**24-650 Applied Finite Element Analysis**

**Assignment 1**

submitted by

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**Objective**

The goal of this assignment is to explore the steady-state thermal conductivity and temperature variations under different material and heat insulation settings. The main object is a casted iron pipe with inside and outside diameters are 70 mm and 90 mm, accordingly.

**Model and Geometry**

The cast iron pipe (see in Fig.1) has inside and outside diameters are 70 mm and 90 mm, accordingly. Moreover, a heat insulation foam with 5mm thick will be applied to the outside surface of the pipe (see in Fig.2).

**Conditions**

The thermal conductivity of the pipe is 52 W/m-C, and the pipe is carrying steam at 155 ℃, with an outside temperature of 20 ℃. We assume that the pipe ends are adiabatic. The foam has a thermal conductivity of 0.20 W/m-C, and the inside surface has a convention coefficient of 20 W/m2 -C, with an outside surface convention coefficient of 3.8 W/m2 -C.

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