ES322 Geomorphology Fall 2006 Final Study Guide

NOTE: The final exam is schedule for 12:00-2 PM on Tuesday.

Study Tips

- complete all labs and worksheets before exam
- use study guide in combination with notes
- go back through the in class / lab exercises, make sure you can work the math / units
- spend a couple days studying, the exam will be essay and there is much material.
- don't wait until the last minute!
- carefully go through the notes, some of the material we briefly discussed, but did not spend much time on in class... but the notes will give you the detail

Exam Procedures

(1) Final exam will be 120 points.
(2) Part 1 - essay questions, focusing mainly on material since mid-term, but with a limited number of comprehensive questions covering material prior to the mid-term. See key-word recommendations below.
(3) Part 2 Open Book- lab-style quantitative questions, map questions, air photo questions, identification of fluvial, coastal landforms, identification of basic climatic / geomorphic features. Association of landforms with processes. Bring a calculator.

Keywords To Focus On Since the Mid-Term

Fluvial

Hydrologic Cycle / Water Budget
Discharge
precipitation
infiltration
intensity
recurrence interval
width/depth ratio
channel area
wetted perimeter
hydraulic radius
gradient
interception
evapotranspiration
soil porosity
soil permeability
runoff
rain splash
suspended load
bed load
saltation
sheet erosion
rill erosion
gully erosion
channel flow
stream erosion
    shear
    abrasion (tools)
    corrosion
Q=VA
V=L/T
A=wd
P=2d + w
velocity profiles
discharge calculations
manning equation
R.I. / probability
energy expenditure
roughness coefficient
stream rating curve
gauging station
flotation load
bernoulli principle
    "fluid lift force"
magnitude-frequency relations
velocity-depth relations
viscosity
laminar flow
turbulent flow
reynolds number
froude number
tranquil flow
rapid flow
boundary condition
slope-discarge relations
stream power calculation
depth-velocity relations
width-velocity relations
sediment load
stream competence
stream capacity
vegetative effect on sed. load
dissolved load
turbulent flow
laminar flow
channel morphology

straight
meandering
braided
anastomosed
meander sinuosity
width/depth ratio vs. channel bank grain size relations
gradient vs. stream type
sed. load vs. stream type
meanders
point bar
cut bank
levee
floodplain
terrace
oxbow lake
oxbow cutoff process
pool-riffle sequences
overbank sedimentation
bankfull discharge vs. flood discharge
meander scrolls
centrifugal force
braid gravel bars
river base level
local base level
regional base level
graded profile
Fluvial System Factors
- slope
- base level
- climate
- discharge
- velocity
- sed. supply
- sed. load

differential erosion
aggradation conditions
degradation conditions
river entrenchment
knickpoints
knickpoint retreat
terraces / incision
drainage patterns
dendritic - flat rocks
trellis - folded rocks
rectangular - fractured rocks
radial - volcanoe
tectonic uplift vs. climate relations
terrace tread
terrace scarp
paleohydrology
slackwater deposits
paleoflood evidence in field
imbricated boulders
fan deposit
fan lobe
gradient decrease
flow expansion
deposition
arid fans
humid fans

Tectonic Geomorphology

convergent boundary
divergent boundary
transform boundary
mountain front
anticline
syncline
mountain building
normal fault
reverse fault
strike slip fault
plunging fold
non-plunging fold
joints
dip
strike
dip slope
scarp slope
grabens
horst
fault-block mountains
half-graben
lithologic resistance to erosion
sandstone-shale example
differential erosion
hog back
resistant bedrock
non-resistant bedrock
law of v-shape patterns
joint-fault erosion
lineaments
active mountain front
inactive mountain front
mountain front sinuosity
soils-fault relations
Steens Mtn example
fault scarp
butte / mesa
cap rock
fault scarp degradation
zig-zag mountains

Coastal Process

coast
beach
tectonics
waves
tides
tsunami
storm surge
longshore drift
rip current
tides
gravity
pocket beach
marine terrace
wave-cut notch
wave-cut terrace
emergent coasts
submergent coasts
erosional coasts
depositional coasts
headlands
sea cliff
sea stacks
sea arches
wave-cut platform
uplifted coasts
sea level change
global sea level rise /fall
global climate cycles
interglacial / glacial
coastal geomorphic hazards
    beach erosion
    cliff erosion
    slope failure
    earthquakes
    flooding
PNW tectonic setting
convergent
subductions
neotectonic uplift
relative sea level change
    uplift vs. SL change
    subsidence vs. SL change
global warming
density currents
thermal expansion of water
re-leveling surveys
tide-gage surveys
tectonic vs. sea level changes
seasonal wave activity in OR
winter vs. summer beaches
rock headlands
pocket beaches
littoral cell
heavy mineral / provenance
estuaries

Key Words from First Exam and Worksheet

resisting framework
    lithology
    rock structure
resistant vs. non-resistant lithologies
isostasy
isostatic rebound
crustal uplift / isostacy
rates of crustal uplift
rates of crustal denudation
bedrock
regolith
residuum
colluvium
alluvium
diamicton
Alluvial Fan
Meandering River
Delta
Arroyo
Pocket Beach
Braided River
Moraine
Cirque
Cinder Cone
Fluvial Terrace
Wave-Cut Terrace
Debris Fan
Fault Scarp
Moraine
Incised Channel
Sea Stack
Drumlin
Pothole
Boulder Field
Scree Slope
Spit
Transverse Dune
Stratovolcano
Triangular Facet
Hogback
Braided Stream
Meander Scroll
Kame
Esker

Other Lab skills / Concepts

Topographic Maps
landform identification
stream gradient calculation
hillslope gradient calculation
elevation / relief
topographic profiles
scale / vertical exaggeration
Air Photo Interpretation
3-D stereo view
landform identification
climate interpretation
scale determination
Fluvial Lab
work key equations:
mannings
continuity
stream power
recur. interval
probability
froude number
unit conversions

channel profiles
w/d calculations
field data collection

-be able to interpret relationships between tectonic uplift and global sea level change, can you identify which process is affecting a given sea level record

-how has global sea level changed during the late Quaternary, and why?

-make sure you can calculate slopes and gradients from topographic maps

-can you plot a ternary diagram using soil texture data?
-can you determine the recurrence interval of a given flood discharge?

- how about solving hydraulic flow problems using Manning's Equation and the Continuity Equation?

-what is the relationship between river load, type of sediment, and river morphology?

-can you identify landforms / geologic processes from air photos?

-could you identify stream drainage types (dendritic, trellis, radial, etc.) from air photos?
-how about identifying other landforms: e.g. point bar, cut bank, alluvial fans, deltas, lava flows, volcanoes?

- make sure you understand all of the concepts associated with the coastal geomorph. lab, as they apply to the pacific northwest.