Ethan Kishinevskiy

4/29/2024

MET330: Fluid Mechanics

Reflective Cover Letter

1. **Persuade, both your instructor and the institution, that your work meets the objectives for this course. Discuss your learning experiences in this course, including any details that are unique to your own learning process, especially as represented by the contents of your portfolio.**
   a. My work meets or exceeds the objectives for this class. As early as test one[Tests (Fluid Mechanics) – MET330 (odu.edu)], I was able to demonstrate knowledge of how to apply Bernoulli's equation to a single-path system between two tanks that were pressurized differently. I also applied conservation of mass as the system was considered steady state and thus the mass flow rate at point 1 must be the flow rate at point 2. There were also questions on every test that I answered which required the computation and consideration of friction losses in pipes. While test 1 and 2 had me do this for a single-pipe system, test 3 [Tests (Fluid Mechanics) – MET330 (odu.edu)] had me perform this on a system with 2 branching paths, a parallel configuration. Test 2 also brought with it the need to calculate the water hammer, cavitation, and forces in pipes. In the group project at the end, my team selected a pump given the scenario and some approximations.

      My learning experience in this course was different to other ones, as this was much different of a course compared to previous ones I had taken. The weekly homework and consistency in method between different problems (set a reference, pick points where you know the most, write out Bernoulli's) were great boons in my success in this course and I greatly enjoyed the consistent approach and philosophy of solving any problem, not just a simple collection.

2. Answer the following questions, using links or excerpts (visual, audio, or written from your ePortfolio to illustrate your answers:

1. **Where is your learning demonstrated in the course?**
    a. My learning is demonstrated throughout the work I have done for the course and in the work I have done with my team, such as the tests[Tests (Fluid Mechanics) – MET330 (odu.edu)], where I showed an understanding of the course materials through the correct procedure and attention to detail on the later tests. The homework[HW – MET330 (odu.edu)] that I did throughout the course should also count for at least an attempt at learning, as the concepts were being solidified through my homework.
2. **What areas did you feel you were most successful, or improved the most?**
    a. I had missed the "major and minor losses" segments of the class, due to the flu, and was launched straight into the first test. On this test I had little idea how to calculate the pressures, but by clever usage of the resources allowed to me, namely the textbook and notes, I was able to find my way out. Now, the major and minor losses are like breathing: they are natural to me. I have also improved at following the procedure, shown in works such as test 2 and test 3.
3. **How do you see this course's content intersecting with your field or career?**
    a. As someone who wishes to go into the field of fluids, It is imperative that I understand and master the concepts in this course to have a good experience in the workplace and my career.
4. **Have you been able to apply concepts you have learned in the course to what you do at work or in other courses?**
    a. Some of the course content is useful In explaining phenomenon in Thermal Applications, such as pressure drop through pipes.
5. **How, when, where and why you might use this information or skill in the future?**
    a. As stated earlier, my interest is in fluid mechanics so there will be a strong usage of the principles of fluid mechanics in my future. I will hopefully use it for the design and sensible implementation of fluid mechanics systems.
6. **Do you think what you learn is important for your professional career?**
    a. Yes, this is addressed above.
7. **Where do you think you will be using everything you learned?**
    a. In my future designs and developments of fluid mechanics systems.
8. **If you were starting this class again, what advice would you give yourself to ensure that you had a successful semester?**
    a. I would definitely make sure that I studied reaction forces in pipes more as there was an issue where I was segmenting the pipes rather than considering them as a whole. Also. I would express viscosity in terms of thickness so that I understood it better throughout the semester.

3. Also answer the following questions:

1. **After taking this class, in what ways have you improved as an engineer? What brought about those improvements?**

a. I have improved in my accuracy and error-checking. This was important as a large flaw I made on test 1 was to not include the right units in my answer, forfeiting those points from a simple mistake. I also realize that engineering is not a linear process and that there are many, many possible roadblocks and problems that may arise. I learned this one from my team and the entire project for ODU Ed+gineering, which was a great experience but certainly unique to what other groups got due to the topic. Finally, I have definitely improved in my work ethic. I have worked tirelessly before, but this semester I really gave it my all to ensure that everything was completed on time and correctly, which I am proud of. This change mostly came about as a result of deficiencies within my team leaving the majority of the work up to two people, and so we adjusted and did the work.

2. **What was your biggest accomplishment in the course? Be specific with respect to your work and the topics you learned in the course.**
   a. My biggest accomplishment was finally being able to understand fluid flow and the energy losses that occur within it. Also, I am quite proud of my understanding of the iterative method for pipe systems, both of which are demonstrated in the written work and Excel spreadsheet for test 3, respectively.
3. **What skills did you master in this course? How are they reflected in the assignments (HW, tests, etc. Be specific.**
   a. I believe that I mastered fluid energy losses and branched systems, as demonstrated in test 3 when I computed the energy losses for a two-branch system and the resulting flow rate increase from a simple single-pipe system. I also mastered Bernoulli's equation for a fluid flow system. This is demonstrated throughout my consistent improvement throughout the semester even to test 3, where I was able to simultaneously compute and manage a system of Bernoulli equations.
4. **What do you feel are your strengths and weaknesses? Explain while making specific references to your work.**
   a. One of my strengths is my perseverance to finish the problem. This is demonstrated through work I haven't submitted, as the final draft of my work is the only thing I have submitted, but the dedication and time of meticulously evaluating the problem and considering solutions is a great strength of mine and I always frame it as a necessity to finish the problem no matter what. This is evident in all the excess papers I have in a pile from the tests in this class as well as some in the homework. Another strength of mine is the ability to assist my classmates (specifically my teammates). On the homework, I was able to assist them and help with their understanding of the problem or concept. I am lucky to have a good grasp of the concepts of this course so that I can assist my teammates in the presentation and other duties they must perform, which is why I chose Technical Leader.

   A weakness I have is that I am sometimes not very attentive to details such as units, which is something I'm still working on in my engineering career. This leads to doing more work than needed, which is detrimental to my performance as a

student. I also have trouble believing that I've done something right even if I know I have, which leads to many needless error checks.

How did you think about this course before you took it and how you think about it now that it is over? How many of your assumptions of understandings changed? Why?

Before I took this course, I thought it would be hard and unintuitive. Though I had an interest in fluids, I felt the course would be difficult, especially considering some of the previous material I had read on the subject (more of theoretical things). After the course, I realized that most of the things are intuitive and easy to understand with the correct explanation. These are phenomena most of us are used to, but not used to explaining. We just know that a fluid…does these things. After this course, though, I feel comfortable explaining (to a certain degree of specificity) fluid mechanics concepts to someone who doesn't understand anything about it. Most, if not all, of my assumptions changed because I was shown the practical situations that fluid mechanics are used in. We learned about topics that mystified me before and why they occur, as well as how to use them to our advantage.