

Astronomy 1102/1104
Study Guide for Exam 1

9 February, 2009

The actual exam will consist of 40 multiple choice questions. An exam consisting of short-answer and essay questions would be preferable, but grading it quickly in a class this size is not practical. If the exam were to take this form, it would include questions like those below. Your textbook provides excellent questions at the ends of the chapters. If you can answer those questions and the ones below, then you have mastered the material.

Explain why science is better described as a process instead of a body of knowledge.

What is a scientific theory?

How do scientists choose among competing hypotheses?

Have scientific laws been proven? Explain.

What needs drove the development of astronomy in the earliest stages of human civilization?

How did Mesopotamian and Greek astronomy differ, and why?

How and why did Mesopotamian civilizations develop astrology? How did this spur the development of astronomy?

Given a latitude on Earth:

What is the altitude of the celestial pole above the horizon?

How high above the horizon is the celestial equator where it crosses the meridian?

How high does the Sun get on the longest day of the year? The shortest?

Describe the path of the Sun with respect to the background stars. What are the key points along this path, and how are they related to the seasons?

What causes the seasons? Use the modern view of the Solar System to explain.

Describe and explain the phases of the Moon as it completes one orbit around Earth.

What circumstances produce a lunar eclipse? A solar eclipse?

Describe the motion and behavior of a superior planet with respect to the background stars.

What is an arche? Give some historical examples of attempts to identify it.

How do we know the Earth is spherical? Give five arguments.

What did Eudoxus contribute to astronomy?

How are the accomplishments of the following philosophers relevant to this course?

Thales
Pythagoras
Plato
Aristotle

How did Hellenic and Hellenistic astronomy differ?

How did Eratosthenes measure the circumference of the Earth?

Explain how Aristarchus estimated the relative distances of the Sun and Moon. Why was his estimate inaccurate?

What other measurements did Aristarchus make?

What are the tools that Ptolemy used to model the motions of the planets? How did he apply them?

How are astrological beliefs tied to a geocentric model of the Solar System?

Describe the following models of the Solar System. How do they account for the behavior of the planets? What do they fail to explain?

The geocentric model of Aristotle
The geocentric model of Ptolemy
The heliocentric model of Copernicus

Compare the Ptolemaic and Copernican systems in terms of the accuracy of their predictions and the ease of computation. What arguments led some people to support the Copernican system?

What happened when the lost Greek classics were reintroduced to Medieval Europe?

How did Aristotle's world view become dogma?

List Galileo's key observations and how they contradicted prevailing beliefs about the heavens and Earth.

What were Tycho Brahe's biggest contributions to astronomy?

Describe Kepler's Laws.

Describe Newton's Laws of Motion.

Describe Newton's Law of Universal Gravitation

How was Neptune discovered?