanding of important topics in philosophy of science by engaging in discussions, completing written exams, and writing an original essay that argues for or against a specific thesis related to philosophy of science.

Assessments:

The assessments in this course are largely designed to keep you engaged with the lectures, readings, and other students in the course. Your grades for discussion, quizzes, and the essay draft total 55% of your grade and it should be easy to do well on these components if you stay engaged. The midterm, final exam, and final draft of the essay will be graded on quality, and to get top marks on these components you will be required to demonstrate understanding of the material (for the midterm and final) and some original philosophical insight (for the final essay). Your final grade in the course will be composed of the following:

Attendance and Participation – 16%

Each student is required to post weekly to the Canvas discussion board, **due each Sunday 11:59pm**. The subject of the post will be one of the readings for the upcoming week. The post can be an objection to some claim or argument in the reading, a request for clarification of some claim or argument in the reading, or an extension of some claim or argument from the reading. You should avoid merely summarizing points from the reading. Original thought is the goal. The hope is that these posts will help you begin to formulate an original thesis for your essay.

Quizzes – 14%

At the end of each two-week unit, we will devote one class period to review, followed by a short quiz on that unit. The goal of the quizzes is to assess whether students are keeping up with reading and lectures. They are designed to be quite easy for students who do so.

Midterm – 15%

The midterm will consist of two short essays (1-2 pages each). Students will be given four essay prompts and may choose to write on any two of them. The essay prompts will be on topics from Units 1-3 of the course. The short essays should demonstrate understanding of the claims and arguments from the

readings and lectures on the given topic. **The essay prompts will be posted 10/9 by 11:59pm and the midterm will be in class on 10/14.**

Presentation – 10%

Students will give a brief presentation in class in which they explain the general topic of their term papers, the thesis, and the original argumentative strategy they intend to pursue. The paper idea needn't be polished at this stage, but it should reflect an honest attempt to construct an original argument. Students will receive feedback from me and their colleagues, which they should consider when writing the rough draft. After the midterm on 10/14 I will post several essay prompts to Canvas. These prompts are meant as examples of the sort of paper you could write. You are not required to write on one of these prompts, but you may. Presentations will occur in class on 10/30 and 11/4.

Essay draft – 15%

One of the most important parts of writing an essay is revision. Students will be required to turn in a rough draft of their final essay, **due 11/25 by 11:59pm, submitted through Canvas.** The essay should present and develop an original thesis on some topic from the course material. Prompts will be provided, but students are welcome to develop their own essay topics, possibly based on a discussion board exchange. The essay should be narrowly focused on a very specific claim, likely a single premise in an argument presented in a lecture or reading. Provide an original argument for your view about that claim and consider objections to your argument. There is no length requirement, but 5-7 pages is a rough target length. The rough draft will be returned with comments on how the essay might be developed and improved. It should be easy to get full points for your draft so long as it reflects an honest effort to make a cogent argument.

Final Essay – 15%

Students will revise their essay drafts based on the comments they receive. You are almost certainly expected to make significant changes to your essay in order to get top marks. The final draft will be graded on quality, not merely on effort. **The final draft will be due 12/9 at 11:59pm, submitted through Canvas.**

Final Exam – 15%

The final exam will be similar in format to the midterm. Students will be given four essay prompts and may choose to write on any two of them. The essay prompts will be on topics from the second half of the course. The short essays should demonstrate understanding of the claims and arguments from the readings and lectures on the given topic. The final exam questions will be posted 12/2. The final exam will be **in class 12/9 at ?**

Course Schedule

8/26 – Course Introduction

Unit 1 – The Problem of Induction

8/28 – Readings: Kent Staley – *An Introduction to Philosophy of Science* Ch 1; David Hume – *An Enquiry Concerning Human Understanding* Ch. 4

9/2 – Readings: Karl Popper - Introduction to *The Logic of Scientific Discovery*, sections 1-3; Pierre Duhem – *Physical Theory and Experiment*

9/4 – Review and Unit 1 Quiz

Unit 2 – Scientific Explanation

9/9 - Readings: Stanford Encyclopedia of Philosophy - *Scientific Explanation*, Sections 1-2; Carl Hempel & Paul Oppenheim – *Studies in the Logic of Explanation*, Sections 1-4

9/11 – Readings: Michael Scriven – Explanations, Predictions, and Laws; Carl Hempel – *Aspects of Scientific Explanation*, Section 3 (posted in two parts)

9/16 – Readings: Stanford Encyclopedia of Philosophy – *Scientific Explanation*, Section 3; Wesley Salmon – Statistical Explanation

9/18 - Review and Unit 2 Quiz

Unit 3 – Laws of Nature

9/23 – Readings: David Hume – *An Enquiry Concerning Human Understanding*, Section 7; Norman Swartz – A Neo-Humean Perspective: Laws as Regularities; David Armstrong – *What is a law of nature?* Ch.2 Section 1

9/25 – Reading: Fred Dretske – Laws of Nature

9/30 – Reading: David Lewis – New Work for a Theory of Universals (selections, in two parts)

10/2 – Review and Unit 3 Quiz

Unit 4 – Time Travel

10/7 – David Lewis, “The Paradoxes of Time Travel”; *12 Monkeys* film; Midterm questions posted

10/9 – Review for Midterm; Unit 4 Quiz; *12 Monkeys* Continued

10/14 - Midterm

Unit 5 – Scientific Realism

10/16 – Readings: Kent Staley – *An Introduction to Philosophy of Science* Ch. 4 & Ch. 10; Larry Laudan, “A Confutation of Convergent Realism”

10/21 - The Pessimistic Meta-Induction – Larry Laudan, “A Confutation of Convergent Realism”

10/23 – Bas Van Fraassen, “The Scientific Image,” Ch. 2, Section 1; John Worrall, “Structural Realism – The Best of Both Worlds?”

10/28 – Review and Unit 5 Quiz

10/30 - Presentations

11/4 – Presentations

Unit 6 – Intertheoretic Relations

11/6 – Readings: Kent Staley – *An Introduction to Philosophy of Science* Ch. 5 & Ch. 6

11/11 – Ernest Nagel – *The Structure of Science*, Ch. 11, Sections 1-3

11/13 - Jerry Fodor – Special Sciences (Or: The disunity of science as a working hypothesis); Paul Churchland – Reduction, Qualia, and the Direct Introspection of Brain States

11/18 – Review and Unit 6 Quiz

Unit 7 – Causation

11/20 - Regularity - J. S. Mill, “A System of Logic”

11/25 - INUS – Jaegwon Kim, “Causes and Events: Mackie on Causation”; Counterfactual – David Lewis, “Causation”; Rough Draft Due

11/28 – Thanksgiving Holiday

12/2 – Review and Unit 6 Quiz; Rought Draft Due

12/4 –Review for Final Exam

12/9 – Final Exam; Final Draft of Essay Due

GRADING

Numeric	Grade	Numeric	Grade
Over 93%	A	73% to 76%	C
90% to 92%	A-	70% to 72%	C-
87% to 89%	B+	67% to 69%	D+
83% to 86%	B	63% to 66%	D
80% to 82%	B-	60% to 62%	D-
77% to 79%	C+	<60%	F

CARNEGIE/STUDENT WORKLOAD -

Activity	Instructor-Led		Independent		Remarks
	Weekly	Course	Weekly	Course	
Class Meetings	4	60			
Course Readings			4	60	
Midterm Prep				5	

Research Proposal				10	
Essay Draft				10	
Final Essay				20	
Quiz Prep				10	
Final Exam Prep				5	
Total Hours		60		120	

TECHNOLOGY REQUIREMENTS FOR BLACKBOARD

Even though this is an on-ground, on-campus, face-to-face, in-person class, some components of your class could be placed on Blackboard (e.g., syllabus).

Hardware & Software

	Windows	Mac OS X
Operating System	Windows 10	OS X 10.12 or later version
Java	Most recent version	Most recent version

Browser

Your browser must always be up to date. We recommend Firefox and Chrome for all Blackboard functions. If you are experiencing problems on another browser, please switch to Firefox or Chrome. To check your browser and system compatibility with Blackboard, please use the Blackboard Browser Checker below to view your functionality. *Please note that checkmarks on all functions does not guarantee a seamless experience.*

Click here: [Blackboard Browser Checker](#)

Internet

Bandwidth: recommended requirement is 5 Mbps per device or higher; anything less will cause potential issues.

Note: Bandwidth is affected by distance from the wireless router or access point, use of Netflix video streaming and number of users on the wireless network.

Streaming services: Sites or applications that use the internet like YouTube, Netflix, P2P, Spotify, or Pandora must be closed before starting a Zoom session.

Connection: You must be connected to the internet via an ethernet cable or Wi-Fi. Hotspots do not have the bandwidth to handle Zoom sessions.

Wi-Fi: Be as close to the router access point as possible to get the best connection. Be aware that locations with free Wi-Fi, i.e. Starbucks or Barnes & Noble, cannot provide enough bandwidth for Zoom sessions and should not be used.

Use the following link to check your speed. Click here: <http://speedof.me>

Diversity and Inclusion:

Individuals of all ages, backgrounds, beliefs, ethnicities, genders (and identities & expressions thereof), national origins, religious affiliations, sexual orientations, ability - and other visible and non-visible differences are welcome in this course. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class. We will be discussing controversial topics in this class and students may confront views that they find wrong or even reprehensible. Where possible I would like to confront those views with reasoned arguments. If you find that a particular reading or assignment is so emotionally charged that it interferes with your ability to complete it, send me an email and we'll see if there is a solution that we can all be happy with.

Academic Accommodation:

If you require any form of accommodation on the grounds of disability, please visit this link: <https://www.callutheran.edu/students/disability-services/register.html> well in advance so that you can submit the necessary documents.

Contact information is dss@callutheran.edu, Phone: (805) 493-3464, Disability Support Services, 60 W. Olsen Rd. #5300, Thousand Oaks, CA, 91360

Religious Accommodation:

If you require any accommodation on religious grounds, please alert me in writing as soon as possible.

Academic Integrity:

All instances of academic offences including plagiarism, cheating on exams, and multiple submission of work, will be handled in accordance with official policy, which can be found here: <https://catalog.callutheran.edu/undergraduate/academicpolicies/>. Please read the policy and ensure that you understand it.