Carnegie Mellon University
Mechanical Engineering
Applied Finite Element Analysis
24-650 Spring 2024
Monday, Wednesday 6 PM to 7:50 PM

Assignment 2

- A note on critical thickness

Critical thickness in heat transfer

- Critical thickness indicates the insulation thickness from which the outward heat loss (heat flow) drops. Upto the critical thickness, the heat flow increases as you increase the insulation. However the heat flow drops once you exceed the critical thickness of the insulation.

- Usually applies to cylindrical and spherical hollow bodies

- Critical radius of the insulation layer depends on the coefficient of thermal conductivity (k) and the outer film coeff (h).
  For a cylindrical geometry it is k/h.