

ESC 1000: Introduction to Earth Science

Study Guide for Lectures 19-22

Note: this study guide lists topics covered in lectures 19-22 (Oct 13 – Oct 22). It is not intended to replace going to lecture or doing the readings, rather, it serves largely to alert you to the important topics covered in these lectures that will likely be covered on the exams. The topics listed are non-exclusive, that is, there will be other material in the lectures that you are likely responsible for learning. Make special note of the vocabulary lists...there is a lot of terminology in this class that you will need to learn. Your textbook has a glossary that should be helpful.

Lecture 19 (Formation of Universe; Oct 13):

Where is Earth with respect to rest of universe?
How do we represent distances in the universe?
What are the main properties of waves, and how are they related to each other?
What is the Doppler Effect, and how is it important to our understanding of the universe?
What is the sequence and general timing of events following the Big Bang?
How and when did our solar system form?
Why are planets round?
How and when did Earth's moon form?

Vocabulary: solar system, galaxies, universe, light year, wave, wavelength, frequency, Doppler Effect, light waves, Edwin Hubble, red shift, Big Bang, nebular hypothesis, solar nebula, planetary nebula, centrifugal force

Lecture 20 (Solar system; Oct 18):

Know the sequence of the planets!!
What are the main components of the solar system?
According to Bode's Law, where is there a planet missing in our solar system, and which one is not part of the pattern of the others?
What are the main features of the orbit path of the planets?
Which planets have unusual rotation?
What are the two main types of planets in our solar system, which planets are in each group, and what are the differences between these groups?
What are the main features of Earth's moon?
Know the main features of the planets discussed in class.
Know which bodies in our solar system have active volcanism.

Vocabulary: planet, asteroid, comet, meteoroid, orbit, rotation, Jovian planet, Terrestrial planet, lunar maria, lunar highlands, asteroid belt, Great Red Spot, Gallilean moons

Lecture 21 (meteorites; Oct 20):

Why do we study meteorites so intensely?

Where do meteorites come originate?

What are the main types of meteorites, what do they represent, and what are their main features?

How do we tell that a rock is a meteorite?

How big does a meteorite have to be initially to do damage?

Know the main events and phenomena associated with the formation of Barringer (Meteor) crater in Arizona.

How do we identify impact craters in the geologic record?

What do meteor showers represent?

How have meteorite impact rates varied through time?

On average, how often does a meteorite large enough to cause major destruction (a “global killer”) strike the earth?

Vocabulary: meteors, meteoroids, meteorites, Widmanstätten patterns, chondrule, regmaglypt, fusion crust, impact crater, shocked quartz, tektites, impact breccia, shattercone,

Lecture 22 (Mars; Oct 22):

What is life, what does it require, and how do we recognize it?

What are the main features of Mars?

How was Mars different earlier in its history than the planet we see today, and what are the implications of this for past life on Mars? Pay special attention to the evidence of the past nature of Mars.

What is the nature (i.e., rock type) of Martian meteorites, and how do we know that they are Martian?

Know the main features of meteorite ALH84001.

What evidence did Kay et al. present to suggest evidence for fossil life in ALH84001, and what are the arguments against this evidence?

Vocabulary: Valles Marineris, Tharsis Graben, Hesperia Planum Ridges, Olympus Mons, SNC, polycyclic aromatic hydrocarbon (PAH)