Midterm #1 Study Guide

Chapter One:
Science and the Scientific Method:
    Hypothesis and Theory
Interior of the Earth:
    Core (inner/outer), Mantle, Crust (continental, oceanic)
    Lithosphere, asthenosphere
Plate Tectonics:
    Divergent, convergent, transform boundaries
History of Geology:
    Hutton and Uniformitarianism

Chapter Two:
Atoms: proton, neutron, electron
Elements: OSiAlFeCaNaKMg
Bonding: ionic, covalent, metallic, van der Waals
Oxygen-Silicon Tetrahedron:
    Silicate Structures: isolated, single and double chain, sheet, framework
Minerals: Silicate Rock Formers
Rock cycle

Chapter Three:
Magmas
Bowens Reaction Series: discontinuous, continuous
Partial Melting, fractional crystallization, crustal assimilation, bimodal volcanism
Igneous rock classification
Plutons: discordant, concordant; tabular and massive
    Dike, sill, batholith, stock, laccolith
Xenolith
Metamorphic roof pendant

Chapter Four:
Lavas: silica content, viscosity, explosiveness
Lava flows: pahoehoe, aa, pillow
Tephra: ash/tuff, cinders, blocks and bombs, volcanic breccia
Constructive Volcanic Landforms
    Lava plateaus, shield, stratovolcano (composite cone), plug dome (volcanic dome), cinder cone
Destructive Volcanic Landforms:
    Maar, calderas, volcanic neck, inverted stream
Historic eruptions:
    Vesuvius, Pelee, Krakatoa, Tambora, St. Helens, Pinatubo

Chapter Five:
Physical Weathering:
- Unloading: exfoliation and jointing
- Frost wedging, root wedging, fire spalling

Chemical weathering:
- Oxidation, hydrolysis, solution

Regolith and soil
Factors in soil formation: climate, time, parent material, organic activity, slope
Soil horizons: O, A, E (zone of leaching), B (zone of accumulation), C
Laterite, pedalfer, pedocal

Chapter Six:
Sedimentary classification system:
- Clastic, Biogenic (organic), Chemical

Sedimentary textures:
- Grain size, angularity, sorting, maturity

Sedimentary structures:
- Ripples (asymmetrical/oscillation), crossbedding, mudcracks, bioturbation, graded bedding/flame structure
- Geopetal indicators
- Paleocurrent indicators

Lithification of sediments
Sedimentary environments:
- Terrestrial, transitional, marine

Chapter Seven:
Factors in metamorphism:
- Heat, pressure, chemically active fluids

Types of metamorphism:
- Thermal (contact), Dynamic (cataclastic), Dynamothermal (regional)

Types of metamorphic rocks:
- Foliated:
  - Slate, phyllite, schist, gneiss
- Non-foliated:
  - Quartzite, marble, greenstone, serpentine

Chapter 22:
The Solar System
Origin of the Solar System:
- Nebular Hypothesis
- Supernova
- Nebula
- Planetary discs
- Solar Fusion
- Meteorites and Comets