GS331 Oceanography Final Study Guide

Suggestions for Preparing:

1. Go over all notes, equation lists, and lab exercises.
2. Make sure that you understand the lab skills, check your work with answer keys.
3. Go over the mid-term study guide, the exam will in part be comprehensive (from before the mid-term, focus on plate tectonics, physiography of ocean basins, and math-physics-chemistry overview).
4. Go over the key words and concepts listed below.
5. Memorize terms, and concepts
6. Read the book, look at relavent figures. Study and memorize all notes covered this term.
7. Bring a calulator, pencil, ruler, pens, etc. to the exam. The exam will be part lab-style problems, fill-in-the-bubble, fill in the blank, and essay.

Key Words and Concepts
Since Mid-Term

matter
element
compound
atom
nucleus
proton
neutron
electron
atomic number
atomic mass
average atomic mass
isotope
atomic charge balance
electron shells
valence electrons
atomic bonding
octet rule
noble gases
ionic bonds
covalent bonds
electron filling
ions
cations
anions
physical states
solid
liquid
gas
molecular kinetic energy
heat capacity
ice/water volume relation
fluid
capillary force
bipolar water molecule
hydrogen bonds
EM spectrum
wavelength
amplitude
frequency
period
albedo
refraction
reflection
energy absorption
absorption vs. depth
turbidity
temp-density relations
density
weight density
heat
heat flow
thermodynamic flux
heat expansion
heat contraction
buoyant force
density-volume relations
ice crystal structure
conduction
convection
radiation
evaporation
freezing
sublimation
calorie
joule
condensation
phase change
latent heat
pH defined
calcium carbonate stability
saturated vs. undersaturated
ion solubility
solvent
solute
ppm
ppt
ppb
o/oo
carbonic acid reaction
carbonate dissolution
buffering capacity
CO2-pressure-temp relations
composition of seawater
Na,Mg,Ca, etc. percentages
salinity
specific conductivity
temp-salinity-density relations
pycnocline
thermocline
halocline

alkalinity
stable isotope
radioactive isotope
O16, O18
global ice budget
Carbon isotopes
superposition
biogenic
lithogenic
stratigraphy
isotope equilibrium
del O18
PDB
SMOW
paleothermometry
mollusks
forminifera
coral
salinity vs. O18
temp vs. O18
latitude vs. O18
isotopic fractionation
"heavy water"
"light water"
glacial climate
interglacial climate
ice sheet
evaporation
late Wisconsinan ice
global sea level
eustatic sea level
deep sea drilling
O18 stratigraphy
O18/O16 ratio
global correlation
radiometric dating
insolation
sun spot
sun spot cycle
sun spot - climate response
orbital forcing
Milankovitch Theory
obliquity
eccentricity
precession
angle of earth tilt
orbital path
plane of ecliptic
perihelion
aphelion
equinox
solistice
frequency
time series
northern hemisphere
southern hemisphere
fall,winter,spring,summer
circular vs. elliptical path
glacial - cold/wet climate
polar cooling
solar influx
albedo
positive feedback

Air-Sea Concepts

seasons
earth rotation
earth tilt
plane of ecliptic
seasonal precession
rotational velocity
23.5 degree tilt
latitudinal insolation
tropic of cancer
tropic of capricorn
equinox
solstice
spring, fall, winter, summer
differential heating
ocean heat capacity
heat absorption
heat reflection
land cooling / heating
ocean cooling / heating
humidity
vapor capacity
temperature vs. humidity
dew point
relative humidity
percent humidity
air lifing
forceful lifting
orographic lifting
frontal wedging
convergence
anticyclone
cyclone
coriolis effect
cw rotation
ccw rotation
wind
air pressure
north: hook right
south: hook left
rising air - low press
falling air - high press
general circulation
equator to pole transfer
heat transfer
warm air rises
cold air sinks
equatorial low
subtropical high
mid-latitude low
polar high
westerlies
easterlies
trade winds
doldrums
polar air mass
tropical air mass
jet stream
"pineapple express"
Hurricane (cyclone)

Waves, Currents, Tides

gyre
coriolis effect
Gulf Stream
California Current
Japan Current
storm surge
dynamic topography
thermohaline circulation
density currents
waves
fetch
wave crest
wave trough
wave height
wave length
tsunami
wave base
surf zone
breaker

longshore drift
tides
tidal bulge
normal tidal bulge
neap tide
spring tide
tidal cycle
high tide
low tide

El Nino Concepts

climate change
storm impact
community model
tides
wave heights
storm wave
beach slope
summer beach
winter beach
longshore drift
littoral cell
trade winds
upwelling
south america
north america
ocean current
easterly winds
El Nino
La Nina
storm track
coastal erosion
wave activity
storm surge
sea surface temperatures

Lab Concepts and Skills

thermocline
surface layer
salinity
density
thermohaline circulation
surface temperatures
isotherms
upwelling
downwelling

Coriolis Effect
isohalines
Knudsen titration
conductivity
dilution
water mass
residence time
thermohaline circulation
isopycnals
temp-salinity diagram
water mixing
current
dynamic topography
density factor
temperature profiles
salinity profiles
water mass characterization
tidal range
tide graph
tide gauge
wind set up
storm surge
nodal point
fetch
wave velocity
wave period
wave frequency
wave length

Lab Skills That You Should Be Able to Do

Plot a graph
Draw a profile given map data
contour salinity, temperature, and depth data
relate salinity and temperature patterns to water density
calculate density, velocity, depth
convert between units of measurement (miles, knots, etc.)
re-arrange equations and solve for unknowns
plot a graph and interpret data
draw a bathymetric map
locate positions on a map using longitude and latitude
triangulate positions on a map
measure and determine compass bearings
determine the depth to seafloor from sonar data