

## GOVT. POLYTECHNIC MAYURBHANJ, TIKARPADA

ACADEMIC SESSION-2026-27

LESSON PLAN

| Discipline :<br>MECHANICAL ENGG. |      | Semester: 3rd Sem                             | Name of the Teaching Faculty :KALEBAR SINGH                                                                                                       |
|----------------------------------|------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Subject : THERMAL<br>ENGG.-I     |      | No. of Days /<br>per week class allotted : 03 | Semester From date : 01/07 /26 To Date : 5/11/26                                                                                                  |
| MONTH                            | Week | Day                                           | Topics                                                                                                                                            |
| JULY                             | 1st  | 1st                                           | Introduction to Thermodynamics — Thermodynamic Systems (closed, open, isolated)                                                                   |
|                                  |      | 2nd                                           | Thermodynamic properties of a system: pressure, volume, temperature                                                                               |
|                                  |      | 3rd                                           | Thermodynamic properties: entropy, enthalpy, internal energy and units of measurement                                                             |
|                                  | 2nd  | 1st                                           | Intensive and extensive properties, Thermodynamic process, path, cycle, state — definitions                                                       |
|                                  |      | 2nd                                           | Path function and point function                                                                                                                  |
|                                  |      | 3rd                                           | Thermodynamic equilibrium, Quasi-static process                                                                                                   |
|                                  | 3rd  | 1st                                           | Laws of thermodynamics (statements only) — Zeroth, First, Second, Third laws                                                                      |
|                                  |      | 2nd                                           | Sources of Energy — Classification: Renewable & Non-Renewable; Fossil fuels (CNG & LPG)                                                           |
|                                  |      | 3rd                                           | Solar Energy: Flat plate & concentrating collectors; Solar Water Heater, Photovoltaic Cell                                                        |
|                                  | 4th  | 1st                                           | Solar Distillation; Wind Energy and Tidal Energy — definitions                                                                                    |
|                                  |      | 2nd                                           | Ocean Thermal Energy, Geothermal Energy; Biogas, Biomass, Biodiesel                                                                               |
|                                  |      | 3rd                                           | Hydraulic Energy, Nuclear Energy, Fuel Cell — Revision of Unit I                                                                                  |
| AUGUST                           | 1st  | 1st                                           | Internal Combustion Engines — Assumptions in air standard cycle analysis; Internal vs External combustion engines                                 |
|                                  |      | 2nd                                           | Advantages of I.C. engines over external combustion engines; Classification of I.C. engines                                                       |
|                                  |      | 3rd                                           | Carnot cycle — description with P-V and T-S diagrams, Otto cycle — description with P-V and T-S diagrams                                          |
|                                  | 2nd  | 1st                                           | Diesel cycle — description with P-V and T-S diagrams                                                                                              |
|                                  |      | 2nd                                           | Neat sketch of I.C. engine indicating component parts, Function & material of                                                                     |
|                                  |      | 3rd                                           | CLASS TEST-1                                                                                                                                      |
|                                  | 3rd  | 1st                                           | Function & material of parts: Connecting rod, wrist pin, piston, cooling fins, cylinder head, valves, Working of four-stroke petrol (S.I.) engine |
|                                  |      | 2nd                                           | Working of four-stroke diesel (C.I.) engine                                                                                                       |
|                                  |      | 3rd                                           | four-stroke engines                                                                                                                               |
|                                  | 4th  | 1st                                           | Comparison of C.I. and S.I. engines; Valve timing & port timing diagrams — Revision of Unit II                                                    |
|                                  |      | 2nd                                           | CHAPTER-3: I.C. Engine Systems — Fuel system of petrol engines; principle of simple carburettor                                                   |
|                                  |      | 3rd                                           | Zenith carburettor — principle of operation                                                                                                       |
| SEPTEMBER                        | 1st  | 1st                                           | Fuel system of diesel engines — types of injectors and fuel pumps                                                                                 |
|                                  |      | 2nd                                           | Cooling system: Air cooling system, Water cooling system — thermo-siphon method of circulation,                                                   |
|                                  |      | 3rd                                           | Ignition systems: Battery-coil ignition — description & working                                                                                   |
|                                  | 2nd  | 1st                                           | Ignition systems: Magneto ignition — description & working; Comparison of two systems                                                             |
|                                  |      | 2nd                                           | Types of lubricating systems used in I.C. engines (with line diagram)                                                                             |
|                                  |      | 3rd                                           | Governing of I.C. engines: Hit & miss method, Quantitative method                                                                                 |
|                                  | 3rd  | 1st                                           | applications                                                                                                                                      |
|                                  |      | 2nd                                           | Objective of super charging — Revision of Unit III                                                                                                |
|                                  |      | 3rd                                           | Brake and Indicated mean effective pressures, Brake and Indicated thermal efficiencies                                                            |
|                                  |      | 1st                                           | class/Quizz test                                                                                                                                  |



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| OCTOBER  | 4th | 2nd | Mechanical efficiency, Relative efficiency, Methods of determination of Brake Power (B.P.)     |
|          |     | 3rd | Methods of determination of Indicated Power (I.P.) and Frictional Power (F.P.)                 |
|          | 1st | 1st | Performance test on I.C. engine, Morse test                                                    |
|          |     | 2nd | Heat balance sheet, Solved numerical problems on B.P., I.P. and efficiencies                   |
|          |     | 3rd | IV                                                                                             |
|          | 2nd | 1st | of air compressors                                                                             |
|          |     | 2nd | Single stage reciprocating air compressor — construction & working (line diagram, P-V diagram) |
|          |     | 3rd | Multi-stage compressors — advantages over single stage compressors                             |
|          | 3rd | 1st | compressor                                                                                     |
|          |     | 2nd | Refrigeration system — components, working & applications                                      |
|          |     | 3rd | Vapour Compression system — components, working & applications                                 |
|          | 4th | 1st | Air conditioning — definition; Classification of air-conditioning systems                      |
|          |     | 2nd | Comfort and Industrial Air-Conditioning; Window Air-Conditioner                                |
|          |     | 3rd | Air-Conditioning system                                                                        |
| NOVEMBER | 1ST | 1st | CLASS TEST/QUIZZ TEST                                                                          |
|          |     | 2nd | Final Revision and semester paper discussion                                                   |
|          |     | 3rd | Final Revision and semester paper discussion                                                   |

  
30/06/26  
SUBJECT EXPERT  
GP MAYURBHANJ

  
30/06/2026  
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