



NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)



LESSON PLAN

SUBJECT: Th-4(THERMAL ENGINEERING I)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	Thermodynamic concept & Terminology	12	12
2	Laws of Thermodynamics	12	14
3	Properties Processes of perfect gas	10	10
4	Internal combustion engine	8	7
5	Air Standard Cycle	10	12
6	Fuels and Combustion	8	6
	Total Period:	60	60

Discipline: MECHANICAL ENGINEERING	Semester: 3rd	Name of the Teaching Faculty: Er. BISHNU CHARAN JENA
Week	Class Day	Theory / Practical Topics
1 st	1 st	1.1 Thermodynamic Systems (closed, open, isolated)
	2 nd	1.2 Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement)
	3 rd	1.2 Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement)
	4 th	1.3 Intensive and extensive properties
2 nd	1 st	1.4 Define thermodynamic processes, path, cycle , state, path function, point function.
	2 nd	1.4 Define thermodynamic processes, path, cycle , state, path function, point function.
	3 rd	1.5 Thermodynamic Equilibrium.
	4 th	1.6 Quasi-static Process
3 rd	1 st	1.7 Conceptual explanation of energy and its sources
	2 nd	1.8 Work , heat and comparison between the two.
	3 rd	1.9 Mechanical Equivalent of Heat

	4th	1.10 Work transfer, Displacement work
4th	1st	2.1 State & explain Zeroth law of thermodynamics.
	2nd	2.1 State & explain Zeroth law of thermodynamics.
4th	3rd	2.2 State & explain First law of thermodynamics.
	4th	2.3 Limitations of First law of thermodynamics
5th	1st	2.4 Application of First law of Thermodynamics (steady flow energy equation and its application to turbine and compressor)
	2nd	2.4 Application of First law of Thermodynamics (steady flow energy equation and its application to turbine and compressor)
	3rd	2.4 Second law of thermodynamics (Claucius & Kelvin Plank statements).
	4th	2.4 Second law of thermodynamics (Claucius & Kelvin Plank statements).
6th	1st	2.4 Second law of thermodynamics (Claucius & Kelvin Plank statements).
	2nd	2.5 Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P (solve simple numerical)
	3rd	2.5 Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P (solve simple numerical)
	4th	2.5 Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P (solve simple numerical)
	1st	2.5 Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P (solve simple numerical)

7 th	2 nd	3.1 Laws of perfect gas: Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure, Guy lussac
	3 rd	Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure, Guy lussac Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure, Guy lussac
	4 th	law, General gas equation, characteristic gas constant, Universal gas 3.2 Explain specific heat of gas (Cp and Cv)
8 th	1 st	3.3 Relation between Cp & Cv.
8 th	2 nd	3.3 Relation between Cp & Cv.
	3 rd	3.4 Enthalpy of a gas.
	4 th	3.5 Work done during a non- flow process.
9 th	1 st	3.6 Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric, Isentropic and polytropic process)
	2 nd	3.6 Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric, Isentropic and polytropic process)
	3 rd	3.6 Application of first law of thermodynamics to various non flow process 3.6 Solve simple problems on above.
	4 th	3.7 Free expansion & throttling process.
10 th	1 st	Internal combustion engine
	2 nd	INTERNAL ASSESSMENT
	3 rd	INTERNAL ASSESSMENT

	4th	4.1 Explain & classify I.C engine.
11th	1st	4.2 Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed & RPM.
	2nd	4.2 Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed & RPM.
	3rd	4.3 Explain the working principle of 2-stroke & 4- stroke engine C.I & S.I engine.
	4th	4.3 Explain the working principle of 2-stroke & 4- stroke engine C.I & S.I engine.
12th	1st	4.4 Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
	2nd	4.4 Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
	3rd	5.1 Carnot cycle
	4th	5.1 Carnot cycle
13th	1st	5.2 Otto cycle.
	2nd	5.2 Otto cycle.
	3rd	5.3 Diesel cycle.
	4th	5.3 Diesel cycle.
	1st	5.4 Dual cycle.

14th	2nd	5.4 Dual cycle.
	3rd	5.5 Solve simple numerical.
	4th	5.5 Solve simple numerical.
15th	1st	5.5 Solve simple numerical.
	2nd	5.5 Solve simple numerical.
	3rd	6.1 Define Fuel.
15th	4th	6.2 Types of fuel.
16th	1st	6.3 Application of different types of fuel.
	2nd	6.3 Application of different types of fuel.
	3rd	6.4 Heating values of fuel.
	4th	6.5 Quality of I.C engine fuels Octane number, Cetane number.