

GOVT. POLYTECHNIC, NAYAGARH

3rd SEMESTER MECHANICAL ENGINEERING (2023-24)

SUBJECT- THERMAL ENGINEERING-I

TOTAL PERIOD-60

NAME OF FACULTY: Prafulla Kumar Mallick, PTGF(Mech)

THEORY-4P/WEEK

Semester from :01/08/2023 to 30/11/2023

Sl No.	week	Day	Topics to be covered
1	1 st	1 st day	Thermodynamic Systems (closed, open, isolated)
		2 nd day	Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement).
		3 rd day	Intensive and extensive properties
		4 th day	Define thermodynamic processes, path, cycle , state, path function, point function & Thermodynamic Equilibrium.
Sl No.	week	Day	Topics to be covered
2	2 nd	1 st day	Work , heat and comparison between the two
		2 nd day	Mechanical Equivalent of Heat.
		3 rd day	Work transfer, Displacement work
		4 th day	State & explain Zeroth law of thermodynamics
Sl No.	week	Day	Topics to be covered
3	3 rd	1 st day	State & explain First law of thermodynamics
		2 nd day	Limitations of First law of thermodynamics
		3 rd day	Application of First law of Thermodynamics (steady flow energy equation and its application to turbine and compressor)
		4 th day	Second law of thermodynamics (Clausius & Kelvin Plank statements)
Sl No.	week	Day	Topics to be covered
4	4 th	1 st day	Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P
		2 nd day	solve simple numerical)
		3 rd day	solve simple numerical)
		4 th day	Numerical on above
Sl No.	week	Day	Topics to be covered
5	5 th	1 st day	Laws of perfect gas:
		2 nd day	Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure, Guy lussac law, General gas equation, characteristic gas constant, Universal gas constant
		3 rd day	Explain specific heat of gas (Cp and Cv)
		4 th day	Relation between Cp & Cv.
Sl No.	week	Day	Topics to be covered

6	6 th	1 st day	Work done during a non- flow process
		2 nd day	Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric, Isentropic and polytrophic process)
		3 rd day	Solve simple problems on above.
		4 th day	Free expansion & throttling process.
Sl No.	week	Day	Topics to be covered
7	7 th	1 st day	Explain & classify I.C engine
		2 nd day	Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed & RPM.
		3 rd day	Explain the working principle of 2-stroke & 4- stroke engine C.I & S.I engine.
		4 th day	Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
Sl No.	week	Day	Topics to be covered
8	8 th	1 st day	Gas Power Cycle
		2 nd day	Carnot cycle
		3 rd day	Otto cycle.
		4 th day	Diesel cycle
Sl No.	week	Day	Topics to be covered
9	9 th	1 st day	Dual cycle
		2 nd day	Solve simple numerical.
		3 rd day	Solve simple numerical.
		4 th day	Solve simple numerical.
Sl No.	week	Day	Topics to be covered
10	10 th	1 st day	Fuels and Combustion
		2 nd day	Define Fuel
		3 rd day	Types of fuel.
		4 th day	Application of different types of fuel
Sl No.	week	Day	Topics to be covered
11	11 th	1 st day	Heating values of fuel.
		2 nd day	Quality of I.C engine fuels Octane number
		3 rd day	Quality of I.C engine fuels Octane number
		4 th day	Numerical problems on above
Sl No.	week	Day	Topics to be covered

12	12 th	1 st day	Numerical problems on above
		2 nd day	Numerical problems on above
		3 rd day	Numerical problems on above
		4 th day	
Sl No.	week	Day	Topics to be covered
13	13 th	1 st day	Numerical problems on above
		2 nd day	Numerical problems on above
		3 rd day	Numerical problems on above
		4 th day	Numerical problems on above
Sl No.	week	Day	Topics to be covered
14	14 th	1 st day	Numerical problems on above
		2 nd day	Numerical problems on above
		3 rd day	Numerical problems on above
		4 th day	Numerical problems on above
Sl No.	week	Day	Topics to be covered
15	15 th	1 st day	Numericals problem solving
		2 nd day	Numericals problem solving
		3 rd day	Doubt clearance and Revision
		4 th day	Doubt clearance and Revision