Astronomy 101 **14 September, 2016**
Study Guide for Mid-term Exam 1

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 that longer 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 to be true? 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?
- What does the daily motion of the Sun look like on those days?

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 the Earth. When does the Moon rise and set depending on its phase?

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 two historical examples of attempts to identify it.

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

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

- Thales
- Pythagoras
- Plato
- Aristotle

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

What other measurements did Aristarchus make?

How did Eratosthenes measure the circumference of the Earth?

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.
- The heliocentric model as modified by Kepler and Newton.

How did the Muslim world contribute to the development of astronomy?

What happened when the lost Greek classics were reintroduced to 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.

How did Aristotle's and Newton's physics differ?

Describe Newton's Law of Universal Gravitation.

How was Neptune discovered?

What does Einstein's Theory of General Relativity tell us about laws and theories?