**Geology 206 Study Guide for Final Exam**

Note: This is a summary of some of the highlight from lecture that may appear on this exam, but you should note that any subject that was covered in lecture may appear on the exam regardless of whether or not it appears on this study guide.

Chapter 1: Introduction- The Science of Historical Geology & 2: Fossils and Early geologists

 What is the age of: the Earth, the oldest rock, & the earliest evidence of life?

 What is a fossil and what is the earliest known evidence of life?

What were the main geologic contributions of: Steno, Smith, Hutton, Lyell, Darwin, Cope, & Marsh ?

 Know the principles of: Original horizontality, Superposition, Faunal succession Cross-cutting relationships, & inclusion

Chapter 3: Time & Geology: **Know names & order of the Eras and Periods in the Phanerozoic Eon & Dates for Eras**

Chapter 5 & Lab Handout on Sedimentary Rock ID: Know the major sedimentary rocks discussed in class & lab.

Know the depositions environments for rocks that display: mud cracks, ripple marks, ripple cross bedding, & red beds

Chapter 6: Know the basic ideas proposed by Darwin in his theory of Natural Selection

What is punctuated equilibrium vs. phyletic gradualism and Convergent Evolution and Divergent Evolution?

 What evidence does the fossil record provide for evolution?

 How do transitional forms, adaptive radiations, and microevolution support natural selections?

Chapters 8 & 9: Earliest Earth & the Proterozoic

 What 4 factors are needed for life as we know it to form?

 How did the Ocean’s form and how did the chemistry of early oceans & the early atmosphere differ from modern?

 How are *Banded Iron Formation & Continental Red Beds, Stromatolite related to O2* levels in the Atmosphere?

 How did organisms during the Archean and Proterozoic (ex. prokaryotes vs. eukaryotes & the appearance of metazoans?

 What was Rodinia and when did it form and break up?

**Terms to know:** *Ediacarn Fauna, Rodinia, Wilson Cycle*

Chapter 10: Early Paleozoic Events: What are *Transgressions* and *Regressions* and what type of rocks are associated with each?

 How was the climate Early Proterozoic different from modern?

Chapter 12: Know order and names of the taxonomic levels from domain to species

What was the “Cambrian Explosion” and how do geologists identify the base of the Cambrian boundary?

What was Burgess Shale? How did it form and what is its significance.

What did the 1st land plants evolve and what challenges did plants & animals have to overcome to adapt to life on land ?

To which taxa did the first land animals belong and which type of fish gave rise to the first land vertebrates?

How did land plants evolution affect: soil thickness, weathering rates, atmospheric gasses, global temp., & organic carbon burial?

Know the basic characteristic of the Phyla: Arthropoda, Mollusca, Cnidaria, & Chordata and the *Tetrapod, Synapsida, Diapsida*

**Mass Extinctions:** How many mass extinctions have there been?

How did the end-Devonian mass extinction differ from the others in timing and how might it be related to the evolution of plants?

How did the Permian-Triassic extinction differ from the others in scale and what has been proposed as the cause of it?

What % of species went extinct at the end of the Permian and then end of Cretaceous (which was bigger)?

What evidence supports the theory that a bolide (asteroid or comet) impact caused the dinosaur extinction?

What other factors may have contributed to the end-Cretaceous extinctions?

Chapter 11: Later Paleozoic Events When did Pangea assemble and how is it related to the formation of the Appalachians?

In what part of North America did the “Antler Orogeny” occur? / How did sea level compare to modern?

**Terms to know:** *Gondwana, Laurentia*

Chapter 13: Mesozoic Events When did Pangea break apart? / How did Mesozoic Sea Levels differ from modern?

What were the paleoclimatic conditions like during the Mesozoic? /What evidence is used to reconstruct Paleozoic climates?

Chapter 14: In what geologic period did the following groups evolve: Birds, Dinosaurs, Mammals, Pterosaurs.

In the Mesozoic, what taxonomic groups were dominant: on the land, the sea, and in the air? / What are the 2 groups of Dinosaurs?

What are the 2 theories about how vertebrate flight evolved and what evidence supports each? / What is the advantage of flight?

When did flowing plants (the Angiosperms) evolve and how did they affect CO2 levels?

Chapter 15 & 16: The Cenozoic: When and why did the Codillera and the Himalayan Mountains form?

How has mammalian diversity changed over the Cenozoic (including the end of the Pleistocene)? What causes have been suggested for the Pleistocene Extinction?