

# Test Two Preview

## AST 105 Life in the Universe

Refer to the start of the Preview Sheet for Test 1 for general study advice.

This test material starts with (blue Course Outline) Unit IX, “The Cosmic Perspective.” This Unit comprises Sections A-C. (The Solar System, Cosmic Perspective—Space, Cosmic Perspective—Time) The test goes on to cover all Units up to Unit XIV, “The Lives and Importance of Stars.”

The “description” material in Unit IX, Section A, is entirely descriptive. You are only working at the memorization level here. You may be queried on any of the material in this section, tho note particularly the size and distance values of the planets given in basic data. These are the numbers that most quantify your general visualization of the Solar System.

Section B, cosmic perspective, deals with space and distances here, and may introduce a few terms relating to the hierarchical structure of the universe, so know them. Remember Powers of Ten from the Web? Watch it again, if you wish, by clicking [here](#).

Section C, more cosmic perspective, deals with time here. Here you’re given some historic background (Who was Bishop Ussher; what did he do?).

Understand the examples given for determining relevant and absolute age dating. Be prepared to determine the age of a rock on the test using radiometric age dating. What were those two astrophysical determinations of the age of the solar system that conform with the results of radiometric age determinations?

### Unit X: Galaxies

Be familiar with the size and shape of our Milky Way Galaxy.

Know the names of the galaxy types; be able to describe them. Be able to say which is/are most conducive to life.

### Unit XI: The Universe—nature and origin

This unit is presented in detail in your blue course outline. There are two very important understandings involved regarding the Big Bang theory.

- The Big Bang is one of the greatest theoretical insights of science. When understanding theories, it is imperative to be familiar with their evidential basis. So note well the lines of evidence that point toward this theory.
- The theory was presented as a process, so know the various stages in the process from the start to the widespread development of galaxies.

## Unit XII: Star basics

Memorize the spectral classification sequence from O to T.

Know the H-R DIAGRAM's axes and where in the diagram the following are positioned: main sequence, red giants, white dwarfs, sun

Double stars - know the following terms

- physical vs. optical
- visual binaries
- spectroscopic binaries
- the Doppler effect---Be ready to calculate the radial velocity of a star, given the equation for doing it.
- astrometric binaries

And what benefits to astronomical understanding do double stars offer?

Do you understand how star mass determines the star luminosity?

Regarding Stellar Populations, just know the relation between chemical composition and age.

## Unit XIII: Star & Planet Formation

Focus on the terms: yin and yang, nuclear fusion, nucleosynthesis.

In the Pre-main sequence phase, know the sequence of steps of the origin of stars and planets we covered in class. What is the condensation sequence? See how today's solar system is directly connected to its origin.

## Unit XIV: Stellar Evolution

What do all stars do while in the main sequence phase? How does Einstein's  $E = mc^2$  apply?

What do stars do following the main sequence stage? (Break up into low and middle -mass stars and high mass stars.) What can massive stars (greater than several solar masses) do that less massive stars can't? What makes it difficult for the high mass stars to support life?

What are white dwarfs, neutron stars, black holes? What probability for life do we expect for life on planets around them?

Of course, know the three astrobiological impacts of stars.

**Regarding the textbook**, my hint is the same for all tests. Any homework question and problem is fair game to ask on the test.