



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	12
4	Internal combustion engine	8	10
5	Air Standard Cycle	10	12
6	Fuels and Combustion	8	6
	Total Period	60	66

Discipline: MECHANICAL ENGINEERING	Semester: 3rd	Name of the Teaching Faculty: Er.Bishnu Charan Jena	
		SESSION:2023-24	EXAMINATION:2023(W)
Week	Class Day	Theory 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)	
	3 rd	1.2 Thermodynamic properties of a system (pressure, volume, temperature, entropy)	
	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	
	4 th	1.10 Work transfer, Displacement work	
4 th	1 st	2.1 State & explain Zeroth law of thermodynamics.	
	2 nd	2.1 State & explain Zeroth law of thermodynamics.	
	3 rd	2.2 State & explain First law of thermodynamics.	
	4 th	2.3 Limitations of First law of thermodynamics	
5 th	1 st	2.4 Application of First law of Thermodynamics (steady flow energy equation and its application to turbine and compressor)	
	2 nd	2.4 Application of First law of Thermodynamics (steady flow energy equation and its application to turbine and compressor)	
	3 rd	2.5 Second law of thermodynamics (Clausius & Kelvin Plank statements)	

Week	Class Day	Theory Topics
5 th	4 th	2.5 Second law of thermodynamics (Clausius & Kelvin Planck statements)
6 th	1 st	2.5 Second law of thermodynamics (Clausius & Kelvin Planck statements)
	2 nd	2.6 Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P (solve simple numerical)
	3 rd	2.6 Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P (solve simple numerical)
	4 th	2.6 Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P (solve simple numerical)
7 th	1 st	2.6 Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P (solve simple numerical)
	2 nd	2.6 Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P (solve simple numerical)
	3 rd	3.1 Laws of perfect gas: Boyle's law, Charles's law, Avogadro's law, Dalton's law of partial
	4 th	3.2 Explain specific heat of gas (C_p and C_v)
8 th	1 st	3.2 Explain specific heat of gas (C_p and C_v)
	2 nd	3.3 Relation between C_p & C_v .
	3 rd	3.4 Enthalpy of a gas.
	4 th	3.5 Work done during a non- flow process.
9 th	1 st	3.5 Work done during a non- flow process.
	2 nd	3.6 Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric, Isentropic and polytrophic process)

Week	Class Day	Theory Topics
9 th	3 rd	3.6 Application of first law of thermodynamics to various non flow process(Isothermal,Isobaric, Isentropic and polytrophic process)
	4 th	3.6 Solve simple problems on above.
10 th	1 st	3.6 Solve simple problems on above.
	2 nd	3.7 Free expansion & throttling process.
	3 rd	4.Internal combustion engine
	4 th	4.1 Explain & classify I.C engine.
11 th	1 st	4.2 Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed &RPM.
	2 nd	4.2 Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed &RPM.
	3 rd	4.3 Explain the working principle of 2-stroke & 4- stroke engine C.I & S.I engine.
	4 th	4.3 Explain the working principle of 2-stroke & 4- stroke engine C.I & S.I engine.
12 th	1 st	4.3 Explain the working principle of 2-stroke & 4- stroke engine C.I & S.I engine.
	2 nd	4.4 Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
	3 rd	INTERNAL ASSESMENT
	4 th	INTERNAL ASSESMENT
13 th	1 st	4.4 Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
	2 nd	4.4 Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
	3 rd	5.1 Carnot cycle
	4 th	5.1 Carnot cycle
14 th	1 st	5.1 Carnot cycle
	2 nd	5.2 Otto cycle.

Week	Class Day	Theory Topics
14 th	3 rd	5.2 Otto cycle.
	4 th	5.2 Otto cycle.
15 th	1 st	5.3 Diesel cycle.
	2 nd	5.3 Diesel cycle.
	3 rd	5.3 Diesel cycle.
	4 th	5.4 Dual cycle.
16 th	1 st	5.5 Solve simple numerical.
	2 nd	5.5 Solve simple numerical.
	3 rd	6.1 Define Fuel.
	4 th	6.2 Types of fuel.
17 th	1 st	6.3 Application of different types of fuel.
	2 nd	6.4 Heating values of fuel.
	3 rd	6.5 Quality of I.C engine fuels Octane number, Cetane number.
	4 th	6.5 Quality of I.C engine fuels Octane number, Cetane number.