ME 306 (AUG) 3:0
Analytical and Statistical Thermodynamics

Instructor(s): Koushik Viswanathan and Gaurav Tomar

Course description:
This course will cover mathematical aspects of macroscale and microscopic thermodynamics. The pre-requisites for this course are courses in engineering mathematics and basic thermodynamics.

Contents: The course will be covered in four parts:
1) Classical theory of thermodynamics: Geometry of fundamental relations, Caratheodory's theorem, thermodynamic potentials
2) Statistical picture and microscopic models for equilibria, expansion methods for partition functions and analyticity
3) Thermodynamic stability: Phase equilibria and separation, thermodynamics of surfaces and multi-component systems
4) Non-equilibrium processes: Langevin equation, fluctuation-dissipation theorem, Fokker-Planck equation, Diffusion equation and dynamic mobility

Prerequisites: Engineering mathematics and thermodynamics at the UG level

Additional information:
Assessment: Periodic assignments, 2 midterm exams and 1 term paper

Course website: