

# CE 365 Project

Fall 2024

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Handed out: **October 24, 2024**

Due back: **December 12, 2024 12noon**

DropBox URL: <https://www.dropbox.com/request/MRFDYUhhZOiupKvwm1n>

## Introduction:

In this project you will make use of the water network distribution program WaterGEMS, by Bentley Systems. The program is widely used in the engineering community and is a state-of-the-art powerful network design application. While somewhat throttled for educational and student use (the size of the network you can create is limited) everything else is exactly as in the professional version.

For this year's project you will work on several problems that differ in their setup. More specifically, the project is comprised of two different sections: in the first part you will go through several tutorials that will familiarize yourself with the use of WaterGEMS. In the second part you will work on two real-world design problems; do not worry as these problems are not overly complex or lengthy in their scope.

## Procedure:

- First, we will need to form groups. To this end we will use the lab groups to form 4- and 3-student groups. The 3-student groups will get some credit at the end because they are one student short dealing with the same workload.
- Second, for the first part of the project I am asking you to work on

## Tutorials: 1, 2, 3, 4, and 5

These tutorials are small and well designed to get you started. While they are very manageable in scope and intended as an introduction, I want you to document them in your lab report. That means, print out the system, briefly summarize what you did, and show the results. Try to not use more than a page for each tutorial documentation but this is not a must. If you need a second page then use one, but do not go over the 2-page limit.

- Third, for the second part of the project I want you to work on

## Problems: 5 (page 270) and then 6 and 7 (page 272-274)

These problems are a little more complex in scope than the tutorials which will provide more of a challenge. As for the tutorials, I need you to document all work that you do, i.e., print the

system layout, what you did, and the designs plus results. For the latter this will be velocity and pressure distributions.

- Fourth, I expect you to deliver a project report that conforms with the highest of reporting standards, just as for the lab reports. In fact, I would recommend that you use the lab report requirements as a guide to organize your lab report. Use Calibri 11, a line spacing of 1.08 and apply 1-inch margins all around. The lab report, while to be in PDF, should be submitted electronically at the indicated return date. Do not produce endless pages of Appendices with plots of velocity and pressure distributions. Select a few that are important and submit those.

### **Grading:**

I will use the same percentages as for the lab report components, so you should be familiar with those by now. Having said that, there is some degree of freedom for you to add components and also a lot of freedom to design a nice report using graphics or visuals or color ... you name it. Spectacular reports will receive extra credit. Your report-presentation will be 20% of the project grade (content is 80%). Recall that the project is worth 17% of the total grade; it pays to do a diligent and good job.

### **Installing Software:**

#### **Option 1:**

If you have the book insert the CD from the back of the book and install WaterGEMS. The App needs the .NET framework in addition to MS Visual C++. You will be prompted for these packages if they are not installed on your computer already. The default installation is in C:/Program Files (x86)/Bentley/. You will also be asked to activate the software -> use the last option 'Evaluation Only' and you should be ready to go.

#### **Option 2:**

If you do NOT have the book, follow the instructions on how to download the software from the Bentley Server, which are in a separate file made available on the course website. (recommended)

### **Lastly:**

I recommend reading chapter 6 in the "Computer Applications in Hydraulic Engineering" as it provides some additional background information on networks and their design. It also outlines how WaterGEMS works in general and gives some strategies how to do a design.

I also urge you to get started NOW! The submission date may seem far away, but it is really just about 7 weeks and experience in previous years has shown that when the deadline is creeping up on you a lot of stress sets in. Stretch it out, make it a pleasant experience instead of cramming, stressing, overnighing, and short-cutting yourself because you are running out of time.

Best of luck!

M Piasecki      October, 2024