

## GS331 Oceanography Mid-Term Study Guide - Fall 2003

### RECOMMENDED STUDY TECHNIQUES

- 1) review the "How to Study Physical Science" guide available on the web site.
- 2) use the concepts below as a guide to help you focus on your notes
- 3) memorize terms and concepts (make flash cards, rewrite definitions 100 times, etc.)
- 4) go back over the labs and make sure you can do the tricks / skills
- 5) review some of the important figures in your lab manual and text
- 6) Read the book again and again.
- 7) be able to link the terms to concepts, and the concepts to Earth processes
- 8) go over the lab exercise answer keys posted on the web site, check your lab work
- 9) Study until you fall over, then study some more.
- 10) change your socks and drink plenty of water
- 11) clean your room....
- 12) Go to the class website and view all notes, answer keys, and material currently available

**I would spend a MINIMUM of 10-12 hours studying for this exam... if I wanted to do well!**

### Key Words for New Material Since Beginning of Term

#### Introduction to Earth Systems

age of Earth	energy	hydrologic cycle
Earth history	force	history of ocean exploration
astronomy	work	deep sea drilling
geology	thermal energy	<b>Physics Review</b>
meteorology	thermodynamics	
oceanography	heat flow	mass
geosphere	conservation of energy	length
lithosphere	potential energy	time
outer core	kinetic energy	temperature
inner core	system	force
mantle	closed system	kg, m, newton
atmosphere	open system	angle
gaseous envelope	isolated system	area
atmospheric composition	positive feed back	volume
hydrosphere	negative feed back	(know all units)
hydrologic cycle	energy flux	Energy
evaporation	mass flux	force
advection	solar energy	pressure
transpiration	geothermal energy	density
precipitation	photosynthesis	work
groundwater	tidal energy	heat
surface water	energy transformation	heat flow
basic earth facts	albedo	heat flux
rotational period	gravity	
revolutional period	acceleration due to gravity	
matter	Newton's second law	

heat expansion  
heat contraction  
solid  
liquid  
gas  
heat transfer  
conduction  
convection  
radiation  
heat gain  
heat loss  
evaporation  
freezing  
condensation  
sublimation  
conservation of mass  
conservation of energy  
newtons' 2nd law  
properties of water  
heat capacity  
fluidity  
viscosity  
density  
salinity  
bipolar molecule  
temp. vs. density  
temp vs. viscosity  
bouyancy  
buouant force  
gravitational force  
"sinker" vs. "floater"  
Archimede's Principle  
upward force vector  
downward force vector  
density vs. buoyancy

### **Maps and Charts**

sonar  
 $v = d/t$   
two-way travel time  
bathymetry  
contour lines  
isobaths  
magnetic north  
magnetic declination  
true north  
longitude

latitude  
equator  
prime meridian  
greenwich  
degrees, minutes, seconds  
north / south pole  
fathom  
feet, meters  
map scale  
fractional scale  
vertical exaggeration  
contour pattern  
slope of ocean floor  
contour maps  
profiles

### **Intro to Geology / Tectonics**

seafloor spreading  
mid-oceanic ridge  
basalt  
sediment  
sand, gravel, mud  
biogenic sediment  
microscopic organisms  
volcanic rocks  
volcanic eruption  
sedimentary rocks  
limestone  
calcium carbonate  
gravel  
sand  
silt  
clay  
shale  
Plate Tectonics  
Lithospheric plate  
Lithosphere  
Crust  
Mantle  
Asthenosphere  
Outer core  
Inner core  
Magma  
Lava  
earthquake  
Geothermal energy  
Geothermal gradient

Continental drift  
Alfred wegener  
Fit of continents  
Magnetic field  
Paleomagnetism  
Seafloor stripes  
Normal polarity  
Reverse polarity  
Polarity reversal  
Plate boundaries  
Convergent  
Divergent  
Transform  
mid-ocean ridge  
seafloor spreading  
trench  
subduction zone  
volcanic arc  
triple point junction  
continental rift  
oceanic-oceanic subduction  
continental-oceanic subduction  
continental-continental  
subduction  
magnetometer  
polar wandering  
polarity reversals  
hotspot  
hotspot track  
Hawaiian Islands  
Mantle convection  
Continental crust (granite-thick)  
Oceanic crust (basalt-thin)  
Plate motion vector  
Rate of plate motion (1-10  
cm/yr)  
Pangaea  
Magnetic declination  
Magnetic inclination  
South pole-up  
North pole-down  
Magnetic field drift  
Oblique subduction  
Continental accretion  
Oregon Coast Range accretion  
Crustal rotation  
Crustal compression  
Crustal tension

## Marine Provinces

Bathymetry  
Fathom  
Average depths (3000-4000 m)  
Sea level  
Relative sea level  
Crustal uplift / subsidence  
Eustatic sea level changes  
Sea level rise  
Sea level fall  
Tidal fluctuation  
Diurnal tidal fluctuation  
Tidal bulge  
Neap tide  
Spring tide  
Gravity pull-Earth-Sun-moon  
Sea level vs. global ice budget  
Glacial climate  
Interglacial climate  
Slope of sea floor  
mid-ocean ridge  
ocean rise  
trenches  
islands  
seamount  
sonar (side-scanning sonar)  
hydrothermal vents  
passive margins  
active margins  
continental shelf  
inner shelf  
outer shelf  
shelf break  
continental slope  
continental rise  
abyssal plain  
submarine canyons  
submarine fans

## Marine Sediments

Sediment  
Lithogenic  
Chemical  
Biogenic  
volcanogenic  
Clastic  
Noclastic

Siliciclastic  
Sediment source (continent)  
Gravel  
Sand  
Silt  
Clay  
Animal skeletons  
Exoskeletons  
Shells  
Macroscopic fossils  
Microscopic fossils  
Calcium carbonate  
Pellets  
Fecal matter  
Evaporite minerals  
Rock salt  
Gypsum  
Neritic sediments  
Turbidites  
Deep ocean sediments  
Pelagic clays  
Chemical oozes  
Biogenic oozes  
Carbonate compensation depth  
Siliceous oozes  
Carbonic acid  
Carbon dioxide  
h-2-O  
dissolved ions  
partial pressure  
carbon dioxide +  
water = carbonic acid  
pH  
calcium carbonate chemistry  
water chemistry  
water-NaCl chemistry  
**Key Words from Lab**  
Unit algebra  
Unit conversion  
Mass  
Length  
Time  
Volume  
Temperature  
Velocity  
Density  
Isobath  
Contour line  
Contour interval

Submarine canyon  
Map scale  
Fractional scale  
North arrow  
True north  
Magnetic north  
Profile  
Vertical exaggeration  
Two way travel time  
One way travel time  
Sonar  
Speed of sound  
Latitude  
Longitude  
Nautical mile  
Statute mile  
Decimal degrees  
Degrees  
Minutes  
Seconds  
Magnetic declination  
Triangulation  
Horizontal scale  
Vertical scale  
Seafloor spreading  
Transform fault  
Tension  
Compression  
Shear  
Plate motion rate  
Spreading rate  
Time zones  
Longitude vs. time zones  
Juan de Fuca Plate  
Seamount  
Guyot  
Fracture zone  
East pacific rise  
mid-ocean ridge  
convergent boundaries  
ring of fire  
volcanic islands  
carbonate content  
clay  
sediment profile  
drill core  
sediment accumulation rate  
sediment trap  
CCD

Carbonate compensation depth

### **Key Concepts / Skills**

Understand the basic interaction between the ocean and the atmosphere (from video 1 we watched).

Understand the hydrologic cycle, be able to sketch it.

Be able to draw bathymetric maps

Be able to draw a profile and determine the vertical exaggeration.

Be able to read a marine map, determine directions, located positions in long. and lat.

Can you solve basic physics problems / equations if given data?

What are the reasons that ocean water circulates?

What density and salinity contrasts would you observe at various positions in the ocean? Why?

How does salinity and density relate to ocean circulation?

Why is the second law of thermodynamics important for ocean processes?

What are the fundamental driving forces of ocean processes? How do they influence the ocean?

Can you identify the basic tectonic features of the seafloor, label them on a map or profile?

Can you list and discuss all of the sediment sources / types in the ocean?

Can you draw a profile from on-shore to off-shore of the ocean, labeling all of the marine provinces?

Can you calculate a sediment accumulation rate?

Can you determine a plate motion rate?

Can you identify seafloor stripes and explain magnetic polarity reversals?

Can you discuss why the term "sea level" is relative?

Can you locate a ship on a nautical map using triangulation?

Can you convert between statute and nautical miles?

Can you locate positions by longitude and latitude?

Can you convert from degrees, minutes, seconds to decimal degrees?

Can you plot data on a graph and interpret the results relative to ocean processes?