

Lesson Plan

Name of the faculty: Sh. Kuldeep Singh & Sh. Tasvir Singh

Discipline: Mechanical

Semester: 3rd Mechanical A & B

Subject: Basics of Electrical and Electronics Engineering

Lesson Plan Duration: 15 weeks

Work Load (Lecture/ Practical) per week (in hours): Lecture- 02

Week	Theory			
	Lecture day	Topic (including assignment / test)		
1 st	1 st	Definition of voltage, current, power and energy with their units, name of instruments used for measuring above quantities, connection of these instruments in an electric circuit.		
	2 nd	Difference between ac and dc. Various applications of electricity.		
2 nd	1 st	Electromagnetic induction-Faraday's Laws, Lenz's Law; Fleming's rules, Principles of a.c. Circuits		
	2 nd	Alternating emf, Definition of cycle, frequency, amplitude and time period. Concept of electrical power, Concept of phase and phase difference.		
3 rd	1 st	Concept of resistance, inductance and capacitance in simple a.c. circuit. Concept of three phase system; star and delta connections; voltage and current relationship		
	2 nd	Revision		
4 th	1 st	Working principle and construction of single phase transformer, transformer ratio, emf equation, tapping of transformer		
	2 nd	power transformer, auto transformer and distribution transformer (brief idea and difference between them), cooling of transformer, applications of various types of transformers.		
5 th	1 st	sessional		
	2 nd	sessional		
6 th	1 st	Difference between high and low voltage distribution system, identification of three-phase wires, neutral wire and earth wire in a low voltage distribution system.		
	2 nd	Identification of voltages between phases and between one phase and neutral. Difference between three-phase and single-phase supply		
7 th	1 st	Description and applications of single-phase and three-phase motors. Introduction to DC motor and its applications,		
	2 nd	Difference between ac and dc motor, Connection and starting of three-phase induction motors by DOL and star-delta starter.		
8 th	1 st	Changing direction of rotation of a given 3 phase induction motor. Motors used for driving pump, compressor and e vehicles.		

	2 nd	Revision		
9 th	1 st	Revision		
	2 nd	Distinction between light-fan circuit and single phase power circuit, sub-circuits, various accessories and parts of domestic electrical installation.		
10 th	1 st	Different types of wires and their IS specification, Identification of wiring systems. Colour coding of electrical wires.		
	2 nd	Second sessional		
11 th	1 st	Second sessional		
	2 nd	Electrical shock and precautions against shock, treatment of electric shock, concept of fuses and their classification,		
12 th	1 st	concept of earthing and various types of earthing, brief description of range of protective devices like MCB, ELCB, and RCB		
	2 nd	Concept of semi conductor, types- P and N type. Diodes and their applications, Transistor – PNP and NPN. Their characteristics and uses.		
13 th	1 st	Introduction to integrated circuit (IC), Different types of ICs used in electric drives and their control circuit.		
	2 nd	Revision		
14 th	1 st	3 rd sessional		
	2 nd	3 rd sessional		
15 th	1 st	Revision(Remedial Classes)		

Lesson Plan

Name of the faculty: Sh. Vikash Dahiya, Lecturer in Mechanical Engg.

Branch: Mechanical

Semester: 3rd Mechanical

Subject: Workshop Technology-II

Lesson Plan Duration: 15 weeks

Work Load (Lecture/ Practical) per week (in hours): Lectures- 03

Week	Theory		Practical	
	Lecture day	Topic (including assignment / test)	Practical Day	Topic
1 st	1 st	Resistance welding: Principle, advantages, limitations, working and applications of spot welding and seam welding		
	2 nd	Other Welding Processes: Principle, advantages, limitations, working and applications of Shielded metal arc welding, submerged arc welding. Welding defects, methods of controlling welding defects and inspection of welded joints.		
	3 rd	Modern Welding Methods: Methods, Principle of operation, advantages, disadvantages and applications of ,		
2 nd	1 st	Tungsten inert gas (TIG) welding, Metal inert gas (MIG) welding.		
	2 nd	Thermit welding, Electro slag welding, Electron beam welding, Ultrasonic welding, Laser beam welding, Robotic welding		
	3 rd	Types of pattern, Pattern material, Pattern allowances, Pattern codes as per B.I.S.		
3 rd	1 st	Introduction to cores, core boxes and core materials,		
	2 nd	Core making procedure, Core prints, positioning of cores		
	3 rd	Moulding Sand: Properties of moulding sand, their impact and control of properties viz. permeability, refractoriness, adhesiveness, cohesiveness, strength, flowability, collapsibility,		
4 th	1 st	Various types of moulding sand, Testing of moulding sand		
	2 nd	Mould Making: Types of moulds, Step involved in making a mould, Molding boxes, hand tools used for mould making,		
	3 rd	Molding processes: Bench molding, floor molding, pit molding and machine molding.		
5 th	1 st	Sessional		
	2 nd	Sessional		
	3 rd	Casting Processes: Charging a furnace, melting and pouring both ferrous and non ferrous metals, cleaning of castings,		
6 th	1 st	Principle, working and applications of Die casting: hot chamber and cold chamber, Centrifugal casting		
	2 nd	Gating and Riser System: Elements of gating system, Pouring basin, sprue, runner, gates, Types of risers, location of risers, Directional solidification.		

	3 rd	Melting Furnaces: Construction and working of Pit furnace, Cupola furnace, Crucible furnace – tilting type, Electric furnace		
7 th	1 st	Casting Defects: Different types of casting defects, Non destructive testing (NDT) of castings: die penetration test, radiography, magnetic particle inspection and ultrasonic inspection.		
	2 nd	Revision		
	3 rd	Revision		
8 th	1 st	Working principle and construction of shaper, slotter and planer		
	2 nd	Type of shapers and slotters Type of planers Quick return mechanism applied to shaper and planer machine.		
	3 rd	Work holding devices used on shaper and planer Types of tools used and their geometry.		
9 th	1 st	Specification of shaper and planer. Speeds and feeds in above processes.		
	2 nd	Introduction to broaching Nomenclature of broach tools, types and material		
	3 rd	Types of broaching machines – single ram and duplex ram horizontal type, vertical type pull up, pull down and push down.		
10 th	1 st	2 nd Sessional		
	2 nd	2 nd Sessional		
	3 rd	2 nd Sessional		
11 th	1 st	Milling methods - up milling and down milling Specification and working principle of milling machine		
	2 nd	Classification, brief description and applications of milling machines Details of column and knee type milling machine		
	3 rd	Milling machine accessories and attachment – Arbors, adaptors, collets, vices, circular table, indexing head and tail stock, vertical milling attachment, rotary table.		
12 th	1 st	Identification of different milling cutters and work mandrels Work holding devices		
	2 nd	Milling operations – face milling, angular milling, form milling, straddle milling and gang milling. Cutting parameters		
	3 rd	Revision		
13 th	1 st	Importance and use of jigs and fixtures, difference between jig and fixture.		
	2 nd	Principal of location Locating and clamping devices		
	3 rd	Types of jigs – drilling jig, template jig and plate jig Types of fixtures – Milling and welding fixture		
14 th	1 st	3 rd Sessional		
	2 nd	3 rd Sessional		
	3 rd	3 rd Sessional		
15 th	1 st	Revision		
	2 nd	Revision		
	3 rd	Revision		

LESSON PLAN

Name of faculty

Sh. Baljit Siwach & Sh. Rajesh Kumar

Discipline

Mechanical Engineering

Semester

3rd Semester

Subject

Mechanical Engineering Drawing

Lesson Plan Duration

15 weeks

Work load (Lecture/ Practical) per week (in hours)

6 Hours Practical

WEEK	PRACTICAL	
	Day Practical	Practical Topic
1	1	Unit- 1 Limit, fits and tolerance Need of limit, fits and tolerance, Maximum limit of size, minimum limit of size, tolerance, allowance, deviation, upper deviation, lower deviation, fundamental deviation, clearance, maximum clearance, minimum clearance. Fits – clearance fit, interference fit and transition fit
	2	Hole basis system, shaft basis system, tolerance grades, calculating values of clearance, interference, hole tolerance, shaft tolerance with given basic size for common assemblies like H ₇ /g ₆ , H ₇ /m ₆ , H ₈ /p ₆ . Basic terminology and symbols of geometrical dimensioning
2	3	tolerances. Unit- 2 Drawing of the following with complete dimensions, tolerances, bill of material and surface finish representation.
	4	Universal coupling and Oldham coupling (Assembly)
3	5	Bearings - Bushed Bearing (Assembly Drawing)
	6	Ball Bearing and Roller Bearing (Assembled Drawing) & Assignment No.-1.
4	7	Plummer Block (Detail and Assembly Drawing)
	8	Foot step Bearing (Assembled Drawing)
5	9	Pulleys, Function of pulley, Types and materials of Pulley
	10	1st Class Test
6	11	Free hand Sketch of Various types of pulleys, Fast and loose pulley (Assembly Drawing)
	12	Pipe Joints, Types of pipe Joints, Symbol and line layout of pipe lines
7	13	Expansion pipe joint (Assembly drawing)
	14	Flanged pipe and right angled bend joint (Assembly Drawing)
8	15	1st Sessional test
	16	Lathe Tool Holder (Assembly Drawing), Reading and interpretation of mechanical components and assembly drawings. & Assignment No.-2.
9	17	Sketching practice of bearings and bracket.
	18	2nd Class Test
10	19	Unit- 3 Drilling Jig (Assembly Drawing)
	20	Unit- 4 Machine vices (Assembly Drawing)
11	21	Unit- 5 I.C. Engine Parts – Piston, Connecting rod (Assembly Drawing)
	22	Crankshaft and flywheel (Assembly Drawing)
12	23	2nd Sessional test
	24	Unit- 6 Boiler Parts, Steam Stop Valve (Assembly Drawing) & Assignment No.-3.
13	25	Blow off cock. (Assembly Drawing)
	26	3rd Class Test
14	27	Unit- 7 Mechanical Screw Jack (Assembled Drawing)
	28	Unit- 8 Gears, Types of gears, Nomenclature of gears, conventional representation of gears
15	29	Draw the actual profile of involute teeth of spur gear by different methods. Assignment No.-4.
	30	3rd Sessional test

Lesson Plan

Name of the faculty: Sh. Aakash Suran, Lecturer in Mechanical Engg.

Discipline: Mechanical

Semester: 3rd Mechanical A & B

Subject: Thermodynamics - I

Duration: 15 weeks

Work Load (Lecture/ Practical) per week (in hours): Lectuers- 03, Practicals-02

Week	Theory		Practical	
	Lecture day	Topic (including assignment / test)	Practical Day	Topic
1 st	1 st	Thermodynamic state and system, boundary, surrounding, universe, thermodynamic systems – closed, open, isolated, adiabatic, homogeneous and heterogeneous, macroscopic and microscopic	1 st & 2 nd	Determination of temperature by 1. Thermocouple 2. Pyrometer 3. Infrared thermometer
	2 nd	properties of system – intensive and extensive, thermodynamic equilibrium, quasi – static process		
	3 rd	reversible and irreversible processes, Zeroth law of thermodynamics, definition of properties like pressure, volume, temperature, enthalpy and internal energy.		
2 nd	1 st	revision		
	2 nd	Definition of gases, explanation of perfect gas laws – Boyle’s law, Charle’s law, Avagadro’s law, Regnault’s law		
	3 rd	Universal gas constant, Characteristic gas constants and its derivation.		
3 rd	1 st	Specific heat at constant pressure, specific heat at constant volume of a gas, derivation of an expression for specific heats with characteristics	1 st & 2 nd	Study the working of Nestler boiler.
	2 nd	numerical problems on gas equation		
	3 rd	Types of thermodynamic processes – isochoric, isobaric, isothermal, adiabatic, isentropic		
4 th	1 st	polytropic and throttling processes, equations representing the processes		
	2 nd	Derivation of work done, change in internal energy, change in entropy, rate of		

		heat transfer for the above processes		
	3 rd	Revision		
5 th	1 st	Laws of conservation of energy, first law of thermodynamics (Joule's experiment) and its limitations	1 st & 2 nd	Study of working of high pressure boiler.
	2 nd	Application of first law of thermodynamics to Non-flow systems – Constant volume, Constant pressure		
	3 rd	Adiabatic and polytropic processes, steady flow energy equation		
6 th	1 st	Application of steady flow energy equation for turbines, pump, boilers, compressors, nozzles, and evaporators.		
	2 nd	Heat source and sink, statements of second laws of thermodynamics: Kelvin Planck's statement		
	3 rd	Classius statement, equivalency of statements, Perpetual motion Machine of first kind, second kind		
7 th	1 st	Carnot engine, Introduction of third law of thermodynamics, concept of irreversibility and concept of entrop	1 st & 2 nd	Demonstration of mountings and accessories on a boiler.
	2 nd	Revision		
	3 rd	Revision		
8 th	1 st	Concept of ideal gas, enthalpy and specific heat capacities of an ideal gas		
	2 nd	P – V – T surface of an ideal gas		
	3 rd	triple point, real gases, Vander-Wall's equation		
9 th	1 st	Revision	1 st & 2 nd	Determination of dryness fraction of steam using calorimeter.
	2 nd	Revision		
	3 rd	Formation of steam and related terms, thermodynamic properties of steam, steam tables, sensible heat, latent heat, internal energy of steam, entropy of water, entropy of steam		
10 th	1 st	T- S diagrams, Mollier diagram (H – S Chart),		
	2 nd	Expansion of steam, Hyperbolic, reversible adiabatic and throttling processes, determination of quality of steam(dryness fraction),		

	3 rd	Revision		
11 th	1 st	Revision	1 st & 2 nd	Demonstrate the working of air compressor.
	2 nd	Uses of steam, classification of boilers, function of various boiler mounting and accessories		
	3 rd	comparison of fire tube and water tube boilers. Construction and working of Lancashire boiler, Nestler boiler		
12 th	1 st	Babcock & Wilcox Boiler. Introduction to modern boilers.		
	2 nd	Meaning of air standard cycle – its use, condition of reversibility of a cycle		
	3 rd	Description of Carnot cycle, Otto cycle, Diesel cycle, simple problems on efficiency for different cycles		
13 th	1 st	Comparison of Otto, Diesel cycles for same compression ratio, same peak pressure developed and same heat input	1 st & 2 nd	Industrial visit may be planned to show working of boilers.
	2 nd	Reasons for highest efficiency of Carnot cycle and all other cycles working between same temperature limits		
	3 rd	Revision		
14 th	1 st	Functions of air compressor – uses of compressed air, type of air compressors		
	2 nd	Single stage reciprocating air compressor, its construction and working, representation of processes involved on P – V diagram, calculation of work done		
	3 rd	Multistage compressors – advantages over single stage compressors, use of air cooler, condition of minimum work in two stage compressor (without proof), simple problems		
15 th	1 st	Rotary compressors – types, working and construction of centrifugal compressor, axial flow compressor, vane type compressor		
	2 nd	Revision		
	3 rd	Revision		

Lesson Plan

Name of the faculty: Sh. Mohit Kadyan, Lecturer in Mechanical Engg.

Discipline: Mechanical

Semester: 3rd Mechanical A & B

Subject: STRENGTH OF MATERIALS

Lesson Plan Duration: 15 weeks

Work Load (Lecture/ Practical) per week (in hours): Lectures- 03, Practicals-02

Week	Theory		Practical	
	Lecture day	Topic (including assignment / test)	Practical Day	Topic
1 st	1 st	Basic concept of load, stress and strain.	1 st & 2 nd	Tensile test on bars of Mild steel and Aluminium.
	2 nd	Tensile, compressive and shear stresses		
	3 rd	Linear strain, Lateral strain, Shear strain, Volumetric strain. Concept of Elasticity, Elastic limit and limit of proportionality		
2 nd	1 st	Hook's Law and Elastic Constants Stress-strain curve for ductile and brittle materials	1 st & 2 nd	Tensile test on bars of Mild steel and Aluminium.
	2 nd	Nominal stress Yield point, plastic stage Ultimate stress and breaking stress		
	3 rd	Percentage elongation Proof stress and working stress, Factor of safety		
3 rd	1 st	Poisson's Ratio Thermal stress and strain	1 st & 2 nd	Bending tests on a steel bar or a wooden beam.
	2 nd	Longitudinal and circumferential stresses in seamless thin walled cylindrical shells.		
	3 rd	Introduction to Principal Stresses, Numerical Problems.		
4 th	1 st	Strain Energy, Resilience, proof resilience and modulus of resilience	1 st & 2 nd	Impact test on metals a) Izod test b) Charpy test
	2 nd	Strain energy due to direct stresses and Shear Stress		
	3 rd	Stresses due to gradual, sudden and falling load.		
5 th	1 st	Concept of moment of inertia and second moment of area		
	2 nd	Radius of gyration, Theorem of perpendicular axis and parallel axis (with derivation).		

	3 rd	Second moment of area of common geometrical sections		
6 th	1 st	Rectangle, Triangle, Circle (without derivation);	1 st & 2 nd	Impact test on metals a) Izod test b) Charpy test
	2 nd	Second moment of area for L,T and I section		
	3 rd	Section modulus and Numerical Problems		
7 th	1 st	Concept of various types of beams and form of loading	1 st & 2 nd	Torsion test of solid specimen of circular section of different metals for determining modulus of rigidity.
	2 nd	Concept of end supports-Roller, hinged and fixed		
	3 rd	Concept of bending moment and shearing force, B.M. and S.F. Diagram for cantilever		
8 th	1 st	simply supported beams with and without overhang subjected to concentrated and U.D.L.		
	2 nd	Concept of Bending stresses		
	3 rd	Theory of simple bending Derivation of Bending Equation Use of the equation $\frac{M}{I} = \frac{\sigma}{y} = \frac{E}{R}$		
9 th	1 st	Concept of moment of resistance $\frac{M}{I} = \frac{E}{R}$	1 st & 2 nd	To plot a graph between load and extension and to determine the stiffness of a helical spring.
	2 nd	Bending stress diagram Section modulus for rectangular, circular and symmetrical I section.		
	3 rd	Calculation of maximum bending stress in beams of rectangular section		
10 th	1 st	Calculation of maximum bending stress in beams circular, and T section.		
	2 nd	Numerical Problems		
	3 rd	Concept of column, modes of failure, Types of columns, modes of failure of columns		
11 th	1 st	Buckling load, crushing load	1 st & 2 nd	Hardness test on different metals.
	2 nd	Slenderness ratio		
	3 rd	Effective length and End restraints		
12 th	1 st	Factors effecting strength of a column		
	2 nd	Strength of column by Euler Formula without derivation		
	3 rd	Rankine Gourdan formula (without derivation)		
13 th	1 st	Concept of torsion, difference		

		between torque and torsion.		
	2 nd	Derivation of Torsion Equation, use of torsion equation for circular shaft (solid and hollow)		

	3 rd	Comparison between solid and hollow shaft with regard to their strength and weight. Power transmitted by shaft		
14 th	1 st	Concept of mean and maximum torque		
	2 nd	Numerical Problems		
	3 rd	Closed coil helical springs subjected to axial load and calculation of: Stress deformation		
15 th	1 st	Stiffness and angle of twist and strain energy		
	2 nd	Strain energy and proof resilience		
	3 rd	Determination of number of plates of laminated spring (semi elliptical type only)		

Lesson Plan

Name of the faculty: Sh. Tasvir Singh, Lecturer in Mechanical Engg.

Discipline: Mechanical

Semester: 5th Mechanical A & B

Subject: CNC Machines and Automation

Lesson Plan Duration: 15 weeks

Work Load (Lecture/ Practical) per week (in hours): Lecturers- 03, Practicals-02

Week	Theory		Practical	
	Lecture day	Topic (including assignment / test)	Practical Day	Topic
1 st	1 st	Introduction to NC, CNC & DNC	1 st	Study of constructional detail of CNC lathe
	2 nd	Their advantages, disadvantages and applications.		
	3 rd	Basic components of CNC machines.	2 nd	Study of constructional detail of CNC lathe
2 nd	1 st	Machine Control Unit. Input devices	1 st	Study of constructional detail of CNC milling machine
	2 nd	selection of components to be machined on CNC machines.		
	3 rd	Axis identification.	2 nd	Study of constructional detail of CNC milling machine
3 rd	1 st	Design features, specification of CNC machines.	1 st	Study the constructional details and working of Automatic tool changer and Multiple pallets
	2 nd	Use of slideways, balls, rollers and coatings, motor and leadscrew, swarf removal, safety and guarding devices.		
	3 rd	various cutting tools for CNC machines.	2 nd	Study the constructional details and working of Automatic tool changer and Multiple pallets
4 th	1 st	Concept of CNC tool holder.	1 st	Develop a part programme for following lathe operations and make the job on CNC lathe. - Plain turning and facing operation - Taper turning operation - Circular interpolation
	2 nd	different pallet systems and automatic tool changer system.		
	3 rd	Management of a tool room.	2 nd	Develop a part programme for following lathe operations and make the job on CNC lathe. - Plain turning and facing operation - Taper turning operation - Circular interpolation
5 th	1 st	Control system	1 st	Develop a part programme for the following milling operation and make the job on CNC milling - Plain milling - Slot milling - Contouring - Pocket milling
	2 nd	Open loop and Closed Loop system		
	3 rd	concept of Actuators	2 nd	Develop a part programme for the following milling operation and make the job on CNC milling - Plain milling - Slot milling - Contouring - Pocket milling

6 th	1 st	Transducers and Sensors	1 st	Preparation of work instructions for machine operator
	2 nd	Tachometer		
	3 rd	LVDT	2 nd	Preparation of work instructions for machine operator
7 th	1 st	opto- interrupters		Preparation of preventive maintenance schedule for CNC machine.
	2 nd	potentiometers of linear		
	3 rd	angular position		Preparation of preventive maintenance schedule for CNC machine.
8 th	1 st	encoder	1 st	Demonstration through industrial visit for awareness of actual working of FMS in production.
	2 nd	decoder		
	3 rd	axis drives	2 nd	Demonstration through industrial visit for awareness of actual working of FMS in production.
9 th	1 st	Introduction to part programming		
	2 nd	basic concepts of part programming		
	3 rd	NC words		
10 th	1 st	part programming formats		
	2 nd	simple programming for rational components		
	3 rd	part programming using connedcycles		
11 th	1 st	subroutines and do loops, tool off sets		
	2 nd	cutter radius compensation and tool wear compensation.		
	3 rd	Common problems in CNC machines related to mechanical		
12 th	1 st	Electrical and pneumatic, electronic components.		
	2 nd	Study of common problem and remedies.		
	3 rd	Use of on- time fault finding diagnosis tools in CNC machines.		
13 th	1 st	Concept of automation		
	2 nd	emerging trends in automation		
	3 rd	automatic assembly		
14 th	1 st	Overview of FMS		
	2 nd	Group technology		
	3 rd	CAD/ CAM and CIM.		
15 th	1 st	Introduction to robot technology		
	2 nd	basic robot motion		
	3 rd	Its applications.		

Lesson Plan

Name of the faculty: Sh. Vikas Goel, Senior Lecturer in Mechanical Engg.

Discipline: Mechanical

Semester: 5th Mechanical A & B

Subject: REFRIGERATION AND AIR CONDITIONING

Lesson Plan Duration: 15 weeks

Work Load (Lecture/ Practical) per week (in hours): Lectures- 03, Practicals- 02

Week	Theory		Practical	
	Lecture day	Topic (including assignment /test)	Practical Day	Topic
1 st	1 st	Introduction to refrigeration, and air conditioning	1 st	Identify various tools of refrigeration kit and practice in cutting, bending, flaring, swaging and brazing of tubes.
	2 nd	meaning of refrigerating effect, units of refrigeration, COP		
	3 rd	methods of refrigeration, Introduction to air refrigerator	2 nd	Identify various tools of refrigeration kit and practice in cutting, bending, flaring, swaging and brazing of tubes.
2 nd	1 st	working on reversed carnot cycle.	1 st	Study of thermostatic switch, LP/HP cut out overload protector filters, strainers and filter driers
	2 nd	Introduction of vapour compression system		
	3 rd	Principle of vapour compression System, function of vapour compression system	2 nd	Study of thermostatic switch, LP/HP cut out overload protector filters, strainers and filter driers
3 rd	1 st	parts of vapour compression system,	1 st	Identify various parts of a refrigerator and window air conditioner.
	2 nd	necessity of vapour compression system,		
	3 rd	□T- Chart, p– H chart.	2 nd	Identify various parts of a refrigerator and window air conditioner.
4 th	1 st	dry, wet and superheated compression.	1 st	To find COP of Refrigeration system
	2 nd	Effect of sub cooling		
	3 rd	super heating, mass flow rate	2 nd	To find COP of Refrigeration system
5 th	1 st	entropy, enthalpy	1 st	To detect trouble/faults in a refrigerator/window type air conditioner
	2 nd	work done		
	3 rd	Refrigerating effect, COP	2 nd	To detect trouble/faults in a refrigerator/window type air conditioner
6 th	1 st	actual vapour compression system	1 st	Charging of a refrigerator/window type air conditioner.
	2 nd	Functions of refrigerants		
	3 rd	classification of refrigerants, properties of R - 717	2 nd	Charging of a refrigerator/window type air conditioner.
7 th	1 st	properties of R - 22	1 st	Study of cut section of single cylinder compressor
	2 nd	Properties of R–134 (a) and CO2		
	3 rd	Properties of ideal refrigerant selection of refrigerant	2 nd	Study of cut section of single cylinder compressor

8 th	1 st	Introduction of simple absorption System, Introduction of domestic electrolux refrigeration systems	1 st	Visit to an ice plant, cold storage plant, central air conditioning plant
	2 nd	Principle of simple absorption system		
	3 rd	Principle of domestic electrolux refrigeration systems	2 nd	Visit to an ice plant, cold storage plant, central airconditioning plant
9 th	1 st	Working of simple absorption system		
	2 nd	Working of domestic electrolux refrigeration systems Solar power refrigeration system		
	3 rd	advantages of solar power refrigeration system over vapour compression system.		
10 th	1 st	disadvantages of solar power refrigeration system over vapour compression system.		
	2 nd	Refrigeration Equipment		
	3 rd	Compressor, Function of compressors		
11 th	1 st	Various types of compressors.		
	2 nd	Condenser – Function, various types of condensers		
	3 rd	Evaporator - Function, types of evaporators		
12 th	1 st	Expansion Valve - Function, various types such as capillary tube, thermostatic expansion valve		
	2 nd	low side and high side float valves, application of various expansion valves		
	3 rd	Safety Devices-Thermostat Safety Devices- overload protector LP		
13 th	1 st	Safety Devices-HP cut out switch		
	2 nd	Definition of Psychrometry		
	3 rd	importance of Psychrometry, specific humidity, relative humidity		
14 th	1 st	degree of saturation		
	2 nd	DBT, WBT, DPT, sensible heat, latent heat.		
	3 rd	Total enthalpy of air		
15 th	1 st	Psychrometry chart and various processes of psychrometry		
	2 nd	Study of window air-conditioning split type air conditioning		
	3 rd	concept of central air- condition, automobile air-conditioning		

Lesson Plan

Name of the faculty: Sh. Kuldeep Singh, Lecturer in Mechanical Engg.

Discipline: Mechanical

Semester: 5th Mechanical

Subject: THEORY OF MACHINES

Lesson Plan Duration: 15 weeks

Work Load (Lecture/ Practical) per week (in hours): Lectures- 02, Practical- 02

Week	Theory		Practical	
	Lecture day	Topic (including assignment /test)	Practical Day	Topic
1 st	1 st	Simple Mechanisms, Introduction to link	1 st & 2 nd	To study inversion of Four Bar Mechanism, Single Slider Crank Chain and Double Slider Crank Chain Mechanism with the help of working models.
	2 nd	kinematic pair, lower and higher pair		
2 nd	1 st	Kinematic chain Mechanism and Inversions	1 st & 2 nd	To construct radial cam profile for uniform velocity with knife edge and roller follower on drawing sheet.
	2 nd	Different types of mechanisms (with examples)		
3 rd	1 st	Introduction to Belt and Rope drives	1 st & 2 nd	To construct radial cam profile for SHM with knife edge and roller follower on drawing sheet.
	2 nd	Types of belt drives, types of pulleys		
4 th	1 st	Concept of velocity ratio, slip and creep	1 st & 2 nd	To construct radial cam profile for uniform acceleration and retardation with knife edge and roller follower on drawing sheet.
	2 nd	crowning of pulleys (simple numericals) condition for maximum horse power (simple numericals)		
5 th	1 st	Different types of chains and their terminology	1 st & 2 nd	To find the moment of inertia of a flywheel.
	2 nd	Gear terminology and types of gears		
6 th	1 st	applications of gears, simple gear train.	1 st & 2 nd	To Study the different types of centrifugal governors & plot graph between R.P.M & Displacement of sleeve.
	2 nd	compound gear train, power transmitted by simple spur gear		
7 th	1 st	Principle of flywheel, applications of flywheel	1 st & 2 nd	To study various types of belts drives and to calculate velocity ratio.
	2 nd	Turning - moment diagram of flywheel for different engines		
8 th	1 st	Fluctuation of speed and speed	1 st & 2 nd	To study different types of gear trains with the help of working models and to calculate Velocity ratio.
	2 nd	Coefficient of fluctuation of speed and energy		
9 th	1 st	Simple numerical problems on fluctuation of speed	1 st & 2 nd	To perform the experiment of Balancing of rotating parts and find the unbalanced couple and forces.
	2 nd	Principal of governor, Simple description		
10 th	1 st	working of Watt , Porter and Hartnel governor (simple numericals based on watt governor)		
	2 nd	Hunting and isochronisms of governor		
11 th	1 st	Stability and sensitiveness of a governor		
	2 nd	Concept of balancing		
12 th	1 st	Introduction to balancing of rotating masses, simple numericals on balancing.		
	2 nd	Simple problems related to several masses rotating in different planes		
13 th	1 st	Concept of vibrations		
	2 nd	Types of vibrations.		
14 th	1 st	longitudinal , transverse and torsional vibrations		
	2 nd	Simple numerical on vibrations. Damping of vibrations		
15 th	1 st	Causes of vibrations in machines		
	2 nd	harmful effects on vibrations, remedies		

Lesson Plan

Name of the faculty: Sh. Parveen Malik, Lecturer in Mechanical Engg.

Discipline: Mechanical

Semester: 5th Mechanical A & B

Subject: Plant Maintenance and Material Handling

Lesson Plan Duration: 15 weeks

Work Load (Lecture/ Practical) per week (in hours): Theory – 03

Week	Theory		Practicals	
	Lecture day	Topic (including assignment / test)		
1 st	1 st	Necessity and advantages of testing, repair and maintenance, common instruments required for testing		
	2 nd	significance of B-T curve in life span of machine tool, Acceptance test for machine tools		
	3 rd	Revision		
2 nd	1 st	Economic aspects, manpower planning and materials management		
	2 nd	Fits and tolerances – common fits and tolerances used for various machine parts		
	3 rd	Revision		
3 rd	1 st	Location, layout of machines in Plant Layout, Principles of Plant layout		
	2 nd	types of plant layout and positioning of machines, grouping of machines.		
	3 rd	Foundation – types of foundation, various considerations for machine foundations, foundation plan, types of foundation bolts		
4 th	1 st	erection and leveling, grouting Vibration, damping, vibration isolation – methods of isolation, anti vibration mounts		
	2 nd	Testing equipment – dial gauge, mandrel, spirit level, straight edge, auto collimator Recalibration of measuring instruments like vernier calliper		
	3 rd	Testing methods – geometrical/alignment test, performance test, testing under load, run test, vibrations, noise		
5 th	1 st	Definition, advantages, limitations, functions and types of maintenance organisation. Types of maintenance viz. emergency, preventive, breakdown/corrective, predictive		
	2 nd	Introduction to computerized maintenance record like facility register, maintenance request		
	3 rd	ISO standards for maintenance documentation Introduction to machine history card – purpose and advantages		
6 th	1 st	Preparation of scheduled yearly plan for preventive maintenance, difference of work content of servicing, repairs and overhauling. MTBF and MTTR. Maintainability		
	2 nd	Spare parts- Need of frequently needed spare parts inventory, Make provision of spares for parts not available in market		
	3 rd	Common parts which are prone to failure, reasons of failure		
7 th	1 st	Repair schedule Parts that commonly need repair such as belts		
	2 nd	couplings, nuts, and bolts repairing the engines, compressors and boilers.		
	3 rd	couplings, nuts, and bolts repairing the engines, compressors and boilers.		

8 th	1 st	couplings, nuts, and bolts repairing the engines, compressors and boilers.		
	2 nd	Revision		
	3 rd	Lubrication methods and periodical lubrication chart for various machines (daily, weekly, monthly)		
9 th	1 st	Handling and storage of lubricants		
	2 nd	Lubricants conditioning and disposal		
	3 rd	Lubricant and their grades needed gears and bearings		
10 th	1 st	Lubricant and their grades needed for chains		
	2 nd	Purpose and procedure of changing oil periodically (like gear box oil)		
	3 rd	Purpose and procedure of changing oil periodically (like gear box oil)		
11 th	1 st	Revision		
	2 nd	Basic principles of material handling,		
	3 rd	Basic types of material handling equipments and its characteristic		
12 th	1 st	Uses and limitations, forklift trucks		
	2 nd	Selection of material handling equipment		
	3 rd	Unit load: pallet sizing and loading		
13 th	1 st	Conveyor models		
	2 nd	Revision		
	3 rd	AGV Systems		
14 th	1 st	Automated Storage		
	2 nd	Retrieval System (ASRS)		
	3 rd	Carousels		
15 th	1 st	Revision		
	2 nd	Revision		
	3 rd	Revision		