

**RAJA KISHORE CHANDRA ACADEMY OF TECHNOLOGY,
NILGIRI BALASORE
DEPARTMENT OF MECHANICAL ENGINEERING**

LESSON PLAN

SUBJECT-THERMAL ENGINEERING-I

BRANCH-MECHANICAL

NAME OF THE FACULTY- ER.GAGAN KUMAR SINGH

SESSION-

SEMESTER-3RD

UNIT	DATE	LECTURE NO.	TOPIC TO BE COVERED
1		1	THERMODYNAMIC CONCEPT & TERMINOLOGY THERMODYNAMIC SYSTEMS (CLOSED, OPEN, ISOLATED)
		2	THERMODYNAMIC PROPERTIES OF A SYSTEM (PRESSURE, VOLUME, TEMPERATURE, ENTROPY, ENTHALPY, INTERNAL ENERGY AND UNITS OF MEASUREMENT).
		3	INTENSIVE AND EXTENSIVE PROPERTIES
		4	THERMODYNAMIC PROCESSES, PATH, CYCLE, STATE, PATH FUNCTION, POINT FUNCTION
		5	THERMODYNAMIC EQUILIBRIUM
		6	QUASI-STATIC PROCESS,
		7	CONCEPTUAL EXPLANATION OF ENERGY AND ITS SOURCES
		8	WORK, HEAT AND COMPARISON BETWEEN THE TWO.
		9	MECHANICAL EQUIVALENT OF HEAT AND NUMERICALS
		10	WORK TRANSFER, DISPLACEMENT WORK AND DERIVATION
		11	NUMERICALS
		12	NUMERICALS IN WORK TRANSFER
2		13	LAWS OF THERMODYNAMICS ZEROth LAW OF THERMODYNAMICS.
		14	FIRST LAW OF THERMODYNAMICS.
		15	NUMERICALS ON FIRST LAW OF THERMODYNAMICS
		16	LIMITATIONS OF FIRST LAW OF THERMODYNAMICS, PMM-1
		17	APPLICATION OF FIRST LAW OF THERMODYNAMICS (STEADY FLOW ENERGY EQUATION AND ITS APPLICATION TO TURBINE AND COMPRESSOR)
		18	NUMERICALS ON STEADY FLOW ENERGY EQUATION FOR TURBINE AND COMPRESSOR
		19	SECOND LAW OF THERMODYNAMICS (CLAUSIUS & KELVIN PLANCK STATEMENTS).
		20	APPLICATION OF SECOND LAW IN HEAT ENGINE, DETERMINATION OF EFFICIENCIES
		21	NUMERICALS ON HEAT ENGINE
		22	APPLICATION OF SECOND LAW IN HEAT PUMP, REFRIGERATOR & DETERMINATION OF C.O.P
		23	NUMERICALS ON HEAT PUMP AND REFRIGERATOR
		24	LIMITATIONS OF SECOND LAW OF THERMODYNAMICS, PMM-2

3		25	PROPERTIES PROCESSES OF PERFECT GAS LAWS OF PERFECT GAS: BOYLE'S LAW, CHARLE'S LAW, AVOGADRO'S LAW
		26	DALTON'S LAW OF PARTIAL PRESSURE, GUY LUSSAC LAW, GENERAL GAS EQUATION, CHARACTERISTIC GAS CONSTANT, UNIVERSAL GAS CONSTANT.
		27	SIMPLE NUMERICALS ON LAWS OF PERFECT GASES
		28	EXPLAIN SPECIFIC HEAT OF GAS (CP AND CV)
		29	DERIVATION OF RELATION BETWEEN CP & CV
		30	ENTHALPY OF A GAS, WORK DONE DURING A NON- FLOW PROCESS FOR ISOBARIC AND ASOCHORIC PROCESS.
		31	APPLICATION OF FIRST LAW OF THERMODYNAMICS TO VARIOUS NON FLOW PROCESS (ISOTHERMAL, ISENTROPIC AND POLYTROPIC PROCESS)
		32	NUMERICALS ON WORKDONE
		33	FREE EXPANSION & THROTTLING PROCESS.
		34	CLASS TEST
4		35	INTERNAL COMBUSTION ENGINE AND CLASSIFICATION OF I.C ENGINE
		36	TERMINOLOGY OF I.C ENGINE SUCH AS BORE, DEAD CENTERS, STROKE VOLUME, PISTON SPEED & RPM.
		37	DIFFERENT COMPONENTS OF ENGINE AND THEIR FUNCTION
		38	WORKING PRINCIPLE OF 2-STROKE ENGINE BOTH C.I AND S.I TYPE
		39	WORKING PRINCIPLE OF 4-STROKE ENGINE (S.I TYPE)
		40	WORKING PRINCIPLE OF 4-STROKE ENGINE (C.I TYPE)
		41	DIFFERENTIATE BETWEEN 2-STROKE & 4- STROKE ENGINE C.I & S.I ENGINE.
		42	CLASS TEST QUESTION DISCUSSION & DISTRIBUTION OF SELECTED QUESTIONS TO THE STUDENT FOR THEIR REFERENCES
5		43	GAS POWER CYCLE CARNOT CYCLE AND ITS EFFICENCY DERIVATION
		44	NUMERICALS ON CARNOT CYCLE
		45	LIMITATIONS OF CARNOT CYCLE
		46	OTTO CYCLE AND ITS EFFICENCY DERIVATION
		47	NUMERICALS ON OTTO CYCLE
		48	DIESEL CYCLE AND ITS EFFICENCY DERIVATION
		49	NUMERICALS ON DIESEL CYCLE
		50	DUAL CYCLE AND ITS EFFICENCY DERIVATION
		51	NUMERICALS ON DUAL CYCLE
		52	COMPARISON OF OTTO, DIESEL AND DUAL CYCLE
6		53	FUELS AND COMBUSTION FUEL AND TYPES OF FUEL
		54	APPLICATION OF DIFFERENT TYPES OF FUEL.
		55	HEATING VALUES OF FUEL.
		56	QUALITY OF I.C ENGINE FUELS OCTANE NUMBER, CETANE NUMBER.
		57	CLASS TEST

		58	CLASS TEST QUESTION DISCUSSION & DISTRIBUTION OF SELECTED QUESTIONS TO THE STUDENT FOR THEIR REFERENCES
		59	DOUBT CLEARING, QUESTION DISCUSSION, CLASS TEST
		60	PREVIOUS SEMESTER QUESTION DISCUSSION
SIGNATURE OF FACULTY MEMBER SIGNATURE OF H.O.D			