# Reflection - Test 1- MET350

### WRITING RUBRIC (Applied to the whole test, not to particular problems)

1.	Purpose	0.5/10.0
2.	Drawings	1.0/10.0
3.	Sources	1.0/10.0
4.	Design considerations	1.0/10.0
5.	Data and variables	0.5/10.0
6.	Procedure	2.0/10.0
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.	P-v and T-s diagrams	2/11
2.	HX effectiveness for previous problem	0/11
3.	State calculations (with regeneration)	2/11
4.	Realize that regeneration hurts	0/11
5.	State calculations (without regeneration)	0/11
6.	Power	1/11
7.	Final results	1/11
	TOTAL	4/11

### PROBLEM 2)

1.	P-v and T-s diagrams	2/8
2.	State calculations	2/8
	Use wc_act = wt_act	
	Use efficiencies to get states	
	Cp & Cv variable	
	P5	
3.	Propulsion efficiency (before and after)	0/8
4.	Final results	0/8
	TOTAL	4/8

## FINAL GRADE: (if everything is correct)

10.0 + (80/2)\*(4/11+4/8) = 44.5

- The course objectives used in this test were: Develop an intuitive understanding of how to apply the first and the second law of thermodynamics to different thermal systems, Apply thermodynamics laws to gas turbines Engines using ideal cycles, reheating regeneration, and inter-cooling cycles, Apply thermodynamics laws to Jet Propulsion Engines using ideal cycles, Apply Rankine Cycle with superheating, re-heating, and regeneration to steam power plants, and Define the thermal efficiency, second law efficiency, and energy availability. Question one was working towards calculating the heat exchanger effectiveness in a rankine cycle with reheating/cooling/regen as well as the thermal efficiency. Question two related to these objectives due to us having to calculate the propulsive efficiency of a jet propulsion system and the isentropic efficiencies of the compressor involved.
- 2) For this test I made several mistakes. For the first question, I didn't include the PV and TS diagrams for when the reheater is off, and I didn't calculate the HX effectiveness correctly. My states were all correct, but I did not set up the equation to solve for T9. In this question, I skipped several steps and was not thorough, so next time I need to take my time and get all of the variables. Question two is only ¼ answered, but my PV and TS diagrams are correct, and my states are mostly correct. I however didn't include the H or Pr and Ps properties from the tables because I didn't know that they were needed. My propulsion force answer was close to the solution but I used a different formula.I also neglected to calculate Wp when finding the propulsive efficiency, and instead used F. If I were taking this test again, I would take the time to find the correct formulas and make sure all properties are shown.
- 3) Based on the writing rubric provided in the test and the correctness of your solution, I calculated my grade to be a 44.5, and with the homework it would be a 54.5. The writing rubric is my strength, because I do understand what the question is asking for and I know how to draw PV and TS diagrams. My weakness is definitely units, no matter if it's Fluid Mechanics or Thermal Apps.

4a) I noticed that it is always hard for me to first start and figure out what I need to calculate, but once I get going and complete the steps in the cycle with the properties it becomes easier. I also did not finish due to a swim meet I had the last two days before the test was due, so I would complete it earlier next time to ensure I have enough time to complete.

4b) I started by getting the states which is our procedure for practice problems and my steps were pretty accurate; writing the diagrams, and using the writing rubric to complete the first part. As I said previously, I would give myself time to complete the exam next time and plan out when I am going to work on it.

4c) What new concepts have you learned?

4d) Engineers use the concept of heat exchangers in everyday life across their industry in air conditioners, cars, refrigeration, gas boilers, and ships. They also use jet propulsion cycles for refrigeration (Vapour-Compression Refrigeration), water cutting, and firefighting (High-Pressure Water Jets).

4e) I will continue using the concepts in class as well as the writing style to solve problems, and will experience these types of questions in the engineering field.

4f) Yes, because my goal is to be an engineer for the Marine Corps so I will be using jet propulsion and hydraulics for missiles. Learning how to solve problems that are not step by step from the textbook are also useful to help us figure things out in any situation.

4g) I can use this information in the future for the equations of finding the variables in HX effectiveness. Comparing the calculated answers vs ones on the chart and then reporting the findings is going to be used in the future when figuring out why changes take place.

4h) Nothing I do at work, but using the format I used in my fluid dynamics class helped me write this test and it was easier to comprehend the question by writing it out.

4i)I was the most successful in completing the properties at each state and got mostly every one correct in both questions. There is no room for improvement yet since this is our first test.

4j) It could be relevant, but I am not 100% sure what I want a career in yet. Thermal Applications concepts aren't something that I would want to study in the future.

4k) I spent 2-3 days on this test, due to my swim meet all day on saturday at UVA and then we spent the night and came back that sunday afternoon. I thought I would have ample time to complete it but I did not. Next time I won't have a swim meet so that won't be a problem.