**Academic Prompt with Rubric**

**Solve Engineering Problems**

**ME 405 Heat Transfer**

**Assignment Steps**

1. Read the problem. Extract given data. Identify information that must be found.

2. Recollect relevant theory involved in the problem.

3. Based on that theory, develop a mathematical model of the problem.

4. Substitute values of the given variables in the mathematical model.

5. Find the unknown.

6. If the unknown is the required solution, stop and check for validity.

7. If there are other unknowns, solve for them sequentially.

8. Validate all the answers through checking and re-substitution methods.

9. Interpret the answers. List them with the required statements.

**Rubric**

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| **Performance indicators** | **(1)**  **Emerging** | **(2)**  **Developing** | **(3)**  **Proficient** | **Scores & comments** |
| Connection to theory | Can connect theoretical concepts to practical problem solving with prompting. | Can relate most theoretical concepts to practical problem solving. | Can relate all theoretical concepts to practical problem solving. |  |
| Mathematical expression | Has difficulty in connecting formulation from theory. Many parts are missing or constructed incorrectly. | Does a good job of expressing applicable theory mathematically with only minor problems. | The problem is formulated correctly demonstrating how the physical theory can be expressed mathematically. |  |
| Solve equations with correct units | Solution approach is correct but there are significant errors in the computations and/or units. | The solution approach was correct and except for minor errors the solution is correct. | The solution approach was correct and produced correct answers with appropriate units. |  |
| Solution checking | Some solution checking was done but was inadequate to verify the accuracy of the solution or related to the posed problem. | Most of the solution was checked and shown to be correct and related to the posed problem. | The solution was carefully checked and shown to be correct and relevant to the posed problem. |  |
| **Overall point and comments** | | | | |

**Scale:** 12/11=A, 10/9=B, 8/7=C, 6/5=D, 4 or less=F