
GLG101: INTRODUCTION TO GEOLOGY I (PHYSICAL)
SPRING 2003
PROFESSOR MATT FOUCH

STUDY GUIDE FOR EXAM #4

In this part of the course, we covered the Chapters 17-23, except Chapter 20. We also covered the very basics of planetary geology. The most important facts and concepts for you to know and understand are listed below. The exam will be in-class, closed everything, with multiple choice and true/false questions. You will not be allowed to wear hats or sunglasses (unless prescribed by a doctor). Please remember to bring your ASU ID and a Number 2 pencil on exam day.

➤ **Streams and Floods: The Geology of Running Water (Chapter 17)**

- Know the various components of stream transportation (suspended load; dissolved load, bed load)
- What factors control stream velocity? (gradient, channel shape, size, roughness, discharge, sediment load)
- Know the relationship between velocity and deposition vs. erosion.
- Understand the transport processes of stream transportation (rolling, sliding, saltation, etc.)
- Understand the locations of erosion and deposition in river bends and meanders
- Be familiar with the changes in erosion and deposition when dams are built in drainage systems
- Understand the basic concepts of a flood frequency curve

➤ **Restless Realm: Oceans and Coasts (Chapter 18)**

- What is the cause of ocean tides on Earth?
- What is a tsunami?
- How hot are hydrothermal springs near a mid-ocean ridge?
- Know how seasonal changes affect beach profiles.

➤ **A Hidden Reserve: Groundwater (Chapter 19)**

- Know what powers the hydrologic cycle (solar energy)
- Understand the various regions in a rain shadow environment
- What is porosity? Permeability? How do they relate to groundwater movement?
- What rocks are highly permeable? What rocks are impermeable?
- How do springs form?
- What geologic feature causes geysers?
- What geologic process makes caves/caverns?

➤ **Dry Regions: The Geology of Deserts (Chapter 21)**

- What are the most important factors that cause a desert?
- Which desert are we located in?
- How does global air circulation relate to the cause of a desert?
- How do winds and streams differ in their ability to transport materials?
- Understand the transport processes of wind transportation (rolling, sliding, saltation, rolling)
- Know the various components of a sand dune (erosion and deposition areas, how shapes relate to wind direction)
- Know the various types of desert-related deposits (eolian, alluvial, evaporite)
- What is loess? Why do we care?

➤ **Amazing Ice: Glaciers and Ice Ages (Chapter 22)**

- What is a glacier?
- How are glaciers formed?
- How does a glacier move? Where is it fastest, slowest? Why?
- What are features caused glacial deposits? (e.g., drumlins, erratics, glacial till, moraines, striations)
- What is an ice age? When was the last one? What happens to the ocean during one?
- Where are the largest ice sheets of the world?
- Know some of the features caused by glaciers (cirques, horns, U-shaped valleys)

➤ **Global Change in the Earth System (Chapter 23)**

- What is the greenhouse effect?
- How are climate and plate tectonics linked?
- Know the effect of humans on global change:
 - global warming
 - ozone depletion
 - acid rain
- What are the 2 main extinction events we discussed in class?

➤ **Planetary Geology (Special Topic)**

- How much of the solar system's mass do the planets take up?
- How strong is the moon's gravity field relative to Earth? (1/6)
- Does Mercury have an atmosphere? (no)
- Which planet is most like Earth in relative size and density? (Venus)
- What is the composition of Mars' ice caps?
- How fast are Saturn's atmospheric winds? (up to 930 mph)