

Semester: 3rd
 No. of periods per week: 4
 End semester exam: 80
 Total Marks : 100

Department: Mechanical Engineering
 Subject: Thermal Engg-1
 Total Periods: 60
 Class test: 20

Sl. No.	Week	Period	Topic to be covered
1.	1 st	1 st	Thermodynamic Systems (closed, open, isolated)
2.		2 nd	Thermodynamic properties of a system (pressure, volume, temperature
3.		3 rd	entropy, enthalpy, Internal energy and units of measurement).
4.		4 th	Intensive and extensive properties Define thermodynamic processes, path, cycle , state, path function, point function.
5.	2 nd	1 st	Thermodynamic Equilibrium. Quasi-static Process
6.		2 nd	Conceptual explanation of energy and its sources
7.		3 rd	Work , heat and comparison between the two. Mechanical Equivalent of Heat.
8.		4 th	Work transfer, Displacement work
9.	3 rd	1 st	State & explain Zeroth law of thermodynamics.
10.		2 nd	State & explain First law of thermodynamics. Limitations of First law of thermodynamics
11.		3 rd	Application of First law of Thermodynamics(steady flow energy equation and its application to turbine and compressor)
12.		4 th	Second law of thermodynamics (Clausius & Kelvin Planck statements).
13.	4 th	1 st	Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P
14.		2 nd	solve simple numerical
15.		3 rd	Laws of perfect gas, Boyle's law, Charle's law, Avogadro's law,
16.		4 th	Dalton's law of partial pressure, Guy lussac Law
17.	5 th	1 st	General gas equation, characteristic gas constant, Universal gas constant.
18.		2 nd	Explain specific heat of gas (Cp and Cv) Relation between Cp & Cv.
19.		3 rd	Enthalpy of a gas. Work done during a non- flow process.
20.		4 th	Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric, Isentropic and polytrophic process)
21.	6 th	1 st	Solve simple problems on above.
22.		2 nd	Free expansion & throttling process.
23.		3 rd	Explain & classify I.C engine.
24.		4 th	Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed & RPM.

25.	7 th	1 st	Explain the working principle of 2-stroke engines
26.		2 nd	Explain the working principle of 4- stroke engine S.I engine
27.		3 rd	Explain the working principle of 2-stroke & 4- stroke engine C.I engine.
28.		4 th	Differentiate between 2-stroke & 4- stroke engine C.I engine
29.	8 th	1 st	Differentiate between 2-stroke & 4- stroke engine S.I engine
30.		2 nd	Study of valve timing diagram
31.		3 rd	What is thermodynamic cycle
32.		4 th	Carnot cycle
33.	9 th	1 st	p-v diagram with process.
34.		2 nd	. Solve simple numerical
35.		3 rd	Otto cycle.
36.		4 th	p-v diagram with process
37.	10 th	1 st	. Solve simple numerical
38.		2 nd	Diesel cycle
39.		3 rd	p-v diagram with process
40.		4 th	. Solve simple numerical
41.	11 th	1 st	Dual cycle
42.		2 nd	p-v diagram with process
43.		3 rd	. Solve simple numerical
44.		4 th	Efficiency comparision between all
45.	12 th	1 st	Comparision between all cycles
46.		2 nd	Define Fuel.Types of fuel
47.		3 rd	Application of different types of fuel.
48.		4 th	Do
49.	13 th	1 st	Do
50.		2 nd	Heating values of fuel
51.		3 rd	Quality of I.C engine fuels
52.		4 th	Octane number, Cetane number
53.	14 th	1 st	Previous years paper discussion
54.		2 nd	Previous years paper discussion
55.		3 rd	Previous years paper discussion
56.		4 th	Previous years paper discussion
57.	15 th	1 st	Revision
58.		2 nd	Revision
59.		3 rd	Revision
60.		4 th	Revision