

For every test you archived in your ePortfolio Google drive, you should have a reflection that briefly discusses:

1) How and why the test demonstrates your work toward one, or more, of the course learning objectives. Be specific on the course objectives you decide to mention.

The test demonstrates my work toward the following course learning objectives:

1. Use MLDT and Effectiveness methods to analyze heat exchanger.

2) A comparison of your test against the available solutions (soon after the test submission deadline, the solutions to the test will be available) and statement of the mistakes you made and what you will do next time to avoid making same mistakes. Please point out exactly where you made the mistake, say why you made the mistake, and how you should have done it. If you were taking this test again, what advice would you give yourself to ensure that you had a successful test?

1. This project has yet to be graded or solutions given.

3) A grade that is based on the writing rubric provided in the test and the correctness of your solution.

1. I give my team a grade of 73 out of 90 on this test.

4) A discussion in which you will answer the following questions:

a. What have you learned?

1. This was a totally new experience and a difficult mental workout. All of the steps of the process were provided. Nothing was hidden from us, however it was difficult all the same. Finding all of the correct values, applying calculations correctly, as well as applying all I had learned over the semester was hard work.

b. Where you think engineers use those concepts (provide specific examples)?

1. Engineers use heat exchangers in a lot of systems in a lot of companies. To know how to design an adequate system is an exciting thing that makes me very marketable to the industry.

c. Where do you think you will be using everything you learned?

1. I can use what I learned in this test in my job, AND in my everyday life outside of work and school. It depends on what type of job I get that will determine how frequently I use these Heat Transfer concepts. Unless I am with a company that designs heat exchangers, the chances of me designing one again are very slim.

d. Do you think what you learn is important for your professional career?

1. I have done these types of test reflections before. The number one thing that I learn from doing these reflections, but have yet to master, is being as detailed as possible in my process of solving the test problems. It is important for me to learn now, as much as I can, about being detail-oriented and knowing EVERYTHING about the subject matter. I know that this will take some time, but it is very important. I may not have enough time/ability to learn EVERYTHING that there is to know about Heat Transfer, but it is important that when I start a career I dedicate myself to learning EVERYTHING I can about my job and what I am doing.

e. How, when, where and why you might use this information or skill in the future?

1. I could be using this knowledge/information when I am designing heat exchangers for a company.

f. Have you been able to apply concepts you have learned in the course to what you do at work or in other courses?

1. I did some work about a year ago at an old job where we were testing the company's products in liquid nitrogen to see what effects the temperature had on the product's performance. I did some thermal analysis of the product on the computer to see the stresses that were occurring during the temperature drop. This is about the only experience that I have with Heat Transfer analysis. I have not done any work with heat exchangers outside of this class.

g. What areas did you feel you were most successful, or improved the most?

1. I honestly don't feel like I improved a lot with this test. The material is difficult for me to understand, and I often struggle with assignments in this class. So if I have successful at all, it is that I am still striving to do well in this class and understand the material as best I can.

h. How do you see this course's content intersecting with your field or career?

1. I still have one more semester of courses before I graduate, so I don't expect that I will retain everything I learn in this class. However, when I start a job that has components in it that deal with Heat Transfer, I am sure that I will recognize/remember the principles that I learned in this class.

In the reflection, you should describe the test using facts and feelings providing relevant details. You should identify strengths and weakness of the test and connect the test with experience. Finally, you should also clearly explain the quality of the artifact and give insight and state reason for judgment.

The course objectives are as follows:

After completing this course, the student should be able to:

- Define different modes of heat transfer.
- Discuss basic laws of conduction, convection and radiation heat transfer.
- Apply the concept of thermal circuit to solve one-dimensional combined mode of heat transfer problems.
- Solve steady one-dimensional heat conduction problems, multi-dimensional heat conduction problems, and unsteady heat conduction problems.
- Explain the physical meaning of dimensionless parameters and their relation to different heat transfer problems.
- Solve simple convection heat transfer problems.
- Differentiate between forced and natural convection heat transfer.
- Solve force convection problems using different experimental correlations.
- Describe heat transfer through tube banks and packed beds.
- Use MLDT and Effectiveness methods to analyze heat exchanger.
- Use commercial computer programs to numerically solve heat transfer systems.

$$(10 \times 4) + (7 \times 4) + 4 + 1 = 40 + 28 + 5 + 73$$

Problem solution rubric

	Exceeds Standard 4 10 points	Meets Standard 3 7 points	Approaches Standard 2 4 points	Needs Attention 1 0 points
1. Purpose 5%	The purpose of the section to be answered is clearly identified and stated.	The purpose of the section to be answered is identified, but is stated in a somewhat unclear manner.	The purpose of the section to be answered is partially identified, and is stated in a somewhat unclear manner.	The purpose of the section to be answered is erroneous or irrelevant.
2. Drawings & Diagrams 10%	Clear and accurate diagrams are included and make the section easier to understand. Diagrams are labeled neatly and accurately.	Diagrams are included and are labeled neatly and accurately.	Diagrams are included and are labeled.	Needed diagrams are missing OR are missing important labels.
3. Sources 5%	Several reputable background sources were used and cited correctly.	A few reputable background sources are used and cited correctly.	A few background sources are used and cited correctly, but some are not reputable sources.	Background sources are cited incorrectly.
4. Design considerations (assumptions, safety, cost, etc.) 10%	Design is carried out with applicable assumptions and full attention to safety and cost, etc.	Design is generally carried out with assumptions and attention to safety, cost, etc.	Design is carried out with some assumptions and some attention to safety, cost, etc.	Assumptions, safety and cost were ignored in the design.
5. Data and variables 5%	All data and variables are clearly described with all relevant details.	All data and variables are clearly described with most relevant details.	Most data and variables are clearly described with most relevant details.	Data and variables are not described OR the majority lack sufficient detail.
6. Procedure 25%	Procedure is described in clear steps. The step description is in a complete and easy to understand short paragraph.	Procedure is described in clear steps but the step description is not in a complete short paragraph.	Procedure is described in clear steps. The step description is in a complete short paragraph but it is difficult to understand.	Procedure is not described in clear steps at all.
7. Calculations 20%	All calculations are shown and the results are correct and labeled appropriately. The units of all values are shown.	Some calculations are shown and the results are correct and labeled appropriately.	Some calculations are shown and the results labeled appropriately.	No calculations are shown OR results are inaccurate or mislabeled.
8. Summary 5%	Summary describes the design, the relevant information and some future implications.	Summary describes the design and some relevant information.	Summary describes the design.	No summary is written.
9. Materials 5%	All materials used in the design are clearly and accurately described.	Almost all materials used in the design are clearly and accurately described.	Most of the materials used in the design are clearly and accurately described.	Many materials are described inaccurately OR are not described at all.
10. Analysis 10%	The design is discussed and analyzed. Argumentative predictions are made about what might happen in case of change in the operation and how the design could be change.	The design is discussed and analyzed. Argumentative predictions are made about what might happen in case of change in the operation.	The design is discussed and analyzed. No argumentative predictions are made about what might happen in case of change in the operation and how the design could be change.	The design is not discussed and analyzed.