

BHUBANANDA 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: B

[Signature]
H O D (Mech Engg.)

BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK
DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

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 (Tues day-1, Thurs day-1 Period, 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	02/07/2024	Discussion of Syllabus and Introduction of Thermodynamic
	03/07/2024	Definition of thermodynamics and application of it in various field
	04/07/2024	1. Thermodynamic concept & Terminology 1.1 Thermodynamic Systems (closed, open, isolated)
	05/07/2024	1.1 Thermodynamic Systems (closed, open, isolated)
2 nd	09/07/2024	1.2 Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement)
	10/07/2024	1.2 Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement)
	11/07/2024	1.2 Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement)
	12/07/2024	1.3 Intensive and extensive properties

Sunita Nayak

BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK
DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

3 rd	16/07/2024	1.4 Define thermodynamic processes, path, cycle , state
	18/07/2024	1.4 Define thermodynamic path function, point function.
	19/07/2024	1.5 Thermodynamic Equilibrium
4 th	23/07/2024	1.6 Quasi-static Process
	24/07/2024	1.7 Conceptual explanation of energy and its sources
	25/07/2024	1.8 Work , heat
	26/07/2024	1.8 Comparison between heat and work
		1.9 Mechanical Equivalent of Heat
5 th	30/07/2024	1.10 Work transfer, Displacement work
	31/07/2024	1.10 Work transfer, Displacement work
	01/08/2024	2. Laws of Thermodynamics
		2.1 State & explain Zeroth law of thermodynamics
6 th	02/08/2024	2.2 State & explain First law of thermodynamics.
	06/08/2024	2.2 State & explain First law of thermodynamics
	07/08/2024	2.3 Limitations of First law of thermodynamics
	08/08/2024	2.4 Application of first law of thermodynamics (steady flow energy equation derivation)
	09/08/2024	2.4 Application of first law of thermodynamics (SFEE application to turbine and compressor)
		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)
	14/08/2024	2.4 Second law of thermodynamics (Claucius & Kelvin Plank statements)
	16/08/2024	Class test-1
8 th	20/08/2024	2.5 Application of second law in heat engine & determination of efficiencies

Smayak

BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK
DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

9 th	21/08/2024	2.5 Application of second law in heat engine & determination of efficiencies
	22/08/2024	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
	27/08/2024	2.5 Solve simple numerical on heat engine, heat pump, refrigerator
	28/08/2024	2.5 Solve simple numerical on heat engine, heat pump, refrigerator
	29/08/2024	2.5 Solve simple numerical on heat engine, heat pump, refrigerator
	30/08/2024	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
10 th	03/09/2024	3.1 Laws of perfect gas: Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure, Guy lussac law
	04/09/2024	3.1 General gas equation, characteristic gas constant, Universal gas constant
	05/09/2024	3.2 Explain specific heat of gas (Cp and Cv) 3.3 Relation between Cp & Cv.
	06/09/2024	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)
	11/09/2024	3.6 Application of first law of thermodynamics to various non flow process (Isobaric)

S. Nayak

BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK
DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

	12/09/2024	3.6 Application of first law of thermodynamics to various non flow process (Isentropic process)
	13/09/2024	3.6 Application of first law of thermodynamics to various non flow process (polytropic process)
12 th	17/09/2024	3.6 Solve simple problems on above process
	18/09/2024	3.6 Solve simple problems on above process
	19/10/2024	3.6 Solve simple problems on above process
	20/10/2024	3.7 free expansion and throttling process.
13 th	24/09/2024	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
	25/09/2024	4.3 Explain the working principle of 2-stroke & 4- stroke C.I engine.
	26/09/2024	4.3 Explain the working principle of 2-stroke & 4- stroke C.I engine.
	27/09/2024	4.3 Explain the working principle of 2-stroke & 4- stroke C.I engine.
14 th	01/10/2024	4.4 Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
	03/10/2024	5. Gas Power Cycle 5.1 Carnot cycle
	04/10/2024	5.2 Otto cycle
15 th	15/10/2024	5.3 Diesel cycle
	17/10/2024	5.4 Dual cycle
	18/10/2024	5.5 Solve simple numerical

Prayal

BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK
DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

16 th	22/10/2024	5.5 Solve simple numerical
	23/10/2024	5.5 Solve simple numerical
	24/10/2024	6. Fuels and Combustion 6.1 Define Fuel.. 6.2 Types of fuel.
	25/10/2024	6.3 Application of different types of fuel
17 th	29/10/2024	6.4 Heating values of fuel. 6.5 Quality of I.C engine fuels Octane number, Cetane number
	30/10/2024	Revision and doubt clear
	01/11/2024	Class test-2
18 th	05/11/2024	Revision and doubt clear
	06/11/2024	Revision and previous year question discussion
	07/11/2024	Previous year question discussion
	08/11/2024	Previous year question discussion

S. Sanyal