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.

The best way to get some idea of how ideas on the world have changed, is to read the original sources. Consequently, much of the time we will be reading and discussing texts of the period - works by Aristotle, Galileo, Newton, and others. The readings chosen for this course do not require any advanced mathematical or technical knowledge. Still, the way authors in the past used to argue their cases appears often unfamiliar to a modern reader and some of these texts may appear challenging. They have to be studied, not just read cursorily. It is important that you prepare well, pay close attention in class, and ask questions when you do not quite follow.

At the end of this course, you will have a general idea not just of how modern scientific ideas and practices emerged, but also how such theories were dependent on people’s basic preconceptions of the world, and how these changed. Moreover, you will have some idea how our knowledge about these developments is based on our reading of the ancient documents.

Some general rules

Everyone is expected to attend lectures, to keep up with the reading schedule, and to participate in class discussion of the reading. The information given during class lecture is vital for understanding the readings. If the students have missed a class, it is their responsibility to find out what has been taught or announced.

Messages will be sent 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.

As a matter of course, students are to abide by the rules of academic integrity; see http://integrity.ou.edu/students.html. More details will be given with the first essay assignment.

**Evaluation**

In this course, you are not asked to memorize facts. Assessment will be by take home essays or open book exams. Essay assignments will normally require that you analyze some of the course readings with the help of the information provided in the course lectures. That is, you are not supposed to look for outside sources. You have to demonstrate that you are able to make sense of the course readings and explain them in their relevant context.

There are 500 points to be earned in this class, in the following way:
- Three essays, 100 points each: 300 points
- Final exam: 100 points
- Class participation, quizzes: 100 points

Students can redo one essay if they feel they have performed below their capabilities. This does not apply if no serious effort has been made in the first place.

Quizzes will normally be assigned over the reading for the next meeting and have to be turned in in writing before that class begins. Unless otherwise stated, they will count for ten points each. Although there will be more than ten quizzes, 100 points is the maximum. If students turn in more quizzes, the ten highest will count.

**Class readings**

There is no required text book on the content of which you will be examined. Still, it is recommended to use a textbook when preparing your work. It will give you better background knowledge and will help you to get names and dates correct, especially on topics that otherwise have only been discussed in class lectures. A list of possible textbooks will be made available in the first weeks of class.

The following readings have been put on D2L or are accessible online:
- Euclid’s Elements, Thomas Heath transl., Dana Densmore ed. (Santa Fe 2003) 1-3.
- Plutarch’s lives, translated by Aubrey Stewart and George Long, II (London 1914) 45-51 (Life of Marcellus, chapter 14-19).
- 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 is open to modification.

Aug 23 Introduction
1. NATURAL PHILOSOPHY

25  Cotes, preface
31  Descartes, The world

Sept 1  Descartes, Treatise on man
6   Aristotle, Physics
8   Hippocratic writings: Treatise on man, sacred disease
13  Lloyd, Appearance versus reality
15

2. MATHEMATICAL SCIENCES

20  Euclid; Asper, Two cultures; FIRST ESSAY DUE
22  Plutarch on Archimedes; Hero, Pneumatics
27  Plato, Republic
29  Astronomical models: http://people.sc.fsu.edu/~dduke/models.htm

Oct 4  Copernicus, Revolutions
6   Kepler, Secret of the universe
11  Galileo, Starry messenger
13  Galileo, Diaologue

3. OBSERVATIONS AND EXPERIMENTS

18  Aristotle on animals; Hippocratic writings, The heart. SECOND ESSAY DUE
20  Ibn Al-Haytham, Optics
25  Peregrinus, Letter on the magnet; Principe, Secrets of alchemy
27  Van Helden, Instruments; Harvey, Motion of the heart

Nov 1  Leeuwenhoek, Letters
3  Newton, New theory of light and colors

4. SCIENCE AND RELIGION

8  Bartlett, The natural and the supernatural; THIRD ESSAY DUE
10  Finocchiaro, Galileo affair
15  Spinoza, On miracles
17  Newton, General Scholium
22  Newton Project (http://www.newtonproject.sussex.ac.uk)
24  (Thanksgiving holiday, no class)
30  TBA

Dec  1  TBA

6   (finals preparation period)
8   (finals preparation period)