

EES 104- HYATT, Spring 2008, REVIEW FOR TEST 3 – FINAL EXAM
EXAM TIME: Thursday May 15, 12:30-2:30 p.m. in Media 201

(Contingency plan due to inclement weather: Sat. Dec. 22, 9:00 a.m., Media 201)

Part I	multiple choice	10 questions, 1point each	= 10
Part II	true/false	10 questions, 1 point each	= 10
Part III	fill in the blank		= 5
Part IV	short answer/define/explain		= 10
Part V	diagram questions		= 10
Part VI	essay / short answer		= 5

TOTALS to 50 converted to a grade out of 200

AS INDICATED IN THE COURSE SYLLABUS, PLEASE NOTE “A FAILING SCORE (<60%) ON THE FINAL TEST AUTOMATICALLY LOWERS THE FINAL COURSE GRADE BY 1 LETTER GRADE (E.G. AN “A” DROPS TO A “B”).

Questions on the test are based on material covered in class lectures and the text book. Topics studied in the lab that are also discussed in class may be included in the lecture test. These sheets indicate topics and questions central to test 3. If you understand and can answer these questions you should do well on the test. As well, as indicated in class several review **questions in the text book** will definitely be covered to one extent or another on the first test (not necessarily word-for-word the same, but the topic will be on the test). Some if not all of the following questions will be on the exam: **Chapter 11:** Q. 2, 13, 21. **Chapter 16:** Q. 1, 9, 11. **Chapter 17:** Q. 7, 8, 21.

EARTHQUAKES – see chapter questions above

What is an earthquake? When an earthquake occurs causing the earth to rupture what style of deformation has occurred? Explain the elastic rebound process as it relates to earthquakes. What causes earthquakes? What are, and what causes foreshocks and aftershocks? What are the focus and the epicenter of an earthquake? With respect to seismic energy waves, what is the difference between body waves and surface waves? **Compare the properties of s-waves, p-waves, and L-waves.** Which of these are body waves? Which goes faster p-waves or s-waves? Which of these types of waves will pass through a liquid? Which of these types of waves is compression and which is shear? Which causes a vibration parallel to the direction of wave propagation? What instrument is used to measure seismic waves. How do seismographs work? Which is fastest and which is slowest: S, P or L waves? How many seismic station records are required to determine the epicenter of an earthquake? **Explain how someone uses seismic records to locate the epicenter of an earthquake.** What is the Mercalli intensity scale and what is it based on? How does it differ from the Richter Scale? How does a seismometer work? **What is the Richter scale based on?** Be able to characterize a seismic wave with respect to wave length and amplitude. Which tends to cause more death, direct or indirect effects of earthquakes. Give an example of a direct and indirect hazard associated with earthquakes. What 5 factors influence the amount of damage caused by an earthquake? What kind of substrate materials tend to amplify vibrations the most? What approaches are used to make buildings or other structures withstand vibrations better? What are tsunamis and why are they dangerous? What kinds of observations and data are used to predict earthquakes? What are common precursors to large earthquakes? What are seismic gaps? For what time frames are earthquakes well predicted, and for what time frames are they poorly predicted.

RUNNING WATER – see chapter questions above

What is the hydrologic cycle? Why are rivers important to people? **Draw a diagram to show the different components of the hydrologic cycle;** make sure to show evaporation, condensation, precipitation, runoff, groundwater flow, and transpiration. Define each. **What is a drainage basin (or watershed) and why is the drainage basin concept important?** How does the size of drainage basins change as you move downstream? How does discharge change as you move downstream? Explain the meaning of splash erosion, sheet flow, rill erosion & flow, and gully erosion and draw a sketch showing where each occurs on a hill slope leading to a stream channel. What is the primary driving force moving water down hill? What is the primary resisting force that slows water down? What factors influence friction between flowing water and the banks? Why are the size and the shape of the channel important to how fast water flows? Where does water flow fastest in a stream channel? What is a thalweg? What is discharge and what are its units of measure? **How is discharge calculated** (give the equation, units, and define all terms in the equation). What is velocity and what are its units of measure? Why does water flow faster in the thalweg than at the side of the channel? What is a hydrograph? **Draw a simple storm hydrograph** and indicate the rising limb, falling

limb, peak discharge, and lag time. When on this storm hydrograph you would expect erosion vs. deposition (explain your reasons for selecting the times that you have chosen). What is the difference between bedrock channels and alluvial channels? Define competence and capacity. By what mechanisms does a stream erode its bed? What are hydraulic action, abrasion and solution as they relate to erosion by flowing water? Draw a figure showing dissolved load, suspended load, bed load, traction load, saltation load. Which type of load contains the largest sized debris? What are mid-channel bars, where do they form, what conditions promote their development, and what kind of stream channel pattern do they produce? **How do point bars, cut banks, and oxbow lakes form?** Draw a sketch to show where a point bar and cut bank occurs. Draw a sketch and explain how an oxbow lake forms. What is a flood plain and where does it occur? How do natural levee's form? What problems arise in relation to siltation and flooding when artificial levees are built along streams? What grain-sized of sediment is usually found on a flood plain? What are deltas, alluvial fans, and natural levees and where along a stream do these landforms occur? **What is "base level"? What is a graded stream?** What directions do streams erode? Why do streams erode vertically, horizontally and in a headward (upstream) direction? Where do these types of erosion dominate along streams? Vertical erosion produces a valley with what shape? What is a "V" shaped valley and where does it occur? In addition to grade and base level name two other large-scale controls on the development of rivers and river landscapes. What are some of the differences between bedrock-controlled streams and alluvial streams? Know the characteristics of dendritic drainage pattern. **How can climate and/or tectonics cause entire stream systems to adjust through modifications to base level and/or grade?**

GROUNDWATER – see chapter questions above

What is groundwater and why is it important? How much groundwater is there in relation to other sources of fresh water on earth? How does groundwater fit into the hydrologic cycle? What is infiltration? **What is the saturated zone, unsaturated zone, water table and capillary fringe?** Be able to draw a sketch showing these different zones. What is the water table? What controls the flow of water in the ground? Write and explain the terms in Darcy's law as written to describe the velocity of groundwater flow? **Explain hydraulic gradient, porosity and permeability?** What is the name of the area where water is added to the groundwater supply? What is recharge and discharge as these terms relate to groundwater? Where do recharge and discharge zones usually occur? What is the name given to a location where groundwater leaks out to the ground surface? What kind of material has a high porosity but a low permeability? Which has a higher permeability; crystalline igneous bedrock, clay or coarse gravel? Which one of the preceding materials will water flow through the fastest? **What is an aquifer, and aquitard (aquiclude)?** What hydraulic characteristics must an aquifer have? Be able to recognize "good" well locations from "bad" well locations for simple geologic settings. Explain and sketch unconfined, confined and artesian aquifers? What is a pump test, drawdown and the cone of depression? Why are pump tests performed? What are the 2 main types of pollutant sources? Describe common problems associated with over-use of groundwater supplies. How does groundwater use contribute to subsidence? What are gaining and losing streams? What is the difference between point and non-point sources of pollution, and give an example of each. Can contaminated ground water be taken out of the ground, cleaned and put back in the ground, how? **What are the main types of aquifers that water is drawn from in Eastern Connecticut?**