Geol 104 Geology of National Parks
Exam I Study Guide

Below is a list of topics you should understand after preparation for you first exam. These topics will be covered on the exam and you should use this list to guide and focus your studying. After studying ask yourself this question: Do I understand these topics? – Can you say something meaningful and in depth about each? If so, you should perform well on the exam.

I. Nebular Hypothesis
- Accretion of the planets in the solar system
  - Terrestrial vs. Giant planets: The effect of the thermal gradient and solar wind
  - Origin of Earth's water
- Magma ocean stage and formation of the Earth's core and mantle

II. Structure of the Earth
- Earth's Composition Layers
- Earth's Rheologic/mechanical Layers
- The nature of the boundaries between composition and rheologic layers in the Earth

III. Plate Tectonics
- Earthquakes and Plates
- Types of plate boundaries, Processes that act at plate boundaries, Results of those processes
  - Divergent, convergent and transform
  - Volcanoes and plate boundaries
  - Transform plate motions and Tuzo Wilson

IV. Mineralogy
- Definition of a Mineral
- Polymorphism
- Diagnostic mineral properties – what dictates the properities?
- General origins of minerals (three ways minerals form)

V. Rocks – what are they?
- Igneous Rocks: Origins, Intrusive vs. Extrusive,
- Sedimentary Rocks: Two basic types
- Rock types and 'corresponding' origin of minerals

VI. Crustal Provinces of North American Continent
- The origin of the North American continent and Pangaea
- The crustal provinces, their characteristics, and the processes that formed them

VII. Topographic and Geologic Maps
- What do they show and how do they show it
- How do river drainages indicate hill slopes?

VIII. Geologic Time: Absolute Age Dating
- Hutton, Uniformitarianism and an Old Earth
- Radioactive Decay: How does it work as a clock?
- Why can't all rocks be dated?
- What is the age of Earth, who dated it and how?

IX. Geologic Time Relative Age Dating
- Principles of relative age dating
- Three types of Unconformities = Gaps in rock record = Gaps in time
- Geologic Time Scale : The 'cause' of the boundaries between the Eras of the Phanerozoic (Paleozoic, Mesozoic, Cenozoic): what are their ages?