

GOVT. POLYTECHNIC, NAYAGARH
3rd SEMESTER MECHANICAL ENGINEERING
LESSON PLAN (2026-27)

SUBJECT- Thermal Engg.-I

NAME OF FACULTY: Mrs. Monalisa Sahoo, Sr. Lect.

W.E.F : 01/07/2026 to 05/11/2026

TOTAL PERIODS-45

THEORY-3P/WEEK

Sl.No.	Week	Day	Topics to be covered
1	1st	1st Day	Introduction to Thermodynamics; Thermodynamic Systems (Closed, Open, Isolated)
		2nd Day	Thermodynamic properties: pressure, volume, temperature, entropy, enthalpy, internal energy and units
		3rd Day	Intensive and extensive properties
2	2nd	1st Day	Thermodynamic processes, path, cycle, state, path function, point function
		2nd Day	Sources of Energy; Renewable and Non-Renewable; Fossil fuels (CNG & LPG)
		3rd Day	Solar Energy; collectors and applications
3	3rd	1st Day	Wind, Tidal, Ocean Thermal, Geothermal, Biomass, Biogas, Biodiesel, Hydraulic, Nuclear Energy, Fuel Cell
		2nd Day	Carnot, Otto and Diesel cycles with P-V and T-S diagrams
		3rd Day	Internal and external combustion engines; advantages and classification
4	4th	1st Day	I.C. engine components, functions and materials
		2nd Day	Working of four-stroke and two-stroke petrol and diesel engines
		3rd Day	Comparison of engine types
5	5th	1st Day	Valve timing and port timing diagrams
		2nd Day	Fuel system of petrol engines; carburetors
		3rd Day	Fuel system of diesel engines; injectors and fuel pumps
6	6th	1st Day	Cooling systems
		2nd Day	Comparison of cooling systems
		3rd Day	Battery coil and magneto ignition systems
7	7th	1st Day	Comparison of ignition systems
		2nd Day	Lubricating systems
		3rd Day	Governing methods and applications
8	8th	1st Day	Supercharging
		2nd Day	Brake, indicated and frictional power
		3rd Day	Efficiencies
9	9th	1st Day	Performance test, Morse test, Heat balance sheet
		2nd Day	Determination of B.P., I.P. and F.P.
		3rd Day	Numerical problems
10	10th	1st Day	Numerical problems
		2nd Day	Air compressors: functions and uses
		3rd Day	Types of air compressors
11	11th	1st Day	Single-stage reciprocating compressor
		2nd Day	Multistage compressors
		3rd Day	Rotary compressors

12	12th	1st Day	Centrifugal compressors
		2nd Day	Axial flow and vane type compressors
		3rd Day	Refrigeration, Refrigerant and COP
13	13th	1st Day	Air refrigeration system
		2nd Day	Vapour compression system
		3rd Day	Air conditioning and classification
14	14th	1st Day	Comfort and Industrial Air Conditioning
		2nd Day	Window Air Conditioner
		3rd Day	Summer Air Conditioning System
15	15th	1st Day	Winter Air Conditioning System
		2nd Day	Year-round Air Conditioning System
		3rd Day	Revision

REFERENCES:

- 1 Introduction to Renewable Energy– Vaughn Nelson, CRC Press
2. Thermal Engineering – P. L. Ballaney, Khanna Publishers, 2002
3. A Course in Thermal Engineering – S. Domkundwar & C.P. Kothandaraman, Dhanpat Rai.
4. Thermal Engineering – R. S. Khurmi and J.K. Gupta, 18th Edition, S. Chand & Co, New Delhi.
5. Thermal Engineering – R. K. Rajput, 8th Edition, Laxmi publications Pvt Ltd, New Delhi. 15

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24/06/26

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