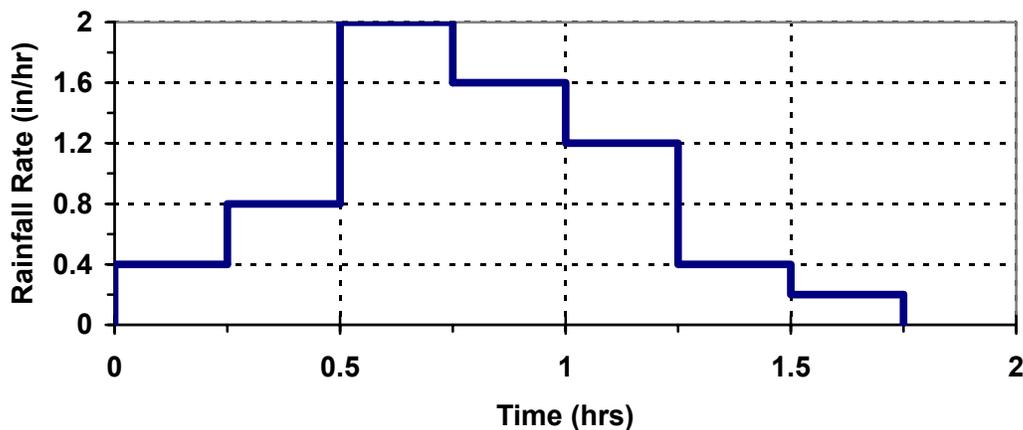


CVEN 463 “Engineering Hydrology”

HEC-HMS LAB EXERCISES

1. Create a new folder somewhere in the computer’s file system using Windows Explorer. Then, create a new HMS project to be stored in your new folder.
2. In your project make a new Basin Model with a single subbasin. The area of this basin is 50 acres; it has a Curve Number of 87; its SCS lag time is 15 minutes; and it has a constant baseflow of 3 cfs. Save the Basin Model.
3. Create a new Precipitation Gage. Input gage data to properly reflect the hyetograph shown below.



* Time 0 in the hyetograph is at 3:00 pm on 3/21/72

4. Create a new Meteorologic Model that applies the Precipitation Gage input in step 3 to the Basin Model and Subbasins of step 2.
5. Create a new Control Specifications module that begins at 1:00 pm on 3/21/72, ends at 1:00 pm 3/22/72, and has a time interval of 10 minutes.
6. Run the software to determine the outflow hydrograph for this subbasin and this storm. Copy and paste the results into Excel to generate time-series graphs of important parameters in Excel.
7. Modify the Basin Model as follows and save it under a new name.
 - a. Route the outflow hydrograph from the subbasin you created in step 2 through a channel with the following properties: 3500 ft long, bed slope 0.0024, Manning’s n 0.034, trapezoidal cross-section with bottom width of 10 ft and side slopes of 3:1 (H:V). Use the Muskingum-Cunge method.

- b. Make a new sub-basin with area 250 acres, CN of 91, SCS lag time of 28 minutes, and no baseflow.
 - c. Join the hydrographs from a. and b. above at a Junction point.
8. Run the simulation again to find the outflow hydrograph for this storm on this basin. You will need to modify the Meteorologic Model and you may want to modify the Control Specifications also based upon your results from the previous run. Copy and paste time-series results into Excel and produce a single graph that compares the hydrographs at (1) outlet of the first subbasin, (2) end of the channel, (3) outlet of the second subbasin, and (4) combined flow at the junction.
9. Rerun all the steps above on your own changing the methods used for runoff and unit hydrographs determination. Be sure to consult the technical manual for the correct interpretation of all input parameters. Be careful – HMS sometimes requires parameters to be input differently from how we have learned some models in class. An example is the Snyder synthetic unit hydrograph.
10. Input a second precipitation gage with rainfall data at the same time as the gage in step 3. Define a new Meteorologic Model to run on the first subbasin alone where Thiessen polygon analysis gives the relevant polygon area for the first gage as 17 acres and 33 acres for the second gage. Rerun the model and compare the new results to the original run.