CE 365K Hydraulic Engineering Design, Spring 2015

Review for Second Exam

The material is classified according to ***Bloom's Taxonomy of Educational Objectives***:

Level	Title	Meaning
1	Knowledge	Definitions, facts, formulas
2	Comprehension	Explanation of definitions, formulas, problem solving procedures
3	Application	Know how to use a formula or procedure to solve simple problems
4	Analysis	Break down a complex problem and solve by steps
5	Synthesis	Derivation of basic formulas, design of new systems
6	Evaluation	Advantages and limitations of alternative approaches

Lectures

Lecture	Topic	Level
15	Discussion of design projects	2
16	Class cancelled because of weather	
17	Detention pond design	3
18	Review of design project concepts	2
19	Pond design using Pond Pack, SCS CN procedure	5
20	Return period and design storms	4
21	Runoff hydrographs	5
22	Return period and design storms	4

Readings

Topic	Level
Haested Section 2.1 Rainfall distribution	3
Haested Section 2.2 Rainfall abstractions (only SCS method)	5
Haested Section 2.4 Computing hydrographs	5
Haested Section 5.1 to 5.4 Detention design principles	2
Haested Section 5.5 to 5.8 Storage and discharge relationships	4
Haested Section 5.6 to 5.8 Detention pond routing	4

Expected Knowledge

1. For a watershed of known area, soil and land use conditions, determine the SCS curve number and compute the depth of direct runoff for a given design storm rainfall depth.
2. Use a depth-duration frequency table and an SCS design storm hyetograph to determine the design storm hyetograph for a particular return period and storm duration.
3. Determine the risk of failure of a structure design for a T-year recurrence interval event to occur at least once in N years.
4. Be able to derive the formula used in the computation in #3

5. For a given watershed and time of concentration, determine the SCS triangular unit hydrograph for a given rainfall duration and determine the direct runoff hydrograph for a given storm depth occurring in that duration.
6. Determine the discharge as a function of water surface elevation for a detention pond whose outlet consist in a combination of an orifice and a rectangular weir.
7. Determine the storage as a function of water surface elevation for a pond with specified ground topography
8. Describe how to use the Pond Pack program for Detention Pond design.

You may bring a review sheet 8/5 x 11 inches with you with anything on it on both sides of the paper that you want.