

## LESSON PLAN

Name of Faculty: Sh. Sunil Kumar (Theory)/ Sh. Sunil Kumar (Practical)

Discipline: Plastic Technology

Semester: IIIrd

Subject: Engineering Fundamental

Lesson plan Duration: 15 WEEKS

Work Load (Lecture/Practical) per week: 4 PERIODS/ 4 PERIODS

Week	THEORY		PRACTICAL	
	Lecture DAY	TOPIC	Practical DAY	TOPIC
1 <sup>ST</sup>	1	<b>Unit 1: Engineering Fundamental :</b> i) Application and Advantages of Electricity	1	Use of Megger: <b>Objective:</b> To make the students familiar with different uses of megger.
	2	Difference between AC and DC		
	3	Various applications of electricity		
	4	Advantages of electrical energy over other types of energy		
2 <sup>ND</sup>	5	ii) Basic Quantities of Electricity :	2	Connection of a three phase motor and starter including fuses and reversing of direction of rotation. <b>Objective:</b> Students may be made familiar with the equipment needed to control a three-phase motor
	6	Definition of voltage, current,		
	7	Power and energy with their units		
	8	Name of the instruments used: Voltmeter,		
3 <sup>RD</sup>	9	Ammeter, energy meter		The students must experience that by changing any two phases, the direction of rotation is reversed.
	10	iii) Distribution System :		
	11	iv) Supply from Poles to Distribution Board		
	12	v) Electric Motors:		
4 <sup>TH</sup>	13	Definition, types and various applications of single phase and three phase motors	3	Trouble shooting in a three-phase motor Loose connections Blown fuse Tripped overload protection Incorrect direction of rotation Single phasing Burnt winding to be simulated by a
	14	Connection and starting of three phase motors by star delta starter		
	15	vi) Measuring Instruments		
	16	Basics of measurement		

				loose connection behind a terminal box
5 <sup>TH</sup>	17	Principles of measurement of DC voltage and DC current		<b>Objective:</b> The students must be able to detect the most common faults, which may occur in a three-phase motor, using meggar wherever necessary.
	18	AC voltage and AC current and resistance using a multimeter block diagram of a CRO		
	19	use for the measurement of voltage (DC and AC), frequency and to study waves shape		
	20	<b>Test-I</b>		
6 <sup>TH</sup>	21	<b>UNIT-II Electronics Engineering :</b> i) Introduction :	4	Treatment of electric shock Teacher may give a demonstration how an electric shock must be treated. Students must be trained to treat the persons suffering from an electric shock
	22	Introduction to active and passive components		
	23	Introduction to intrinsic and extrinsic semiconductor		
	24	PN junction diode		
7 <sup>TH</sup>	25	Mechanism of current flow in PN junction	5	Measurement of resistors by an ordinary multimeter and their verification on the basis of colour code.
	26	Diode (PN junction) as rectifier		
	27	Half wave rectifier,		
	28	Full wave rectifier and filter circuits		
8 <sup>TH</sup>	29	Brief idea and typical application of power diode, zener diode, photo diode	6	<b>Unit-II</b> Plotting of formal V-1 characteristics of PN junction diode
	30	Concept of bipolar transistor - PNP and NPN,		
	31	Their characteristics and uses		
	32	ii) Digital Electronics :		
9 <sup>TH</sup>	33	Basic difference between analog and digital signal	7	Rectifier circuits using semiconductor diode, measurement of input and output voltage and plotting of input and output wave shape for (i) half wave rectifier (ii) full wave rectifier
	34	Binary and hexadecimal number system		
	35	Binary addition, subtraction,		
	36	Multiplication and division.		
10 <sup>TH</sup>	37	Definition,	8	Verification and interpretation of truth tables for AND, OR, NOT, NAND, NOR and EX-OR gates
	38	Symbols and truth table of NOT, AND, OR, NAND, NOR, EX-OR Gates, Boolean algebra		
	39	Demorgan's theorem General principle of A/D and D/A conversion techniques		
	40	Brief idea of their applications		
11 <sup>TH</sup>	41	iii) Programmable Logic Controller :	9	Working of a PLC on PLC Trainer
	42	Basic concept of PLC, its block diagram and applications		
	43	<b>Test-II</b>		
	44	<b>UNIT-III Civil Engineering :</b>		
12 <sup>TH</sup>	45	i) Construction Materials	10	Unit-III : The students should be

	46	Basics of various construction materials such as stones, bricks, lime		taken to different construction sites to show them various construction materials, concreting process and construction of RCC structural elements, foundations and other civil works
	47	Cement and timber along with their properties		
	48	Physical/ field testing and uses		
13 <sup>TH</sup>	49	Elements of brick masonry	11	Note: While imparting instructions, teachers are expected to lay more emphasis on concepts and principles.
	50	ii) Foundations		
	51	Types of various foundations		
	52	their salient features		
14 <sup>TH</sup>	53	Suitability of various foundations for heavy light	12	It will be better if the classes for general engineering are conducted in the laboratories and organized demonstrations for explaining various concepts and principles
	54	Vibrating machines.		
	55	iii) Factors to be considered for installation/erection		
	56	Commissioning of plastic processing machinery		
15 <sup>TH</sup>	57	Vibrations- their effects		Viva voce and final evaluation
	58	Methods to control vibrations		
	59	General method of alignment/leveling		
	60	<b>Test-III</b>		

## LESSON PLAN

Name of Faculty: Sh. Arun Syan (Theory)/ Sh. Arun Syan (Practical)

Discipline: Plastic Technology

Semester: IIIrd

Subject: SOM

Lesson plan Duration: 15 WEEKS

Work Load (Lecture/Practical) per week: 4 PERIODS/ 4 PERIODS

Week	THEORY		PRACTICAL	
	Lecture DAY	TOPIC	Practical DAY	TOPIC
1 <sup>ST</sup>	1	<b>Unit 1: SOM :</b> Introduction to SOM	1	Tensile test on bars of Mild steel and Aluminium
	2	Stresses and Strains : Concept of load, stresses and strain		
	3	Tensile compressive and shear stresses and strains		
	4	Concept of Elasticity, Elastic limit and limit of proportionality		
2 <sup>ND</sup>	5	Hook's Law, Young Modulus of elasticity	2	Bending tests on a steel bar or a wooden beam
	6	Nominal stress, Stress strain diagram		
	7	Yield point, plastic stage		
	8	Ultimate strength and breaking stress		
3 <sup>RD</sup>	9	Percentage elongation, Proof stress and working stress	3	Impact test on metals  Izod test Charpy test
	10	Factor of safety, Poisson's ratio, Shear modulus		
	11	Longitudinal and circumferential stresses in seamless thin walled cylindrical shells (derivation of these formulae not required)		
	12	<b>Unit-II: Resilience :</b> Resilience, proof resilience and modulus of resilience		
4 <sup>TH</sup>	13	Strain energy due to direct stresses	4	Torsion test on specimens of different metals for determining modulus of rigidity
	14	Stresses due to gradual, sudden and falling load		
	15	Numerical problems		
	16	<b>Class Test-I</b>		
5 <sup>TH</sup>	17	<b>Unit-III : Moment of Inertia</b>	5	To determine the stiffness of a helical spring and to plot a graph
	18	Concept of moment of Inertia and second		

		moment of area		between load and extension.
	19	Radius of gyration , section modulus		
	20	Theorem of perpendicular axis and parallel axis ( without derivation)		
6 <sup>TH</sup>	21	Second moment of area of common, geometrical sections: Rectangle, Triangle, Circle (without derivation) Second moment of area for I,T, L, Z section	6	Hardness test on different metals.
	22	<b>Unit-IV</b> : Bending Moment and Shearing Force		
	23	Concept of beam and type of loading		
	24	Concept of end supports-Roller, hinged and fixed		
7 <sup>TH</sup>	25	Concept of bending moment and shearing force		
	26	B.M. and S.F. Diagram for cantilever and simply supported beams with and without overhang subjected to concentrated and U.D.L		
	27	Simple numerical problems		
	28	<b>Test-II</b>		
8 <sup>TH</sup>	29	<b>Unit-V</b> : Bending stresses		
	30	Concept of Bending stresses		
	31	Theory of simple bending		
	32	Use of the equation $f/y = M/I = E/R$		
9 <sup>TH</sup>	33	Concept of moment of resistance		
	34	Bending stress diagram		
	35	Calculation of maximum bending stress in beams of rectangular, circular, and T section		
	36	Permissible bending stress Section modulus for rectangular, circular and symmetrical I section		
10 <sup>TH</sup>	37	Simple numerical problems		
	38	<b>Unit-VI</b> : Columns : Concept of column, modes of failure		
	39	Types of columns		
	40	Buckling load, crushing load, Slenderness ratio		
11 <sup>TH</sup>	41	Factors effecting strength of a column		
	42	End restraints, Effective length		
	43	Strength of column by Euler Formula without derivation		
	44	Rankine Gourdan formula ( without derivation)		

12 <sup>TH</sup>	45	Simple numerical problems		
	46	<b>Unit-VII : Torsion</b>		
	47	Concept of torsion- difference between torque and torsion		
	48	Use of torque equation for circular shaft		
13 <sup>TH</sup>	49	Comparison between solid and hollow shaft with regard to their strength and weight.		
	50	Power transmitted by shaft, Concept of mean and maximum torque		
	51	Simple numerical problems		
	52	<b>Unit-VIII: Springs</b> : Closed coil helical springs subjected to axial load		
14 <sup>TH</sup>	53	Impact load		
	54	Stress deformation		
	55	Stiffness and angle of twist and strain energy		
	56	Proof resilience		
15 <sup>TH</sup>	57	Laminated spring (semi elliptical type only)		Viva voce and final evaluation
	58	Determination of number of plates		
	59	Simple numerical problems		
	60	<b>Class Test-III</b>		

## LESSON PLAN

Name of Faculty: Sh. Ajay Kumar (Theory)/ Sh. Ajay Kumar (Practical)

Discipline: Plastic Technology

Semester: IIIrd

Subject: VFF

Lesson plan Duration: 15 WEEKS

Work Load (Lecture/Practical) per week: 3 PERIODS/ 4 PERIODS

Week	THEORY		PRACTICAL	
	Lecture DAY	TOPIC	Practical DAY	TOPIC
1 <sup>ST</sup>	1	<b>Unit 1: Introduction</b> Introduction to VFF	1	To verify Bernoulli theorem
	2	Basic Terminology of Fluid		
	3	Specific Mass, Specific Volume ,		
2 <sup>ND</sup>	4	Specific Weight, Specific Gravity	2	To determine the Reynolds number and observe the pattern of laminar and turbulent flow
	5	Pressure, Viscosity, Surface Tension		
	6	Capillarity ,Compressibility , Vapor pressure		
3 <sup>RD</sup>	7	<b>Unit-II : Viscous Flow</b>	3	To determine the discharge coefficient (Cd) for an venturimeter
	8	Classification of Fluid, Ideal Fluid, Real Fluid, Newtonian Fluid, Non-Newtonian Fluid		
	9	Pseudo-plastic, Viscosity(Dynamic & Kinematics ),Newton's Law of Viscosity		
4 <sup>TH</sup>	10	Effect of Viscosity on Temperature	4	To determine the discharge coefficient (Cd) for an orificemeter
	11	Effect of Viscosity on Motion, Classification of Viscous Flow		
	12	Laminar Flow, Turbulent Flow		
5 <sup>TH</sup>	13	Steady and Unsteady Flow,	5	To study the constructional features of reciprocating
	14	Uniform & Non Uniform Flow		
	15	<b>Class Test - I</b>		
6 <sup>TH</sup>	16	<b>Unit-III : Discharge</b>	6	To study the constructional features of centrifugal pump.
	17	Rate of discharge , velocity measurement, continuity equation		
	18	Types of flow line, Path line, Stream line, Streak line, Potential line		
7 <sup>TH</sup>	19	Flow net, Types of flow in a pipe,	7	To calibrate Bourdon gauge on pressure calibration test rig
	20	uniform flow, Compressible Flow, Incompressible Flow		

	21	turbulent Flow, Rotational Flow, Irrotational Flow,		
8 <sup>TH</sup>	22	One dimensional Flow,	8	To determine Darcy's coefficient of friction for flow through pipes
	23	Two dimensional Flow,		
	24	Three dimensional Flow		
9 <sup>TH</sup>	25	<b>Unit-IV</b> : Bernoulli's Equation and its application in fluid flow	9	To determine Chezy's coefficient of friction for flow through pipes.
	26	Venturi Meter, Orifice Meter, Pitot Tubes		
	27	Rota-meter, nozzle, Euler's equations		
10 <sup>TH</sup>	28	Hagen-Poiseuille's equation	10	To verify the loss of head due to sudden expansion
	29	Reynold's and Froude's number and their use		
	30	<b>Class Test-II</b>		
11 <sup>TH</sup>	31	<b>Unit-V</b> : Flow through pipes	11	To verify the loss of head due to sudden contraction
	32	Discharge through a compound pipe(series and parallel arrangement)		
	33	Flow through sudden enlargement, Flow through sudden contraction, Flow through obstruction in a pipe		
12 <sup>TH</sup>	34	Loss of head in pipes (Darcy's and Chezy's formula), Loss of head due to friction in a viscous flow		
	35	<b>Unit-VI</b> : Pressure Measurement : Concept of Gauge Pressure		
	36	Absolute Pressure, Atmospheric Pressure, Measurement of Fluid Pressure		
13 <sup>TH</sup>	37	Piezometer Tube, Manometer, Simple Manometer, Micro manometer		
	38	Differential Manometer, Mechanical Gauge, Bourdon's Gauge,		
	39	Diaphragm Pressure Gauge, Dead Weight Pressure Gauge		
14 <sup>TH</sup>	40	<b>Unit-VII</b> : Pumps and Valves		
	41	Construction and working of the Reciprocating Pump		
	42	Centrifugal Pump, Relief valve		
15 <sup>TH</sup>	43	Pressure Reducing Valve, Pressure control Valve		Viva voce and final evaluation
	44	Servo Valve and Brake Valve		
	45	<b>Class Test-III</b>		



## LESSON PLAN

Name of Faculty: Sh. Pankaj Garg (Theory)

Discipline: Plastic Technology

Semester: IIIrd

Subject: PST-I

Lesson plan Duration: 15 WEEKS

Work Load (Lecture/Practical) per week: 3 PERIODS

Week	THEORY	
	Lecture DAY	TOPIC
1 <sup>ST</sup>	1	<b>Unit 1: Introduction</b> Introduction to PST-I
	2	Introduction to Polymers:
	3	Classification of polymer Natural, Semisynthetic, Synthetic,
2 <sup>ND</sup>	4	Linear, Branched, Cross linked polymers
	5	Thermoplastic, Thermoset, Commodity,
	6	Engineering, Speciality
3 <sup>RD</sup>	7	Condensation, Addition, Polymer blends
	8	Alloys, Plastics,
	9	Elastomers, Fibers
4 <sup>TH</sup>	10	<b>Unit II : Brief History of Polymers</b>
	11	Scope
	12	Study and Applications of Conventional polymers
5 <sup>TH</sup>	13	Comparison with Conventional Materials (Metals, Wood etc.).
	14	Study of Polymers in new emerging areas like food packaging
	15	Membrane separations,
6 <sup>TH</sup>	16	Conducting polymers
	17	Biomedical applications
	18	<b>Class Test-I</b>
7 <sup>TH</sup>	19	<b>Unit-III : Petrochemicals:</b>
	20	Introduction
	21	Raw materials,
8 <sup>TH</sup>	22	Petroleum refining
	23	Petrochemical process technology with reference to sources for general monomers
	24	Vinyl
9 <sup>TH</sup>	25	Chloride,
	26	Ethylene,
	27	Propylene
10 <sup>TH</sup>	28	Acrylonitrile

	29	Styrene
	30	Methyl Methacrylate
11 <sup>TH</sup>	31	Phenol,
	32	Polyols,
	33	Isocyanates
12 <sup>TH</sup>	34	<b>Class Test- II</b>
	35	<b>Unit-IV : Introduction to Polymer Reaction Mechanism</b>
	36	Reaction mechanism of addition
13 <sup>TH</sup>	37	Condensation polymerization
	38	Thermodynamic
	39	Kinetic requirements of a reaction
14 <sup>TH</sup>	40	Copolymerization
	41	Ionic Polymerization
	42	<b>Unit V: Macromolecular concept</b>
15 <sup>TH</sup>	43	Secondary bonding in polymers
	44	Stereo isomerism in polymers
	45	<b>Class Test-III</b>

## LESSON PLAN

Name of Faculty: Sh. Shiv Kumar (Theory)

Discipline: Plastic Technology

Semester: IIIrd

Subject: PMP

Lesson plan Duration: 15 WEEKS

Work Load (Lecture/Practical) per week: 3 PERIODS

Week	THEORY	
	Lecture DAY	TOPIC
1 <sup>ST</sup>	1	<b>Unit 1: Introduction</b> Introduction to PMP-I
	2	General characteristics of thermoplastics
	3	Thermosets
2 <sup>ND</sup>	4	Elastomers
	5	Crystalline
	6	Amorphous polymers
3 <sup>RD</sup>	7	Their relation to processing
	8	Applications
	9	<b>Unit II : Thermoplastics :</b>
4 <sup>TH</sup>	10	General preparation, properties and applications of the following
	11	PE - Linear low density polyethylene (LLDPE),
	12	Low density Polyethylene (LDPE)
5 <sup>TH</sup>	13	High density polyethylene (HDPE)
	14	UHMWHDPE
	15	PVC and major vinyl chloride co-polymers
6 <sup>TH</sup>	16	PP,PC,
	17	PS-GPPS, HIPS
	18	Nylons - Nylons 6, 66
7 <sup>TH</sup>	19	PMMA
	20	ABS, SAN
	21	Cellulose plastics
8 <sup>TH</sup>	22	PET, PBT.
	23	Thermoplastic polyurethane (TPU)
	24	<b>Class Test-I</b>
9 <sup>TH</sup>	25	<b>Unit – III : Thermosetting resins</b>
	26	Synthesis
	27	Properties
10 <sup>TH</sup>	28	Applications of phenol resins (urea, melamine),

	29	Poly urethanes
	30	Silicone resins
11 <sup>TH</sup>	31	Epoxy resin
	32	Unsaturated polyesters
	33	<b>Class Test - II</b>
12 <sup>TH</sup>	34	<b>Unit-IV : Elastomers</b>
	35	General preparation
	36	Properties and Applications of Natural Rubber (NR)
13 <sup>TH</sup>	37	Styrene Butadiene Rubber (SBR)
	38	Polyisoprene
	39	Chloroprene
14 <sup>TH</sup>	40	Polybutadiene
	41	Ethylene Propylene Diene Monomer (EPDM)
	42	Nitrile rubber
15 <sup>TH</sup>	43	Silicone rubber
	44	Elastomers
	45	<b>Class Test-III</b>

## LESSON PLAN

**Name of Faculty:** Sh. Ajay Kumar (Practical)

**Discipline:** Plastic Technology

**Semester:** IIIrd

**Subject:** CAD

**Lesson plan Duration:** 15 WEEKS

**Work Load (Lecture/Practical) per week:** 6 PERIODS

Week	PRACTICAL	
1 <sup>ST</sup>	Lecture DAY	TOPIC
1 <sup>ST</sup>	1	<b>Unit 1: Introduction</b> Introduction to CAD
	2	Introduction to AutoCAD :
	3	Starting up, practice on – how to create a new drawing file
2 <sup>ND</sup>	4	Setting drawing limits & saving a file
	5	Drawing lines in different ways using absolute co-ordinates
	6	User co-ordinates, WCS, UCS, drawing circles, drawing arcs, drawing ellipses
3 <sup>RD</sup>	7	Drawing polygons, drawings splines. Drawing polylines, using window, zoom commands.
	8	<b>Unit – II :</b> Practice on Edit commands such as erase copy, mirror, array
	9	Offset, rotate, oops, undo, redo, scale, stretch, trim
4 <sup>TH</sup>	10	Break, extend, chamfer, fillet, O snap command
	11	<b>Unit-III :</b> Practice on Text commands
	12	Editing text, text size, text styles, change properties commands.
5 <sup>TH</sup>	13	<b>Unit-IV :</b> Practice on Layer Commands:
	14	Creating layer
	15	Freeze
6 <sup>TH</sup>	16	Layer on/off colour assigning
	17	Current layer, load line type, lock & unlock layer
	18	Move from one layer to other
7 <sup>TH</sup>	19	<b>Unit- V :</b> Practice on Hatching
	20	Hatch pattern selection
	21	<b>Unit- VI :</b> Practice on Dimensioning
8 <sup>TH</sup>	22	Dimensioning
	23	Angular dimensioning radius/.diameter dimensioning O-snap command
	24	Aligned dimensioning
9 <sup>TH</sup>	25	Editing of dimensioning
	26	Tolerances in dimensioning

	27	<b>Unit-VII : Practice on print/plot commands</b>
10 <sup>TH</sup>	28	Export/import commands
	29	<b>Unit-VIII : Practice on making complete drawings of components by doing following exercises</b>
	30	Detail and assembly drawing of the following using AUTOCAD (2D)
11 <sup>TH</sup>	31	Plummer Block, Wall Bracket, Stepped pulley, V-belt pulley
	32	Flanged coupling, Machine tool Holder (Three views), Screw jack or knuckle joint
	33	Isometric Drawing by CAD using Auto CAD (one sheet)
12 <sup>TH</sup>	34	Drawings of following on computer
	35	Cone, Cylinder, Isometric view of objects
	36	<b>Unit-IX : Modelling (02 sheets)</b>
13 <sup>TH</sup>	37	3D modelling, Transformations, scaling, rotation, translation
	38	<b>Unit-X : Creating Chamfer and Fillet</b>
	39	Practice on surface modeling, create part file
14 <sup>TH</sup>	40	practice on assembly of parts, creating assembly view
	41	Orthographic views, section view ( Practice on different views, practice on data transfer)
	42	<b>Unit-XI :</b>
15 <sup>TH</sup>	43	Introduction to Other Softwares
	44	Pro Engineer/ CATIA/ Inventor/ Unigraphics/ Solid Work: Salient features
	45	Viva voce and final evaluation