

## LBCL 394

# History of Science: From Antiquity to the Renaissance

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A pattern of non-attendance can result in a failing grade. Assignments are **DUE IN CLASS, IN PRINT**. Assignments submitted late (i.e. after the scheduled class) will be penalized one letter-grade per day (i.e., an "A" becomes "A-"), or one half letter-grade if submitted ANY time after class but before the next calendar day. In accordance with College and University regulations, plagiarism is strictly prohibited and can result in serious sanctions. Students should familiarize themselves with the code of rights and responsibilities of the university: <http://concordia.ca/vpirsg/documents/policies/BD-3.pdf>

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**Course description:** This course presents a brief survey of natural philosophy from the ancient Greeks to Copernicus by a close reading of select primary sources.

**Evaluation & Term Work:** The final grade will be based on the following scheme:

- 10% Participation
- 40% Two short papers (20% each)
- 10% Reading Quizzes
- 40% Final Examination
- Participation (10%): Students are expected to participate in the discussion of the reading assignments. This is NOT a grade *merely* for attendance.

Reading Quizzes (10%): There will be ten (10) reading quizzes (1% each) throughout the term given at the **beginning** of class. These will consist of 5-10 simple questions (such as fill-in blank or multiple choice) based on the reading for the day.

Short Papers (40%): Students are required to submit two short papers approximately four (4) pages (double-spaced, 12p font) in length. A list of short essay questions is found below. Essays are to be based solely on the primary source reading of the course; no additional research or sources are needed or recommended. These essay questions can also serve as final examination study questions.

Final Examination (40%): The final examination, scheduled in the regular examination period, will be comprehensive.

Texts: Plato's *Timaeus* (Hackett Publishing) is available in the LAC and Webster libraries and the bookstore. The remainder of the material will be shared electronically.

### Course Calendar/Reading Schedule

*Chapters/Sections in square brackets are for particular emphasis in your reading*

#### Introduction: the Origins of Natural Philosophic Inquiry

- ▶ **Tuesday Sept. 5:** Introduction; Ancient Civilizations and the Greek Enlightenment/Presocratics

#### 1. Plato and Cosmic Origins

- ▶ **Thursday Sept. 7:** Plato, *Timaeus* (17a-27b)
- ▶ **Tuesday Sept. 12:** Plato, *Timaeus* (27b – 47e)
- ▶ **Thursday Sept. 14:** Plato, *Timaeus* (48a – 69a)
- ▶ **Tuesday Sept. 19:** Plato, *Timaeus* (69b-92c)

#### 2. Aristotle's Natural Philosophy

- ▶ **Thursday Sept. 21:** Aristotle, *Physics*, Book II, Chs. 1-3, 7-9
- ▶ **Tuesday Sept. 26:** Aristotle, *The Parts of Animals*, Part I
- ▶ **Thursday Sept. 28:** Aristotle, *On Generation and Corruption*, Book I [Chs. 4, 9, 10]
- ▶ **Tuesday Oct. 3:** Aristotle, *On Generation and Corruption*, Book II [Chs. 1-3, 8, 10]
- ▶ **Thursday Oct. 5:** Aristotle, *Physics*, Book IV [Chs. 4, 6-7, 11, 12]

**\*\*\*FALL BREAK\*\*\***

- ▶ **Tuesday Oct. 17:** Aristotle, *On the Heavens*, Book I [Chs. 2, 3, 8, 9]
- ▶ **Thursday Oct. 19:** Aristotle, *On the Heavens*, Book II [Chs. 3, 4, 7, 9-11, 13-14]
- ▶ **Tuesday Oct. 24:** Aristotle, *Physics*, Book VIII [Chs. 1, 4-5, 9, 10]; *Metaphysics* XII, Chs. 6, 7

**\*\*\*\*First Short Paper Due\*\*\*\***

#### 3. Foundations of Ancient Medicine

- ▶ **Thursday Oct. 26:** Hippocratic Writings: *The Oath; Science of Medicine; The Nature of Man; The Sacred Disease & Tradition in Medicine*
- ▶ **Tuesday Oct. 31:** Galen, *My Own Books, The Order of My Own Books, The Best Doctor is Also a Philosopher, The Best Constitution of Our Bodies*

#### **4. Roman and Hellenistic Natural Philosophy**

- ▶ **Thursday Nov. 2:** Euclid, *Elements*, Book I [1, 2, 4, 13, 14, 31, 41, 47]
- ▶ **Tuesday Nov. 7:** Pliny, *Natural History*, Book II “Astronomy” & Book VIII “Land Animals”
- ▶ **Thursday Nov. 9:** Ptolemy, *Almagest*, Book I.1-9; VII.4, IX.1

#### **5. Natural Philosophy and Medieval Theology**

- ▶ **Tuesday Nov. 14:** Al-Kindi, *The Explanation of the Proximate Efficient Cause For Generation and Corruption*
- ▶ **Thursday Nov. 16:** Maimonides, *The Guide of the Perplexed*, Book II, Chs. 13-24 [Chs. 13-18]
- ▶ **Tuesday Nov. 21:** Albertus Magnus, *On Animals*, Book I, Tract I, Chs. 1-4
- ▶ **Thursday Nov. 23:** Albertus Magnus, *On Animals*, Book I, Tract I, Chs. 5-8

#### **6. Medieval Physics and Renaissance Astronomy: The Copernican Revolution?**

- ▶ **Tuesday Nov. 28:** Nichole Oresme and John Buridan, Excerpts on Motion & Diurnal Motion [Buridan, “Impetus Theory of Projectile Motion”]

\*\*\*\* *Second Short Paper Due*\*\*\*\*

- ▶ **Thursday Nov. 30:** Copernicus *On the Revolution of the Celestial Spheres*, Book I.1-12.

## Essay Questions

### 1<sup>st</sup> Paper (due Oct. 24<sup>th</sup> in class)

*Plato*

- Why does Timaeus call his account of the origins of the world is only a “likely tale”?
- Why does the *Timaeus* end in a moral lesson to order the soul? What has this to do with the cosmos?
- How in Timaeus’ account is the cosmos made according to Intellect?
- Why must Timaeus introduce the effects of Necessity into his account of cosmic origins?
- What role do the “Platonic solids” play in Timaeus’s account of Necessity?

*Aristotle*

- Why in Book II of Aristotle’s *Physics* is the final cause “prior” to the other three in understanding the causes of change?
- In *The Parts of Animals*, how does the “final cause” help us understand living things?
- In *On Generation and Corruption*, why does Aristotle distinguish actual from potential?
- In *On Generation and Corruption*, how do the simple elements relate to the elementary qualities, and how do they together help understand change?
- Why for Aristotle, in Book IV of *Physics*, is there no “void” or empty space?
- In *On the Heavens*, Book I, why does Aristotle argue that the heavens are one and eternal?
- In *On the Heavens*, Book II, why does Aristotle argue that the earth is a sphere at the centre of the cosmos?

### 2<sup>nd</sup> Paper (due Nov. 28<sup>th</sup> in class)

- For the **Hippocratic writings**, why is medicine a science? What is it a knowledge of?
- Why, for **Galen**, is the best doctor also a philosopher? Consider more than one text in your answer (i.e., not only the text by that title).
- How is **Euclid's** Elements (Book I) a model of good reasoning?
- What is the significance of **Pliny’s** treatment of “land animals” for natural philosophy?
- Why for **Ptolemy** does the Earth rest immobile at the centre of the cosmos?
- How is **Al-Kindi's** The Explanation of the Proximate Efficient Cause indebted to Aristotle?
- Why the eternity of the world such an important topic for **Maimonides**?
- What is **Albertus Magnus’s** purpose in writing *On Animals*?
- What criticisms did **Jean Buridan** and **Nichole Oresme's** writings on locomotion and/or earthly rotation have for Aristotle's physics? What are the implications?