

# Geology 333 Lab Final Exam Information (10 AM - Noon, Tues., May 2)

## PLEASE WRITE LEGIBLY ON EXAM TO RECEIVE FULL CREDIT

The Lab final exam is worth ~25% of your Lab grade. A 100% score on the Lab final exam is 65 points but there will be 4 extra credit points, which makes 69 points (~106%) the maximum possible score.

### **Part 1: Mineral Identification in Hand Sample and Thin Section (12 points)**

- You will be given two minerals that you need to characterize in hand sample and thin section. The minerals will be from the following list:
  - Amphibole, Biotite, Calcite, Muscovite, Olivine, Plagioclase Feldspar, Pyroxene, and Quartz
- For hand samples you need to give mineral name, hardness, cleavage, streak, luster, and reaction with acid. You will be given a handout with hardness values of fingernail, penny, glass and ceramic plate as well as luster terms and associated definitions. You will be provided materials to perform mineral tests.
- In thin section you need to describe relief (high, medium or low), pleochroism (yes or no), isotropic (yes or no), cleavage (maximum number of cleavage planes and their associated orientations in thin section; remember, for some minerals you can view fewer cleavage planes in thin section than in hand sample), and birefringence order (1<sup>st</sup>, 2<sup>nd</sup>, or 3<sup>rd</sup>+).

### **Part 2: Rock Identification in Hand Sample and Thin Section (33 points)**

- You will be given three rocks that you need to characterize in hand sample and thin section.
- There will be one sample from each rock type (igneous, metamorphic and sedimentary). Samples will be selected from those that we studied in the Rock Labs involving the petrographic microscope (Labs #5 - 10).
- Using terms given in Lab, you need to describe the rock texture (grain sizes, shapes, arrangements, packing, sorting, rounding) and the rock composition (identify the major minerals and their % abundance). For igneous rocks you need to state whether it is silicic or mafic. For metamorphic rocks you need to state whether it is foliated or not and the foliation type, if present. For sedimentary rocks you need to describe the nature of the pore filling (matrix/micrite, cement/spar, or empty), any clay mineral alteration of framework grains, and any fossils (based on hand sample only). You will be given a handout with a list of terms and associated definitions as well as figures used for thin section descriptions: grain size (including conversion from field of view to grain size), igneous crystal shape, grain roundness (with an illustrative figure), grain arrangement, sorting (with an illustrative figure), grain contacts (with an illustrative figure), degree of induration, and fossils (with an illustrative figure).
- You will need to name the rock correctly including the appropriate descriptive terms, e.g., oosparite, quartz arenite, biotite schist, and porphyritic olivine basalt.
- You will need to state whether or not the rock makes a good building stone. If it does make a good building stone, then you need to give an example of its use, e.g., outside steps, roof shingle, or outside walls. If it does not make a good building stone, then you need to explain why not.

### **Part 3: Short Answer Questions (20 points)**

- There will be five short answer questions, which cover topics from any of the Labs, except Soils.
- Write using complete sentences.
- Two of the short answer questions will be from the following Labs: Geology Field Trip to Fithian Cyclothem and X-ray Diffraction of Everyday Materials.

### **Part 4: EXTRA CREDIT - Mineral and Rock Identification of Hand Samples (4 points possible)**

- You will need to identify of four Rock or Mineral Samples by name only. No penalty for guessing.