CE 315
Hydraulic Engineering
Matlab Project

Submission Deadline: 21.01.2021 - 24:00

! Please submit your codes as a single folder including .m files to the Dropbox Link below.

! Example script names: surname_1 for the first question; surname_2_a_b & surname_2_c for the second question.

! Please do not forget to include functions used in the scripts

!! Please develop your own algorithms; copying someone else's work will be punished.

Dropbox Link for submission:
https://www.dropbox.com/request/uNDiluhwDBkFavB8BoKc
Drive Link for the codes developed in the sessions:
https://drive.google.com/drive/folders/1riC-iced9631TxvVVA_6oCeLZp6StrZW?usp=sharing

1) Consider the pump-pipeline system shown in the figure below. The reservoir water surface elevations are z_A= 100m and z_B = 110m. The 0.13-m-diameter cast iron pipe connecting the two reservoirs has a length of 20m.

Develop a matlab code

a) plot the pump characteristic curve using the experimental measurements shown in the table below.

Delivery Pressure (bar)	Inlet Pressure (Bar)	Flow Rate (l/s)
3.90	-1.20	50
3.20	-1.80	100
2.55	-2.10	150
2.00	-2.30	200
1.20	-2.40	250

b) plot the system curve on the same graph(Assuming no minor losses)(Hint: you can use the frictionf.m).

c) determine the system flow rate. (Code has to print the result on the command window.)

2) A concrete, trapezoidal channel with a 5-m bottom width and side slopes of 1 discharges $35m^3$/sec. The bottom slope of the channel is 0.004. A dam is placed across the channel and raises the water level to a depth of 3.4m.

   a) Develop a matlab code to determine the flow classification (e.g, M-2 , S-1) upstream of the dam. (you can use normaldepth_trapz.m and criticaldepth_trapz.m)

   b) Develop the code further using standard step method to compute the water surface profile at 50-m intervals until 250m.
   (Code has to print the result on the command window.)

   c) Develop a matlab code using the direct step method to compute the distance between the dam and the hydraulic jump. (when $y=y_c$)