

CE 20500 Engineering Geology
Study Guide – Term exam #1 – covers material from lecture #1 to #8

Definitions to know:

Accretion (in terms of planetary formation)

S waves

P waves

Crust

Mantle

Core

Mantle plumes

Magnetic reversals

Rock

Mineral

Ionic and Covalent bonding

Crystalline

Unit cell, plane lattice, and space lattice

4 fundamental unit cell shapes

plane lattices

14 Bravais lattices

Cleavage

Fracture

Moh's Hardness Scale and what determines hardness of a mineral

What are silicates and the different types of silicates

Characteristics of sheet silicates (base exchange capacity, which sheet silicates can exchange interlayer cations, which sheet silicates can expand due to water adsorption)

What are oxides, sulfides, sulfates, carbonates

Igneous Rock

Magma

Lava

Eruption

Pyroclastic

Ash

Lapilli

Bombs/blocks

Intrusive

Extrusive

Phaneritic

Aphaneritic

Holocrystalline

Holohyaline

Hypocrystalline

Porphyritic

Phenocryst

Groundmass

Vesicle

Felsic
Mafic
Granite, Rhyolite
Diorite, Andesite
Gabbro, Basalt
Bowen's Continuous Series
Bowen's Discontinuous Series
Shield Volcanoes
Composite Volcanoes
Crater
Caldera
Cinder Cone
Dike
Sill
Batholith
Laccolith
Stock
Pluton
Volcanic Neck
Volcanic Pipe
Pahoehoe
A'a
Pyroclastic flow
Pyroclastic surge
Lahar
Nuee ardentes
Sediment
Clastic rock
Nonclastic rock
Clast
Detrital
Roundness/Angularity
Sphericity
Claystone, siltstone, sandstone, conglomerate, breccia, shales, coquina
Sorting
Porosity
Permeability
Types of nonclastic sedimentary rocks
Oolitic limestone
Lithification
Cementation

Concepts to know:

Principle of Uniformitarianism
Evidence for Big Bang
Formation of elements heavier than Fe

Why the terrestrial planets are different than the outer planets
How continents form (timeline from Earth formation)
General characteristics of the chemical composition, geophysical attributes, and mineralogy of Earth's crust, mantle, and core
What Banded Iron Formations tell us about the early atmosphere
How mineralogists classify minerals
Importance of gypsum and anhydrite to engineering
General composition (SiO_2 , FeO , MgO) of the common intrusive and extrusive igneous rocks
How water affects melting temperature of a rock
Partial Melting
Origin of basaltic, andesitic, and rhyolitic magmas and their characteristics
Bowen's Reaction Series and consequences of Bowen's Reaction Series
Bowen's Reaction Series and mineral stability
How shield volcanoes form
How composite volcanoes form
Hotspot theory of basaltic shield volcano formation
How caldera's form
How pyroclastic surges can form from pyroclastic flows
Characteristics of pyroclastic flows, surges, and lahars
Types of volcanic gases
Methods of volcano eruption prediction
Grain size of clastic rocks
How sorting can be used as a depositional indicator