MET440 Test 2 Reflection

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I feel that test number 2 has demonstrated my work towards objective number 4 in the syllabus, Solve steady one-dimensional heat conduction problems. I feel that objective number 4 was demonstrated for the fact that when we make a 3D cut line, we are not analyzing anything outside of that 3D cutline. I feel that test 2 also demonstrated my work towards objective 6 in the syllabus, solve simple convection heat transfer problems.

In problem one, I made mistakes manipulating my equation to the correct form which then trickled down throughout the problem and in turn I ended up with the wrong answer. I also did not provide an equation for "Q", rather I just provided an equation for "T". I should've taken the time to better understand the actual meaning behind the equations themselves and what to manipulate when. With the idea in mind that I do not have a strong point in manipulating equations with just variables in place, the advice I would give myself if I were taking this test again would be to take the time to better understand the equations at hand and to better understand how to manipulate these equations for different types of shapes.

What my grade should be is as follows: 1. Purpose 0.5/10.0 2. Drawings 1.0/10.0 3. Sources 0.5/10.0 4. Design considerations 1.0/10.0 5. Data and variables 0.5/10.0 6. Procedure 2.5/10.0 7. Calculations 2.0/10.0 8. Summary 0.5/10.0 9. Materials 0.5/10.0 10. Analysis 1.0/10.0 Total 10.0/10.0.

Problem 1: 1. Right Diff Equation 1/10 2. Right Bound Cond 1/10 3. Introduce g and k before integrate 1/10 4. Integrate diff Eq 1/10 5. Get C1 and C2 with BC 0/10 6. T equation .5/10 7. Q equation 0/10 8. Units of C1, C2, and Q 0/10 9. What if g=0? 0/10 10. Final results correctness .3/10 Total 4.8/10

Problem 2: 1. Right geometry 1/6 2. Right material properties 1/6 3. Right BC and g 0/6 4. Comparison plot for T 0/6 5. Heat transfer comparison 1/6 6. Final result correctness .3/6 Total 4.2/6

For problem 1, I encountered problems manipulating the equation to the correct form and understanding what needs to go where and when it needs to be done. I do not have strong point in manipulating equations with just variables but in order to troubleshoot this issue I rewatched the lectures going over how to manipulate these types of equations and followed along with the equation I was working with. For problem 2, I ran into issue with Comsol not agreeing with what I was wanting it to do. I watched videos online explaining how to create different graphs as well as enter in expressions but in the end, I could not get Comsol to do what I needed it to.

In order to complete the whole test, I set aside dedicated extended periods of time to work on the assignment. During these times I would take short breaks when I felt I was hitting a wall to give myself time to stop thinking about what I was working on in hopes that when I came back my mind would be clearer. I did become sick Wednesday with a cold which has had my mind foggy, but still worked through it to get my test completed

As for the new concepts that I have learned, this is the first time I have worked with Comsol, so the idea of using this program is completely new to me. By using Comsol I have also

been able to learn the visual concepts behind what it is we analyzing inside of different pieces of geometry as well as how heat transfers throughout the pieces of geometry.

With my interest being manufacturing engineering, I believe it is possible I will see these concepts being used in injection molding and blow molding manufacturing facilities. The amount of heat that is used during the blow molding process is critical to acquiring what it is a manufacturer is looking for out of the process.

As for what I do right now for work, I do not feel it is entirely as important as it will be for my future career path. When I am welding, I do consider the heat transfer concepts but I am not able to do anything with them. As for my future, especially in manufacturing, I do believe heat transfer will have a contribution to the things I will be working with.

As I said before, I have considered the concepts when I am welding, as well as when I am putting together mechanical rooms, but I have not necessarily been able to apply the concepts. Although I do see the courses content intersecting with my field at a point where the engineers are designing or working on new welding processes. Especially in higher quality materials, or materials that need pre heated, the analysis that goes into these processes requires the study of heat transfer.

I spent about 14 hours working on the test and organized my time by setting aside dedicated extended periods of time to stay focused on the assignment. I did take short breaks during these extended periods of time when I felt I was hitting a wall and just needed some time to clear my mind. If I were to take this test again, I would consider taking a half day off work to spend more time trying to understand how to use Comsol as well as understand the manipulation of the equation from problem 1. I would do this because I felt comsol was introduced fairly quickly with little time to become well rounded with the program. As for the equation, as I said before manipulating equations is not my strong point, so becoming more familiar with the manipulation of the equation from problem 1 would have helped me better understand the problem at hand.