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University of California, San Diego
Philosophy 32 Philosophy and the Rise of Modern Science
Winter 2019

Professor Donald Rutherford
Office hours: W 4-5pm, F 12-1 pm, and by appt.
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Teaching Assistant: Leo Moauro
Office hour: W 4-5 and 6-7 pm
Office: HSS 7089
Class website: http://ted.ucsd.edu

Lecture: MWF 11-11:50 pm
Classroom: Peterson 102

Discussion sections:
M 4-4:50 pm, Center 217B
W 5-5:50 pm HSS 2150

Description
This class examines the intersecting developments of philosophy and science in the seventeenth and eighteenth centuries from a variety of perspectives. We will study how modern science emerges in reaction to Aristotle's theory of nature, the dominant account of the universe during the previous two millenia. We will consider how philosophical issues—concerning space, matter, motion and force—drive scientific inquiry, and how new philosophical theories of knowledge and human nature track the progress of science. And we will investigate the relation of the new science to traditional Biblical religion, noting the points at which the two come into conflict and the efforts made by scientists and philosophers to reconcile their theories with religious doctrines. Our modern world takes shape in the seventeenth century and is significantly defined by the rise of modern science. We will use the lens of philosophy to examine that development and its continuing importance for our understanding of ourselves and the world around us.

Required Text
The Scientific Background to Modern Philosophy: Selected Readings, ed. Michael R. Matthews (Hackett, 1989)

All other readings for the class will be made available via the class TritonEd site.

Assignments and Grading (total 100 points)

- Two take-home midterms, each worth 25 points (the first midterm will be distributed on January 27 and will be due at 11:59 pm on February 3; the second exam will be distributed on February 24 and will be due at 11:59 pm on March 3). All exams will be submitted on TritonEd via Turnitin.com.

- Weekly quizzes, given in section. Each will be worth 2 points. You may count your best 5 quizzes for a total of 10 points. No makeup quizzes will be given.

- Section participation, worth 10 points.

- Final examination, worth 30 points; cumulative but concentrating on material from the latter part of the course.

- Both midterms and the final examination must be taken to pass the class.

Other Important Information

- Regular attendance and completion of the required reading ahead of lectures are critical. Engagement with the course presupposes that you have done the assigned reading and are prepared to discuss it in class.

- Use of computers and other electronic devices is allowed in class for legitimate pedagogical purposes, not for web surfing or personal communications. I will make my slides available after class, so there is no reason to try to write down everything on them. In general, you should remain as focused on the content of the lecture as possible.

- 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) **l** osd@ucsd.edu (email) **l** http://disabilities.ucsd.edu (website)

- If accommodations are needed for religious or other reasons that conflict with your attendance or participation in the course, please discuss the matter with me as soon as possible.

- Extensions will only be given to those who present evidence of a valid excuse in a timely manner. Note that computer or printer failure does **not** usually constitute a valid excuse, so be sure to take all necessary precautions to safeguard your work (backup, backup, backup!). If at any time you believe you have a legitimate claim to an extension, bring it to my attention as soon as possible (e.g., if you are going to be out of town for a legitimate purpose, such as a university-sponsored performance, athletic event, conference, or the equivalent). Unexcused late exams will be penalized the equivalent of one +/- letter grade per day.

- Students should familiarize themselves with the UCSD Policy on Integrity of Scholarship: http://students.ucsd.edu/academics/academic-integrity/policy.html. There is a zero-tolerance policy on plagiarism in this class. If you are pressed for time or blocked, it is **always** better to talk with me and to take the late penalty if necessary, than to submit work that is not your own. All written work will be submitted to turnitin.com, so there is a very high probability that plagiarism will be detected. Anyone who is found to have plagiarized work will receive an F for the course. Additional disciplinary penalties may be assigned by the UCSD administration. Receipt of this syllabus constitutes an acknowledgement that you are responsible for understanding and acting in accordance with UCSD guidelines on academic integrity.

Schedule of Classes and Reading Assignments

UNIT 1 THE SCIENTIFIC REVOLUTION: FROM ARISTOTLE TO GALILEO

WEEK 1

January 7 Introduction

January 9 Aristotelian Physics
Reading: Aristotle, excerpts from *Physics*, bks. 2 and 4 (Matthews, 7-19) and *On the Heavens*, bk. 1, parts 2-3 (TritonEd)

January 11 Scientific Explanation
Reading: Aristotle, excerpts from *Posterior Analytics* (Matthews, 26-32)

Week 2

January 14 The Heliocentric System
Reading: Nicholas Copernicus, excerpts from *Commentariolus* (1512) and *On the Revolution of the Heavenly Spheres* (1543) (Matthews, 36-44)

January 16 The Scientific Mind
Reading: Francis Bacon, *New Organon* (1620), Part 1, secs. 1-65 (TritonEd)

January 18 Scientific Methods
Reading: Bacon, *New Organon*, Part 1, sec. 92-117 (TritonEd)

Week 3
January 21 MLK DAY – No Class

January 23 Galileo's Challenge to the Catholic Church
Reading: Galileo Galilei, excerpts from *The Sidereal Messenger* (1610) (TritonEd)

January 25 Reconciling Science and Religion
Reading: Galileo, *Letter to the Grand Duchess* (1615) (TritonEd)

Week 4
January 28 Galilean Science
Reading: Galileo, excerpts from *The Assayer* (Matthews, 56-61) and *Two New Sciences* (1638) (Matthews, 81-86)

January 30 Against Aristotle
Reading: Galileo, excerpts from *Dialogue concerning the Two Chief World Systems* (1632) (Matthews, 61-71)

February 1 The Tower Argument
Reading: Galileo, excerpts from *Dialogue concerning the Two Chief World Systems* (Matthews, 71-81)

UNIT 2 LAWS, CAUSES AND GOD

Week 5
February 4 Descartes's Project
Reading: René Descartes, *Discourse on the Method* (1637), parts 1-2, 4-5 (TritonEd); *Principles of Philosophy*, "Letter from the Author" (Matthews, 94-97)

February 6 Descartes on Matter and Motion
Reading: Descartes, *Principles of Philosophy* (1641), part 2, secs. 1-35; part 3, secs. 1-30 (TritonEd)

February 8 Descartes on Laws of Nature and Force
Reading: Descartes, *Principles*, part 2, secs. 36-64 (TritonEd)

Week 6
February 11 Experimental Philosophy
Reading: Robert Boyle, excerpts from *New Experiments Physico-Mechanical, Touching the Spring of the Air* (1660) (TritonEd)

February 13 The Mechanical Philosophy
Reading, Robert Boyle, excerpts from *The Excellency and Grounds of the Corpucular or Mechanical Philosophy* (1674) (Matthews, 109-23)

February 15 Self-Moving and Self-Knowing Matter
Reading: Margaret Cavendish, *Observations upon Experimental Philosophy* (1666), chap. 35 (TritonEd)

Week 7
February 18 President's Day – No class

February 20 Occasionalism
Reading: Nicolas Malebranche, *Search after Truth* (1674), bk. 6, pt. 2, chs. 3 and Elucidation 15 (excerpt) (TritonEd)

February 22 Against Final Causes
Reading: Benedict Spinoza, *Ethics* (1677), Appendix to Part 1 (TritonEd)

Week 8
February 25 The Invention of Modern Physics
Reading: Isaac Newton, Preface to the *Principia* (1687) (Matthews, 137-9) Definitions and Laws (TritonEd)

February 27 Space, Time and Force
Reading: Newton, *Principia*, Scholium (Matthews, 139-46); Part III, "Rules for Reasoning" (Matthews, 146-8)

March 1 Gravity and the Argument from Design
Reading: Newton, *Principia* (2nd edition), General Scholium (Matthews, 148-53); *Optiks* (1717), Query 31 (Matthews, 153-8)

UNIT 3 A SCIENCE OF HUMAN NATURE

Week 9
March 4 Naturalizing Human Beings
Reading: David Hume, Introduction to *A Treatise of Human Nature* (1739) (TritonEd)

March 6 Skepticism about Induction
Reading: *An Enquiry concerning Human Understanding* (1748), sec. 4 (TritonEd)

March 8 The Basis of Causal Reasoning
Reading: *An Enquiry concerning Human Understanding*, sec. 5 (TritonEd)

Week 10
March 11 Liberty and Necessity
Reading: Hume, *An Enquiry concerning Human Understanding*, sec. 8 (TritonEd)

March 13 Animal Reason versus Scientific Reasoning
Reading: Hume, *Enquiry concerning Human Understanding*, sec. 9 (TritonEd)

March 15 Review

Monday, March 18 FINAL EXAM, 11:30 am-2:30 pm