

ES106 Summer 2015 Final Exam Study Guide

RECOMMENDED STUDY TECHNIQUES

- 1) Follow the "How to Study Physical Science" guide available on the web site.
- 2) Review the class notes, use the key words below as a glossary check list of terms and concepts.
- 3) Use the concepts below as a guide to help you focus on your notes
- 4) memorize terms and concepts (make flash cards, rewrite definitions 100 times, etc.)
- 5) go back over the labs and make sure you can do the tricks / skills
- 6) review some of the important figures in your lab manual and text
- 7) review your Moodle practice quiz questions and answer sheets
- 8) Read over the figures and text in the chapters listed on the syllabus.
- 9) study until you're sick of it, then study some more until you pass out
- 10) change your socks and drink plenty of water

I WOULD STUDY A MINIMUM OF 10-12 HOURS IF I WANTED TO DO WELL ON THE FINAL EXAM!

KEY WORDS

Introduction (Note Set 1)

Moodle Practice Quiz 1

Earth System Science
astronomy
geology
oceanography
meteorology
oceanography
environmental spheres
 lithosphere
 atmosphere
 hydrosphere
 biosphere
Earth visualization
 rotation
 revolution
energy
heat
matter
three driving energy sources
 gravity
 geothermal heat
 solar energy

Basic Science Review (Note Set 2)

Moodle Practice Quiz 1

hypothesis
theory
hypothesis testing
observation
law
force

thermal energy
conservation of energy
energy transformation
heat flow
heat absorption
heat emitters
exponential notation
scientific notation
metric system
metric unit conversion

Intro to Hydrosphere (Note Set 4)

water
water vapor
atmospheric moisture
oceans
surface water
ground water
ice
global ice
hydrologic cycle
evaporation
convection
ocean evaporation
land evaporation
biosphere
transpiration
evapotranspiration
ice sheets
oceans
atmospheric moisture
fresh water storage

Chemistry of Water (Note Set 5-6)

Moodle Practice Quiz 2

atoms
isotopes
oxygen isotopes
carbon isotopes
ion
cation
anion
dissolved ions in water
molecules
compounds
octet rule
stable-8 configuration
valence shell
electron shells
atomic no.
atomic mass
no. protons
no. neutrons
no. electrons
ionic bonding
covalent bonding
solute
solvent
salinity
concentration
mass percent
parts per thousand
density
hydrogen bonds
polar covalent bonds

Heat Energy (Note Set 5)

phase changes
 states of matter
 solid
 liquid
 gas
 heat energy
 floaters
 sinker
 gravity-driven density contrast
 temperature
 degree C/F
 heat flow
 high temp to low temp
 heat - volume expansion
 cooling-volume contraction
 volume-density relationships
 heat loss
 heat gain
 heat transfer
 conduction
 convection
 radiation
 heat absorber
 heat reflector
 convection cells
 evaporation
 condensation
 melting
 freezing

Intro to Oceanography (Note Set 8-9)**Moodle Practice Quiz 3 and 4**

Ocean distribution
 plate tectonics
 seafloor
 seafloor volcanism
 seafloor basalt
 ocean crust
 mid-ocean ridge system
 divergent plate boundary
 paleomagnetism
 normal polarity
 reverse polarity
 deep ocean trench
 continental shelf
 continental slope
 continental rise
 abyssal plain
 deep sea canyons
 submarine fans

tides
 lunar gravity
 global sea level
 passive / active margins
 marine sediment
 terrigenous sediment
 chemical sediment
 biogenic sediment
 composition of seawater
 dissolved ions (Cl, Na, Ca, Br)
 salinity
 parts per thousand
 thermohaline circulation
 temp-density relations
 salinity-density relations
 waves
 wind-driven waves
 storm surge
 wavelength
 amplitude
 wave height
 tsunamis
 wave base
 wave velocity
 surf zone
 breaker
 longshore current
 rip current
 density-driven circulation
 wind-driven circulation
 thermohaline circulation
 upwelling

Structure Atmosphere (Note Set 10)**Moodle Practice Quiz 5**

meteorology
 weather
 climate
 temperature
 humidity
 precipitation
 cloudiness
 air pressure
 wind speed
 atmosphere composition
 nitrogen
 oxygen
 argon
 carbon dioxide
 water vapor
 dust

condensating nuclei
 atmospheric structure
 troposphere
 tropopause
 stratosphere
 stratopause
 altitude vs. temp variation
 altitude vs. press. variation
 Earth-Sun Relation
 Rotation / revolution
 speed of rotation
 earth day / earth year
 rotational axis
 north pole
 south pole
 equator
 axial tilt (23.5 deg.)
 insolation
 angle of incidence
 summer solstice
 winter solstice
 spring equinox
 fall equinox
 circle of illumination
 tropic of cancer (23.5 deg north)
 tropic of Capricorn (23.5 deg. South)
 atmospheric heat transfer
 conduction
 convection
 radiation
 absorption
 reflection
 continental heating
 ocean heating
 latitudinal heating
 general circulation

Moisture (Note Set 11)**Moodle Practice Quiz 6**

water vapor
 precipitation
 solid, liquid, gas
 heat energy
 evaporation
 condensation
 freezing
 heat
 humidity
 specific humidity
 relative humidity
 vapor saturation

dew point temperature
saturation capacity
temperature vs. humidity
temperature vs. air volume
hot air balloon model
dew point
fog / clouds / rain
condensating nuclei
cloud droplets
rising air mass
sinking air mass
Lifting Mechanisms
 forceful lifting
 convergent lifting
 orographic lifting
 frontal wedging
cloud form
 cirrus
 cumulus
 stratus
nimbostratus
rain-hail-snow

Pressure (Note Set 12)

Moodle Practice Quiz 7

air pressure
force / unit area = pressure
altitude vs. air pressure
millibar
pounds per sq. inch
barometer
rising barometer
falling barometer
wind

wind and pressure
pressure differential
pressure map
isobars
pressure gradient
coriolis effect
 N. Hemisphere - hook right
 S. Hemisphere - hook left
clockwise vs. counterclockwise
rotation
air deflection
wind speed
jet stream
cyclone
anticyclone
converging air
diverging air
rising / cooling air
falling / warming air
rain vs. sunny weather
global circulation
general circulation
atmospheric heat exchange
latitudinal heating / cooling
convection cells
hadley cells
cooling / sinking air
warming / rising air
equatorial circulation
polar circulation
equatorial low
subtropical high
mid-latitude low
polar high

deserts vs. latitude
rain forest vs. latitude
Mid-latitude westerlies
trade winds
easterly vs. westerly flow

Weather Patterns (Note Set 13)

air mass
weather fronts
source regions
Fronts
cold fronts
warm front
frontal wedging
occluded fronts
weather vs. frontal position
hurricanes
tropical cyclone

Big Chill / Climate Change Video

Greenland Ice Sheet
Antartica Ice Sheet
Global climate change
Paleoclimate record
Gulf Stream / Conveyor Belt
Ocean-atmosphere interaction
Global warming/sea level rise
Gulf Stream
Oxygen isotopes
Ice ages
Last Ice Age 20,000 years Ago
Glacial (cold)/interglacial (warm)
Sea Level Rise / Fall

Key Concepts and Problem Solving Skills

Introduction / Water / Oceans:

Can you convert from English to metric system units?
Can you do unit algebra?
Do you know the difference between mass, volume, length, time, density?
Can you draw and label the hydrologic cycle?
Can you calculate concentrations in mass percent, ppt?
Can you explain all of the processes involved with the phase change of water from solid to liquid to gas?
Can you sketch the water molecule and explain the chemical bonding involved?
Can you read the periodic chart and determine the basic characteristics of atoms of elements?
Can you determine whether an element forms a cation or anion? and what the charge is? and why?
Do you understand the concept of valence electrons and how they control atomic bonding?
Do you know the types of heat transfer mechanisms?
Can you list 4 or 5 unique properties of water?
Do you know the basic composition of seawater?
Can you list the 4 most abundant ions contained in seawater?
do you know the approximate concentration of salts in the ocean?
Do you know the mechanisms by which ocean currents are formed?
Do you know how ocean waves are generated? What are the controlling factors?
How are tides generated?
Can you list the three sources of ocean sediment?
Can you draw a profile sketch of the seafloor from on the continent to offshore in the abyssal plain?
Can you draw a sketch of a mid-ocean ridge?

Key Concepts and Problem Solving Skills

Atmosphere / Weather:

Can you label and identify the structure of the atmosphere from surface to stratosphere?
Do you know the basic characteristics of the troposphere?
Do you know the composition of the atmosphere? Can you list it from memory?
Do you know how the seasons work and why? Daily temperature fluctuations and why?
Do you know about solar influx vs. latitude vs. angle of incidence?
Do you understand relative vs. specific humidity?
Do you know the mechanisms for lifting of air? Can you sketch them from memory?
Can you sketch / label the three basic cloud types?
Do you know the mechanisms of cyclones and anticyclones?
Can you make an interpretation from an isobaric pressure map?
Can you sketch / label the global atmospheric circulation model?
Can you sketch / label warm fronts, cold fronts, and occluded fronts?

Have you gone over all of your Moodle Practice Questions and memorized the answers?