1. ME 3333, Heat Transfer

2. 3 credits, 4 contact hours


5. Specific course information:
   a. Catalog description: Conduction, convection, and radiation. Boundary layer analysis using momentum and energy equations. Applications such as: fins, heat exchangers, electronics cooling, bioheat transfer, energy conversion, phase change energy storage and boiling.
   b. Prerequisites: ME 3332, ME upper division.
   c. Required course.

6. Course outcomes (related ABET student outcomes indicated in square brackets):
   a. An ability to use fundamental heat transfer rate equations of conduction, convection and radiation in analysis. [1]
   b. An ability to apply the fundamentals of heat conduction, which may include: steady and transient heat conduction, one-dimensional conduction and conduction in multi-dimensions. [1,2]
   c. An ability to compute convective heat transfer coefficients for a variety of engineering problems including: forced convection, natural convection, internal flows, external flows, and laminar and turbulent flows. [1,2]
   d. A working understanding of radiation heat transfer. [1,2]
   e. An ability to apply elementary numerical approaches to heat transfer analysis. [1,2]
   f. An ability to apply conduction, convection and radiation fundamentals to applications such as: fins, heat exchangers, electronics cooling, bioheat transfer, energy conversion technologies, and phase change energy storage and boiling. [1,2]

7. Course topics:
   a. Foundations of heat transfer.
   b. Conduction heat transfer.
   c. External convective heat transfer.
   d. Dimensional analysis.
   e. Internal viscous flow and heat transfer.
   f. Heat exchangers.
   g. Thermal radiation.