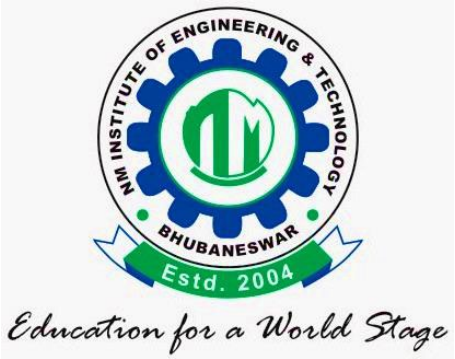
NM INSTITUTE OF ENGINEERING & TECHNOLOGY

BHUBANESWAR

Mechanical Engineering Department



LESSON PLAN

Session 2023-2024

Semester: 3rd

Subject : THERMAL ENGINEERING-1

Faculty Name: SUSHREE SUCHARITA KAR

Subject: THERMAL ENG.-1 No of Days/per week class allotted: _____

Semester from date : _____to date: _____ No. of Weeks:_____

Week	Class Day	Theory topics
1	1	Thermodynamic Systems (closed, open, isolated)
	2	Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement).
	3	Intensive and extensive properties
	4	Define thermodynamic processes, path, cycle , state
2	1	path function, point function.
	2	Thermodynamic Equilibrium
	3	Quasi-static Process
	4	Conceptual explanation of energy and its sources
3	1	Work , heat and comparison between the two.
	2	Mechanical Equivalent of Heat.
	3	Work transfer, Displacement work
	4	State & explain Zeroth law of thermodynamics.
4	1	State & explain First law of thermodynamics.
	2	Limitations of First law of thermodynamics
	3	Application of First law of Thermodynamics
	4	steady flow energy equation and its application to turbine and compressor
5	1	Second law of thermodynamics (Claucius & Kelvin Plank statements).
	2	Application of second law in heat engine, heat pump, refrigerator
	3	determination of efficiencies & C.O.P (solve simple numerical)
	4	Introduction to Laws of perfect gas
6	1	Boyle's law, Charle's law
	2	Avogadro's law
	3	Dalton's law of partial pressure
	4	Guy lussac law,
7	1	General gas equation, characteristic gas constant.
	2	Universal gas constant.
	3	Explain specific heat of gas (Cp and Cv)
	4	Relation between Cp & Cv.

Signature of Faculty

Subject: _____ No of Days/per week class allotted: _____

Semester from date : _____to date: _____ No. of Weeks:_____

Week	Class Day	Theory topics
8	1	Enthalpy of a gas.
	2	Work done during a non- flow process.
	3	Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric)
	4	Isentropic and polytrophic process
9	1	Solve simple problems on above.
	2	Solve simple problems on above.
	3	Free expansion & throttling process
	4	Introduction to IC engine
10	1	Explain I.C engine.
	2	classify I.C engine.
	3	Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed &RPM.
	4	Explain the working principle of 2-stroke C.I & S.I engine.
11	1	Explain the working principle of 4- stroke engine C.I & S.I engine.
	2	Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
	3	Differentiate external &internal engine
	4	Introduction to gas power cycle
12	1	Uses of gas power cycle
	2	Carnot cycle
	3	Otto cycle
	4	Diesel cycle.
13	1	Dual cycle
	2	P-h & T-s diagram
	3	Solve simple numerical.
	4	Solve simple numerical.
14	1	Introduction to Fuels and Combustion
	2	Define Fuel.
	3	Uses of fuels
	4	Types of fuel.
15	1	Application of different types of fuel.
	2	Heating values of fuel
	3	Quality of I.C engine fuels Octane number,
	4	I.C engine fuels Cetane number.

Signature of Faculty