

Study Guide for Earth 002 Final Exam

Intro to Geosciences

- Identify & classify Earth systems: lithosphere, atmosphere, hydrosphere, cryosphere, and biosphere
- Use the density equation to calculate sample densities.
- Use the rate equation to answer simple word problems.

Imagery and Maps

- Know how to identify latitude/longitude and UTM coordinates.
- Draw the contour lines on a given map of point elevations.
- Know what is meant by contour intervals.
- Be able to calculate elevation differences between two places on a topographic map.
- draw a topographic profile from a topographic map
- recognize the profile of a valley created by a river and a valley created by a glacier.

Plate Tectonics

- list the 3 types of plate boundaries.
- explain on what types of plate boundaries we might find different types and frequencies of earthquakes, volcanoes, and mountains.
- know which type of plate boundary will experience the deepest earthquakes.

Earthquakes

- given a seismogram, be able to identify the P-wave, S-wave, and surface waves.
- distinguish between P-waves, S-waves, and surface waves in speed, movement, and types of material through which they can propagate.
- given a nomogram, be able to calculate the magnitude of an earthquake.
- explain how you would calculate the distance from a seismograph station to the epicenter of an earthquake.

Minerals

- You should be able to identify and answer questions about the hardness, cleavage, luster, color, and special properties (salty, fizzes, etc.) of the following minerals:

Calcite, Halite, Quartz, Biotite, Hornblende (Amphiboles), Augite (Pyroxenes), Galena, Pyrite, Hematite, Olivine

Igneous Rocks

- You should be able to identify the following rocks:

Granite, Diorite, Gabbro, Peridotite
Rhyolite, Andesite, Basalt
Pumice, Scoria, Tuff

- describe these rocks based on their textures (phaneritic, porphyritic, aphanitic, vesicular, glassy, pyroclastic), composition (felsic, intermediate, mafic, ultramafic), and location of formation (volcanic vs. plutonic).
- identify the main minerals in the phaneritic rocks (quartz, K-feldspar, light and dark plagioclase, biotite, amphibole, pyroxene, and olivine).

Surface Water Processes

- given multiple gradients or slopes of a river, recognize which is steep and which is gently sloping.
- relate erosive power to the slope of a stream.

Sedimentary Rocks

- You should be able to identify the following rocks:

Conglomerate, Breccia
Quartz sandstone
Shale
Limestone (all kinds)
Coal
Gypsum

- distinguish these rocks based on clast size
- know the difference between cobble, pebble, sand, silt, and clay.
- say whether a rock is clastic or chemical.
- identify the depositional environment for each of these rocks.

Groundwater

- given a contour map of water table depths, recognize which direction groundwater flows.
- determine whether a rock type is more or less likely to have groundwater flow through it.

Metamorphic Rocks

- You should be able to identify the following rocks:

Marble, quartzite
Slate, phyllite, schist, gneiss
Serpentine

- identify whether a rock is foliated or nonfoliated.

- be familiar with the different types of foliation discussed in class (e.g gneissic banding and schistosity).
- be able to name a protolith for the given rock

Geologic Time

- order the events of a sedimentary profile
- given information about a radioactive isotope, calculate how many half-lives have passed since crystallization of an igneous rock and/or calculate the age of the rock.

Structural Geology/ Geologic Maps

- recognize the different types of folds (anticline, syncline, plunging, and overturned) and faults (normal, reverse/thrust, and strike-slip).
- recognize a right-lateral and left-lateral strike-slip fault.
- complete a diagram of the cross-section or map-view of a fold or fault.

Climate

- Identify the consequences of global warming.
- Interpret graphs about climate change.