LESSON PLAN

Name of Faculty: Sunil Kumar (Theory)/ Virender Nehra (Practical)

Discipline: Plastic Technology

Semester: V

Subject: PLASTIC PROCESSING TECHNIQUES-1I

Lesson plan Duration: 15 WEEKS

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

Week	THEORY		PRACTICAL	
	Lecture DAY	TOPIC	Practical DAY	TOPIC
1ST	1	**Unit 1: Introduction** Introduction to extrusion process,	1	To produce rigid PVC pipe of 3 different diameters on extruder
	2	different types of extruders:-		
	3	single screw extruder		
	4	twin screw extruder		
2ND	5	vented barrel extruder	2	To study the specification and working of extruder available in the lab
	6	general principles of operation		
	7	Die swell		
	8	function of various parts with details of operating conditions.		
3RD	9	Barrel,	3	Production of component on hand operated blow molding machine, using at least 3 moulds
	10	Screw,		
	11	Screenpack		
	12	Die,		
4TH	13	Breaker plate,	4	To study the specification and working of automatic Blow Moulding Machine
	14	Adaptor		
	15	Types of screws in use for processing different plastics processing		
	16	Feed zone		
5TH	17	Compression zone	5	Production of components on semi automatic blow machine by setting the process parameters
	18	Metering zone		
	19	**Class Test-II**		
	20	Die zone		
6TH	21	L/D ratio and its significance		
	22	Nip rolls		
	23	Bubble casing		
	24	Winding equipment		
7TH	25	Cutting devices		
	26	Stretching and orientation		
	27	Extruder performance their curves		
	28	Extruder performance their curves		

8TH	29	Extruder performance their curves		
	30	Extruder performance their curves		
	31	Blown film extrusion		
	32	Extrusion of pipes,		
9TH	33	Wires and cables		
	34	Sheets and filaments		
	35	Coextrusion of films and sheets		
	36	CLASS TEST 2		
10TH	37	**BLOW MOULDING :** Basic principles of blow moulding		
	38	Types of blow moulding :- Extrusion blow moulding		
	39	Injection blow moulding		
	40	Blow molding of irregular shapes		
11TH	41	Raw Materials for blow moulding		
	42	Production of parison,		
	43	a). by extrusion		
	44	b). by injection		
12TH	45	Parison wall thickness control		
	46	Parison blowing systems		
	47	Effect of process variables on product design and properties.		
	48	Parison programming,		
13TH	49	Mould venting		
	50	Newer concepts including EBM		
	51	Stretch blow moulding,		
	52	Injection stretch blow moulding,		
14TH	53	Multi layer moulding etc		
	54	Conversion of plastic films into laminate		
	55	Metal plastic laminates,		
	56	Paper- plastic laminates,		
15TH	57	Plastic-plastic laminates.		Viva voce and final evaluation
	58	Advantages of multi- layer packaging,		
	59	Disadvantages of multi layer packaging		
	60	CLASS TEST 3		

LESSON PLAN

Name of Faculty: Sh. Shiv Kumar (Theory)/ Virender Nehra (Practical)

Discipline: Plastic Technology

Semester: V

Subject: DDM-I

Lesson plan Duration: 15 WEEKS

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

Week	THEORY		PRACTICAL	
	Lecture DAY	TOPIC	Practical DAY	TOPIC
1ST	1	**Unit 1: Introduction** Introduction to Mould design	1	Procedure for Designing an Injection Mold: Primary positioning of inserts,.
	2	Concept considerations		
	3	Materials used for dies and moulds		
	4	Characteristics of dies and moulds		
2ND	5	Impressions Core and cavity		the ejector system, the ejector grid, complete the top half of drawing, complete the plan view, complete the cross-section, complete the drawing
	6	Types of cavity and core,		
	7	Their advantages disadvantages		
	8	Bolster plate and its types		
3RD	9	Guide pillar	2	To design and draw various mould parts
	10	Guide bush		
	11	Register ring and their types		
	12	Mould clamping		
4TH	13	Direct, indirect	3	To design and draw a single impression two plate injection mould by taking suitable at least four component
	14	**Class test –I**		
	15	Parting surface		
	16	Types of parting surface		
5TH	17	Selection of parting surface	4	To design and draw a multiple impression two plate injection mould by taking suitable at least two component
	18	Relief of parting surfaces		
	19	Venting		
	20	Feed system		
6TH	21	Runners	5	To design and draw a multiple impression three plate injection mould by taking suitable at least two component
	22	Sprue		
	23	Runners and its types		
	24	Balancing of runners		
7TH	25	Size of runners	6	To design and draw a multiple impression split mould by taking suitable at least two component
	26	Gates		
	27	Types of gates		
	28	Size of gates		
8TH	29	Ejection system	7	To design and draw a multiple

	30	Ejector grid		impression runnerless mould by taking suitable component
	31	Ejector plate assembly		
	32	Ejection techniques		
9TH	33	Ejection from fixed half		
	34	Sprue pullers		
	35	Cooling system		
	36	Cooling integer type mould plates and its types		
10TH	37	Cooling insert bolster assembly and its types		
	38	Cooling other mold parts		
	39	Water connection and its types		
	40	**Class Test – II**		
11TH	41	Introduction to Splits		
	42	Sliding splits and types		
	43	Angled lift splits and types		
	44	Side cores and side Cavities		
12TH	45	Introduction		
	46	Types of side core and side cavities		
	47	Molding Internal Undercuts		
	48	Introduction		
13TH	49	Form pin		
	50	Split core		
	51	Side core		
	52	Stripping internal undercut		
14TH	53	Mould for threaded component		
	54	Introduction		
	55	Moulds for internally threaded components and its types		
	56	Moulds for externally threaded components and its types		
15TH	57	Types of Mold : Two plate mould		Viva voce and final evaluation
	58	Three plate mould		
	59	Hot runner mould		
	60	**Class Test-III**		

LESSON PLAN

Name of Faculty: Arun Syan (Theory)/ Sunil Kumar (Practical)

Discipline: Plastic Technology

Semester: V

Subject: MPPM

Lesson plan Duration: 15 WEEKS

Work Load (Lecture/Practical) per week: 3 PERIODS/ 2 PERIODS

Week	THEORY		PRACTICAL	
	Lecture DAY	TOPIC	Practical DAY	TOPIC
1ST	1	**Unit 1: Introduction** Introduction to MPPM	1	To check the line alignment/levelling of various machinery like PVC pipe plant, injection molding machine and blow molding machine
	2	Maintenance and its Objectives		
	3	Importance of maintenance		
2ND	4	Preventive maintenance	2	Repair and maintenance of hydraulic system in machines such as injection molding, blow molding machines
	5	Breakdown maintenance		
	6	Predictive maintenance		
3RD	7	Schedule maintenance and maintenance planning	3	Study of repair and maintenance of hydraulic motors
	8	Factors to be considered by Installation/erection and commissioning of plastic processing machinery		
	9	Vibrations and foundation		
4TH	10	General method of alignment/levelling	4	Study of lubrication system, central lubrication system, o-rings, oil seals
	11	**Class Test - I**		
	12	Repair maintenance of following electrical equipments		
5TH	13	Electrical induction motors (slipping motors and squirrel cage motors variable speed motors squirrel cage motors variable speed motors)	5	To carry out break down maintenance of electrical equipments like induction motors, variable speed motors, circuit breakers used in plastics processing machinery
	14	Their characteristics speed control		
	15	Starters, circuit breakers (air circuit breakers, oil circuit breakers and miniature circuit breakers)		
6TH	16	Brief introduction to limit switches timers	6	Repair and maintenance of heater
	17	Relays, temperature controllers		
	18	Thermocouples		

7TH	19	Heaters (ordinary and ceramic type)	7	To carry out the preventive maintenance of machines like injection molding machine,
	20	Study of safety rules and Regulations		
	21	**Class Test-II**		
8TH	22	Repair and maintenance of following components used in plastics processing machinery		blow molding machine, PVC pipe plant, CNC injection molding machine
	23	Barrel		
	24	Screw		
9TH	25	Thrust unit, primary gearboxes	8	Repair and maintenance of various pumps and valves
	26	Calender roll, mill roll		
	27	Pumps- gear pump		
10TH	28	Piston pump		
	29	Radial/axial pump and screw pump		
	30	Valves		
11TH	31	Valve sequences		
	32	Valve counted balance		
	33	Break valve		
12TH	34	Pressure reducing valve		
	35	Throttle valve		
	36	Different control valves		
13TH	37	Solenoid valves		
	38	Hydraulic motors		
	39	Hydraulic actuators		
14TH	40	Filters, compressors		
	41	Oil seals , O-rings		
	42	Lubrication system-central lubrication system		
15TH	43	Transmission system i.e. gears		Viva voce and final evaluation
	44	V-belts, chains		
	45	**Class Test-III**		

LESSON PLAN

Name of Faculty: Sh. Pankaj Garg (Theory)/ Virender Nehra (Practical)

Discipline: Plastic Technology

Semester: V

Subject: Compounding And Formulation of Plastics (CAFP)

Lesson plan Duration: 15 WEEKS

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

Week	THEORY		PRACTICAL	
	Lecture DAY	TOPIC	Practical DAY	TOPIC
1ST	1	**Unit 1: Introduction** Introduction to CAFP	1	Extraction of inorganic additives from PVC i.e. fillers, pigments etc. by dissolving
	2	Principles of compounding		
	3	for modifying and enhancing processing		
	4	Application properties		
2ND	5	Service life of plastics		PVC compound in solvents such as THF, EDC and Cyclohexanone and removing PVC and soluble organic materials
	6	**Class test –I**		
	7	**Unit –II :** Definition of additives		
	8	Classification of additives		
3RD	9	Description of following additives and their functions	2	Making a PVC compound having following ingredients (100 parts) Stabilizer (2 – 3 parts), Lubricant (0.5 – 1.0 parts);
	10	Properties Modifiers		
	11	Plasticisers		
	12	Fillers		
4TH	13	Impact modifiers		plasticizers (20 – 50 parts); Pigment (0.5 – 1 part) and Filler (10 –40 parts) on a two roll mill and compression moulding of a sheet
	14	Extenders		
	15	Processing aids		
	16	Heat stabilizers		
5TH	17	Lubricants	3	Cutting dunbell shaped test pieces for tensile strength from compression moulded sheet as prepared in (2) and
	18	Solvents and diluents		
	19	Surface property modifiers		
	20	Antistatic agents		
6TH	21	Antislip agent		finding tensile strength and elongation with or without plasticizer. Calculation of percent increase in elongation
	22	Antiblock/slip additives		
	23	Colourants		
	24	Pigments and dyes		
7TH	25	Antiageing additives	4	Analysis of the effects of fillers on mechanical properties of PVC compound
	26	Antioxidants		
	27	Anti-ozonants		

	28	UV stablisers		
8TH	29	Fungicides	5	Compounding of polyethylene with various additives, fillers, stabilizers, blowing agent and rubber
	30	Antitermites		
	31	Bactericide additives		
	32	Miscellaneous additives:		
9TH	33	Blowing agent	6	Mechanical property measurement of compounded polyethylene and evaluation of the effect of compounding variables.
	34	Flame retardants		
	35	Mould Release agents		
	36	Defoamers		
10TH	37	Smoke Suppressants	7	To synthesize the UF resin with suitable additives
	38	**Class Test – II**		
	39	**Unit – III :** Formulation of various ingredients in the compounding		
	40	Role of various ingredients in the compounding for both		
11TH	41	Thermoplastics materials	8	To synthesize the nylon 6,6 with suitable additives
	42	Thermoset materials		
	43	**Unit-IV :** Compounding equipments :		
	44	Ribbon blender		
12TH	45	High speed mixer		
	46	Banbury mixer		
	47	Two roll mill		
	48	Mixer extruder (construction and working of these equipments)		
13TH	49	Ultra turax mixers		
	50	High sheer mixers		
	51	Intensive dry mixer		
	52	Compounders		
14TH	53	Twin screw extruders		
	54	Construction of Kneaders		
	55	Working of Kneaders		
	56	Dispersors		
15TH	57	**Unit – V :** Compounding of PVC for rigid		Viva voce and final evaluation
	58	Semi-rigid		
	59	Flexible applications.		
	60	**Class Test-III**		

LESSON PLAN

Name of Faculty: Sh. Ajay Kumar (Theory)

Discipline: Plastic Technology

Semester: V

Subject: EE

Lesson plan Duration: 15 WEEKS

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

Week	THEORY	
	Lecture DAY	TOPIC
1ST	1	**Unit 1: Introduction** Introduction to EE
	2	Definition of EE
	3	Scope and Importance of Environmental Education
2ND	4	**Unit-II :** Basics of ecology
	5	Biodiversity
	6	Eco system and sustainable development
3RD	7	**Unit-III :** Sources of pollution natural
	8	Sources of pollution manmade
	9	Causes of pollution
4TH	10	Effects of pollution
	11	Control measures of pollution
	12	Air pollution,
5TH	13	Water pollution,
	14	Noise pollution,
	15	Soil pollution,
6TH	16	Radioactive and nuclear their units of measurement
	17	**Class Test-I**
	18	**Unit – IV :** Solid waste management
7TH	19	Causes Effects
	20	Control measures of urban and industrial waste
	21	**Unit – V :**Mining and deforestation
8TH	22	Causes effects
	23	Control measures
	24	**Unit – VI :** Environmental Legislation
9TH	25	Water (prevention and control of pollution) Act 1974
	26	Air (Prevention and Control of Pollution) Act 1981
	27	Environmental Protection, Act 1986
10TH	28	Role and Function of State Pollution Control Board

	29	Environmental Impact Assessment (EIA)
	30	**Class Test-II**
	31	**Unit – VII :** Role of Non-conventional Energy Resources
	32	Solar Energy
	33	Wind Energy
12TH	34	Bio Energy
	35	Hydro Energy
	36	**Unit – VIII:** Current Issues in Environmental Pollution
13TH	37	Global Warming
	38	Green House Effect
	39	Depletion of Ozone Layer
14TH	40	Recycling of Material
	41	Environmental Ethics
	42	Rain Water Harvesting
15TH	43	Maintenance of Groundwater
	44	Acid Rain, Carbon Credits
	45	**Class Test-III**

LESSON PLAN

Name of Faculty: Sh. Pankaj Garg/ Sh. Shiv Kumar (Practical)

Discipline: Plastic Technology

Semester: V

Subject: ES-I

Lesson plan Duration: 15 WEEKS

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

Week	PRACTICAL	
	Lecture DAY	TOPIC
1ST	1	**Unit 1: Introduction** Introduction to ES
	2	Writing skills
2ND	3	Official correspondence
	4	Business correspondence
3RD	5	Job application
	6	Covering letter
4TH	7	Resume
	8	Resume preparation
5TH	9	Resume preparation
	10	Resume preparation
6TH	11	Report writing
	12	Report writing on various current issues
7TH	13	Report writing on various current issues
	14	Key features and kinds
8TH	15	**Unit-II :** Oral Communication Skills
	16	Giving advice
9TH	17	Making comparisons
	18	Agreeing
10TH	19	disagreeing
	20	Taking turns in conversation
	21	Fixing appointments
11TH	22	Cancelling appointments
	23	**Unit-III :** Introduction to Generic Skills
12TH	24	Stress management
13TH	25	Time management
	26	Negotiations
14TH	27	Conflict resolution
	28	Team work
15TH	29	Leadership qualities
	30	**Viva voce and final evaluation**