# ESCI 402: Lab Test Review Sheet

*****THE BEST WAY TO STUDY IS TO REVIEW EACH OF THE LABS AND CAREFULLY READ THE INTRODUCTION TO EACH LAB*****

**Lab 1. Minerals, Igneous Rocks, and Metamorphic Rocks**

- **Minerals**
  - **Identification Properties (color, streak, crystal form, hardness, luster, cleavage, density, taste)**
  - **ID common minerals (e.g. quartz, calcite, feldspar, mica, olivine)**
- **Igneous Rocks**
  - **Classification – Composition (mafic vs. felsic) and texture (intrusive/phaneritic vs. extrusive/aphanitic)**
  - **ID common igneous rocks (granite, diorite, gabbro, rhyolite, andesite, basalt)**
- **Metamorphic Rocks**
  - **Classification – Composition (protolith) and Texture (foliated vs. non-foliated)**
  - **ID common metamorphic rocks (slate, phyllite, schist, gneiss, marble, quartzite)**

**Lab 2. Sedimentary Rocks**

- **Formation (erosion, transport, deposition)**
- **Clastic**
  - **Grain size (claystone/shale, siltstone, sandstone, conglomerate, breccias)**
  - **Composition (quartz, clay, rock fragments)**
  - **Roundness**
  - **Sorting**
  - **Immature vs. mature clastic rocks**
- **Nonclastic/Biochemical**
  - **Carbonates (limestone, dolomite)**
  - **Chert**
  - **Evaporites**
  - **Coal**
- **Sedimentary structures (cross beds, mud cracks etc)**
- **Depositional environments**

**Lab 3. Fossils**

- **Preservation (replacement, permineralization, carbonization, trace fossils, molds and casts)**
- **Classification (Protists, Porifera, Bryozoa, Cnidaria, Brachiopoda, Mollusca, Arthropoda, Echinodermata, Chordata)**
- **Identifying characteristics for different Phyla (e.g. 5-way symmetry for echinoderms)**

**Lab 4. Stratigraphic Ordering**

- **Ordering events in time using principles of historical geology (e.g. superposition, lateral continuity, original horizontality, cross-cutting relationships etc)**
- **Stratigraphic correlation (lithostratigraphy, biostratigraphy, magnetostratigraphy)**
- **Transgressive-regressive sequences**

**Lab 5. Maps and Cross Sections**

- **Map basics (scale, contour lines, contour interval, latitude/longitude)**
- **Constructing elevation profile and simple geological cross-section**
- **Interpreting outcrop patterns (e.g. map expression of anticline and syncline)**
- **Strike/dip, fold types, fault types**

**Lab 6 & 7. James Hall Geological Quad and Cross-Section**

- **Data collection for mapping (geographic location, rock type, strike/dip, elevation)**
- **Data analysis for mapping (contouring elevation, geological contacts, bedding orientation)**
- **Constructing cross-section (elevation profile, geological contacts, structural interpretation)**
- **Developing a geological column (superposition of geological units)**
- **Depositional and structural interpretation**

**Lab 8. Depositional Environments**

- **Relationship between sedimentary facies and depositional environments**
- **Sedimentary facies map (data)**
- **Paleogeographic environments map (interpretation)**

**Lab 9. Regional Geology of North America 1: Appalachian Region**

- **Using geological maps to determine age, type, and location of different rock units**
- **Interpreting faults and folds using geological maps**
- **Integrating information from map into understanding of Earth history for that region**
- **Differences between New England, Ridge and Valley, Piedmont provinces**

**Lab 10. Paleogeographic Reconstruction: Playing Wegener in a Mock World**

- **Information useful for paleogeographic reconstructions (present-day geography, lithological changes, paleontological changes, isotopic dates)**
- **Specific lithological and paleontological changes associated with convergence, divergence, sea level change**
- **Determining original cratons using basement rocks and isotopic dates**

**Lab 11. Dinosaur Locomotion**

- **Using trace fossils (e.g. dinosaur trackway) to estimate extinct behavior (e.g. dinosaur speed) using simple quantitative models**
- **Estimating unknown parameters (e.g. dinosaur leg length) from known parameters (e.g. dinosaur foot length)**

**Lab 12. Regional Geology of North America – Cordilleran Region**

- **Using geological maps to determine age, type, and location of different rock units**
- **Interpreting faults and folds using geological maps**
- **Integrating information from map into understanding of earth history for that region**
- **Laramide vs Sevier style mountain ranges and basins**
- **Yellowstone hotspot, Colorado plateau, Basin and Range province, Cascade volcanoes, Sierra Nevada arc/forearc basin/accretionary prism/trench.**