NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

SUBJECT: BASIC THERMAL ENGINEERING(AEPC209-TH:5)

Name of the Faculty- Er.Pradyumna Kumar Khilar

Branch- Automobile Engineering **Session-** 2025-26

Semester- 3rd **Examination-** 2025 (W)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	Fundamentals of Thermodynamics	9	11
2	Laws of Thermodynamics	9	13
3	Properties & Processes of perfect gas	9	11
4	Gas and vapour Power Cycles	9	14
5	Fuels and Combustion	9	11
	Total Period:	45	60

Khilar 10/07/2025

Sign of the faculty

Khilar 10/07/2025

Sign of H.O.D

Name of the programme: Diploma in AUTOMOBILE ENGINEERING	Semester: 3rd	**Name of the Teaching Faculty:** Er.Pradyumna Kumar Khilar	
		Academic Year : 2025-26	**Examination :** 2025 (W)
Course Code: AEPC209 TH-5	**Course Year:** Second Year	**No. of Classes Alloted Per Week**	4
		Planned Classes Required to Complete the Course	60

Week	Class Day	Topics to be Covered
1st	1st	**UNIT-I:Fundamentals of Thermodynamics(Introduction)** Thermodynamic Systems (closed, open, isolated)
	2nd	Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement)
	3rd	Thermodynamic properties of a system (pressure, volume, temperature, entropy, enthalpy, Internal energy and units of measurement)
	4th	Intensive and extensive properties
2nd	1st	Thermodynamic processes, path, cycle, state, path function, point function
	2nd	Thermodynamic Equilibrium
	3rd	Quasi-static Process
	4th	Energy and its sources, Work, heat and comparison between Work and heat
3rd	1st	Mechanical Equivalent of Heat, Work transfer
	2nd	Displacement work
	3rd	Displacement work
	4th	**UNIT-II:Laws of Thermodynamics(Introduction)**
4th	1st	Zeroth law of thermodynamics, First law of thermodynamics, Limitations of First law of thermodynamics.
	2nd	Applications of First law of Thermodynamics
	3rd	Steady flow energy equation and its application to turbine and compressor
	4th	Steady flow energy equation and its application to turbine and compressor
5th	1st	Steady flow energy equation and its application to turbine and compressor
	2nd	Second law of thermodynamics, Clausius and Kelvin Plank statements
	3rd	Second law of thermodynamics, Clausius and Kelvin Plank statements
	4th	Second law of thermodynamics, Clausius and Kelvin Plank statements
6th	1st	Application of second law in heat engine, heat pump, refrigerator, Efficiencies and C.O.P.
	2nd	Application of second law in heat engine, heat pump, refrigerator, Efficiencies and C.O.P.

Week	Class Day	Topics to be Covered
6th	3rd	Application of second law in heat engine, heat pump, refrigerator, Efficiencies and C.O.P.
	4th	Application of second law in heat engine, heat pump, refrigerator, Efficiencies and C.O.P.
7th	1st	**UNIT-III:Properties & Processes of perfect gas(Introduction)**
	2nd	Laws of perfect gas, Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure, Guy lussac law.
	3rd	Laws of perfect gas, Boyle's law, Charle's law, Avogadro's law, Dalton's law of partial pressure, Guy lussac law.
	4th	General gas equation, characteristic gas constant, Universal gas constant.
8th	1st	General gas equation, characteristic gas constant, Universal gas constant.
	2nd	Specific heat of gas (Cp and Cv), Relation between Cp and Cv.
	3rd	Specific heat of gas (Cp and Cv), Relation between Cp and Cv.
	4th	Enthalpy of a gas, Work done during a non- flow process
9th	1st	Applications of first law of thermodynamics to various non flow processIsothermal, Isobaric, Isentropic and polytrophic process.
	2nd	Applications of first law of thermodynamics to various non flow processIsothermal, Isobaric, Isentropic and polytrophic process.
	3rd	Free expansion and throttling process.
	4th	**UNIT-IV:Gas and vapour Power Cycles(Introduction)**
10th	1st	Carnot cycle
	2nd	Carnot Cycle
	3rd	Carnot Cycle
	4th	Stirling Cycle
11th	1st	Stirling Cycle
	2nd	Ericsson Cycle
	3rd	Ericsson Cycle
	4th	Air Standard Cycles, Otto Cycle
12th	1st	Air Standard Cycles, Otto Cycle
	2nd	Air Standard Cycles, Diesel Cycle
	3rd	Dual Cycle
	4th	Dual Cycle
13th	1st	Comparison of Otto, Diesel and Dual Cycles.
	2nd	**UNIT-V:Fuels and Combustion(Introduction)**
	3rd	Fuels, Exothermic and Endothermic reactions

Week	Class Day	Topics to be Covered
13th	**4th**	Heating values of fuel
14th	**1st**	Heating values of fuel
	2nd	Different types of fuels, solid, liquid and gaseous fuels
	3rd	Different types of fuels, solid, liquid and gaseous fuels
	4th	Calorific Value – Higher and Lower Calorific Values
15th	**1st**	Calorific Value – Higher and Lower Calorific Values
	2nd	Air – Fuel Ratio
	3rd	Stoichiometry
	4th	Octane number,Cetane number

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