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**Submitted to**

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**MME 9710 Advanced Computational Fluid Dynamics Assignment 1**

# Assignment 1 - Steady-State Conduction

# Instruction: Solve each of the following problems and explain your results. For each problem, determine an appropriate number of control volumes through a grid independence study. Determine the number of iterations required for convergence and comment on the result.

## **Problem 1 - Linear Heat Conduction**

Solve for the one-dimensional temperature distribution in a square bar of mild steel as given below. The properties of mild steel are:

* k = 60 [W/m⋅⋅K]
* ρ = 7800 [kg/m33]
* cp= 430 [J/kg⋅⋅K]

Assume the convection coefficient is zero on the exposed surfaces, and fixed end temperatures of T1 =100 ˚C and T2 = 0 ˚C.