MINERALOGY

know what a unit cell is
define and understand crystal form, cleavage
know how main mineralogical tests work (hardness, acid, etc.)

PETROLOGY

know all three rock classes (igneous, sedimentary, metamorphic)
know important subclasses (igneous may be mafic, intermediate or felsic, and intrusive or extrusive; sedimentary may be clastic, carbonate, evaporite; metamorphic may be foliate or non-foliate)
know main rock types, how to recognize and distinguish them, criteria for recognition (I have been known to have students pass a rock sample around during an exam and have to answer questions on it. . .)
know how each rock type forms, and how the process of formation produces the features of each major rock type

PLATE TECTONICS

understand how very different lines of evidence are put together to support the tectonic model—*don't just memorize factoids*! You need to know how the theory really works, and how the evidence is used to support it
know the important lines of evidence for plate tectonics, including: biogeography; apparent pole wander (APW); ages of oceanic crust; magnetic stripes
know major features caused by tectonic phenomena, including: mid-oceanic ridges subduction zones (and their features, such as trenches and island arcs); hot-spot chains; fold-belt mountains

VOLCANOES / MOUNTAINS / EARTHQUAKES

know basic types of volcanoes, how each forms, how to recognize each
know basic types of intrusive bodies, how each forms, how to recognize each
know basic types of folds and faults
understand earthquake causes
have a rough working knowledge of Richter and Mercalli scales
be able to place what you've learned in a plate tectonic context (i.e. use plate tectonics to explain why we get stratovolcanoes or deep-focus earthquakes where we do)

STRATIGRAPHY / HISTORICAL GEOLOGY

- know basic rules (Steno's Law, Smith's Law, uniformitarianism) and how to apply them (you do not need to know peoples' names or dates)
- know how relative dating and stratigraphic correlation work
- know basics of radiometric dating and ways to cross-check it (no math will be required, but be able to explain it in words clearly and accurately)
- know major geologic time periods

GENERAL ADVICE

- I have this evil habit of writing test questions that draw on material from several different parts of the course. Don't try to learn this stuff as a set of isolated factoids. That does you know good unless you can perceive how they all fit together.
- I am going to emphasize the "Big Ideas" here—these would be plate tectonics and geologic time. These touch a large number of other areas of earth science; they're the "glue" that holds everything in this course together.
- I really emphasize the process of science. Make sure you know what a hypothesis is and how it's tested; make sure you understand the nature of evidence. One of the greatest scientists of all time once said, "How odd it is that anyone would not see that all observation must be for or against some view, if it is to be of any service."