Astronomy Before the Telescope
Outline Syllabus

Instructor:
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Course Description:
This course provides an introduction to the history of astronomy from ancient times down to the invention of the telescope, focusing on the development of astronomy in Babylon, Greece, China, the medieval Islamic world, and Europe. The course will cover topics such as the invention of the zodiac, cosmological models, early astronomical instruments, and the development of astronomical theories. We will also explore the reasons people practiced astronomy in the past. No prior knowledge of astronomy is needed for this course.

Course Aims:
The course has two principal aims:

- To introduce students to the history of astronomy in the ancient and medieval world and to explore its heritage in different cultures.
- To encourage students to think about science as a global phenomenon.

Course Objectives:
By the end of the course students should be able to:

- Identify the key stages in the development of astronomy as a science.
- Understand the cross-cultural transmission of scientific ideas and theories.
- Explain basic astronomical and cosmological ideas developed in the ancient and medieval world.
- Explain the relationship between astronomy, astrology and society in early cultures.

Assessment:

Weekly short questions (due Tuesdays 10am)	30%
Midterm exam (23 October)	30%
Final Exam (20 December)	40%

Reading List:

John M. Steele, *A Brief Introduction to Astronomy in the Middle East* (London-San Francisco-Beirut: Saqi Books, 2008). ISBN 978-0863564284. Paper $11.95.

Class Outline:

Lectures	Subject
1	Introduction. Basic astronomical phenomena. Prehistoric astronomy
2–6	Mesopotamia: Skywatching, omens and the birth of astronomy; the development of the idea of astronomical prediction; observational techniques and methods; the development of the first astronomical theories.
7–8	Egypt: The Egyptian calendar; Egyptian views of the sky and the cosmos; star clocks.
9–12	Ancient Greece: Early cosmological ideas; the earth-centered universe; Hipparchus and the application of geometry to astronomical prediction; Ptolemy and the culmination of Greek astronomy; "other" astronomies – the Antikythera Mechanism.
13–14	The Islamic World: The assimilation of Greek astronomy into Islamic science; astronomy and society: prayer times, the *qibla*, and the calendar; developments in astronomical theory; the astrolabe and other instruments.
15	MIDTERM
16	The Islamic World (continued)
17–20	China: Origins of Chinese astronomy; the official nature of astronomy in China; astronomical observations and their astrological and political uses; astronomical instruments; astronomy and the calendar; the decline of Chinese astronomy and the coming of the Jesuits.
21–24	Renaissance Europe: Building on the Islamic astronomical heritage; Copernicus and the sun-centered universe; Tycho Brahe and precise astronomical observation; Galileo and the church; Kepler and the beginning of modern astronomy.
25	Mesoamerica: Mayan astronomy and calendars; astronomy and the landscape
26	Conclusions & review: Transmission of scientific knowledge from culture to culture; astronomy and world heritage.