

6. Syllabus/Topics covered**Objective**

To teach the basic principles and provide a working knowledge thermodynamics and associated physical processes, with emphasis on practical applications.

Course Overview

No.	Chapter Name	Description
1	Definitions	Property, state, closed and open systems, temperature, pressure, work interactions, and heat transfer. State postulate.
2	Forms of energy	Kinetic, potential, and internal.
3	Properties of pure substances	Equilibrium diagrams, and quality. Ideal gas and incompressible substances.
Quiz 1		
4	Conservation of mass	Closed and open systems, and steady and transient processes.
5	Conservation of energy	Closed and open systems, and steady and transient processes.
6	Introduction to the second law	Entropy, Tds equations, irreversibility, and isentropic efficiency
Quiz 2		
7	Second law analysis	Closed and open systems, and steady and transient processes.
8	Power, refrigeration, and heat pump systems	Vapor cycles (e.g., ideal, Rankine, and vapor-compression); and air standard analysis of gas cycles (e.g., ideal, Brayton, Otto, and diesel).
9	Additional second law topics (with practical applications)	Kelvin-Planck and Clausius statements, the Clausius inequality, and exergy (availability)
Quiz 3		
10	Optional topics (with practical applications)	Methods to improve cycle performance, including reheat, regeneration, and intercooling.
Final Exam		