

**ChE 306: HEAT TRANSFER**  
FALL 2010  
PROBLEM-SOLVING QUIZ  
WEDNESDAY, DECEMBER 1, 2010

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This quiz will count as 1/6 of the total quiz grade for the semester, with the highest 5 quiz scores counting for the other 5/6.

The problem-solving quiz is a required element of our departmental ABET accreditation process and is tied specifically to ChE 306.

This quiz will be scored based on a rubric that measures your ability to take a written problem, develop a strategy to solve it, and correctly apply concepts from heat transfer to provide an accurate solution. Your work should not only be correct, but be well-organized, concise and consider the feasibility of your answer.

The quiz will be 50 minutes, consisting of one question, similar to a homework problem. The subject matter can be anything from the semester. The quiz will be open book/closed notes/closed homework. Calculators will be needed.

In developing your answer, be careful to show your solution strategy as well.

The quiz score will be based entirely on the problem-solving rubric table (later in this handout)

A copy of your quiz will be retained in your departmental folder for ABET records, and a composite report will be written to improve the teaching methods used in ChE classes.

## PROBLEM-SOLVING RUBRIC

NAME \_\_\_\_\_

Category	1 (Low)	2	3	4	5 (High)	Score	Weight
<b>Understanding Problem Statement &amp; Defining Problem</b>	Cannot understand the problem without assistance from others.	Some difficulty reducing the statement to a defined focused problem.	Some fundamental error in translating problem statement.	Problem diagram done nearly correctly.	Able to convert detailed problem statement to diagram, listing all knowns and unknowns.		0.4
<b>Understanding Fundamental Principles in the Problem</b>	Does not know the principles that apply to solving the problem	Misses critical principle in solution method.	Fundamental error in selection of equations (e.g., using transport instead of thermo)	Small errors in selection of equations to use.	Identifies the modes of heat transfer, and understands the type of problem well enough to describe to others.		0.4
<b>Ability to Find Appropriate Data to Formulate a Solution</b>	Unable to identify need to data to complete a problem.	Has difficult finding data appropriate for a problem.	Able to find most common data, but not able to identify all important data	Minor mistakes made/overlooked one piece of data	Knows what data to collect/ look up for each fluid at the correct temperature		0.4
<b>Developing a Strategy to Solve the Problem (Equation(s))</b>	Cannot solve the problem independently at all. Would require help from others.	Incorrect strategy from the beginning... would need help from an example to solve.	Difficulty in more than one step in solution strategy.	Small trouble with 1 step in strategy.	Understands the equations to solve, and the order to solve them in		0.4
<b>Ability to Concisely Present the Problem and its Solution</b>	Cannot describe steps to solve or the reasons for each step.	Basic steps make sense, but not concise or logical enough to reproduce.	Solution is somewhat disorganized, difficult to reproduce.	Most of solution is neat and ordered; others can follow with little trouble.	Able to solve the problem in a way others can follow easily.		0.4
						<b>SCORE</b>	<b>TOTAL</b>
						Max 25	Max 10