

Course Title: Thermodynamics-I

Course Code: PE-210

Course Contents

Introduction

Fundamentals; thermodynamics properties, intensive and extensive properties; pressure; temperature.

Laws of Thermodynamics & its Applications

Zeroth Law of thermodynamics. Energy, potential energy; kinetic energy; internal energy; first law of thermodynamics; non-flow energy equation; steady flow energy equation; flow work, Reversibility.

Second law of thermodynamics; entropy; uses of entropy.

Behaviors of ideal gas, various gas equations; dryness fraction, sub cooled and superheated liquid.

Raoult's law; Henry's Law.

Thermodynamics Cycles

Carnot cycle, Vapor power cycles; steam power plant; Air standard cycles; Diesel and Otto cycles. Refrigeration cycle; reversed Carnot;

Pump and Compressors

COP of heat pump and refrigerators. Reciprocating compressors.

Text book(s)

1. Yunus A. Cengel, Michael A. Boles, "Thermodynamics An Engineering Approach", Fifth Edition, Tata McGraw-Hill, 2006.

Reference Book(s)

2. R.K. Rajput, "Engineering Thermodynamics", Third edition, Laxmi Publication, 2007.