Final Course Reflection Joey Cantrell

1. Upon completion of this course, I have learned and developed new skills relative to Fluid Mechanics that met the intended objectives of the course outlined in the syllabus as follows:
    - I was able to further my understanding of specific weight and specific gravity from previous courses with respect to their impact on fluid systems and calculations. I learned how the viscosity of a fluid can affect its ability to flow in a system and its impact on the friction force. The course discussed the importance of pressure of fluids and on fluids. The impacts and differences between atmospheric pressure and gage pressure.
    - The course focused on the pressures on fluids and how to compute them using the Gamma-H equation. We learned that pressure increases as you go further down away from the surface and decreases as you rise to the surface. We also worked with flow meters and how to compute pressures using a flow meter.
    - We learned that buoyancy is the tendency of an object to float in a fluid (water or air). The course taught us how to determine the stability of an object based on calculating the center of gravity, center of buoyancy, and knowing d=some information on the density and/or area of the object.
    - The course showed us the effects of different pipes and fittings on the fluid flow in the system. We learned that each fitting (e.g. valve, elbow, etc.) had some level of impact on the fluid flow. Also, the overall length of the pipe plays a role in the system dynamics.
    - The course taught that using Bernoulli's equation is vital in understanding and computing pressures, heights, or velocities within a system. The equation uses the fact that no matter where you select the points, the properties associated with each side of the equation must equal (conservation of energy). When dealing with the conservation of mass, we focused on the increase of pressure, increases the density even though the volume is decreased. Thus, the overall mass is conserved.
    - The course taught us to compute all of the various frictions factors for each of the fittings in each branch of the system. For parallel systems, we learned that each of the branches must sum to the overall total for the system before and/or after the branches. In a network system, we had to solve for each network by assigning the flow into and out of each part of the network. The overall effect of the network had to be zero in the end meaning that some flows were treated positive in one network and negative in another depending on the direction of flow.
    - The course project touched on almost every one of these aspects of Fluid Mechanics. The team had to design the channel, determine if water hammer would cause a failure, compute forces in pipes to determine system properties, and develop a flow meter to measure pressure. We also had to determine flow rates, velocities, and frictions losses to complete the system.

- We learned that pumps do not change the velocity of the fluid flowing through the system (i.e. it is the same before and after the pump). This concept seemed strange to me, but after it was explained it made perfect sense. The pump does create pump head which has to be considered in Bernoulli's equation to help determine the correct parameters associated with the system.
- The first parameters that are needed to select the pump are the pump head and the flow rate desired for the system. Once these are determined, the rest depends on the pump dimensions, motor speed, and electrical requirements of the system.

2. Answers for each item below:
    - My learning of the material in this course is demonstrated all throughout my ePortfolio and my Google Drive. I was able to successfully complete all of the homework problems assigned to me and the project tasks. I also achieved respectable scores on both of the tests =, which highlighted my ability to apply the knowledge from the course. See items in the links: https://sites.wp.odu.edu/met330cantrell/assignments/ and https://sites.wp.odu.edu/met330cantrell/project/
    - I feel I was more successful on the earlier material dealing more with pressure, buoyancy, and forces from the fluids. This is evident by my better score on the first test than my score on the second test.
    - This course deals with the flow of fluids and I work at a company that deals with heat exchangers and fluid flow problems. Our designs are very complex and intricate, but this course has opened my eyes into some of the logic behind the designs that I have always been perplexed by in the past.
    - Yes, I have been able to converse and provide better opinions or resolutions to some problems that have been discussed at my company.
    - As discussed previously, I am already applying what I have learned to become a more valuable contributor to my company by understanding issues and being able to work with others to resolve the problems.
    - Yes, since my company deals with these types of systems it makes what I have learned even more valuable than the typical student that may be hired into a company that deals with different systems.
    - In my daily interactions with my colleagues.
    - I would devote more time to focus on the concepts and not relying on just the examples to get through. The concepts that were covered in class touched on the different techniques that we needed; however, they were applied to different scenarios. This created some confusion early, but I was able to figure the techniques out at some point making the course easier.

3. Answers for each item below:
    - I have improved both with the knowledge that I have gained and the techniques of better understanding the techniques to apply in a given situation. Many of the assignments were derivations of the examples with twists on what parameters were needed, but followed the exact same technique to solve.
    - My biggest accomplishment would be leading the project and getting it completed without having complete control. I like to control situations that impact me directly and with long distance team members this was not possible. I know that our project was not perfect in the end, but was satisfied with the efforts that all the team members put forth.
    - The skills that I mastered during this course were the pressure calculations (using Gamma-H and Bernoulli's equation) and the forces applied by the fluids. This is demonstrated by the higher test score on the first test.
    - My strengths are the mathematical calculations and being able to figure out the parameters needed based on the equations and the values given. The analytical nature of my background (B.S. in Mathematics) allows me to analyze the information provided and make the proper assignments and calculations. There are no specific examples to point to as this is just something that is instinctual in how I approach problems and solutions. My biggest weakness is the desire to jump straight to the equation and calculations part of the problem without fully establishing the technique needed to solve the particular problem.
    - I was not sure about the course to start with due to the different teaching style of the professor and the grading scale being so heavily based on a team project. However, I feel that both helped get more out the class and learn more about myself as a developing engineer and how I learn and apply that knowledge from the course material.