

ESC 1000: Introduction to Earth Science

Study Guide for Lectures 7-10

Note: this study guide lists topics covered in lectures 7-10 (Sep 8 – Sep 15). 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 7 (Gemstones; Sep 8):

What properties make some minerals valuable as gemstones?

What causes coloration of minerals/gemstones?

Which gemstone discussed is not a mineral?

Gemstones: quartz gems, opal, ruby, sapphire, emerald, aquamarine, topaz, tourmaline, nephrite, jadeite, turquoise, peridot, garnet-for these, know what the mineral name/type is if given (including which ones are just different colorations of the same mineral), the geologic environment (if given), and the main geographic sources

What are pegmatites, and why are they good environments for gem formation?

Which gemstones are common rock-forming minerals?

Vocabulary: hardness, transparency, color, reflectance, defects, impurities, microcrystalline, asterism, pegmatite, igneous, irradiation, heat treatment,

Lecture 8 (Diamonds; Sep 10):

What properties make diamonds so special?

What are diamonds used for?

What conditions are required for diamonds to form, and what parts of the earth do they come from?

Why are kimberlites important for finding diamonds?

How old are diamonds?

What are the most important diamond mining regions/countries?

Where are gem grade diamonds found in the U.S/North America?

What are the four “C’s” of diamond buying?

Vocabulary: refractive index, dispersion, luster, kimberlites, eclogite, carat, karat,

Lectures 9-10 (Rock Cycle; Sep 13 and 15):

Know the rock cycle diagram printed below (you can bring it into class, we will use it as a basis for discussion and annotate it through the lecture).

What is a mass transfer cycle?

What are the reservoirs and processes of the rock cycle?

What are the two types of clues that we use to understand the origin of rocks (know specifically how these clues are used for the three main rock types; i.e., what type of information do they give us in each case?)? (NOTE-we will discuss this in detail for sedimentary and metamorphic rocks in these lectures; igneous rocks will be discussed in detail in Lecture 11)

What factors favor the melting of rocks?

Why does lava tend to rise through the crust?

What are the two main types of weathering, and how do they differ in terms of their effect on rocks?

How do sediments become sedimentary rocks (what are the factors involved)?

What are the two main types of sedimentary rocks, and how do they differ?

What is limestone, and how is it important to Florida?

What physical factors influence metamorphism?

What leads to heating of rocks during metamorphism?

What can we learn from foliation, which types of metamorphic rocks display it and which ones do not?

What can metamorphic zones tell us?

Vocabulary: mass transfer cycle, reservoir, processes of transformation and transportation, igneous rocks, sedimentary rocks, metamorphic rocks, sediments, magma, lava, melting, cooling, ascension, magma chambers, plutonic (intrusive) rocks, volcanic (extrusive) rocks, weathering, erosion, transport, deposition, mechanical weathering, chemical weathering, abrasion, unloading, frost wedging, thermal expansion, layers (beds), burial, lithification, compaction, cementation, detrital rocks, chemical rocks, limestone, coquina, chalk, strata, ripple marks, graded beds, mud cracks, fossils, sedimentary structure, sedimentary environment, metamorphism, contact metamorphism, confining pressure, differential stress, geothermal gradient, metamorphic textures, foliation, metamorphic zones, index minerals, regional metamorphism, uplift

