HSCI 3013-001: History of science to the age of Newton, Fall 2012

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The class meets on Monday, Wednesday and Friday from 11.30 a.m. to 12.20 p.m. in PHSC 416.

Introduction
This course will give insight into the way people in the past, roughly speaking from ancient
times to the seventeenth century, viewed nature and tried to understand and explain it. In most
cases, their ideas do not strike us as particularly “scientific”. Properly speaking, there was not
such a thing as modern science in this period. In investigating nature, people did not just come
up with different theories than the ones we are familiar with. They often were interested in
completely different things and asked questions to which our answers would not have made
sense.
The course offers not just a rehearsal of important discoveries - although these will inevitably
turn up - but also aims to give insight into the genesis of modern scientific thinking and modern
scientific practices. We are not just interested in how people found the “correct” answers, but
also in their own way of thinking and how it came about that our present theories make sense to
us at all.

General rules
Everyone is expected to keep up with the reading schedule and to participate in class discussion of
the reading. Exams are given both over the assigned readings and over the information the instructor
gives in class. If the students have missed a class, it is their responsibility to find out what has been
taught or announced.
Messages will be send to your OU email account. If you do not use that account normally, please
arrange for emails to be forwarded from that account to the one you use.
It is the policy of the university to excuse the absence of students that result from religious
observances and to provide without penalty for the rescheduling of examinations and additional
required class work that may fall on religious holidays. Please see me in advance.
Any student in this course who has a disability that may prevent him or her from fully
demonstrating his or her abilities should contact me personally as soon as possible so that we can
discuss accommodations necessary to ensure full participation and facilitate your educational
opportunities.
Evaluation
There are 500 points to be earned in this course, in the following way:
Quizzes: 150 points
First (short) essay: 50 points
Two main essays, 100 points each: 200 points
Final exam: 100 points
Quizzes will be on a weekly bases, with in principle 10 points for each quiz.
Instructions for essays will be given with the assignment of the first essay. Students can ask to
remake one essay if they feel they have performed below their capabilities. (This does not hold if
no serious effort has been made in the first place.)
The final exam is a take-home exam.

Class readings. The following readings have been put on D2L or are available online:

- Peter Harrison, ‘Fixing the meaning of Scripture. The Renaissance Bible and the origins of
- Isaac Newton, The mathematical principles of natural philosophy, translated by Andrew Motte
  and Florian Cajori (Berkeley 1966) xx-xxxiii (preface by Cotes), 543-547 (general scholium).
  (Xenophanes).
  (Evanston, Ill. 1963) 113-137.
- Plato, from the Republic, in: Plato, Apology, Crito, Phaedo, Symposium, Republic, translated
- Aristotle, Physics, translated by Ph.H. Wicksteed and F.M. Cornford (Cambridge, Mass. and
  original edition 1851).
- Plutarchus, Life of Marcellus, chapter 14-19.
- Edward Grant, Physical science in the Middle Ages (New York etc. 1971) 20-36.
- Robert Bartlett, The natural and the supernatural in the Middle Ages (Cambridge 2008) 111-
  148.
- The letter of Petrus Peregrinus on the magnet, A.D. 1269, fr. Arnold ed. (New York 1904) 1-
  21.
- S.J. Linden ed., The alchemy reader. From Hermes Trismegistus to Isaac Newton (Cambridge
- Nicolaus Copernicus, On the revolutions: http://www.webexhibits.org/calendars/year-text-
  Copernicus.html.
- William Gilbert, De magnete, translated by P. Fleury Mottelay (New York 1958) 22-27, 64-71,
  308-312.
William Harvey, *An anatomical disputation concerning the movement of the heart and blood*, translated by G. Whitteridge (Oxford etc. 1976) 74-77, 100-105.
- René Descartes, *The world*, chapters VI and VII
- Anoni van Leeuwenhoek, *Alle de brieven*, I (Amsterdam 1939)
- Christiaan Huygens, On the motion of bodies from impact
(http://www.princeton.edu/~hos/Mahoney/texts/huygens/impact/huyimpact.html.)
- Isaac Newton, New theory of light and colors
(www.newtonproject.sussex.ac.uk/texts/viewtext.php?id=NATP00006&mode=normalized)

*Reading schedule*. The schedule is subject to modification

| Aug  | 20   | Introduction                             |
|      | 22   | Harrison, Fixing the meaning of scripture; Physiologus |
|      | 24   |                                          |
| 27   | Newton, Principia                         |
| 29   | http://www.newtonproject.sussex.ac.uk     |
| 31   |                                          |
| Sept | 3    | (Labour day, no class)                   |
|      | 5    | Barnes, Early Greek philosophy; **First (short) essay due** |
|      | 7    | Hippocrates, Sacred disease              |
|      | 10   | Plato, Republic                          |
|      | 12   | Epicurus, Letter to Herodotus            |
|      | 14   |                                          |
|      | 17   | Aristotle, Physics                       |
Aristotle, on animals

Hero, Pneumatics; Plutarch, Life of Marcellus

http://people.sc.fsu.edu/~dduke/models.htm

Grant, Physical science in the Middle Ages

Bartlett, The natural and the supernatural

Peregrinus, On the magnet

Book of secrets

Avicenna, from The alchemy reader.

Second essay due

Copernicus, On the revolutions

Gilbert, On the magnet

Harvey, Motion of heart and blood

Van Helden, Instruments

Galileo, Starry messenger

Finocchiaro, Galileo affair

Descartes, World

Fontenelle, Conversations on the plurality of worlds
12 Leeuwenhoek, Letters on Spermatozoa
14 Huygens, On the motion of bodies from impact
16 (t.b.a.)
19 Third essay due
21, 23 (Thanksgiving Holiday, no class)
26 Newton, theory of light and colors
28
30
Dec 3 t.b.a.
5 t.b.a.
7 t.b.a.