

LESSON PLAN

FACULTY NAME – PARVEEN KUMAR

DISCIPLINE - MECHANICAL ENGINEERING

SEMESTER - 2ND

SUBJECT - FUNDAMENTALS OF IT

LESSON PLAN DURATION – 16 WEEKS

WORK LOAD / WEEK - LECTURE -2

PRACTICAL -4

WEEK	THEORY		PRACTICALS
	DAY/ LECTURE	TOPIC (INCLUDING ASSIGNMENT/TEST)	
1ST	1	UNIT I . Basics of Computer - Brief history of development of computers, Definition of Computer	
	2	Block diagram of a Computer, Hardware, Software, Booting: Cold and Hot Booting	
2ND	3	Interaction between the CPU and Memory with Input/output devices,	PRACTICAL - 1
	4	Function of CPU and major functional parts of CPU.	
3RD	5	Memory, Bit, Nibble, Byte, KB, MB, GB, TB, PB, Functions of memory	
	6	Use of storage devices in a Computer, List types of memory used in a Computer,	PRACTICAL -2
4TH	7	Importance of cache memory, CPU speed and CPU word length	
	8	UNIT II . Basic Internet Skills - Understanding browser, Introduction to WWW, efficient use of search engines,	
5TH	9	awareness about Digital India portals (state and national portals) and college portals.	PRACTICAL - 3
	10	Advantages of Email, Various email service providers,	
6TH	11	Creation of email id, sending and receiving emails,	
		SESSIONAL TEST - 1	
	12	Attaching documents with email and drive.	PRACTICAL -4

7TH	13	Effective use of Gmail, G-Drive, Google Calendar, Google Sites,	
	14	Google Sheets, Online mode of communication using Google Meet & WebEx.	
8TH	15	UNIT – III - Basic Logic building - Introduction to Programming, Steps involved in problem solving, Definition of Algorithm	PRACTICAL -5
	16	Definition of Flowchart, Steps involved in algorithm development differentiate algorithm and flowchart,	
9TH	17	symbols used in flowcharts, algorithms for simple problems, flowcharts for simple problems,	
	18	Practice logic building using flowchart/algorithms	PRACTICAL -5
10TH	19	UNIT VI . Office Tools - Office Tools like LibreOffice/OpenOffice/MSOffice.	
	20	OpenOffice Writer – Typesetting Text and Basic Formatting, Inserting Images, Hyperlinks, Bookmarks,	
		SESSIONAL TEST - 2	
11TH	21	Introducing LibreOffice/OpenOffice Calc, Working with Cells, Sheets,	
	22	data, tables, using formulae and functions, using charts and graphics.	PRACTICAL - 6
12TH	23	OpenOffice Impress – Creating and Viewing Presentations,	
	24	Inserting Pictures and Tables, Slide Master and Slide Design, Custom Animation	
13TH	25	UNIT V - Use of Social Media	
	26	Introduction to Digital Marketing – Why Digital Marketing,	PRACTICAL -7
14TH	27	Characteristics of Digital Marketing	
	28	Tools for Digital Marketing, , Effective use of Social Media like LinkedIn,	
15TH	29	Google+, Facebook, Twitter, etc.: Features of Social media, Advantages and Disadvantages of Social Media.	
	30	SESSIONAL TEST - 3	
	31	REVISION	PRACTICAL -8

16TH	32	REVISION	
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LESSON PLAN

FACULTY NAME – PARVEEN KUMAR

DISCIPLINE - MECHANICAL ENGINEERING

SEMESTER - 3RD

SUBJECT - MECHANICAL ENGINEERING DRAWING -II

LESSON PLAN DURATION – 8 WEEKS

WORK LOAD / WEEK - 6 PRACTICAL

WEEK	THEORY	
	DAY/ LECTURE	TOPIC (INCLUDING ASSIGNMENT/TEST)
1 ST	1	1. Limit, fits and tolerance
	2	Need of limit, fits and tolerance, Maximum limit of size, minimum limit of size,
	3	tolerance, allowance, deviation, upper deviation, lower deviation, fundamental deviation, clearance, maximum clearance, minimum clearance.
	4	Fits – clearance fit, interference fit and transition fit. Hole basis system, shaft basis system, tolerance grades,
	5	calculating values of clearance, interference, hole tolerance, shaft tolerance with given basic size for common assemblies like H7/g6, H7/m6, H8/p6.
	6	Basic terminology and symbols of geometrical dimensioning and tolerances. Surface finish representation
2 ND	7	2 . Drawing of the following with complete dimensions, tolerances, bill of material and surface finish representation.
	8	Universal coupling and Oldham coupling (Assembly)
	9	Bearings
	10	Bushed Bearing (Assembly Drawing)
	11	Ball Bearing and Roller Bearing (Assembled Drawing)
	12	Plummer Block (Detail and Assembly Drawing)
3 RD	13	Foot step Bearing (Assembled Drawing)
	14	Pipe Joints , Types of pipe Joints, Symbol and line layout of pipe lines
		SESSIONAL - 1
	15	Expansion pipe joint (Assembly drawing)
	16	Flanged pipe and right angled bend joint (Assembly Drawing)
	17	Reading and interpretation of mechanical components and assembly drawings
	18	Sketching practice of wall bracket.
	19	3 .Drilling Jig (Assembly Drawing)
4 TH	20	4.Machine vices (Assembly Drawing)
	21	Lathe Tool Holder (Assembly Drawing)
	22	Lathe tail stock (assembly drawing)
	23	Locking by spring washers, Locking plates.
	24	5. I.C. Engine Parts

	25	Piston
5TH	26	Connecting rod (Assembly Drawing)
	27	Crankshaft and flywheel (Assembly Drawing)
	28	SESSIONAL – II
	29	6. Boiler Parts
	30	Steam Stop Valve (Assembly Drawing)
	31	Blow off cock. (Assembly Drawing)
6TH	32	7. Mechanical Screw Jack (Assembled Drawing)
	33	8. Gears
	34	Gear, Types of gears, Nomenclature of gears and conventional representation
	35	Draw the actual profile of involute teeth of spur gear by approximate method and base circle method.
	36	REVISION
	37	REVISION
7TH	38	REVISION
	39	REVISION
	40	SESSIONAL - III
	41	REVISION
	42	REVISION
	43	REVISION
8TH	44	REVISION
	45	REVISION
	46	REVISION
	47	REVISION
	48	REVISION
	49	REVISION

LESSON PLAN

NAME OF FACULTY: SH. HANISH SAINI

DISCIPLINE: MECHANICAL ENGINEERING, GOVT. POLYTECHNIC,
AMBALA CITY

SEMESTER: III

SUBJECT - STRENGTH OF MATERIAL

LESSON PLAN DURATION: 16 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: 3

LECTURES / 2 PRACTICALS

WEEK	LECTURE NO.	THEORY	PRACTICALS
I	1	UNIT -1 STRESS AND STRAINS Basic concept of load, stress and strain Tensile, compressive and shear stresses	1. Tensile test on bars of Mild steel and Aluminum.
	2	Linear strain, Lateral strain, Shear strain, Volumetric strain. Concept of Elasticity, Elastic limit and limit of proportionality Hook's Law and Elastic Constants	
	3	Stress-strain curve for ductile and brittle materials Nominal stress, Yield point, plastic stage	
II	4	Ultimate stress and breaking stress Percentage elongations Proof stress and working stress Factor of safety	
	5	Poisson's Ratio Thermal stress and strain	2. Bending tests on a steel bar or a wooden beam.

	6	Longitudinal and circumferential stresses in seamless thin walled cylindrical shells. Introduction to Principal stresses	
III	7	UNIT – 2 RESILIENCE Strain Energy, Resilience, proof resilience and modulus of resilience	
	8	Strain energy due to direct stresses and Shear Stress	
	9	Stresses due to gradual, sudden and falling load.	
		SESSIONAL TEST - I	
	10	UNIT -3 MOMENT OF INERTIA Concept of moment of inertia and second moment of area Radius of gyration	
	11	Theorem of perpendicular axis and parallel axis (with derivation)	

IV	12	Second moment of area of common geometrical sections : Rectangle, Triangle, Circle (without derivation); Second moment of area for L,T and I section Section modulus	3. Impact test on metals a) Izod test b) Charpy test
V	13	UNIT- 4 BENDING MOMENT AND SHEARING FORCES Concept of various types of beams and form of loading Concept of end supports-Roller, hinged and fixed	
	14	Concept of bending moment and shearing force	.
	15	B.M. and S.F. Diagram for cantilever and simply supported beams with and without overhang subjected to concentrated and U.D.L	
VI	16	UNIT – 5 BENDING STRESSES Concept of Bending stresses Theory of simple bending, Derivation of Bending Equation	4. Torsion test of solid specimen of circular section of different metals for determining modulus of rigidity.
	17	Use of the equation Concept of moment of resistance Bending stress diagram	
	18	Section modulus for rectangular, circular and symmetrical I section. Calculation of maximum bending stress in beams of rectangular, circular, and T section.	
VII	19	UNIT -6 COLOUMNS Concept of column, modes of failure Types of columns, modes of failure of columns	
	20	Buckling load, crushing load Slenderness ratio	
	21	Effective length End restraints	
VIII	22	Factors effecting strength of a column	
	23	Revision	
	24	SESSIONAL TEST - II	
IX	25	Analysis and Revision of Test and student's sessional test discussion.	
	26	Strength of column by Euler Formula without derivation	
	27	(Same continue) Strength of column by Euler Formula without derivation	

X	28	Rankine Gourdan formula (without derivation)	5. To plot a graph between load and extension and to determine the stiffness of a helical spring
	29	Continue same with revision	
	30	Continuous same with revision previous	
XI	31	UNIT -7 TORSION Concept of torsion, difference between torque and torsion.	
	32	Continue same as above	
	33	Derivation of Torsion Equation, use of torsion equation for circular shaft, (solid and hollow	
XII	34	Continue same as above	
	35	Comparison between solid and hollow shaft with regard to their strength and weight	
	36	Continue same as above	
XIII	37	Power transmitted by shaft Concept of mean and maximum torque	
	38	Continues previous lecturer as above	
	39	UNIT -8 SPRINGS Closed coil helical springs subjected to axial load	
XIV	40	calculation of	
	41	Stress deformation - Stiffness and angle of twist and strain energy	
	42	(Same as above) Stress deformation - Stiffness and angle of twist and strain energy	6. Hardness test on different metals.
XV	43	Strain energy and proof resilience	
	44	Determination of number of plates of laminated spring (semi elliptical type only)	
XVI	46	SESSIONAL TEST - III	
	47	Revision	
	48	Revision	

LESSON PLAN	
Name of Faculty	: SH HITESH AGGARWAL
Discipline	: Mechanical Engineering
Semester	: 3 rd Semester
Subject	: THERMODYNAMICS - I
Lesson Plan Duration:	: 15 Weeks
Work Load (Lecture/Practical)	: 3Hrs. Lecture & 3 Practical

Week	Day	Topic(Including Assignment/Test)	Practical
1	1	Fundamental Concepts Thermodynamic state and system, boundary, surrounding, universe, thermodynamic systems – closed, open, isolated, adiabatic, homogeneous and heterogeneous, macroscopic and microscopic	Determination of temperature by thermocouple
	2	properties of system – intensive and extensive, thermodynamic equilibrium, quasi – static process, reversible and irreversible processes	
	3	Zeroth law of thermodynamics	
2	4	definition of properties like pressure, volume, temperature, enthalpy and internal energy	Determination of temperature by pyrometer
	5	Laws of Perfect Gases Definition of gases, explanation of perfect gas laws – Boyle's law, Charle's law, Avagadro's law, Regnault's law	
	6	Universal gas constant, Characteristic gas constants and its derivation.	
3	7	Specific heat at constant pressure, specific heat at constant volume of a gas, derivation of an expression for specific heats with characteristics	Determination of temperature by Infrared thermometer
	8	simple numerical problems on gas equation	

	9	Thermodynamic Processes Types of thermodynamic processes	
4	10	isochoric, isobaric, isothermal	Demonstration of mountings and accessories of a boiler.
	11	adiabatic, isentropic, polytropic	
	12	throttling processes, equations representing the processes	
5	13	Derivation of work done, change in internal energy, change in entropy, rate of heat transfer for the above process.	Study the working of Lancashire boiler and Nestler boiler.
	14	1 st Class test	
	15	1 st sessional test	
6	16	Laws of Thermodynamics Laws of conservation of energy, first law of thermodynamics (Joule's experiment) and its limitations	Study of working of high pressure boiler
	17	Application of first law of thermodynamics to Non-flow systems – Constant volume, Constant pressure, Adiabatic and polytropic processes	
	18	Steady flow energy equation, Application of steady flow energy equation for turbines, pump, boilers, compressors, nozzles, and evaporators.	
7	19	Heat source and sink, statements of second laws of thermodynamics: Kelvin Planck's statement, Classius statement, equivalency of statements	Study of boilers (Through industrial visit)
	20	Perpetual motion Machine of first kind, second kind	

	21	Carnot engine,	
8	22	Introduction of third law of thermodynamics	Study of boilers (Through industrial visit)
	23	concept of irreversibility and concept of entropy.	
	24	Concept of ideal gas, enthalpy and specific heat capacities of an ideal gas, $P - V - T$ surface of an ideal gas	
9	25	triple point, real gases, Vander-Wall's equation	Study of boilers (Through industrial visit)
	26	Formation of steam and related terms, thermodynamic properties of steam, steam tables	
	27	sensible heat, latent heat, internal energy of steam, entropy of water, entropy of steam, $T - S$ diagrams, Mollier diagram ($H - S$ Chart)	
10	28	Expansion of steam, Hyperbolic, reversible adiabatic and throttling processes, determination of quality of steam (dryness fraction)	VIVA
	29	2 nd class test	
	30	2 nd sessional test	
11	31	Uses of steam, classification of boilers, function of various boiler mounting and accessories	Determination of Dryness fraction of steam using calorimeter.
	32	comparison of fire tube and water tube boilers	
	33	Construction and working of Lancashire boiler, Nestler boiler, Babcock & Wilcox Boiler	

12	34	Introduction to modern boilers.	Determination of Dryness fraction of steam using calorimeter.
	35	Meaning of air standard cycle – its use, condition of reversibility of a cycle	
	36	Description of Carnot cycle, Otto cycle	
13	37	Diesel cycle, simple problems on efficiency for different cycles.	Demonstrate the working of air compressor.
	38	Comparison of Otto, Diesel cycles for same compression ratio, same peak pressure developed and same heat input	
	39	Reasons for highest efficiency of Carnot cycle and all other cycles working between same temperature limits	
14	40	Functions of air compressor – uses of compressed air, type of air compressors	Demonstrate the working of air compressor.
	41	Single stage reciprocating air compressor, its construction and working, representation of processes involved on P – V diagram, calculation of work done	
	42	Multistage compressors – advantages over single stage compressors, use of air cooler, condition of minimum work in two stage compressor (without proof) simple problems Multistage compressors	
15	43	3 rd class test	VIVA
	44	Rotary compressors – types, working and construction of centrifugal compressor, axial flow compressor, vane type compressor	
	45	3 rd sessional test	

LESSONPLAN

NAME OF FACULTY: MISS KIRAN

DISCIPLINE: MECHANICAL ENGINEERING,

G.P.AMBALA

SEMESTER: III

SUBJECT: WORKSHOP TECHNOLOGY- I

LESSON PLAN DURATION: 15 WEEKS

WORKLOAD (LECTURE/PRACTICAL) PERWEEK: (3 lectures)

WEEK	THEORY	
	LECTUR E NOS	TOPIC
1 st	1	Unit-1 Welding - Resistance welding : principle , advantages ,limitations , working and application of spot welding and seam welding
	2	Other welding processes : principal , advantages ,limitation ,working and application of shielded metal arc welding submerged arc welding , welding defects ,method of controlling welding defects and inspection of welded joint
	3	Modern welding method : Method ,principal of operation ,advantages , disadvantages and application of tungsten inert gas welding ,
2 nd	4	Metal inert gas welding , thermit welding ,electro slag welding electron beam welding , ultrasonic welding , laser welding , robotic welding
	5	Unit-2 Foundry techniques – pattern making ,types of pattern ,pattern material ,pattern allowances ,pattern codes as per B.I.S ,introduction to cores
	6	Core boxes and core material , core making procedure , core prints , positioning of cores
3 rd	7	Moulding and casting : properties of moulding sand ,their impact and control of properties viz, permeability ,refractoriness ,adhesiveness ,cohesiveness ,strength
	8	Flowability , collapsibility,various types of moulding sand ,testing of moulding sand
	9	Mould making : types of moulds ,step involved in making a mould , molding boxes ,hand tool used for mould making , molding processes: bench molding , floor molding , pit molding and machine molding
4 th	10	Casting process : charging a furnace , melting and pouring both ferrous and non ferrous metals , cleaning of castings , principal , working and application of die casting : hot chamber and cold chamber , centrifugal casting .
	11	Gating and risering system: Elements of gating system , pouring basin , sprue , runner gates ,types of risers, location of risers , directional solidification , melting furnaces :construction and working of pit furnace , cupola furnace , crucible furnace -tilting type electric furnace
	12	Casting defects :different types of casting defects ,non destructive testing of casting :die penetration test , radiography , magnetic particle inspection and ultrasonic inspection
5 th	13	SESSIONAL TEST-I
	14	Unit-3 shaping ,slotting and planing – working principal and construction of shape ,slotter and planer . types of shapers and slotters , types of planers .
	15	Quick return mechanism applied to shaper and planer machines ,work holding devices used on shaper and planer , types of tools used and their geometry

6 th	16	Specification of shaper and planer , speeds and feeds in above processes
	17	Broaching – Introduction to broaching , nomenclature of broach tools , types and material, types of broaching machines – single ram and duplex ram horizontal type ,vertical type pull up , pull down and push down .
	18	Unit -4 Milling : milling method – up milling and down milling
7 th	19	Specification and working principal of milling machine .
	20	Classification , brief description and application of milling machines
	21	Details of column and knee type milling machine .
8 th	22	Milling machine accessories and attachment – arbors , adaptors ,collets ,vices ,circular table
	23	Indexing head and tail stock , vertical milling attachment , rotary tables
	24	Identification of different milling cutters and work mandrels
9 th	25	SESSIONALTEST-II
	26	Work holding devices
	27	Milling operation – face milling
10 th	28	Angular milling , form milling
	29	Straddle milling and gang milling
	30	Cutting parameters
11 th	31	Unit – 5 Jigs and Fixtures – Importance and use of jigs and fixtures
	32	Difference between jig and fixture
	33	Principle of location
12 th	34	Location and clamping devices
	35	Types of jigs
	36	Drilling jig
13 th	37	Template jig
	38	Plate jig
	39	SESSIONALTEST-III
14 th	40	Types of fixtures
	41	Milling and welding fixture
	42	Revised SessionalTest-1
15 th	43	Revised SessionalTest-2
	44	Revised SessionalTest-3
	45	Seminar
16 th	46	Seminar

LESSON
PLAN FACULTY NAME – Preeti kataria
MECHANICAL ENGINEERING
SEMESTER - 3rd
SUBJECT - BEEE
LESSON PLAN DURATION – 16 WEEKS
WORK LOAD / WEEK - 2 LECTURE

WEEK	THEORY	
	DAY/ LECTURE	TOPIC (INCLUDING ASSIGNMENT/TEST)
1 ST	1	UNIT -1- Basic Electrical Quantities - Definition of voltage, current, power and energy with their units, name of instruments used for measuring above quantities,
	2	connection of these instruments in an electric circuit. Difference Between ac and dc. Various applications of electricity.
2 ND	3	UNIT II - AC Fundamentals - Electromagnetic induction-Faraday's Laws, Lenz's Law ,
	4	Principles of a.c. Circuits; Alternating emf,
3 RD	5	Definition of cycle, frequency, amplitude and time period.
	6	Concept of electrical power, Concept of phase and phase difference.
4 TH	7	Concept of resistance, inductance and capacitance in simple a.c. circuit.
	8	Concept of three phase system; star and delta connections ;voltage and current relationship
		SESSIONAL TEST - 1
5 TH	9	UNIT III - Transformer - Working principle and construction of single phase transformer,
	10	transformer ratio, emf equation, tapping of transformer,
6 TH	11	Brief idea and difference between them),
	12	cooling of transformer, applications of various types of transformers.
7 TH	13	UNIT IV - Difference between high and low voltage distribution system,
	14	identification of three-phase wires,
8 TH	15	neutral wire and earth wire in a low voltage distribution system.
	16	Identification of voltages between phases and between one phase and neutral.
9 TH	17	Difference between three-phase and single-phase supply
	18	UNIT V - Electric Motor - Description and applications of single-phase and three-phase motors.
10 TH	19	Introduction to DC motor and its applications,
	20	Difference between ac and dc motor,
11 TH	21	Connection and starting of three-phase induction motors by DOL and star-delta starter.
	22	Changing direction of rotation of a given 3 phase induction motor.
		SESSIONAL TEST - 2
12 TH	23	Motors used for driving pump
	24	compressor and e vehicles.
13 TH	25	UNIT - VI - Domestic Installation - Distinction between light-fan circuit and single phase power circuit,
	26	sub-circuits, various accessories and parts of domestic electrical installation.
14 TH	27	Different types of wires and there is specification, Identification of wiring systems.
	28	Colour coding of electrical wires.

15TH	29	UNIT – VII - Electrical shock and precautions against shock, treatment of electric shock, concept of fuses and their classification,
	30	concept of earthing and various types of earthing, brief description of range of protective devices like MCB, ELCB, and RCB
16TH	31	UNIT – VIII -Concept of semi conductor, types- P and N type. Diodes and their applications, Transistor – PNP and NPN. Their characteristics and uses.
	32	Introduction to integrated circuit (IC), Different types of ICs used in electric drives and their control circuit.
		SESSIONAL TEST - 3

LESSON PLAN

NAME OF FACULTY: SH. SANJEEV KUMAR

DISCIPLINE: MECHANICAL ENGINEERING-

G.P.AMBALA SEMESTER: V

SUBJECT: REFRIGERATION AND AIRCONDITIONING LESSON

PLAN DURATION: 15 WEEKS

WORKLOAD(LECTURE/PRACTICAL)PERWEEK:(3 lectures, 2Practical)

WEEK	THEORY		PRACTICALS
	LECTURE NOS	TOPIC	TOPIC
1 st	1	Unit-1 –REFRIGERATION , Fundamentals of Refrigeration	Practical-1 Identify various tools of refrigeration kit and practice in cutting, bending, flaring, Swaging and brazing of tubes
	2	Introduction to refrigeration, and air conditioning	
	3	Meaning of refrigerating effect, units Of refrigeration, COP, methods of refrigeration	
2 nd	4	Introduction to air refrigeration, working On reversed carnot cycle.	Practical-2 Study of thermostatic switch, LP/HP cut out overload protector filters, strainers and filter driers.
	5	Unit-2 Vapour Compression System	
	6	Introduction, principle, function, parts and Necessity of vapour compression system,	
3 rd	7	T- ϕ and p-H charts, dry, wet and superheated compression.	Practical-3 Identify various parts of a refrigerator and window air conditioner.
	8	Effect of subcooling, super heating,	
	9	Mass flow rate, entropy, enthalpy	
4 th	10	work done, Refrigerating effect and COP.	Practical-4 To find COP of Refrigeration system
	11	Actual vapour compression system	
	12	Refrigerants, Functions,	
5 th	13	SESSIONAL TEST-I	Repeat Practical 1 to 4
	14	Unit-3 Refrigerants, Functions, classification of refrigerants, properties of R-717	
	15	R-22, R-134(a) and CO ₂	
6 th	16	Properties of ideal refrigerant, selection of refrigerant	Repeat Practical 1 to 4
	17	Unit-4 Vapour Absorption System	
	18	Introduction, principle and working of simple absorption system and domestic electrolux Refrigeration systems	
7 th	19	Solar power refrigeration system, advantages and disadvantages of Solar power refrigeration system over vapour Compression system	Repeat Practical 1 to 4
	20	Unit-5 Refrigeration Equipment, Compressor-Function, various types of compressors	

	21	Condenser- Function, varioustypes of condensers, Evaporator-Function, typesof evaporators	
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8 th	22	Expansion Valve-Function, various types such As capillary tube, thermostatic	Practical-5 To detect trouble/ faults in a refrigerator/window type air conditioner
	23	Expansion valve, low side and high side float valves, application of various Expansion valves	
	24	Safety Devices-Thermostat, overload protector LP,HP cutout switch	
9 th	25	SESSIONAL TEST-II	Practical-6 Charging of a refrigerator/window type air conditioner.
	26	Unit-6- Psychrometry Definition, importance,	
	27	Specific humidity, relative humidity,	
10 th	28	Degree of saturation DBT	Practical-7 Study of cut section of single cylinder compressor
	29	WBT, DPT,	
	30	Sensible heat, latent heat	
11 th	31	Total enthalpy of air. Psychrometry chart and Various processes of psychrometry	Practical-8 Visit to an ice plant, cold storage plant, central air conditioning plant
	32	by pass factor, room sensible heat factor, effective room sensible heat factor	
	33	Grand sensible heat factor, ADP, room DPT.	
12 th	34	Heating and humidification, cooling and dehumidification,	Repeat Practical 5 to 8
	35	Study of window air-conditioning,	
	36	Split type air conditioning,	
13 th	37	Concept of central air-condition,	Repeat Practical 5 to 8
	38	Automobile air-conditioning	
	39	SESSIONAL TEST-III	
14 th	40	Inverter technology, auto-defrosting,	Repeat Practical 5 to 8
	41	Blast cooling, star rating	
	42	Revised Sessional Test-1	
15 th	43	Revised Sessional Test-2	Repeat Practical
	44	Revised Sessional Test-3	
	45	Seminar	
16 th	46	Seminar	

LESSON PLAN

NAME OF FACULTY: SH. JAGJIT SINGH NARANG /SH.HANISH SAINI

DISCIPLINE: MECHANICAL ENGINEERING - G.P. AMBALA

SEMESTER: V

SUBJECT: CNC MACHINES AND AUTOMATION LESSON PLAN

DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: (3 lectures, 2 Practical)

WEEK	THEORY		PRACTICALS
	LECTURE NOS	TOPIC	TOPIC
1 st	1	Unit-1- Introduction, Introduction to NC, CNC & DNC,	Practical-1 Study of constructional detail of CNC lathe.
	2	Advantages, disadvantages and its Applications.	
	3	Basic components of CNC machines, Machine Control Unit,	
2 nd	4	Input devices, selection of components to be machined on CNC machines,	Practical-2 Study of constructional detail of CNC milling machine.
	5	PLC Control and its purpose, types and applications.	
	6	Classification Of NC Systems According to Feedback, motion, positioning.	
	7	Unit-4- Part programming and basic procedure of part programming, Rules for Axis identification, NC words, Blocks, part programming formats,	
	8	simple programming for rational components (Point to point, Straight line, curved surface), tool off sets, cutter radius compensation and wear compensation. Comparative study of Fanuc Controller and Sinumerik codes.	
3 rd	9	Advanced Structures in Part Programming Advantages of using advanced structures, part programming using canned cycles,	Repeat Practical 1 to 2
	10	subroutines and do loops, mirror image	
th	11	Construction and Tooling Need of Special mechanical design features for CNC, specification Chart of CNC machines, types of slideways, balls, rollers,	Practical-3 Study the constructional details and working of Automatic tool changer and Multiple pallets
	12	motor- servo/stepper , recirculating ball screw and nut assembly,	
	13	swarf removal, safety and guarding devices,	
5 th	14	Various cutting tools for CNC machines, overview of tool holder, different pallet systems and	Practical-4 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.
	15	automatic tool changer-ATC system, tool change cycle,	
	16	types of tool magazines, specialized work done in CNC tool room	

6 th	17	SESSIONAL TEST –I	Repeat Practical 1 to 4
	18	Unit-3- System Devices- Control System; Open Loop and Closed Loop System,	
	19	Concept of Actuators, Transducers and Sensors, Tachometer, LVDT,	
7 th	20	Interrupters, potentiometers for linear and angular position	Repeat Practical 1 to 4
	21	Encoder and decoder and axis drives	
	18	Unit-4- Part Programming, Introduction to Part programming, Basic concepts of part programming,	
8 th	19	NC words, part programming formats, simple programming for rational components, part programming using conned cycles,	Repeat Practical 1 to 4
	20	subroutines and do loops, tool off sets, cutter radius compensation and tool wear compensation	
	21	Unit-5 - Problems in CNC Machines, Common problems in CNC machines related to mechanical,	
9 th	22	electrical and pneumatic, electronic components.	Practical-5 Develop a part programme for the following milling operation and make the job on CNC milling - Plain milling - Slot milling - Contouring - Pocket milling
	23	Study of common problems and remedies,	
	24	use of on-time fault finding diagnosis tools in CNC machines	
10 th	25	SESSIONAL TEST -II	Practical-6- Calculate coordinate points for a zig zag job by considering sign convention for milling
	26	Unit-6- Automation and NC system	
	27	Automation, suitability of production system to automation , types	
11 th	28	automatic assembly, manufacture of printed circuit boards(PCB),	Practical-7 Using canned cycle - Create a part program for drilling, tapping, counter sinking and produce component in the Machine
	29	manufacture of integrated Circuits, Overview of FMS,	
	30	AGV-types, ASRS,	
12 th	31	Group technology, CAD/CAM and CIM,	Practical-8 Demonstration through industrial visit for awareness of actual working of FMS in production.
	32	Automated Identification system	
	33	Unit-7- Automated inspection: Off-line, On-line, Contact, Non-contact;	

13th	34	Coordinate Measuring machines; Machine vision,	Practical 9 Use of software for any one of turning or milling operations on CNC turning center. Program Writing Turning simulator for generation of tool path.
	35	concept of AI and its applications in manufacturing	
	36	Robotics, nomenclature of joints, motion	

14th	37	SESSIONAL TEST -III	Repeat Practical 5 to 8
	38	Revision/doubt clearing Sessional Test -1	
	39	Revision/doubt clearing Test -2	
15th	40	Revision/doubt clearing Test -3	Practical 10- Demo of 3-D Printing.
	41	Programming- PTP, Lathe	
	42	Canned Cycle	
16th	43	Any Other Query	Repeat Practical 9- 10

Lesson Plan

Name of the Teacher with Designation : Sh. Ram Niwas

Discipline : Mech. Engg.

Semester : 4th Semester

Subject : Industrial Engineering

Lesson Plan Duration : 15 weeks

Work Load (Lecture / Practical) per week (In hours) : Lectures : 03 , Practicals : Nil

Week	Theory		Practical
	Lecture Day	Topic (Including Assignment / Test)	Practical Day
1 st	1 st	Chapter-1 Productivity Introduction to productivity, factors affecting productivity Measurement of productivity	1 st
	2 nd	Causes of low productivity	
	3 rd	Methods to improve productivity	
2 nd	4 th	Chapter-2 Work Study Definition and scope of work study	2 nd
	5 th	Inter-relation between method study and work measurement	
	6 th	Inter-relation between method study and work measurement	
3 rd	7 th	Inter-relation between method study and work measurement	3 rd
	8 th	Human aspects of work study	
	9 th	Role of work study in improving productivity.	
4 th	10 th	Chapter-3 Method Study	4 th
	11 th	Method Study Objectives and procedure for Method analysis	
	12 th	Information collection and recording techniques.	
5 th	13 th	Information collection and recording techniques.	5 th
	14 th	Information collection and recording techniques.	
	15 th	Information collection and recording techniques. Assisnment No. 1 Productivity, causes of low Productivity, Method to improve Productivity, Human Aspect of work study, Role of Work study to improve productivity, Information and Recording Techniques	
6 th	16 th	Sessional Test No. 1	6 th
	17 th	Chapter-4 Motion Analysis Motion Analysis , Principles of Motion analysis	
	18 th	Motion Analysis , Principles of Motion analysis	
7 th	19 th	Therbligs and SIMO charts	7 th
	20 th	Therbligs and SIMO charts	
	21 st	Normal work area and design of work places. Ergonomics	
	22 nd	Chapter-5 Work Measurement Work Measurement Objectives , Work measurement techniques	

8 th	23 rd	Stop watch time study	8 th
	24 th	Principle, equipment used and procedure	
9 th	25 th	Systems of performance rating	9 th
	26 th	Calculation of basic times; various allowances	
	27 th	Calculation of standard time, work sampling	
10 th	28 th	Standard data and its usage	10 th
	29 th	Chapter-6 Wages and incentives Schemes	
	30 th	Wage payment plans and incentives	
11 th	31 st	Wage payment plans and incentives	11 th
	32 nd	Various incentive plans, incentives for indirect labour Assisnment No. 2 Motion Analysis and its Principles, Therbligs and SIMO Chart, Work Measurement techniques, Stop watch Study Procedure, Standard data and Its usage, Wages plans , Various incentives for indirect labour.	
	33 rd	Sessional Test No. 2	
12 th	34 th	Chapter-7 Production Planning and Control Production Planning and Control Introduction, objectives and components (functions) of P.P.C	12 th
	35 th	Advantages of production planning and Production Control, stages of P.P.C , Process planning, routing, scheduling, dispatching and follow up	
	36 th	Routing purpose, route sheets, scheduling – purpose	
13 th	37 th	Machine loading chart, Gantt chart, dispatching – purpose and procedure	13 th
	38 th	Follow up – purpose and procedure. CPM/PERT technique,	
	39 th	Drawing of simple networks and critical time calculation , Production Control in job order	
14 th	40 th	Batch type and continuous type of productions. , Difference between these controls	14 th
	41 st	Chapter-8 Stores Management Different Layout and structures of stores	
	42 nd	Inventory control, calculation of EOQ	
15 th	43 rd	Bin cards and various forms required in stores for documentation. Purchase procedures	15 th
	44 th	Estimation of cost for machining processes, Numerical problems Assisnment No. 3 PPC Objectives and its different stages, Machine loading chart and Gantt chart , PERT and CPM Techniques and difference between these two, Different Layout and structures of stores, , Inventory control, calculation of EOQ	
	45 th	Sessional Test No. 3	

Name of the Faculty:	HARJIT CHAWLA
Discipline:	MECHANICAL
Semester:	5 th
Subject:	Theory of Machines

Lesson Plan Duration: 15 weeks (from Aug, 2026 to Nov 2026)

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

Week	Theory		Practical
	Lecture day	Topic(including assignment/test)	Topic
1st	1st	UNIT-1 SIMPLE MECHANISMS Introduction to Machines and Theory of Machines. Kinematics of Machines: - Definition of Kinematics, Dynamics, Statics, Kinetics	1. To study inversion of Four Bar Mechanism, Single Slider Crank Chain and Double Slider Crank Chain Mechanism with the help of working models
	2nd	Kinematic link, Kinematic Pair and its types, constrained motion and its types. Kinematic chain and its types, Mechanism, inversion, machine and structure.	
2nd	1st	Inversions of Kinematic Chain: Inversion of four bar chain.	Checking of practical copy/ viva/Revision.
	2nd	Coupled wheels of Locomotive & Pantograph. Inversion of Single Slider Crank chain- Rotary I.C. Engines mechanism.	
3rd	1st	Crank and Slotted lever quick return mechanism.	2. To construct radial cam profile for uniform velocity with knife edge and roller follower on drawing sheet
	2nd	Inversion of Double Slider Crank Chain- Scotch Yoke Mechanism & Oldham's coupling.	
4th	1st	UNIT-II CAMS & FOLLOWERS Definition and function of cam.	Checking of practical copy/ viva/ Revision.
	2nd	Different types of cams and followers and their specific applications Terminology of cam profile.	
5th	1st	Displacement diagram for uniform velocity, S.H.M. and uniform acceleration and deceleration.	3. To construct radial cam profile for SHM with knife edge and roller follower on drawing sheet.

	2 nd	Drawing of profile of radial cam with knife-edge and roller follower with and without offset with reciprocating motion.	
6 th	1 st	Sessional Test-1	Checking of practical copy/ viva/Revision.
	2 nd	UNIT-III FLYWHEEL Flywheel - Concept, function and applications of flywheel. Types of flywheel: (i) Disc type (ii) Rim type (Specific application of these two).	
7 th	1 st	Turning moment diagram for single cylinder 4-Stroke I.C. Engine and Steam Engine (Single Acting & Double Acting).	4. To construct radial cam profile for uniform acceleration and retardation with knife edge and roller follower on drawing.
	2 nd	Coefficient of fluctuation of energy, Coefficient of fluctuation of speed and its significance. Numerical.	
8 th	1 st	GOVERNORS Concept, function and applications of Governors. Comparison between Flywheel and Governor Terminology used in Governors.	5. To find the moment of inertia of a flywheel.
	2 nd	Types of centrifugal Governor: Construction and working of Simple Watt governor. Porter Governor and Hartnell Governor.	
9 th	1 st	UNIT-IV MECHANICAL POWER TRANSMISSION Introduction to Mechanical Power, Need of Power Transmission, Methods of Power Transmission.	6. To Study the different types of centrifugal governors & plot graph between R.P.M & Displacement of sleeve.
	2 nd	Introduction to belt drives. Flat belt drive and V -belt drive, Relative advantages and disadvantages. Types and application of belt drives- Open belt drive, Closed or crossed belt drive, Fast and loose pulley, Stepped cone pulley, Jockey pulley drive, Quarter turn belt drive, Compound belt drive. Length of belt.	

10th	1st	Sessional Test-2	Checking of practical copy/ viva/Revision.
	2nd	Concept of velocity ratio, slip and creep; crowning of pulleys. Ratio of driving tensions, power transmitted, centrifugal tension, and condition for maximum horse power (simple numerical)	
11th	1st	Introduction to Chain Drive, Different types of chains and their applications. Advantages disadvantages of chain drive relative to belt drive.	7. To study various types of belts drives and to calculate velocity ratio.
	2nd	Gear Drive -Different types of gears and their applications. Gear train, Types and application of different gear trains: Simple, compound, reverted and epi cyclic gear trains.(simple numerical) Relative advantages and disadvantages of Gear drive over other belt drives.	
12th	1st	UNIT-V VIBRATIONS & BALANCING Concept and terminology used in vibrations.	8. To study different types of gear trains with the help of working models and to calculate Velocity ratio.
	2nd	Causes of vibrations in machines; their harmful effects and remedies	
13th	1st	Types of vibrations-Free, forced and damped. Damping of vibrations. Resonance.	9. To perform the experiment of Balancing of rotating parts and find the unbalanced couple and forces
	2nd	Concept of balancing, static and dynamic balancing, Need of balancing of machine parts.	
14th	1st	Balancing of rotating masses in the same plane and different planes.	Checking of practical copy/ viva/Revision.
	2nd	Revision	
15th	1st	Sessional Test-3	Checking of practical copy/ viva/Revision.
	2nd	Revision	