



Thermodynamics I

Course code: 28161
Credits: 3
Course Type: Theoretical
Prerequisites: Differential Equations, Physics 2
Course Length: 51 hours

Outlines:

- 1- Definition of thermodynamics & the application in industry.
- 2- System & control volume, state, process, properties, units, temperature scale & zeroth law of thermodynamics.
- 3- Pure substance, definition & properties, quality and thermodynamical tables, equation of state for ideal gases.
- 4- work and Heat in thermodynamics
- 5- conservation of energy or first law of thermodynamics, enthalpy, steady state, steady flow process, uniform state uniform flow process throttling, soul thompson factor, heat capacity, internal energy, conservation of man, volumetric & man flow rate.
- 6- Heat engines and Heat pumps, thermal efficiency & coefficient of performance second law of thermodynamics, reversible process, can not cycle.
- 7- the clausius inequality, entropy, change of entropy for reversible and irreversible process, lost work, the increase in entropy principles.
- 8- Entropy and change of entropy for ideal gases, efficiency in thermodynamics
- 9- Irreversibility, reversible work, availability or exergy.

References:

1. "Fundamental of Classical Thermodynamics", G. V. Whalen. R. Sountag.
2. "Fundamentals of Engineering Thermodynamics", M. J. Moran and H. N. Shapiro.
3. "Heat and Thermodynamics", M. W. Zemansky and R. H. Dittman.