

LESSON PLAN

NAME OF FACULTY: SHIV KUMAR

DISCIPLINE: MECHANICAL ENGINEERING

SEMESTER: IV

SUBJECT: CAD/ CAM

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: 4 PRACTICALS

Week	Theory	
	Lecture Day	Topic (including assignments/test)
1st	1	1. Computer Aided Design (CAD) 03 Sheets
	2	1.1 Introduction to Computer Aided Drafting
	3	(2D) commands of any one software (Auto CAD, ProE, Solid works, Unigraphics etc.)
	4	1.2 Introduction to CAD Software
2 nd	5	Installing CAD Software, Familiarization with software, coordinate system (Absolute, Relative and Polar)
	6	snap, grid, and ortho mode and setting of units and layout.
	7	1.3 Exercises on preparing drawings of some machine elements using: Drawing commands – point, line, arc, circle, ellipse
	8	Editing commands – scale, erase, copy, stretch, lengthen and explode.
3 rd	9	1.4 Dimensioning and placing text in drawing area
	10	sectioning and hatching
	11	Inquiry for different parameters of drawing entity
	12	Create layers within a drawing
4 th	13	1.5 Some exercise on simple drawings
	14	Copy Checking/Revision
	15	Copy Checking/Revision
	16	Copy Checking/Revision
5 th	17	2. Prepare assembly drawing of the following using Drafting Software (2D) 3 sheets
	18	2.1 Plummer Block
	19	2.2 Stepped pulley, V-belt pulley
	20	2.3 Machine tool Holder
6 th	21	2.4 Wall Bracket
	22	Copy Checking/Revision
	23	Copy Checking/Revision
	24	Copy Checking/Revision
7 th	25	3. Isometric Drawing by CAD using any part modeling Software (3D) 2 sheets
	26	Introduction: Part modelling
	27	Datum Plane

	28	constraint; sketch
8 th	29	Dimensioning
	30	Extrude
	31	Revolve
	32	Sweep
9 th	33	Blend
	34	Protrusion
	35	Extrusion
	36	Rib; shell
10 th	37	Hole
	38	Round
	39	Chamfer
	40	Copy
11 th	41	Mirror
	42	Assembly
	43	Align
	44	Orient
12 th	45	Exercises for 3D Drawings
	46	3.1. Flanged coupling
	47	3.2. Bearing Block
	48	3.3. Bushed bearing
13 th	49	4. Computer Aided Manufacturing (CAM)
	50	4.1. Introduction to CAM software, steps in using CAM software
	51	4.2 Generate part program using CAM software (MasterCAM/EdgeCAM
	52	Any other CAM software) for turning jobs
14 th	53	4.3 Generate part program using CAM software (MasterCAM/EdgeCAM
	54	Any other CAM software) for milling jobs
	55	Copy Checking/Revision
	56	Copy Checking/Revision
15 th	57	Copy Checking/Revision
	58	Copy Checking/Revision
	59	Copy Checking/Revision
	60	Copy Checking/Revision

Lesson Plan (4th Semester)

Name of Faculty : Ms. Pujjwal Mittal
Designation : Lecturer
Discipline : Common with Civil, Computer, Electrical, Mech
Semester : 4th
Subject : English & Communication Skills-II
Lesson Plan Duration: 15 Weeks (from February 2024 to June 2024)
Work Load(Lecture/Practical)per week(In hours): 02-Lectures / 02-Practicals

Week	Theory		Practical	
	Lecture Day	Topic(including assignment/Test)	Pract. Day	Topic
1st	1st	UNIT I Reading All The World's A Stage – W. Shakespeare	1	Reading:- Reading Practice of the above lessons in the Lab Activity classes.
	2nd	<ul style="list-style-type: none"> • Life Sketch of Dr. Abdul Kalam • The Portrait of a Lady - Khushwant Singh 	2	Comprehension exercises of unseen passages along with the given lessons.
2nd	1st	The Doctor's Word by R K Narayan	3	Vocabulary enrichment and grammar exercises based on the above selective readings..
	2nd	Speech by Dr Kiran Bedi at IIM Indore 2007 Leadership Concepts	4	Situational Conversation: Requesting and responding to requests; Expressing sympathy and condolence.
3rd	1st	The Bet - by Anton Chekov	5	Warning; Asking and giving information.
	2nd	Revision	6	
4th	1st	UNIT -II Effective Communication Skills Modern means of Communication (Video Conferencing, e- mail, Teleconferencing)	7	
	2nd	Effective Communication Skills: 7 C's of Communication	8	Getting and giving permission.
5th	1st	Non-verbal Communication – Significance, Types and Techniques for Effective Communication	9	Asking for and giving opinions.

	2nd	Barriers and Effectiveness in Listening Skills	10	A small formal and informal speech.
6th	1st	Barriers and Effectiveness in Speaking Skills	11	Seminar
	2nd	Revision/Test	12	Debate
7th	1st	UNIT III, Professional Writing	13	Practice
	2nd	<ul style="list-style-type: none"> Correspondence: Enquiry letters, placing orders, complaint letters Report Writing 	14	Practice
8th	1st	<ul style="list-style-type: none"> Memos Circulars 	15	Unseen Comprehension Passages and vocabulary enhancement.
	2nd	<ul style="list-style-type: none"> Press Release Inspection Notes and tips for Note-taking 	16	Interview Skills: Preparing for the Interview and guidelines for success in the Interview and significance of acceptable body-language during the Interview.
9th	1st	<ul style="list-style-type: none"> Corrigendum writing Cover Letter 	17	Written and Oral Drills will be undertaken in the class to facilitate holistic linguistic competency among learners.
	2nd	Drawing inferences	18	Participation in a GD, Functional and Non-functional roles in GD, case studies and role plays.
10th	1st	Revision/Assignment	19	Presentations, using audio-visual aids (including power-point).
	2nd	UNIT IV. Grammar and Vocabulary Prepositions	20	. Telephonic interviews, face to face interviews
11th	1st	Conjunctions	21	Presentations as Mode of Communication: Persuasive Presentations using multi-media aids
	2nd	Punctuation	22	Practice
12th	1st	<ul style="list-style-type: none"> Idioms and Phrases Pairs of words (Words commonly misused and confused) 	23	Practice
	2nd	Translation of Administrative and Technical Terms in Hindi or Mother	24	Practice

		tongue		
13th	1st	UNIT V Employability Skills. Presentation Skills: How to prepare and deliver a good presentation	24	Practice
	2nd	Telephone Etiquettes	26	Exercise
14th	1st	<ul style="list-style-type: none"> • Importance of developing employable and soft skills • Resume Writing: Definition, Kinds of Resume, Difference between Bio-data and Curriculum Vitae and Preparing a Resume for Job/ Internship 	27	Exercise
	2nd	<ul style="list-style-type: none"> • Group discussions: Concept and fundamentals of GD, and learning Group Dynamics. • Case Studies and Role Plays 	28	Exercise
15th	1st	Revision	29	Exercise
	2nd	Test	30	Exercise

LESSON PLAN

NAME OF FACULTY: SHIV KUMAR

DISCIPLINE: MECHANICAL ENGINEERING

SEMESTER: IV

SUBJECT: HYDRAULICS AND PNEUMATICS

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: THEORY-3 & PRACTICAL- 2

WEEK	THEORY		PRACTICALS
	LECTURE NO	TOPIC	TOPIC
1 st	1	1. Introduction Fluid, types of fluid; properties of fluid viz mass density, weight density (specific weight),	1. Measurement of pressure head by employing. i) Piezometer tube ii) Single and double column manometer
	2	specific volume, capillarity, specific gravity, viscosity,	
	3	compressibility, surface tension, kinematic viscosity and dynamic viscosity and their units.	
2 nd	4	2. Pressure and its Measurement 2.1 Concept of pressure (Atmospheric Pressure, gauge pressure, absolute pressure).	2. To find out the value of coefficient of discharge for a venturimeter.
	5	Pascal's Law, Static Pressure 2.2 Pressure measuring devices: peizometer tube manometers - simple U-tube	
	6	Pressure measuring devices: Differential single column including simple problems	
3 rd	7	Pressure measuring devices: Inverted U-tube including simple problems	Copy Checking/revision
	8	Pressure measuring devices: micro manometer including simple problems	
	9	2.3 Bourdon pressure gauge, Diaphragm pressure gauge,	
4 th	10	Dead weight pressure gauge	3. Measurement of flow by using venturimeter.
	11	SESSIONAL TEST-I	
	12	3. Flow of Fluids Types of fluid flow – steady and unsteady, uniform and non-uniform, laminar and turbulent;	
5 th	13	rate of flow and their units; continuity equation of flow;	4. Verification of Bernoulli's theorem.
	14	potential energy of a flowing fluid; total head;	
	15	Bernoulli's theorem (statement and proof) and its applications	
6 th	16	Discharge measurement with the help of venturi-meter	Copy Checking/revision
	17	Discharge measurement with the help of orifice meter.	

	18	Discharge measurement with the help of pitot-tube, limitations of Bernoulli's theorem simple problems.	
7 th	19	4.Flow through Pipes 4.1 Definition of pipe flow, wetted perimeter,	5. To find coefficient of friction for a pipe (Darcy's friction).
	20	hydraulic mean depth, hydraulic gradient; loss of head due to friction;	
	21	Chezy's equation and Darcy's equation of head loss (without proof), Reynold's number and its effect on pipe friction; siphon,	
8 th	22	Nozzle - definition, velocity of liquid flowing through the nozzle, power developed.	6. To study hydraulic circuit of an automobile brake and hydraulic ram.
	23	Water hammer, anchor block, syphon, surge tank (concept only).	
	24	4.2 Loss of head in pipes due to sudden enlargement, sudden contraction, obstruction on flow path, change of direction and pipe fittings (without proof)	
9 th	25	SESSIONAL TEST-II	Copy Checking/revision
	26	5. Flow through Orifices : Cc, Cv, Cd,	
	27	flow through drowned orifices	
10 th	28	flow through partially drowned orifices	7. Study the working of a Pelton wheel and Francis turbine.
	29	time for emptying a tank through a circular orifice. Simple problems	
	30	6. Hydraulic Machines: Description, operation and application of hydraulic systems –	
11 th	31	Description, operation and application of hydraulic ram, hydraulic jack,.	8. To study a single stage centrifugal pump for constructional details and its operation to find out its normal head and discharge.
	32	Description, operation and application of hydraulic brake	
	33	hydraulic accumulator, hydraulic door closer, hydraulic press,	
12 th	34	selection of specification of above systems for different applications	Copy Checking/revision
	35	7. Water Turbines and Pumps 7.1 Concept of a turbine, types of turbines – impulse and reaction type, difference between them.	
	36	Construction and working of pelton wheel, Francis turbine.	
13 th	37	Construction and working of Propeller and Kaplan turbines.	Copy Checking/revision
	38	Unit speed, unit power, unit discharge, specific speed of turbines, selection of turbines based on specific speed.	
	39	7.2 Concept of hydraulic pump, single acting reciprocating pump (construction and operation only)	
14 th	40	vane, screw and gear pumps.	VIVA - VOICE
	41	7.3 Construction, working and operation of centrifugal pump.	
	42	Performance, efficiencies and specifications of a centrifugal pump.	

15th	43	Trouble shooting and problems in centrifugal pumps and remedial measures, pitting, cavitations, priming	VIVA - VOICE
	44	VIVA - VOICE	
	45	SESSIONAL TEST-III	

LESSON PLAN

NAME OF FACULTY: SHIV KUMAR

DISCIPLINE: MECHANICAL ENGINEERING

SEMESTER: IV

SUBJECT: MACHINE DESIGN

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: 3 LECTURES

Week	Theory	
	Lectures Day	Topics
1 st	1	UNIT I 1. Introduction
	2	1.1 Design – Definition, Type of design, necessity of design, Comparison of designed and undersigned work, Design procedure, Characteristics of a good designer
	3	1.2 Design terminology: stress, strain, factor of safety, factors affecting factor of safety, stress concentration, methods to reduce stress concentration, fatigue, creep and tenacity, endurance limit. SN Curve and its significance
2 nd	4	1.3 General design consideration, Selection of materials, criteria of material selection, Codes and Standards (BIS standards)
	5	1.4 Various design failures- maximum normal stress theory, maximum stress theory, maximum strain theory
	6	UNIT II 2. Design of Shaft
3 rd	7	2.1 Type of shaft, shaft materials, Type of loading on shaft, standard sizes of shaft available
	8	2.2 Shaft subjected to torsion only, determination of shaft diameter (hollow and solid shaft) on the basis of : - Strength criterion - Rigidity criterion
	9	2.3 Determination of shaft diameter (hollow and solid shaft) subjected to bending
4 th	10	2.4 Determination of shaft diameter (hollow and solid shaft) subjected to combined torsion and bending.
	11	Revision Previous Topics
	12	Assignment/test
5 th	13	SESSIONAL TEST -I
	14	UNIT III 3. Design of Key
	15	3.1 Types of key, materials of key, functions of key
6 th	16	3.2 Failure of key (by Shearing and Crushing).
	17	3.3 Design of key (Determination of key dimension)
	18	3.4 Effect of keyway on shaft strength. (Figures and problems).
7 th	19	4. Design of Coupling
	20	Necessity of a coupling, advantages of a coupling
	21	types of couplings, design of muff coupling

8 th	22	Design of flange coupling. (Both protected type and unprotected type).
	23	UNIT IV 5. Design of Joints
	24	Types of joints - Temporary and permanent joints, utility of various joints
9 th	25	5.1 Design of Temporary Joints
	26	Knuckle Joints – Different parts of the joint, material used for the joint, type of knuckle Joint, design of the knuckle joint. (Figures and problems).
	27	Cotter Joint – Different parts of the spigot and socket joints, Design of spigot and socket joint.
10 th	28	5.2 Design of Permanent Joint
	29	Riveted Joints. : Rivet materials, Rivet heads, leak proofing of riveted joint – caulking and fullering.
	30	Different modes of rivet joint failure
11 th	31	Design of riveted joint – Lap and butt, single and multi riveted joint.
	32	Welded Joint - Welding symbols. Type of welded joint, strength of parallel and transverse fillet welds.
	33	SESSIONAL TEST -II
12 th	34	Strength of combined parallel and transverse weld.
	35	UNIT V 6. Design of Screwed Joints and Springs
	36	6.1 Design of screw: Introduction, Advantages and Disadvantages of screw joints, location of screw joints
13 th	37	Important terms used in screw threads, designation of screw threads
	38	Initial stresses due to screw up forces, stresses due to combined forces, Design of Screw jack
	39	6.2 Design of Spring: Classification and applications of springs, spring terminology
14 th	40	Stresses in springs, Wahl's correction factor
	41	Design of open coil helical spring subjected to uniform applied load under tension and compression.
	42	Assignment/Test
15 th	43	Revision
	44	SESSIONAL TEST -III
	45	Revision

LESSON PLAN

NAME OF FACULTY: SHIV KUMAR

DISCIPLINE: MECHANICAL ENGINEERING

SEMESTER: IV

SUBJECT: MATERIAL AND METALLURGY

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: THEORY- (3 PERIODS/ 2PERIODS)

WEEK	THEORY		PRACTICALS
	LECTURE NO.	TOPIC	TOPIC
1 st	1	1. Introduction Material, History of Material Origin, Scope of Material Science.	1. Classification of about 25 specimens of materials/machine parts into (i) Metals and non metals (ii) Metals and alloys (iii) Ferrous and non ferrous metals (iv) Ferrous and non ferrous alloys
	2	Overview of different engineering materials and applications.	
	3	Classification of materials, Thermal, Chemical and Electrical properties of various materials.	
2 nd	4	Mechanical properties of various materials, Present and future needs of materials.	2. Given a set of specimen of metals and alloys (copper, brass, aluminum, cast iron, HSS, Gun metal); identify and indicate the various properties possessed by them.
	5	Overview of Biomaterials and semi- conducting materials.	
	6	Various issues of Material Usage-Economical, Environment and Social.	
3 rd	7	2.Crystallography Fundamentals of Crystal, Unit Cell, Space Lattice,	Copy Checking/revision
	8	Arrangement of atoms in Simple Cubic Crystals, BCC, FCC and HCP Crystals,	
	9	Number of atoms per unit Cell, Atomic Packing Factor	
4 th	10	Deformation: Overview of deformation behavior and its mechanisms,	3. Study of heat treatment furnace.
	11	Behavior of material under load and stress-strain.	
	12	Failure Mechanisms: Overview of failure modes, fracture, fatigue and creep.	
5 th	13	SESSIONAL TEST-I	4. Study of a metallurgical microscope and a specimen polishing
	14	3. Metals And Alloys Introduction: History and development of iron and steel.	

	15	Different iron ores, Raw Materials in Production of Iron and Steel.	machine.
6 th	16	Basic Process of iron-making and steel-making,	Copy Checking/revision
	17	Classification of iron and steel.	
	18	Cast Iron: Different types of Cast Iron, manufacture and their usage.	
7 th	19	Steels: Steels and alloy steel,	5. To prepare specimens of following materials for microscopic examination and to Examine the microstructure of the specimens of following materials: i) Brass ii)Copper iii)Grey iv)Malleable v)Low carbon steel vi)High carbon steel vii) HSS
	20	Classification of plain carbon steels,	
	21	Availability, Properties and usage of different types of Plain Carbon Steels,	
8 th	22	Effect of various alloys on properties of steel,	6. To anneal a given specimen and find out difference in hardness as a result of annealing.
	23	alloy steels (high speed steel, stainless steel,	
	24	Uses of spring steel, silicon steel	
9 th	25	Non Ferrous Materials: Properties and uses of Light Metals and their alloys,	Copy Checking/revision
	26	properties and uses of White Metals and their alloys.	
	27	4. Theory of Heat Treatment Purpose of heat treatment,	
10 th	28	Solid solutions and its types,	7. To normalize a given specimen and to find out the difference in hardness as a result of normalizing.
	29	Iron Carbon diagram,	
	30	Formation and decomposition of Austenite, Martensitic Transformation – Simplified Transformation Cooling Curves	
11 th	31	SESSIONAL TEST-II	8. To harden and temper a specimen and to find out the difference in hardness due to tempering.
	32	various heat treatment processes- hardening, tempering, annealing, normalizing, Case hardening and surface hardening	
	33	Types of heat treatment furnaces required for above operations (only basic idea)	
12 th	34	5. Engineering Plastics Important sources of plastics,	Copy Checking/revision
	35	Classification-thermoplastic and thermo set and their uses.	
	36	Various Trade names of Engg. Plastics, Plastic Coatings.	
13 th	37	6. Advanced Materials	Copy Checking/revision

		Composites-Classification, properties, applications	
	38	Ceramics-Classification, properties.	
	39	applications Heat insulating materials	
14th	40	7. Miscellaneous Materials Asbestos, Glass wool,	Viva-voice
	41	Properties and uses of thermocole, cork, mica.	
	42	Overview of tool and die materials,	
15th	43	Materials for bearing metals, Spring materials,	Viva-voice
	44	Materials for Nuclear Energy, Refractory materials.	
	45	SESSIONAL TEST-III	

LESSON PLAN

NAME OF FACULTY: SHIV KUMAR

DISCIPLINE: MECHANICAL ENGINEERING

SEMESTER: IV

SUBJECT: THERMODYNAMICS-II

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: 3 LECTURES/2 PRACTICALS

Week	Theory		Practicals
	Lectures Day	Topics	Topics
1 st	1	Unit-I. IC Engines	1. Dismantle an IC engine and note down the condition of various parts, removal and fitting of piston, rings, measuring of bore size, crank shaft ovality and assemble it.
	2	1.1 Introduction,	
	3	1.2 Working principle of two stroke and four stroke cycle SI engines and CI engines, Otto cycle, diesel cycle and dual cycle	
2 nd	4	1.3 Location and functions of various parts of IC engines and materials used for them	2. Servicing of petrol engine.
	5	1.4 Concept of IC engine terms: bore, stroke, dead centre, crank throw	
	6	compression ratio, piston displacement, piston speed	
3 rd	7	2. Fuel Supply in Petrol Engine	Copy Checking / revision
	8	2.1 Concept of carburetion	
	9	2.2 Air fuel ratio	
4 th	10	2.3 Simple carburetor and its application MPFI,	3. Demonstration of electronic ignition system
	11	Common rail system,	
	12	super charging and turbo charger	
5 th	13	Problem solving	Copy Checking / revision
	14	SESSIONAL TEST-I	
	15	Unit II 3. Fuel System of Diesel Engine	
6 th	16	3.1 Components of fuel system	4. Valve servicing, grinding, lapping and fitting mechanism and tappet adjustment.
	17	3.2 Description and working of fuel feed pump	
	18	3.3 Fuel injection pump	
7 th	19	3.4 Injectors	Copy Checking /
	20	4 Cooling and Lubrication	

	21	4.1 Function of cooling system in IC engine	revision
8 th	22	4.2 Air cooling and water cooling system, use of thermostat, radiator and forced circulation in water cooling (description with line diagram)	5. Determination of BHP by dynamometer.
	23	4.3 Function of lubrication	
	24	4.4 Types and properties of lubricant	
9 th	25	4.5 Lubrication system of engine	Copy Checking / revision
	26	Revision of previous topics	
	27	SESSIONAL TEST-II	
10 th	28	Unit-III 5 Testing of IC Engines	6. Morse test on multi-cylinder petrol engine.
	29	5.1 Engine power - indicated and brake power	
	30	5.2 Efficiency - mechanical, thermal. relative and volumetric	
11 th	31	5.3 Methods of finding indicated and brake power	7. Testing of engine pollution
	32	5.4 Morse test for petrol engine	
	33	5.5 Heat balance sheet	
12 th	34	5.6 Concept of pollutants in SI and CI engines, pollution control, norms for two four wheelers – BIS – I, II, III and IV methods of reducing pollution in IC engines	8. Demonstration and study of lubrication system of a multi cylinder IC engine
	35	UNIT IV 6. Steam Turbines and Steam Condensers	
	36	6.1 Introduction, main parts, uses and classification of steam turbine 6.2 Construction and working principle of impulse and reaction steam turbines and comparison	
13 th	37	6.3 Governing of steam turbines 6.4 Steam nozzles - types and applications	Copy Checking / revision
	38	6.5 Function of a steam condenser, elements of condensing plant and types of steam condenser (Jet and surface). 6.6 Comparison between jet condenser and surface condenser	
	39	6.7 Cooling pond and cooling towers	
14 th	40	UNIT V 7. Gas Turbines and Jet Propulsion	9. Draw heat balance sheet of a 4 stroke IC engine
	41	7.1 Classification, open cycle gas turbine and closed cycle gas turbine, comparison of gas turbines with reciprocating IC engines, applications and limitations of gas turbine	

	42	7.2 Open cycle constant pressure gas turbines - general layout, PV and TS diagram and working of gas turbine 7.3 Closed cycle gas turbines, PV and TS diagram and working	
15 th	43	7.4 Principle of operation of ram-jet engine and turbo jet engine - application of jet engines 7.5 Supercharger and turbocharger engine	Viva-Voice
	44	SESSIONAL TEST-III	
	45	Revision	

LESSON PLAN

NAME OF FACULTY: SHIV KUMAR

DISCIPLINE: MECHANICAL ENGINEERING

SEMESTER: IV

SUBJECT: WORKSHOP PRACTICE-III

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: 6 PRACTICALS

Week	Lecture day	Topics
1 st	1	GRINDING SHOP
	2	1. Job on grinding machine using a surface grinder.
2 nd	3	2. Prepare a job on cylindrical grinding machine
	4	3. Grinding a drill-bit on tool and cutter grinder.
3 rd	5	4. Prepare a job on centerless grinding machine
	6	5. Exercise on dressing a grinding wheel.
4 th	7	ADVANCE MACHINE SHOP
	8	1. Prepare a slot on one face using milling machine
5 th	9	2. Prepare a T slot on vertical milling machine.
	10	3. Prepare a job on milling machine by using a form cutter
6 th	11	4. Exercise of cutting a spur gear on a hobbing machine
	12	5. Perform machining operation on EDM/wire cut machine.
7 th	13	6. Demonstration of modern machining processes such as ECM/USM/LBM etc. through industrial visit.
	14	7. Demo of metal forming operations such as Forging, Extrusion, Rolling, Press Working etc. through industrial visit.
8 th	15	METAL COATING AND FINISHING SHOP
	16	1. Prepare a job by using metal finishing operations such as lapping, buffing, polishing, burnishing on a work piece.
9 th	17	2. Prepare a job to finish an internal surface using honing process
	18	3. Carry out electroplating on a job
10 th	19	4. Finishing a metal surface using a metal spray
	20	5. Finishing a metal surface using powder Coating
11 th	21	Copy Checking/revision
	22	ADVANCE FITTING SHOP
12 th	23	1. Prepare a composite job of drilling, reaming, counter boring, counter sinking and tapping operations
	24	2. Prepare dove tail fitting on mild steel specimen
13 th	25	Prepare radius fitting on mild steel specimen
	26	3. Perform pipe threading operation using die and assembly of the same with pipe fittings
14 th	27	Copy Checking/Revision

	28	Revision
15 th	29	Revision
	30	Revision

LESSON PLAN

NAME OF FACULTY: SHIV KUMAR

DISCIPLINE: MECHANICAL ENGINEERING

SEMESTER: IV

SUBJECT: WORKSHOP TECHNOLOGY-III

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: 3 LECTURES

Week	Theory	
	Lectures Day	Topics
1 st	1	UNIT I 1. Gear Manufacturing
	2	Gear materials and specifications, Gear manufacturing by Casting, Moulding, Stamping
	3	Machining; Gear generating methods: Gear Shaping with pinion cutter & rack cutter; Gear
2 nd	4	hobbing; Description of gear hob; Operation of gear hobbing machine; Gear finishing processes
	5	UNIT II 2. Grinding
	6	Principles of metal removal by Grinding; Abrasives – Natural & Artificial; Bonds and binding processes: Vitrified, silicate, shellac, rubber, bakelite
3 rd	7	Factors affecting the selection of grind wheels: size and shape of wheel, kind of abrasive, grain size, grade and strength of bond, structure of grain,
	8	spacing, kinds of bind material; Standard marking systems: Meaning of letters & numbers sequence of marking, Grades of letters;
	9	Truing, dressing, balancing and mounting of wheel. Selection of grinding wheel. Grinding machines classification: Cylindrical, Surface, Tool & Cutter grinding machines
4 th	10	Construction details; Principle of centreless grinding; Advantages & limitations of centreless grinding;
	11	Revision Previous Topics
	12	Assignment/test
5 th	13	SESSIONAL TEST -I
	14	UNIT III 3. Modern Machining Processes
	15	Introduction – comparison with traditional machining; Ultrasonic Machining: principle, Description of equipment, applications; Electric Discharge Machining (EDM): Principle, Description of equipment,
6 th	16	Dielectric fluid, tools (electrodes), Process parameters, Output characteristics, applications. Wire cut EDM: Principle, Description of equipment,
	17	Controlling parameters; applications;
	18	Abrasive Jet Machining: principle, description of equipment, application;
7 th	19	Laser Beam Machining: principle, description of equipment, application

	20	Electro Chemical Machining: description of equipment, application
	21	UNIT IV 4. Metal Forming Processes
8 th	22	Press Working - Types of presses, type of dies and punches selection of press die, die material.
	23	Press Operations-Shearing, piercing
	24	Press Operations- trimming, punching
9 th	25	Press Operations- notching, shaving
	26	Press Operations- embossing, stamping
	27	Forging - Open die forging
10 th	28	Forging - closed die forging
	29	Forging - Press forging, upset forging, swaging
	30	up setters, roll forging, Cold and hot forging
11 th	31	Rolling - Elementary theory of rolling, Types of rolling mills, Thread rolling, roll passes, Rolling defects and remedies
	32	Extrusion and Drawing - Type of extrusion- Hot and Cold, Direct and indirect. Pipe drawing, tube drawing, wire drawing
	33	SESSIONAL TEST -II
12 th	34	UNIT V 5. Metal Finishing Processes
	35	Purpose of finishing surfaces. Surface roughness-Definition and units, Honing Process, its applications,
	36	Description of hones. Brief idea of honing machines. Lapping process, its applications.
13 th	37	Description of lapping compounds and tools. Brief idea of lapping machines. Polishing, Buffing, Burnishing and super finishing
	38	6. Metallic Coating Processes
	39	Metal spraying – Wire process, powder coating process, applications,
14 th	40	Electroplating: Basic principles, Plating metals, applications; Hot dipping: Galvanizing, Tin coating, Parkerising, Anodizing. Organic coatings
	41	Oil base Paint, Lacquer base, Enamels, Bituminous paints, rubber base coating; Finishing specifications.
	42	Assignment/Test
15 th	43	Revision
	44	SESSIONAL TEST -III
	45	Revision