

Phil 145: Philosophy of Science

Summer Session I 2020

Instructor: Nathaniel Greely

Teaching Assistant: Richard Vagnino

Lecture MW 11am-1:50pm

Instructor Office Hours: MW 2pm

Teaching Assistant Office Hours:

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 60% of your grade and it should be easy to do well on these components if you stay engaged. The take-home midterm and final essay will be graded on quality and in order to get top marks on these components you will be required to demonstrate understanding of the material (for the midterm) and some original philosophical insight (for the final essay). Your final grade in the course will be composed of the following:

Weekly Online Discussion – 20%

Each student is required to post twice weekly to the Canvas discussion board: (a) one original submission and (b) one reply to another student's submission, **due each Friday 11:59pm**.

(a) The original submission can be an objection to some claim or argument in lecture or reading, a request for clarification of some claim or argument from lecture or reading, or an extension of some claim or argument from the lecture or reading. You should avoid merely summarizing points from the lecture or reading. Original thought is the goal. The hope is that these posts will help you begin to formulate an original thesis for your essay.

(b) The reply to another student's submission should be respectful and constructive, but may be an objection to a claim or argument they make in their submission, a request for clarification of a claim or argument they make in their submission, or an extension of some claim or argument they make in their submission. You should avoid merely agreeing with or summarizing the other student's post.

Weekly Online Quizzes – 20%

Quizzes will be timed, multiple-choice, and accessible through Canvas, **posted each Thursday by 11:59pm and due each Sunday 11:59pm**. 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.

Take-home midterm – 20%

The midterm will consist of two short essays (1-2 pages each). Students will be provided four essay prompts and may choose to write on any two of them. The essay prompts will be on topics from weeks 1-2 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 Thursday, 7/9 by 11:59pm and the midterm will be due Sunday, 7/12 by 11:50pm, submitted through Canvas.**

Essay draft – 20%

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 Sunday, 7/19, submitted through Canvas**. The essay should present and develop an original thesis on some topic in philosophy of science. 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 – 20%

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 7/31 at 11:59pm.**

Course Schedule

Week 1 – The Logic of Science

6/29 – Course introduction; The problem of Induction

Readings: Kent Staley – *An Introduction to Philosophy of Science* Ch 1

David Hume – *An Enquiry Concerning Human Understanding* Ch. 4

7/1 - Falsification; The Duhem Problem and Underdetermination

Readings: Kent Staley – *An Introduction to Philosophy of Science* Ch. 2 & 3

Karl Popper - Introduction to *The Logic of Scientific Discovery*, sections 1-3

Pierre Duhem – *Physical Theory and Experiment*

7/3 – Discussion questions due

7/5 – Quiz 1 due

Supplemental Readings:

David Hume - *A Treatise of Human Nature*, book 1, part 3, section 6

Stanford Encyclopedia of Philosophy – *The Problem of Induction*

W.V.O Quine – *Two Dogmas of Empiricism*

Week 2 - Scientific Explanation

7/6 – The Deductive-Nomological Model of Scientific Explanation

Readings: Stanford Encyclopedia of Philosophy - *Scientific Explanation*, Sections 1-2

Carl Hempel & Paul Oppenheim – *Studies in the Logic of Explanation*, Sections 1-4

Michael Scriven – Explanations, Predictions, and Laws

7/8 – The Inductive-Statistical Model; The Statistical Relevance Model

Readings: Carl Hempel – *Aspects of Scientific Explanation*, Section 3 (posted in two parts)

Stanford Encyclopedia of Philosophy – *Scientific Explanation*, Section 3

Wesley Salmon – Statistical Explanation

7/10 – **Discussion questions due**

7/12 – **Quiz 2 Due; Midterm Due**

Supplemental Readings:

Week 3 – Laws of Nature

7/13 – The Regularity Account

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

7/15 – The Necessitarian Account; The Best Systems Account

Readings: Fred Dretske – Laws of Nature

David Lewis – New Work for a Theory of Universals (selections, in two parts)

7/17 – **Discussion Questions due**

7/19 – **Quiz 3 Due; Essay Draft Due**

Supplemental Readings:

Week 4 – Scientific Realism

7/20 - Logical empiricism; No Miracles Argument; Pessimistic Meta-induction

Readings: Kent Staley – *An Introduction to Philosophy of Science* Ch. 4 & Ch. 10

Larry Laudan – A Confutation of Convergent Realism

7/22 - Constructive empiricism; Structural realism

Readings: Bas Van Fraassen – *The Scientific Image*, Ch. 2, Section 1

John Worrall – Structural Realism: The Best of Both Worlds?

7/24 – Discussion Questions due

7/26 – Quiz 4 due

Week 5 – Intertheoretic relations

7/27 – Diachronic Theory Change

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

7/29 – Synchronic Theoretic Reduction

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

Jerry Fodor – Special Sciences (Or: The disunity of science as a working hypothesis)

Paul Churchland – Reduction, Qualia, and the Direct Introspection of Brain States

7/31 – Discussion Questions due; Final essay due

OSD Accommodation:

If you require any form of accommodation on the grounds of disability, please make sure you have registered with the Office for Students with Disabilities and have followed their guidelines for alerting instructors to your particular needs. The university's policy on the accommodation of disability can be found here: <https://senate.ucsd.edu/Operating-Procedures/Senate-Manual/Appendices/3> Students requesting accommodations for this course due to a disability must provide a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD) which is located in University Center 202 behind Center Hall. Students are required to present their AFA letters to Faculty (please make arrangements to contact me privately) and to the OSD Liaison in the department in advance so that accommodations may be arranged. 858.534.4382 (phone) | osd@ucsd.edu (email) | <http://disabilities.ucsd.edu> (website)

Religious Accommodation:

If you require any accommodation on religious grounds, please alert me in writing as soon as possible. The university's policy on religious accommodation can be found here: <https://senate.ucsd.edu/operating-procedures/educational-policies/courses/epc-policies-on-courses/policy-exams-including-midterms-final-exams-and-religious-accommodations-for-exams/>

Academic Integrity:

All instances of academic offences including plagiarism, cheating on exams, and multiple submission of work, will be handled in accordance with official UCSD policy, which can be found here: <http://senate.ucsd.edu/Operating-Procedures/Senate-Manual/Appendices/2>. Please read the policy and ensure that you understand it.

Integrity Statement:

"Academic Integrity is expected of everyone at UC San Diego. This means that you must be honest, fair, responsible, respectful, and trustworthy in all of your actions. Lying, cheating or any other forms of dishonesty will not be tolerated because they undermine learning and the University's ability to certify students' knowledge and abilities. Thus, any attempt to get, or help another get, a

grade by cheating, lying or dishonesty will be reported to the Academic Integrity Office and will result sanctions. Sanctions can include an F in this class and suspension or dismissal from the University. So, think carefully before you act by asking yourself: a) is what I'm about to do or submit for credit an honest, fair, respectful, responsible & trustworthy representation of my knowledge and abilities at this time and, b) would my instructor approve of my action? You are ultimately the only person responsible for your behavior. So, if you are unsure, don't ask a friend—ask your instructor, instructional assistant, or the Academic Integrity Office. You can learn more about academic integrity at academicintegrity.ucsd.edu” (Source: Academic Integrity Office, 2018)