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.

- Solve simple convection heat transfer problems.
- Differentiate between forced and natural convection heat transfer.
    - The problem was a plastic rod that was losing heat via natural convection.
- Use commercial computer programs to numerically solve heat transfer systems.
    - I used COMSOL to help me solve the second portion of this exam.

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?

- Upon first glance, I thought that I did everything incorrectly. However, after a closer look, I realized that all of my answers were solved for correctly and varied only slightly from the solutions given on Blackboard.
- I can tell that while my answers were correct, they were not solved for the same way as in the solution. I will study the solutions manual and learn from it.

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

- Based on the analysis performed on the last page of this document, I give myself a grade of 66%. While I think that I did very well on the first portion of the test, I did very poorly on the second portion which involved utilizing COMSOL for answers.

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

a. What have you learned?

- That I need to stop overthinking things. I talked with my professor while the test was available and his observation/advice was to not complicate the test so much. One of the first things stated on the test file when opened is to remain calm and to not overthink. I need to keep learning this.

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

- Product design of everything from consumer products to space equipment. Perhaps in cryogenic testing, where a product is dipped into a freezing liquid inside of a ladle. That ladle has to be able to withstand the convection of the temperature leaving it to the surrounding liquid without it breaking.

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

- 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. Even if I get a modeling and simulation job designing things, I will have to account for Heat Transfer to some degree in all of the designs.

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

- I really learned on this test that I have to work on not overthinking things. I learned to keep pushing onward in solving these (seemingly) difficult problems and keep trying to figure out how to use the tools at my disposal (COMSOL).

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

-This information will be useful when I consider how temperature affects the things that I am designing. If a client gives me some of his products parameters for temperature, I will need to be able to solve for some of the products dimensions (in this case the diameter) and for the temperatures inside the product to know what material to design the project out of.

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

- This test dealt with natural convection and I will be using that the rest of this semester. I do not currently have a job, since I am a full-time student, so I have not used the principles at work yet.

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

- My confidence during this test was waning profusely. Now that I have the solutions, I see that I was able to solve the problems correctly, albeit through different methods than were given in the solutions. This has boosted my confidence and my strength to keep pushing forward in this class and that is a healthy improvement.

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

- I have no idea what the future holds. I have no specific jobs lined up, and I have no specifc job that I desire strongly. I may end up using this course's content explicitly one day, but it may just be simple principles that I've learned here that will help me to solve problems later in life.

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 LMTD and Effectiveness methods to analyze heat exchanger.
- Use commercial computer programs to numerically solve heat transfer systems.

PART 1
PART 2

Problem solution rubric

	Exceeds Standard	Meets Standard	Approaches Standard	Needs Attention
	4	3	2	1
	10 points	7 points	4 points	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.

10 x 10 = 100

10+0+10+4+4+0+0+0+0+0+14 = 32 = 132/200 = 66%