

Thermodynamics

Code	Credit Hours
ME102	2-0

Course Description

This course is an introduction to the concepts of energy and entropy. It provides the basic tools necessary for the analysis of any engineering system in which energy transfer or energy transformations occur; thus, thermodynamics is an important part of the training of almost all engineering disciplines.

Text Book:

1. Thermodynamics: An Engineering Approach by Y. A. Cengel and M. A. Boles, 5th Ed. McGraw Hill Publications

Reference Book:

1. Fundamentals of thermodynamics by Michael J Moran and Howard N. Shapiro, 8th Edition. Wiley Publications

Prerequisites

ASSESSMENT SYSTEM FOR THEORY

Quizzes	15%
Assignments	5%
Mid Terms	30%
ESE	50%

ASSESSMENT SYSTEM FOR LAB

Assignments	n/a
Lab Work and Report	n/a
Lab ESE/Viva	n/a

Teaching Plan

Week No	Topics	Learning Outcomes
1-2	Introduction	Course Introduction, Basic Laws, Pressure, Temperature, Mass, Volume, SI units , Conversion in systems

3-8	First Law of Thermodynamics	First Law of Thermodynamics, Conservation of energy, Closed system, Energy Balance Equation, Pure substances, Phase diagrams, p-t, p-v, diagrams. Supercooled, saturated, vapour phase. Processes on phase diagrams.
9	MID Term Exam	
10-13	Control volumes	Control volumes, mass balance, continuity equation, turbine, nozzles, compressors
14	Second Law of thermodynamics	Second Law of thermodynamics, heat engines, reversible processes, Carnot cycle, refrigeration cycle.
15-17	Entropy	Entropy, Law of increase in entropy, Entropy of a reversible process, entropy of on isolated system
18	End Semester Exam	

Practical:

Experiment No	Description
1	n/a
2	n/a
3	n/a
4	n/a
5	n/a
6	n/a
7	n/a
8	n/a
9	n/a
10	n/a
11	n/a
12	n/a
13	n/a
14	n/a
15	n/a
16	n/a