

# HISTORY AND PHILOSOPHY OF SCIENCE

PHI 101  
Fall 2019  
MW 8:30-10:00am  
Melville Library N4006

James Sares  
james.sares@stonybrook.edu  
Office: Harriman Hall 141  
Office Hours: MW 10:00-11:00am

This course is an historical introduction to the philosophy of science and nature. During the semester, we will examine the ways in which philosophical presuppositions about the nature of being and knowing affect our conceptualizations of physical reality. We will consider how the methods of investigating nature reflect these presuppositions and lend to a picture of the world as rule-governed and organized. We will question the relationship between philosophy and empirical science, underscoring the historically late occurrence of the institutionalized distinction between these disciplines. In what ways are empirical sciences indebted to philosophical presuppositions, and should philosophy mold itself off of the empirical sciences? These broad and contentious questions bring us to the heart of philosophical inquiry, challenging the ways we investigate reality and what we can know of it. Particular attention will be paid to topics in physics (including causality, motion, and space-time) and in scientific methodology.

As this is a course in the history of philosophy, the semester is divided into three historical units:

1. *Ancient Investigations of Nature and Being*. We will examine the origins of scientific thinking in Ancient Greece with the pre-Socratics, Plato, and Aristotle. Selected topics include: Pre-Socratic debates between atomism and monism, Plato's concept of the world-soul, Aristotle's view of causality in nature, and Aristotle's establishment of scientific method.
2. *The Modern Scientific Revolution and its Critics*. We will examine how the investigation of nature is transformed through the reimagination of scientific method and the rise of mechanism and determinism. Selected topics include: debates over deductive versus inductive method in Descartes and Francis Bacon, the possibility of empirical 'knowledge' versus 'fact,' and new understandings of the world as mechanistic.
3. *Kant and the Irreducible Problems of Cosmology*. We will examine, in view of the problems of modern science, the (still relevant) insights of Immanuel Kant on the "antinomies of reason" with regard to atomism, the beginning of the world, and the nature of causality.

## Degree Requirements and Prerequisites

This course fulfills DEC G and SBC Hum requirements. Although this is an introductory course and does not assume prior philosophical knowledge, there will be a number of intensive readings and difficult writing assignments requiring serious commitment from each course member.

## Required Texts

Most of the texts we will read are available in PDF form on Blackboard. These texts must be printed out and brought to class when appropriate. Otherwise, I have ordered students to purchase:

Plato, *Timaeus and Critias* (Oxford University Press) ISBN: 9780192807359.

Aristotle, *Physics* (Oxford University Press) ISBN: 978-0199540280.

Descartes, *Discourse on Method* (Hackett Classics) ISBN: 9780872204225.

Bacon, *Selected Philosophical Works* (Hackett Classics) ISBN: 9780872204706.

If you have financial concerns about obtaining these texts, please contact me as soon as possible.

## Assignments and Grading

*Attendance, Participation, and Short Writing Assignments (20%)*: Attendance will be taken every class. You must arrive on time and participate regularly during class sessions. You must bring all relevant course materials in hard copy to class. I also conduct class with group discussions in mind, which means that students should be prepared to contribute meaningfully to questions. In addition to in-class discussions and debates, your participation grade will include short 1-2 page doubled-spaced responses to questions I give throughout the semester. Expect 5-6 or so of these short assignments, graded check, check-minus, or check-plus. Based on these assignments, I reserve the right to raise (or lower) your grade by up to 2/3 of a letter grade (e.g. B+ to A).

*Reading quizzes (20%, 10 quizzes for 2% each)*: There will be ten short reading quizzes consisting of straightforward reading comprehension questions. Being absent and thus missing a quiz will automatically result in a 0 for that quiz, unless due to medical emergency or other extenuating circumstances.

*Midterm Exam (30%)*: An in-class midterm exam will consist of short open responses to be written during the course of a designated class period.

*Final Exam (30%)*: The take-home final exam will consist of two short essay topics. I will distribute a list of possible questions before the exam, along with my expectations. Each essay must be 900-1000 words, for a total of 1800-2000 words.

*Grading Scale*: A (93-100%), A- (90-92%), B+ (87-89%), B (83-86%), B- (80-82%), C+ (77-79%), C (73-76%), C- (70-72%), D+ (67-69%), D (63-66%), D- (60-62%), F (below 60%)

## Course Policies

*Lateness and absences*: You are allowed two unexcused absences during the semester. After you miss three classes unexcused, your participation grade will drop by a letter grade per absence. If you miss six classes without a valid excuse, you will fail the

course. Lateness will not be tolerated. If you are consistently late more than five minutes for class, I will begin counting late arrivals as absences.

*Technology Policy:* This is a no-screens course, meaning that laptops and cellphones are not allowed. However, exceptions will be made for students who require the appropriate services.

*Disability Support Services (DSS) Statement:* If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, Room 128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

*Academic Integrity Statement:* Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at: [http://www.stonybrook.edu/commcms/academic\\_integrity/index.html](http://www.stonybrook.edu/commcms/academic_integrity/index.html).

*Critical Incident Management:* Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.

#### Course Schedule. \* = Assignment Due

##### I. Ancient Investigations of Nature and Being

August 26	Introduction to course. Milesians and Heraclitus, selections.
August 28	Being against Becoming, Parmenides, selections.
September 2	Labor Day. No Class. Read Plato.
September 4	Plato on Being and Becoming, <i>Timaeus</i> 17a-34a. Quiz 1.
September 9	Plato on Soul and Time, <i>Timaeus</i> 34a-47e.
September 11	Plato on Space and Necessity, <i>Timaeus</i> 47e-69a. Quiz 2.
*September 16	Plato on Order and Purpose, <i>Timaeus</i> 69a-92c.
September 18	Aristotle on Nature and Causality, <i>Physics</i> I-III. Quiz 3.

September 23	Aristotle on Space, Time, and Motion, <i>Physics</i> IV-VI.
September 25	Aristotle on Moved and the Unmoved, <i>Physics</i> VII-VIII. Quiz 4.
*September 30	Aristotle's Organon, <i>Categories</i> 1-5, <i>De Interpretatione</i> 1-4, 9.
October 2	Aristotle on Method, <i>Posterior Analytics</i> I, 1-4; II, 8-10, 19. Quiz 5.

## II. The Modern Scientific Revolution and its Critics

October 7	Descartes on Method, <i>Discourse on Method</i> Parts 1-3.
October 9	Descartes on Method, <i>Discourse on Method</i> Parts 4-6. Quiz 6.
October 14	Fall Break. No Class. Read Bacon.
October 16	Bacon on Method, <i>The New Organon</i> Preface and Book I.
*October 21	Bacon on Method, <i>The New Organon</i> Book II.
October 23	Buffer Class if delayed / Other readings TBD if not. Quiz 7.
October 28	Review for Midterm.
October 30	MIDTERM EXAM.
November 4	Kepler, Galilei, Boyle, Huygens, Newton handout.
November 6	Kepler, Galilei, Boyle, Huygens, Newton handout. Quiz 8.
*November 11	Husserl on the "Crisis" of Science handout.
November 13	Husserl on Science and the Lifeworld handout. Quiz 9.
*November 18	Husserl and the Human Being handout.
November 20	Husserl and the Human Being handout. Quiz 10.

## III. Kant and the Irreducible Problems of Cosmology

November 25	The First & Second Antinomies, <i>Critique of Pure Reason</i> selections.
November 27	Thanksgiving Break. No Class. Review Kant.
December 2	The Third & Fourth Antinomies, <i>Critique of Pure Reason</i> selections.
December 5	Buffer Class if delayed / Other readings TBD if not.
December 9	Review of the course.