Geology 214
Concepts to Focus on for Test 2

Please do not email me requesting answers to any of the following (the answers are all in the notes). However, feel free contact me for clarification about any of the concepts, or stop by my office for more information.

Chapter 9
What holds a slope in place and what pulls slope material down?
Understand the driving forces and resisting forces.
What causes cohesion? What causes mechanical friction?
What does “factor of safety” refer to when applied to slope stability?
Why is vegetation important for the stability of slopes?
How does slope aspect impact the stability of slopes?
How does water make a slope more unstable?
How does the slope angle influence slope stability?
How does clay impact the stability of a slope?
How is a reduction groundwater related to land subsidence (e.g., Central Valley, CA)?
What water-soil relationships cause a building to sink (e.g., leaning tower of Pisa).
What are “triggers” for landslides (e.g., what happens when the toe of a slope is removed or an EQ)?
What “rapid” subsidence issues does Bellingham face?
What is solution leaching and how is it related to rapid subsidence?
What are some ways to mitigate the hazards of landslides and unstable slopes?

What types of sediments are most susceptible to liquefaction?
What determines the “shear strength” of sediments?
Why do liquefiable sediments have to be saturated with water?
Why does ground shaking due to earthquakes amplify in soft sediments?
What is lateral spreading?
Why is the Bellingham waterfront susceptible to these hazards?

Chapter 8
Understand what a watershed or drainage basin is and what basin characteristics influence stream discharge in a watershed.
How is stream “discharge” quantified?
What is stage height?
What is a rating curve?
What is a hydrograph?
What watershed characteristics would make the hydrograph higher and narrower; wider and flatter?
How does rain on snow affect a hydrograph?
What is the orographic effect?
Why is runoff less in August in a PNW watershed than in April (for an equivalent rainfall event)?
What months of the year is the Pacific Northwest most susceptible to floods? Why?
What time of year are rivers in Minnesota most susceptible to floods?
What cause upstream (or flash) floods?
What factors created the large (1990) flood in the Nooksack River?
What is a 100 year flood? How is it estimated?
Chapter 12
What are some ways floods can be mitigated (levees, dams, buyouts, insurance, floodplain maps)?
What are good and bad attributes of levees?

What is groundwater?
What type of sediments form most of the aquifers in the Puget Sound region?
What is porosity and what factors determine the magnitude of porosity?
What is hydraulic conductivity (permeability) and what determines its magnitude?
What creates a hydraulic gradient?
What is Darcy’s Law?
What controls the velocity of groundwater flow?
What controls the shape of a cone of depression?
What is the Gyben-Herzberg Relation (z = 40h)