HSCI 3013-001: History of science to the age of Newton, Spring 2013

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The class meets on Monday, Wednesday and Friday from 9.30 to 10.20 a.m. in Adams Hall 304.

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 class, in the following way:
First (short) essay: 50 points
Three essays, 100 points each: 300 points
Final exam: 100 points
Class participation: 50 points
Instructions for essays will be given in class and with the assignment for the first essay. Please read them carefully. Students can ask to remake one essay if they feel they have performed below their capability. (This does not hold if no serious effort has been made in the first place.) Quizzes may be asked in class on an irregular basis. In order to get the 50 points for class participation, students have to make at least 2/3 of the quizzes.
The final exam is a paper on a chosen topic, which has been prepared and discussed in class. Specific instructions and information on grading will be given in due time.

Class readings. The following readings have been put on D2L:

- William Harvey, *An anatomical disputation concerning the movement of the heart and blood*, translated by G. Whitteridge (Oxford etc. 1976) 74-77, 100-105.
- Isaac Newton, New theory of light and colors (www.newtonproject.sussex.ac.uk/texts/viewtext.php?id=NATP00006&mode=normalized)

*Reading schedule*. The schedule may be subject to modification.

Week 1. Introduction

Jan 14 Introduction

16 Descartes, *The world*

18

Week 2-5. Science in antiquity

21 (Martin Luther King Day, no class)

23 Barnes, *Early Greek philosophy*

25 Burkert, *Pythagoreanism*

28 Plato, Republic. **First (short) essay due.**

30 Plutarch on Archimedes

Febr 1

4 *Hippocratic writings*

6 Aristotle, *Historia animalium*
Aristotle, *Meteorology*

Aristotle, *Physics*

Hero, *Pneumatics*

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

Week 6. Science in the Islamic world

18 Islamic science: reading t.b.a. **Second essay due**

20 Islamic science: reading t.b.a.

22 Islamic science: reading t.b.a.

Week 7. Science in medieval Europe

25 Bartlett, *The natural and the supernatural*

27 Peregrinus, *Letter on the magnet*

Mar 1

Week 8-9. Astronomy and science in the Renaissance

4 Copernicus, *On the revolutions*

6

8

11 Harvey, *Movement of the heart*

13 Gilbert, *On the magnet*

15 Van Helden, Instruments

18-22 (Spring vacation, no class)

Week 10. Galileo

25 Galileo, *Starry messenger*. **Third essay due**
Week 11. Descartes and mechanical science

Apr  1  Descartes, *World*; Fontenelle, *Plurality of worlds*

3  Leeuwenhoek, *Letters*

5

week 12-13. Newton and Newtonianism

8  Newton, *Mathematical principles*

10  http://www.newtonproject.sussex.ac.uk

12

15  Newton, *New theory of light and colors*

17

19  **Fourth essay due**

Week 14. Individual projects

22  t.b.a.

24  t.b.a.

26  t.b.a.

29  finals preparation week

May  1  finals preparation week

3  finals preparation week