

BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK
DEPARTMENT OF MECHANICAL ENGINEERING



SUBJECT: Thermal Engg-1

FACULTY: Manorama Sarabu

ACCADEMIC SESSION: 2026-27

SEMESTER: 3rd

SEC: A

Manorama Sarabu
01/7/26

[Signature]
H. O. D. 01.7.26
Mechanical Engg. Dept

TH:5- THERMAL ENGINEERING I

C205.1:	Understand thermodynamic properties, processes, equilibrium, laws of thermodynamics, and different conventional and non-conventional energy sources.
C205.2	Explain the construction, working principles, and thermodynamic cycles of internal combustion engines including two-stroke and four-stroke petrol and diesel engines.
C205.3	Describe the fuel, cooling, ignition, lubrication, and governing systems used in internal combustion engines and compare their performance.
C205.4	Analyze the performance parameters of I.C. engines such as brake power, indicated power, efficiencies, and heat balance and solve related numerical problems.
C205.5	Understand the construction, working, and applications of reciprocating and rotary air compressors and compare single-stage and multi-stage compressors.
C205.6	Explain the principles, components, working, and applications of refrigeration and air-conditioning systems used in domestic and industrial applications.

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LESSON PLAN

Discipline; Mechanical Engg	Semester:3rd (A)		Name of the teaching Faculty:Manorama Sarabu (Sr. Lect. Mechanical)
Subject:Thermal Engg. I	No. of day/per week class allotted:3P		Semester from date-1/07/26 To date: 5/11/26
Week	Class day Mon-1p,Tue-1p,Fri-1p	No. Of Period Available	No of weeks:15, Theory Topic
1st	3/7/26	1	Introduction to Thermodynamics: Thermodynamic Systems (closed, open, isolated) ;
	6/7/26	1	Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy,
	7/7/26	1	Internal energy and units of measurement) ; Intensive and extensive properties ;;
2nd	10/7/26	1	Define thermodynamic processes, path, cycle , state, path function, point function; Thermodynamic Equilibrium
	13/7/26	1	Quasi-static Process ; Laws of thermodynamics (statements only)
	14/7/26	1	Sources of Energy: Brief description of energy Sources: Classification of energy sources:
3rd	17/7/26	1	Renewable, Non-Renewable; Fossil fuels (CNG & LPG) ;
	20/7/26	1	Solar Energy: Flat plate and concentrating collectors & its applications (working principles of Solar Water Heater
	21/7/26	1	, Photovoltaic Cell, Solar Distillation);Definitions of Wind Energy;
4th	24/7/26	1	Tidal Energy; Ocean Thermal Energy; Geothermal Energy; Biogas, Biomass, Bio-diesel; Hydraulic Energy, Nuclear Energy; Fuel cell.
	27/7/26	1	Internal Combustion Engines: Assumptions made in air standard cycle analysis;
	28/7/26	1	Brief description of Carnot, Otto and Diesel cycles with P-V and T-S diagrams;
5Th	31/7/26	1	Internal and external combustion engines; advantages of I.C. engines over external combustion engines;
	3/8/26	1	Function of each part and materials used for the component parts -
	4/8/26	1	Cylinder, crank case, crank pin, crank, crank shaft, connecting rod,
6th	7/8/26	1	wrist pin, piston, cooling pins cylinder heads, exhaust valve, inlet valve;
	10/8/26	1	Working of four-stroke and two stroke petrol and diesel engines;;.
	11/8/26	1	Comparison of two stroke and four stroke engines; Comparison of C.I. and S.I. engines
7th	14/8/26	1	Valve timing and port timing diagrams for four stroke and two stroke engines
	17/8/26	1	I.C. Engine Systems: Fuel system of Petrol engines;;
	18/8/26	1	Principle of operation of simple and Zenith carburettors; Fuel system of Diesel engines

9th	21/8/26	1	Types of injectors and fuel pumps; Cooling system;
	24/8/26	1	air cooling, water cooling system with thermo siphon method of circulation
	25/8/26	1	and water cooling system with radiator and forced circulation (description with line diagram).
10th	1/9/26	1	Comparison of air cooling and water cooling system; Ignition systems – Battery coil ignition and magneto ignition (description and working).
	7/9/26	1	Comparison of two systems; Types of lubricating systems used in I.C. engines with line diagram;
	8/9/26	1	Types of governing of I.C. engines – hit and miss method, quantitative method,
11th	11/9/26	1	qualitative method and combination methods of governing; their applications; Objective of super charging.
	15/9/26	1	CLASS TEST-I
	18/9/26	1	Performance of I.C. Engines:
12th	21/9/26	1	Brake power; Indicated power;;
	22/9/26	1	Frictional power; Brake and Indicated mean effective pressures
	25/9/26	1	Frictional power; Brake and Indicated mean effective pressures
13th	28/9/26	1	Brake and Indicated thermal efficiencies;
		1	Mechanical efficiency; Relative efficiency;
	29/9/26	1	Performance test; Morse test; Heat balance sheet
14th	7/10/26	1	Methods of determination of B.P., I.P. and F.P.;
	8/10/26	1	Simple numerical problems on performance of I.C. engines
	11/10/26	1	: Unit-V: Air Compressors: Functions of air compressor; Uses of compressed air; Types of air compressors; Single stage reciprocating air compressor - its construction and working (with line diagram) using P-V diagram;
15th	15/10/26	1	Multi stage compressors – Advantages over single stage compressors; Rotary compressors
	18/10/26	1	Centrifugal compressor, axial flow type compressor and vane type compressors.
	21/10/26	1	Refrigeration & Air-conditioning: Refrigeration; Refrigerant; COP;;
16th	22/10/26	1	Air Refrigeration system: components, working & applications
	25/10/26	1	Vapour Compression system: components,;.
	28/10/26	1	working & applications; Air conditioning
17th	29/10/26	1	Classification of Air- conditioning systems, Comfort and Industrial
	5/11/26	1	CLASS TEST-II
	6/11/26	1	Air-Conditioning; Window Air- Conditioner; Summer Air-Conditioning system
18th	9/11/26	1	Winter Air-Conditioning system, Year-round Air-Conditioning system
	8/11/26	1	Revision

Signature of Faculty

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