

C. V. RAMAN POLYTECHNIC, BHUBANESWAR**LESSON PLAN****Session (2026-2027)**

Discipline: Mechanical Engineering	Semester: 3rd Semester, Winter/2026	Name of the Faculty: Dr. Shubhashree Mohapatra, Assistant Professor Email ID: shubha.shree@cvrp.edu.in
Subject: THERMAL ENGINEERING I Theory- 05 (ME PC209)	No. of Days/week: 03	Start Date: 1/07/2026 End Date: 5/11/2026

Week	Class Day	Theory Topics
1st	1st	Thermodynamic system, Thermodynamic Properties of a system
	2nd	Intensive and extensive properties
	3rd	Define thermodynamic processes, path, cycle, state, path function, point function
2nd	1st	Thermodynamic Equilibrium; Quasi-static Process
	2nd	Laws of thermodynamics (statements only)
	3rd	Brief description of energy Sources: Classification of energy sources, Introduction about Renewable, Non-Renewable energy
3rd	1st	Fossil fuels, CNG, LPG, Solar Energy: Flat plate and concentrating collectors
	2nd	Applications of solar cell (Solar Water Heater, Photovoltaic Cell, Solar Distillation); Wind Energy
	3rd	Tidal Energy; Ocean Thermal Energy; Brief description of Geothermal Energy
4th	1st	Brief description of Biogas, Biomass, Bio-diesel; Brief description of Hydraulic Energy, Nuclear Energy; Fuel cell.
	2nd	Introduction to Internal Combustion Engines: Assumptions made in air standard cycle analysis
	3rd	Brief description of Carnot, Otto and Diesel cycles with P-V and T-S diagrams;
5th	1st	Internal and external combustion engines; advantages of I.C. engines over external combustion engines; classification of I.C. engines
	2nd	Neat sketch of I.C. engine indicating component parts; Function of each part and materials used for the component parts - Cylinder, crank case, crank pin, crank, crank shaft, connecting rod, wrist pin, piston, cooling pins cylinder heads, exhaust valve and inlet valve
	3rd	Working of four-stroke petrol and diesel engines
6th	1st	Working of two stroke petrol and diesel engines
	2nd	Valve timing and port timing diagrams for four stroke and two stroke engines.
	3rd	Comparison of two stroke and four stroke engines; Comparison of C.I. and S.I. engines
7th	1st	Brief description of I.C. Engine Systems: Fuel system of Petrol engines
	2nd	Principle of operation of simple and Zenith carburettors
	3rd	Fuel system of Diesel engines; Types of injectors and fuel pumps

8th	1st	Brief description of Cooling system: air cooling, water cooling system with thermo siphon method of circulation and water cooling system with radiator and forced circulation (description with line diagram).
	2nd	Comparison of air cooling and water cooling system
	3rd	Ignition systems - Battery coil ignition and magneto ignition (description and working)
9th	1st	Comparison of two systems; Types of lubricating systems used in I.C. engines with line diagram
	2nd	Types of governing of I.C. engines - hit and miss method, quantitative method
	3rd	Types of governing of I.C. engines-qualitative method and combination methods of governing; their applications; Objective of super charging
10th	1st	Performance of I.C. Engines: Brake power; Indicated power
	2nd	Performance of I.C. Engines: Frictional power; Brake and Indicated mean effective pressures
	3rd	Brake and Indicated thermal efficiencies; Mechanical efficiency; Relative efficiency
11th	1st	Performance test; Morse test; Heat balance sheet
	2nd	Methods of determination of B.P., I.P. and F.P
	3rd	Simple numerical problems on performance of I.C. engines
12th	1st	Simple numerical problems on performance of I.C. engines
	2nd	Simple numerical problems on performance of I.C. engines
	3rd	Air Compressors: Functions of air compressor; Uses of compressed air; Types of air compressors
13th	1st	Single stage reciprocating air compressor - its construction and working (with line diagram) using P-V diagram
	2nd	Multi stage compressors - Advantages over single stage compressors
	3rd	Rotary compressors: Centrifugal compressor, axial flow type compressor and vane type compressors
14th	1st	Refrigeration & Air-conditioning: Refrigeration: Refrigerant and COP
	2nd	Air Refrigeration system: components, working & applications; Vapour Compression system: components, working & applications
	3rd	Air conditioning; Classification of Air-conditioning systems; Comfort and Industrial Air-Conditioning
15th	1st	Window Air-Conditioner; Summer Air-Conditioning system
	2nd	Winter Air-Conditioning system, Year-round Air-Conditioning system
	3rd	Revision


 Signature of Faculty


 Signature of H.O.D.