# ES202 Midterm Study Guide

## Recommended Study Techniques

(1) go over pre-lab questions / study them
(2) review the "How to Study" sheet handed out at beginning of term
(3) use the concepts below as a guide to help you focus on your notes
(4) memorize terms and concepts
(5) go over your on-line homework questions / answers, make sure you know the answers
(6) go back over the labs and make sure you can do the tricks / skills
(7) review some of the important figures in your lab manual and text
(8) go to the lab and look at the lab answer keys, minerals and rocks, work with the samples in lab
(9) review the techniques for working with maps / air photos
(10) polish your shoes and drink plenty of Diet Coke (a proud sponsor of G202)
(11) avoid acoholic beverages and mind-altering cold medicine the night before the quiz
(12) clean out the smashed and leaking ketchup packets in your glove compartment....

**NOTE: I would spend a minimum of 10-12 hours studying for this quiz if I wanted to do well.**

## Part 1. Lecture Concepts

### Key Words

***Fundamentals***
Environmental Spheres
Lithosphere
Biosphere
Hydrosphere
Age of the Earth
Ultimate Driving Forces
- Climate
- Gravity
- Tectonics

Crustal Composition
Core
Mantle
Crust
Oceanic Crust
Continental Crust
Asthenosphere
Lithosphere
"Plates"
Scientific Method
Hypothesis
Experimental Design
Unit Algebra
Unit Conversion
Graphing
Equation of Line
Slope of Line
y=mx + B
map view
cross-section view
3-D view
metric / English units
mass
temperature
density

***Mineral/Rock Overview***
rock
mineral
element
compound
atom
nucleus
electron
proton
neutron
mineral properties
crystal form
luster
color
streak
hardness
cleavage
fracture
specific gravity
rock forming minerals
silicates
carbonates
oxides
sulfates
halides
rock cycle
igneous
metamorphic
sedimentary
magma / lava
fast-cooling lava
slow-cooling magma
two-phase cooling
extrusive / lava
intrusive / magma
weathering
sediment
sediment transport
sediment burial
lithification
fossil
metamorphic

foliation
granite
basalt
obsidean
sandstone
shale
limestone
siltstone
gneiss
slate
marble
quartz
feldspar
muscovite
biotite

***Plate Tectonics Overview***
Continental Drift
Plate Boundaries
- Convergent
- Divergent
- Transform

Spreading Center
Subduction Zone
Volcanic Arc
Mountain Building

***Weathering /Sediment***
Weathering
Erosion
Sediment
Agents of Transport
- Wind
- Water
- Ice
- Gravity

Physical Weathering
- rk fragmentation
- frost wedging
- unloading/release
- Thermal Expansion
- Root Wedging
- Animal Burrowing

Chemical Weathering
- carbon dioxide
- carbonic acid

non-foliated
- water

Clay (size / mineral)

***Sedimentary Rocks***
weathering
sediment
erosion
lithification
- compaction
- cementation

Sed. Rock types
- Detrital
- Biochemical
- chemical

sediment size fractions
- gravel
- sand
- silt
- clay

grain shape
grain sorting
rock types
- sandstone
- conglomerate
- shale
- limestone
- evaporites

crystalline vs. microcrystalline
coal
clastc / nonclastic
marine
nonmarine
fluvial
lacustrine
glacial

***Sedimentary Features***
sedimentary structures
methods of transport
- bedload
- suspension
- dissolved load

cross-stratification
graded bedding
reverse grading
heat-pressure-chemical
normal grading
asymmetric ripples
symmetric ripples
flute casts
cast vs. mold
mudcracks
raindrop imprints
paleocurrents

***Intro to Topo Maps***
topographic maps
north arrow
map scale
contour interval
index contour

***Soil/Mass Wasting***
bedrock
soil
regolith
colluvium
alluvium
drift
lacustrine
anthropogenic
aeolian
clay
mass wasting
slope gradient
angle of repose
creep
slide
flow
debris flow
mud flow
landslide
debris slide
solifluction
slump
rock fall
rivers
channels
valley

**Questions for Thought**

How do the three ultimate driving forces relate to anything that we've covered since the beginning of the term?

What is the elemental composition of the Earth's crust? atmopshere?

What is the difference between a rock and mineral? Can you sketch the rock cycle yet?

What is the controlling factor of mineral properties? Why are they different?

What is the crust anyhow? Can you draw a diagram of the interior of the Earth (core, mantle, asthenosphere, crust)?

What factors influence how fast a rock will weather? Do all rocks weather at the same rate?

What is the difference between weathering and erosion?

What are the two meanings of the word "clay"?

What do rocks inherently decompose? Why are clay minerals stable at the Earth's surface?

What is the sedimentary process from start to finish?

How does transport energy relate to grain size of deposits? (e.g. would you find boulders in the deep ocean?)

What are the basic marine and nonmarine sedimentary environments?

What are sedimentary structures and how are they used to reconstruct sedimentary environments?

What type of environment do the various sed. rock types form? e.g. sandstone, conglomerate, evaporites, coal, mudcracks, limestone, etc. where would these rocks form at the earth's surface?

What is mass wasting and what are some of the processes associated with it? What drives mass wasting on the surface of the Earth?

How do rocks physically and chemically weather? What are some of the specific processes?

What types of work do rivers perform at the Earth's surface? How is the work of a river related to energy and force? to gravity? to climate?

How do sediments accumulate over time? How is time recorded in the rock record?

**2. Lab Skills to Work On**

Applying the scientific method
basic metric / english unit conversion
graphing
drawing sketch maps and cross-sections
Identifying basic mineral properties
- which minerals / rocks fizz?
- metallic vs. nonmetallic
- light vs. dark colored
- 1 or 3 directions of cleavage

can you do a basic mineral hardness test?
Could you identify an igneous, sedimentary vs. metamorphic rock?
what about the three diff. types of sed. rocks?
Can you estimate: grainsize? sorting? grading? angularity?
What about basic paleocurrent directions? How can you tell which way the fluid was moving when the sediment was deposited?
What about recognizing some basic sedimentary structures?
Associating a specific rock type to a possible sedimentary environment?
How does transport energy relate to grain size of deposits? (e.g. would you find boulders in the deep ocean?)
What are the basic marine and nonmarine sedimentary environments?
What are sedimentary structures and how are they used to reconstruct sedimentary environments?
What type of environment do the various sed. rock types form? e.g. sandstone, conglomerate, evaporites, coal, mudcracks, limestone, etc. where would these rocks form at the earth's surface?
Can you determine the elevation of a point on a topographic map?
Can you identify hills and valleys on a topographic map?
By reading a topo map, can you determine “up hill” and “down hill”