

BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK
DEPARTMENT OF MECHANICAL ENGINEERING



LESSON PLAN

SUBJECT: THERMAL ENGINEERING-I

FACULTY: MRS. SUNITA NAYAK

Sunita Nayak

ACADEMIC SESSION: 2024-25

SEMESTER: 3rd

SEC: A

[Signature]
H O D (Mech Engg.)

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Discipline: Mechanical Engg.	Semester: 3 rd Sec-A	Name of the teaching faculty: Sunita Nayak
Subject: THERMAL ENGINEERING-I	No of days/per week class allotted: 4 (Mon day-1 period, Tues day-1 period, Fri day-1 period, Sat day-1 period)	Semester from date: 01/07/2024 to date: 08/11/2024 No. of weeks-18
Week	Class day	Theory/practical topics
1 st	1/07/2024	Discussion of Syllabus and Introduction of Thermodynamic
	02/07/2024	Definition of thermodynamics and application of it in various field
	05/07/2024	1. Thermodynamic concept & Terminology 1.1 Thermodynamic Systems (closed, open, isolated)
	06/07/2024	1.1 Thermodynamic Systems (closed, open, isolated)
2 nd	08/07/2024	1.2 Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement)
	09/07/2024	1.2 Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement)
	12/07/2024	1.2 Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement)
	13/07/2024	1.3 Intensive and extensive properties

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3 rd	15/07/2024	1.4 Define thermodynamic processes, path, cycle , state
	16/07/2024	1.4 Define thermodynamic path function, point function.
	19/07/2024	1.5 Thermodynamic Equilibrium
	20/07/2024	1.6 Quasi-static Process
4 th	22/07/2024	1.7 Conceptual explanation of energy and its sources
	23/07/2024	1.8 Work , heat
	26/07/2024	1.8 Comparison between heat and work 1.9 Mechanical Equivalent of Heat
	27/07/2024	1.10 Work transfer, Displacement work
5 th	29/07/2024	1.10 Work transfer, Displacement work
	30/07/2024	2. Laws of Thermodynamics
	02/08/2024	2.1 State & explain Zeroth law of thermodynamics
	03/08/2024	2.2 State & explain First law of thermodynamics.
6 th	05/08/2024	2.2 State & explain First law of thermodynamics
	06/08/2024	2.3 Limitations of First law of thermodynamics
	09/08/2024	2.4 Application of first law of thermodynamics (steady flow energy equation derivation)
	10/08/2024	2.4 Application of first law of thermodynamics (SFEE application to turbine and compressor)
	12/08/2024	2.4 Second law of thermodynamics (Claucius & Kelvin Plank statements)
7 th	13/08/2024	2.4 Second law of thermodynamics (Claucius & Kelvin Plank statements)
	16/08/2024	Class test-1
		2.5 Application of second law in heat engine & determination of efficiencies

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	17/08/2024	2.5 Application of second law in heat engine & determination of efficiencies
8 th	20/08/2024	2.5 Application of second law in heat pump, refrigerator & determination of COP
	23/08/2024	2.5 Application of second law in heat pump, refrigerator & determination of COP
	24/08/2024	2.5 Solve simple numerical on heat engine ,heat pump, refrigerator
	27/08/2024	2.5 Solve simple numerical on heat engine, heat pump, refrigerator
9 th	30/08/2024	2.5 Solve simple numerical on heat engine, heat pump, refrigerator
	31/08/2024	3. Properties Processes of perfect gas 3.1 Laws of perfect gas: Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure, Guy lussac law
	02/09/2024	3.1 Laws of perfect gas: Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure, Guy lussac law
10 th	03/09/2024	3.1 General gas equation, characteristic gas constant, Universal gas constant
	06/09/2024	3.2 Explain specific heat of gas (Cp and Cv) 3.3 Relation between Cp & Cv.
	09/09/2024	3.4 Enthalpy of a gas. 3.5 Work done during a non- flow process
11 th	10/09/2024	3.6 Application of first law of thermodynamics to various non flow process (Isothermal)
	13/09/2024	3.6 Application of first law of thermodynamics to various non flow process (Isobaric)

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	14/09/2024	3.6 Application of first law of thermodynamics to various non flow process (Isentropic process)
12 th	17/09/2024	3.6 Application of first law of thermodynamics to various non flow process (polytrophic process)
	20/09/2024	3.6 Solve simple problems on above process
	21/10/2024	3.6 Solve simple problems on above process
13 th	23/09/2024	3.6 Solve simple problems on above process
	24/09/2024	3.7 free expansion and throttling process.
	27/09/2024	4. Internal combustion engine 4.1 Explain & classify I.C engine 4.2 Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed & RPM
	28/09/2024	4.3 Explain the working principle of 2-stroke & 4- stroke C.I engine.
14 th	30/09/2024	4.3 Explain the working principle of 2-stroke & 4- stroke engine S.I engine
	01/10/2024	4.4 Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
	04/10/2024	5. Gas Power Cycle 5.1 Carnot cycle
	05/10/2024	5.2 Otto cycle
15 th	14/10/2024	5.3 Diesel cycle
	15/10/2024	5.4 Dual cycle
	18/10/2024	5.5 Solve simple numerical

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	19/10/2024	5.5 Solve simple numerical
16 th	21/10/2024	5.5 Solve simple numerical
	22/10/2024	6. Fuels and Combustion 6.1 Define Fuel.. 6.2 Types of fuel.
	25/10/2024	6.3 Application of different types of fuel
	26/10/2024	6.4 Heating values of fuel. 6.5 Quality of I.C engine fuels Octane number, Cetane number
17 th	28/10/2024	Revision and doubt clear
	29/10/2024	Class test-2
	01/11/2024	Revision and doubt clear
	02/11/2024	Revision and doubt clear
18 th	04/11/2024	Revision and previous year question discussion
	05/11/2024	Previous year question discussion
	08/11/2024	Previous year question discussion

Srinivas