

ME 651 Numerical Methods for Thermal Radiation Heat Transfer (3-0-0-6)

Pre-Requisite : ME-604 Conduction and Radiation

Fundamentals of thermal radiation; Radiative transfer without participating media; Radiative transfer with participating media; Governing equations in radiative transfer analysis with participating media; Methods for solving radiative transfer problems - analytic method, Monte Carlo method, zonal method, flux method, P-N approximation, discrete ordinate method, finite element method, discrete transfer method, finite volumet method, collapsed dimension method. Application of numerical methods for solving conjugate radiation, conduction and/or convection problems in 1-D and 2-D Cartesian and axi-symmetric geometry.

Textsbooks:

- [1] R. Siegel and J. R. Howell, *Thermal Radiation Heat Transfer*, 3rd edition, Taylor and Francis, 1992.
- [2] M. F. Modest, *Radiative Heat Transfer*, McGraw-Hill, 1993.
- [3] M. N. Ozisik, *Radiative Transfer and Interactions with Conduction and Convection*, John Wiley & Sons, 1973.