

Lesson Plan

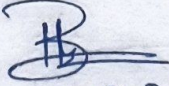
Discipline: Mechanical Engg.	Semester: 3 rd	Faculty Name: Litu Behera
Subject: Thermal Engineering-I	No. of Days/per week class allotted:04	Semester from 15.09.2022 to 22.12.2022 No. of weeks:15
week	Class day	Theory topics
1 st	1 st	Thermodynamic concept & Terminology Thermodynamic Systems (closed, open, isolated),
	2 nd	Thermodynamic properties of a system (pressure, volume, temperature and units of measurement.)
	3 rd	Problems on absolute pressure and temperature relationship.
	4 th	Thermodynamic properties of a system (entropy, Enthalpy, Internal energy and units of measurement).
2 nd	1 st	Intensive and extensive properties, Define thermodynamic processes, path.
	2 nd	Define thermodynamic cycle, state, path function, point function.
	3 rd	Thermodynamic Equilibrium, Quasi-static Process.
	4 th	Conceptual explanation of energy and its sources.
3 rd	1 st	Work, heat and comparison between the two.
	2 nd	Mechanical Equivalent of Heat.
	3 rd	Work transfer, Displacement work
	4 th	Problem on Displacement work.
4 th	1 st	Laws of Thermodynamics State & explain Zeroth law of thermodynamics, State & explain First law of thermodynamics.
	2 nd	Problems on First law of thermodynamics.
	3 rd	Problems on First law of thermodynamics, Limitations of First law of thermodynamics.
	4 th	First law of Thermodynamics (steady flow energy equation)
5 th	1 st	application of steady flow energy equation to turbine
	2 nd	Problems on SFEE to turbine.
	3 rd	application of steady flow energy equation to compressor
	4 th	Problems on SFEE to compressor.
6 th	1 st	Second law of thermodynamics (Clausius & Kelvin Plank statements).

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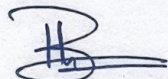
	2 nd	Application of second law in heat engine & determination of efficiencies
	3 rd	Problems on heat engine
	4 th	Application of second law in heat pump, refrigerator & determination of C.O.P
7 th	1 st	Problems on heat pump and refrigerator
	2 nd	Properties Processes of perfect gas Laws of perfect gas: Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure, Guy lussac law.
	3 rd	General gas equation, characteristic gas constant, Universal gas constant.
	4 th	Explain specific heat of gas (Cp and Cv) and Relation between Cp & Cv.
8 th	1 st	Enthalpy of a gas and problem on it.
	2 nd	Work done during a non- flow process.
	3 rd	Problems on non flow work done
	4 th	Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric, Isentropic and polytrophic process)
9 th	1 st	Problems on various non flow process
	2 nd	Free expansion & throttling process.
	3 rd	Internal combustion engine Explain & classify I.C engine.
	4 th	Terminology of I.C Engine such as bore, dead centers, stroke volume.
10 th	1 st	Terminology of I.C Engine such piston speed & RPM.
	2 nd	Explain the working principle of 2-stroke engine (C.I & S.I engine)
	3 rd	Explain the working principle of 4-stroke engine (C.I & S.I engine)
	4 th	Differentiate between 2-stroke & 4- stroke engine.
11 th	1 st	Differentiate between C.I & S.I engine.
	2 nd	Gas Power Cycle Carnot cycle
	3 rd	Problems on carnot cycle.
	4 th	Otto cycle.
12 th	1 st	Problems on Otto cycle
	2 nd	Diesel cycle.
	3 rd	Problems on Diesel cycle
	4 th	Dual cycle.
13 th	1 st	Problems on Dual cycle

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	2 nd	Comparison among otto, diesel and dual cycle
	3 rd	Fuels and Combustion Define Fuel and Types of fuel.
	4 th	Application of different types of fuel.
14 th	1 st	Heating values of fuel.
	2 nd	Problems on Heating values of fuel.
	3 rd	Quality of I.C engine fuels
	4 th	Octane number and Cetane number
15 th	1 st	Revision of module-1,2 & 3 with Previous year question
	2 nd	Revision of module-4,5 & 6 with Previous year question
	3 rd	Previous year question discussion
	4 th	Question bank discussion

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