KIIT POLYTECHNIC

Department of Mechanical Engineering

LESSON PLAN

Session :: Winter -2022

Course Type :: Theory

Semester/Branch :: 3rd Semester, Mechanical Engineering

Subject (with code) :: Thermal Engineering (I) (Th.4)

Contact hours/week :: 4

Name of Faculty :: Abhijit Samant

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SL. No	CLAS S ID	COURSE CONTENT	MODE OF DELIVERY	EXHIBIT/ REFERENCE
1	1	Define Thermodynamics. Define System, surroundings and boundary. Explain open closed and isolated system.	Video Content	https://youtu.be/iUEjQQ trT50
2	2	Define Intensive and extensive properties. Differentiate between homogeneous and heterogeneous system.	Lecture (Explanation)	Study Material
3	3	Define Microscopic and macroscopic approach of thermodynamics. Explain Continuum Approach, Quasi-static process	Lecture (Explanation)	1.Study Material 2.Thermal Engineering by Mahesh.M Rathore(Book)
4	4	Thermodynamic properties of a system (Pressure, volume, temperature and units of measurement).	Flipped Class	
5	5	Define thermodynamic State, path, process and Cycle.	Video Content	https://youtu.be/v0IdjFP GcQI
6	6	Explain Thermodynamic equilibrium i.e. thermal mechanical and chemical equilibrium.	Lecture (Elaboration)	Study Material
7	7	Conceptual explanation of energy and its sources.	Student Presentation	
8	8	Explain work and heat, their relation, units and Work transfer,	Lecture (Explanation)	Study Material
9	9	Derive the formula for the work done in a closed system.	Lecture (Explanation)	Study Material
10	10	Explain Mechanical equivalence of heat and Differentiate between heat and work.	Lecture (Explanation)	Study Material
11	11	Assignment Evaluation & Class Test		
12	12	State and explain Zeroth law and First law of thermodynamics. Limitation of First law	Lecture (Explanation)	Study Material
13	13	Application of first law for flow process. Derivation of steady flow energy equation.	Lecture (Explanation)	Study Material
14	14	Application of SFEE in Nozzle Turbine and Compressor.	Video Content	https://youtu.be/9aAZQ 9-jcuY

15	15	Define Thermal reservoir. Concept of heat	Lecture	Thermal Engineering by	
13	13	engine, heat pump and refrigerator.	(Explanation)	Mahesh.M	
		engine, neat pump and renigerator.	(Explanation)	Rathore(Book)	
16	16	Statement of Second law of thermodynamics	Lecture	Study Material	
10	10	(Clausius and Kelvin Planck Statement)	(Elaboration)	Study Material	
17	17	Application of second law in heat engine,	Lecture	Study Material	
1 /	1 /	Refrigerator, and Heat Pump determination of	(Explanation)	Study Waterian	
		efficiency.	(Explanation)		
18	18	Assignment Evaluatio	n & Class Tost		
19	19	Solve the problem using Second law of	Problem based	T	
19	19	Thermodynamics.	learning		
20	20	Solve problem in Heat engine, heat pump and	Problem based		
20	20	Refrigerator.	learning		
21	21	Explain Laws of Perfect gas, Boyle's law,	Lecture	Study Material	
21	21			Study Material	
22	22	Charle's law, Avogadro's law.	(Explanation)	C. 1 M 1	
22	22	Dalton's law of Partial pressure, Gay-Lussac law,	Lecture	Study Material	
	22	General gas equation	(Explanation)		
23	23	Explain Characteristic gas constant, Universal	Lecture	Thermal Engineering by	
		gas constant and define the relation between	(Explanation)	Mahesh.M Rathore	
		them.		(Book)	
24	24	Define Enthalpy, Entropy, and Internal Energy	Lecture	Study Material	
		of a Thermodynamic system.	(Explanation)		
25	25	Explain specific heat of gas (Cp and Cv)	Problem based	Study Material	
		Relation between Cp & Cv	learning	Study Material	
26	26	Derive the work done during a non- flow process	Lecture	Study Material	
		i.e. Isochoric, Isobaric.	(Explanation)		
27	27	Application of first law in Isothermal, Isentropic	Lecture	Thermal Engineering by	
	-	and Polytrophic Process.	(Explanation)	Mahesh.M Rathore	
		una i cij wopine i rocessi	(Emplanation)	(Book)	
28	28	Assignment Evaluation & Class Test			
29	29	Classroom Problems	Problem based		
			learning		
30	30	Define & classify I.C engine	Video Content	https://youtu.be/vIJ50aU	
		2 cinic of cinetity is original	, 1 5 5 5 11 5 11 5	iBgM	
31	31	Terminology of I.C Engine	Hybrid	Study Material	
51	31		I DANDLIU		
		Terminology of i.e Engine	публа		
		Terminology of the Engine	пубпа	https://youtu.be/fw8Jfoif	
32	32			https://youtu.be/fw8Jfoif 1BM	
32	32	Explain the working principle of 4-stroke S.I	Video Content	https://youtu.be/fw8Jfoif 1BM https://youtu.be/Pu7g3uI	
		Explain the working principle of 4-stroke S.I engine and C.I engine.	Video Content	https://youtu.be/fw8Jfoif 1BM https://youtu.be/Pu7g3uI G6Zo	
32	32	Explain the working principle of 4-stroke S.I engine and C.I engine. Explain the working principle of 2-stroke S.I and		https://youtu.be/fw8Jfoif 1BM https://youtu.be/Pu7g3uI G6Zo https://youtu.be/OiX9oX	
33	33	Explain the working principle of 4-stroke S.I engine and C.I engine. Explain the working principle of 2-stroke S.I and C.I engine.	Video Content Video Content	https://youtu.be/fw8Jfoif 1BM https://youtu.be/Pu7g3uI G6Zo https://youtu.be/OiX9oX vxZWs	
		Explain the working principle of 4-stroke S.I engine and C.I engine. Explain the working principle of 2-stroke S.I and	Video Content	https://youtu.be/fw8Jfoif 1BM https://youtu.be/Pu7g3uI G6Zo https://youtu.be/OiX9oX vxZWs https://youtu.be/FEyXPI	
33	33	Explain the working principle of 4-stroke S.I engine and C.I engine. Explain the working principle of 2-stroke S.I and C.I engine. Differentiate between S.I and C.I engine.	Video Content Video Content Video Content	https://youtu.be/fw8Jfoif 1BM https://youtu.be/Pu7g3uI G6Zo https://youtu.be/OiX9oX vxZWs https://youtu.be/FEyXPI QvuyY	
33	33	Explain the working principle of 4-stroke S.I engine and C.I engine. Explain the working principle of 2-stroke S.I and C.I engine.	Video Content Video Content Video Content Lecture	https://youtu.be/fw8Jfoif 1BM https://youtu.be/Pu7g3uI G6Zo https://youtu.be/OiX9oX vxZWs https://youtu.be/FEyXPI	
33 34 35	33 34 35	Explain the working principle of 4-stroke S.I engine and C.I engine. Explain the working principle of 2-stroke S.I and C.I engine. Differentiate between S.I and C.I engine.	Video Content Video Content Video Content	https://youtu.be/fw8Jfoif 1BM https://youtu.be/Pu7g3uI G6Zo https://youtu.be/OiX9oX vxZWs https://youtu.be/FEyXPI QvuyY	
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33 34 35 36	33 34 35 36	Explain the working principle of 4-stroke S.I engine and C.I engine. Explain the working principle of 2-stroke S.I and C.I engine. Differentiate between S.I and C.I engine. Differentiate between 2-stroke & 4- stroke engine. Assignment Evaluation	Video Content Video Content Video Content Lecture (Explanation) on & Class Test	https://youtu.be/fw8Jfoif 1BM https://youtu.be/Pu7g3uI G6Zo https://youtu.be/OiX9oX vxZWs https://youtu.be/FEyXPI QvuyY	
33 34 35	33 34 35	Explain the working principle of 4-stroke S.I engine and C.I engine. Explain the working principle of 2-stroke S.I and C.I engine. Differentiate between S.I and C.I engine. Differentiate between 2-stroke & 4- stroke engine. Assignment Evaluation Explain the Carnot cycle with P-V and T-S	Video Content Video Content Video Content Lecture (Explanation) on & Class Test Lecture	https://youtu.be/fw8Jfoif 1BM https://youtu.be/Pu7g3uI G6Zo https://youtu.be/OiX9oX vxZWs https://youtu.be/FEyXPI QvuyY	
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41	41	Explain the Dual cycle with P-V and T-S diagram and derive the process involved in Dual cycle.	Lecture (Explanation)	Study Material
42	42	Derive the efficiency of Dual cycle.	Lecture (Explanation)	Study Material
43	43	Define Fuel and its types. Explain application of fuel.	Lecture (Explanation)	Thomas I Engine aging hy
44	44	Define Heating value of fuel.	Lecture (Explanation)	Thermal Engineering by Mahesh.M Rathore (Book)
45	45	Explain Calorific value and Quality of I C engine fuel.	Lecture (Explanation)	(DOOK)
46	46	Discussion on Previous year question paper		
47	47	Discussion on Previous year question paper		
48	48	Discussion on Previous year question paper		

Signature of Concern Teacher