

Principles of Geology II

Study Guide for the 1st Hour Exam (to be held on February 18, 2009)

There will be 25 multiple-choice questions, 10 definitions, and one short-answer question. If you have been attending all classes and have taken good notes, then you will be quite OK. Pay attention to the concepts. Understand the important terms and illustrations in each chapter. Go over the review questions and the important terms at the end of each chapter in your textbook. Some of the questions will come from your textbook.

Here are some hints and ideas that you should know for the test:

The Universe and the Solar System

What is the purpose and scope of historical geology? What are the most important concepts in understanding the Earth's history (e.g. dynamism of the earth as revealed by plate tectonics, evolution, and vastness of geologic time, uniformitarianism, etc.)?

How was the Universe created? What are some evidences that support the Big Bang theory? What is the universe made of? What are the possible fates of the universe?

How was the solar system created? What processes are responsible for generation of the layered earth, atmosphere, oceans, and magnetosphere?

What are some basic differences between the terrestrial planets and jovian planets?

How was the Moon created? What are the major features observed on the Moon's surface?

Know the basic facts about the earth (e.g. thickness of the crust, lithosphere, asthenosphere, mantle, and core).

Know the basic facts (only the ones covered during the lecture) about each of the planets in the solar system (their position from the sun, shape, surface temperature, composition, atmosphere, land features, etc.).

Rocks and Minerals:

Know the difference between rocks and minerals. Understand the rock cycle. Know how do the igneous, metamorphic, and sedimentary rocks differ from each other.

Know examples of all major groups of minerals (e.g. silicates, carbonates, oxides, etc). Know the difference between (and examples of) ferromagnesian and non-ferromagnesian silicate minerals.

Know the names of (both plutonic and volcanic) major igneous rocks. How can you use the texture and composition (color) of igneous rocks to decipher the history of their formation?

Know the difference between foliated and non-foliated metamorphic rocks. Know how you can use the grade of metamorphism (high vs. low) and composition (e.g. either fizzes with HCl or not) of metamorphic rocks to determine their origin (regional vs. contact) and protolith (parent rock).

Why are sedimentary rocks important in studying of the earth history?

Know the processes that are responsible for generation of sedimentary rocks.

What can you tell about origin and travel distance of sedimentary rock by studying their texture (roundness, angularity, sorting, grain size) and composition?

What is facies analysis? What criteria are used in facies analysis? Know specific examples of sedimentary rocks that you would find in various environments of deposition.

What is Walther's law? Why is this law important in understanding sequences of sedimentary rocks? How can this be applied to decipher geologic processes (transgression/regression) in rock records?

Plate Tectonics - A Unifying Model:

Why is the concept of plate tectonics so vital in studying history of the Earth?

What is the difference between the concept of continental drift and plate tectonics?

What evidence was the concept of continental drift based on? What was the major flaw in this concept?

How did the discovery of sea-floor spreading, convection currents in the Mantle, and magnetic anomaly patterns observed on the ocean floor support the theory of plate tectonics?

What is polar wander curve? How do polar wander curves support the idea of plate tectonics?

What evidence did the ODP collect that support the concept of plate tectonics?

Know the major features are associated with three different type of plate?

How does the presence of hot spots verify the plate movement and their rates?