

BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK
DEPARTMENT OF MECHANICAL ENGINEERING



LESSON PLAN

SUBJECT: THERMAL ENGINEERING-I

FACULTY: MRS. SUNITA NAYAK

Sunita Nayak

ACADEMIC SESSION: 2023-24

SEMESTER: 3rd

SEC: A

[Signature]
31/07/23
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, Tues day, Wednes day, Fri day)	Semester from date:01/08/2023 to date:30/11/2023 No. of weeks-15
Week	Class day	Theory/practical topics
1 st	1/08/2023	Discussion of Syllabus and Introduction of Thermodynamic
	02/08/2023	Definition of thermodynamics and application of it in various field
	4/08/2023	1. Thermodynamic concept & Terminology 1.1 Thermodynamic Systems (closed, open, isolated)
2 nd	7/08/2023	1.1 Thermodynamic Systems (closed, open, isolated)
	08/08/2023	1.2 Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement)
	09/08/2023	1.2 Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement)
	11/08/2023	1.3 Intensive and extensive properties

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3 rd	14/08/2023	1.4 Define thermodynamic processes, path, cycle, state
	16/08/2023	1.4 Define thermodynamic path function, point function.
	18/08/2023	1.5 Thermodynamic Equilibrium
4 th	21/08/2023	1.6 Quasi-static Process
	22/08/2023	1.7 Conceptual explanation of energy and its sources
	23/08/2023	1.8 Work, heat
	25/08/2023	1.8 Comparison between heat and work
		1.9 Mechanical Equivalent of Heat
5 th	28/08/2023	1.10 Work transfer, Displacement work
	29/08/2023	1.10 Work transfer, Displacement work
	01/09/2023	2. Laws of Thermodynamics
6 th	4/09/2023	2.1 State & explain Zeroth law of thermodynamics
	05/09/2023	2.2 State & explain First law of thermodynamics.
	08/09/2023	2.2 State & explain First law of thermodynamics
7 th	11/09/2023	2.3 Limitations of First law of thermodynamics
		2.4 Application of first law of thermodynamics (steady flow energy equation derivation)
	12/09/2023	2.4 Application of first law of thermodynamics (SFEE application to turbine and compressor)
	13/09/2023	2.4 Second law of thermodynamics (Clausius & Kelvin Planck statements)
	15/09/2023	Class test-1
8 th	18/09/2023	2.5 Application of second law in heat engine & determination of efficiencies

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	22/09/2023	2.5 Application of second law in heat pump, refrigerator & determination of COP
9 th	25/09/2023	2.5 Solve simple numerical on heat engine, heat pump, refrigerator
	26/09/2023	2.5 Solve simple numerical on heat engine, heat pump, refrigerator
	27/09/2023	3. Properties Processes of perfect gas
	29/09/2023	3.1 Laws of perfect gas: Boyle's law, Charles's law, Avogadro's law, Dalton's law of partial pressure, Gay Lussac law
10 th	03/10/2023	3.1 General gas equation, characteristic gas constant, Universal gas constant
	04/10/2023	3.2 Explain specific heat of gas (C_p and C_v)
		3.3 Relation between C_p & C_v .
	06/10/2023	3.4 Enthalpy of a gas. 3.5 Work done during a non-flow process
11 th	09/10/2023	3.6 Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric)
	10/10/2023	3.6 Application of first law of thermodynamics to various non flow process (Isentropic and polytrophic process)
	11/10/2023	3.6 Solve simple problems on above process
	13/10/2023	Internal examination
12 th	16/10/2023	3.6 Solve simple problems on above process
	17/10/2023	3.7 free expansion and throttling process.

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13 th	18/10/2023	4. Internal combustion engine 4.1 Explain & classify I.C engine
	20/10/2023	4.2 Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed & RPM
	30/10/2023	4.3 Explain the working principle of 2-stroke & 4- stroke C.I engine.
	31/10/2023	4.3 Explain the working principle of 2-stroke & 4- stroke engine S.I engine
	01/11/2023	4.4 Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
	03/11/2023	5. Gas Power Cycle 5.1 Carnot cycle
14 th	06/11/2023	5.2 Otto cycle
	07/11/2023	5.3 Diesel cycle
	08/11/2023	5.4 Dual cycle
	10/11/2023	5.5 Solve simple numerical
15 th	13/11/2023	5.5 Solve simple numerical
	14/11/2023	6. Fuels and Combustion 6.1 Define Fuel.. 6.2 Types of fuel.
	15/11/2023	6.3 Application of different types of fuel
	17/11/2023	6.4 Heating values of fuel.
		6.5 Quality of I.C engine fuels Octane number, Cetane number

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16 th	20/11/2023	Class test-2
	21/11/2023	Revision and doubt clear
	22/11/2023	Revision and doubt clear
	24/11/2023	Revision and doubt clear
17 th	28/11/2023	Revision and previous year question discussion
	29/11/2023	Previous year question discussion