

Lesson Plan

Name of Faculty : Satender Vashishtha

Discipline : Ceramic Engg.

Semester : 5th

Subject : **Modern Ceramics**

Lesson Plan Duration :

Work Load (Lecture /Practical) per week in hours: Lecture : 3 Practical NIL

Week	Theory		Practical	
	Lecture Day	Topic (Including assignment/test)	Practical Day	Topic
1 st	1	Introduction and Overview of Newer Ceramics.		
	2	Scope of Newer Ceramics, & classification		
	3	Revision and assignment of chapter 1		
2	4	Superconductivity:- Phenomenon		
	5	properties of superconductors, Meissner effect.		
	6	Development of high temperature ceramic super conductors		
3	7	Their crystal structure,		
	8	Application of super conductors		
	9	Revision of chapter 2		
4	10	Assignment of Chapter 2		
	11	Nuclear Ceramics:- Nuclear energy,		
	12	types of reactors,		
5	13	fuel elements, containers, moderators, control rods, structural parts, irradiation effect,		
	14	ceramic materials used in technology, their classification & applications		
	15	Revision of chapter 3		
6	16	Assignment of chapter 3		
	17	Ist Sessional test as per HSBTE academic calendar		
	18	Dielectric & magnetic ceramics:- Barium titanate, manufacture of barium titanate,		
7	19	hexagonal & polycrystalline ferrites, rare earth garnets.		
	20	orthoferrites, ilmenites, classification of ferrites		
	21	types of ferrite, hard & soft ferrites,		
8	22	manufacturing of soft ferrites, hard ferrite, applications of ferrites		

	23	Revision of chapter 4		
	24	Assignment of chapter4		
9	25	Ceramic capacitors: - Thin film capacitor		
	26	thick film capacitor,		
	27	multilayer capacitors		
10	28	Revision of chapter 5 and Assignment of chapter5		
	29	Ceramic sensors: Resistors, Ceramic materials: Properties, manufacturing,. Ceramic materials: their shaping, sintering and finishing, and applications.		
	30	Varistors Ceramic materials: Properties, manufacturing their shaping, sintering and finishing, and applications.		
11	31	Thermistors. Ceramic materials: Properties, manufacturing their shaping, sintering and finishing, and applications.		
	32	piezoelectricity phenomenon		
	33	Revision of chapter 6		
12	34	Assignment of chapter 6		
	35	Bio-Ceramics: - Ceramic materials for artificial tooth and bone joints		
	36	Elementary idea about preparation, properties and		
13	37	manufacture of bio- ceramics		
	38	Applications of Bio Ceramics		
	39	Revision of chapter 7		
14	40	Assignment of chapter 7		
	41	2 nd Sessional test as per HSBTE academic calendar		
	42	Piezoelectric, ferroelectric,		
15	43	pyroelectric and electro-optic ceramics.		
	44	Basic theory of development of piezoelectricity		
	45	ferroelectricity in ceramic materials. PZT and PLZT based materials		
16	46	Revision of chapter 8		
	47	Assignment of chapter 8		
	48	Third sessional Test as per HSBTE Calender		

Lesson Plan

Name of Faculty : V.N.JHA
 Discipline : Ceramic Engg.
 Semester : 5th
 Subject : **GLASS TECHNOLOGY - II**
 Lesson Plan Duration :

Work Load (Lecture /Practical) per week in hours: Lecture : 3 Practical 6

Week	Theory		Practical	
	Lecture Day	Topic (Including assignment/test)	Practical Day	Topic
1	1	Fundamental concept of glassy state, chemistry of glass in light of atomic structure	1	Determination of thermal expansion of glass
	2	Viscosity, thermal expansion and density measurement	2	Determination of thermal expansion of glass
	3	origin of thermal stresses, tempering and annealing of glass, detection and measurement of strain		
2	4	chemical durability, effect of composition on glass manufacturing	3	Determination of refractive index of glass.
	5	Revision of chapter 1	4	Determination of refractive index of glass.
	6	Assignment of chapter 1		
3	7	Melting and refining of glass,	5	Determination of low temperature viscosity
	8	annealing and decolourisation	6	Determination of low temperature viscosity
	9	temporary strain and permanent strain,		
4	10	durability, attack of water on glass, acid attack, alkali attack	7	Examination of Common defects in glass
	11	Revision of chapter 2	8	Examination of Common defects in glass
	12	Assignment of chapter 2		
5	13	Colourants of glass-Titanium, oxides, Chromium oxide, manganese oxide	9	Examination of strain in glass
	14	Iron oxide, Cobalt oxide, Nickel oxide, Copper oxide, Selenium oxides and others	10	Examination of strain in glass
	15	Revision of chapter 3		

6	16	Assignment of chapter 3	11	Determination of hardness and durability of glass.
	17	Ist sessional Test	12	Determination of hardness and durability of glass.
	18	Manufacturing of glass bottles , hollow and pressed ware		
7	19	sheet and plate glass	13	Determination of viscosity of molten glass
	20	safety glass, optical glass, toughned glass,	14	Determination of viscosity of molten glass
	21	fibre glass, heat resistance glass		
8	22	window glass	15	Determination of glass, cutting, sandblasting, silvering and enameling.
	23	Revision of chapter 4	16	Determination of glass, cutting, sandblasting, silvering and enameling
	24	Assignment of chapter 4		
	26	detection and prevention: - blisters and seeds bad colour	18	Preparation of container glass, mixing, melting, tests during melting.
	27	bad workmanship		
10	28	Revision of chapter 5	19	Preparation of special glasses such as crystal, semi crystal and signal glasses
	29	Assignment of chapter 5	20	Preparation of special glasses such as crystal, semi crystal and signal glasses
	30	2 nd Sessional Test		
11	31	ASTM methods for determination of strain point ,annealing point,	21	Revision
	32	determination of softening point, density	22	Revision

	33	determination of co-efficient of thermal expansion		
12	34	determination of viscosity	23	Revision
	35	Revision of chapter 5	24	Revision
	36	Assignment of chapter 5		
13	37	Elementary knowledge of Glass Ceramics and Fibre Optics	25	Revision
	38	Revision and Assignment of chapter 6	26	Revision
	39	Introduction to- (i) Statistical quality control (ii) Basis of ISO-9000		
14	40	TQM	27	Revision
	41	Pollution Control Systems in Glass Industry	28	Revision
	42	Revision and Assignment of chapter 7		
15	43	Principles and methods of glass working- fourcaults machine	29	Revision
	44	pitsburg process, blowing,	30	Revision
	45	gobfeeder, ribbon machine , spinning glass		
16	46	Revision and assignment	31	Revision
	47	3 rd Sessional Test	32	Revision
	48	Revision		

Lesson Plan

Name of Faculty : Ashwani Kumar
 Discipline : Ceramic Engg. Semester : 5th
 Subject : **CERAMIC PROCESSING TECHNOLOGY**
 Lesson Plan Duration :
 Work Load (Lecture /Practical) per week in hours: Lecture : 4 Practical NIL

Week	Theory		Practical	
	Lecture Day	Topic (Including assignment/test)	Practical Day	Topic
1	1	Pressing : Dry Pressing		
	2	Iso-static Pressing Plastic shaping : Extrusion		
	3	Jiggering & Jollying		
	4	Injection Moulding		
2	5	Slip Casting : Hollow Casting		
	6	Solid Casting , Tape Casting		
	7	Revision of Unit - I		
	8	Assignment of Unit - I		
3	9	Effects of processing on properties:- Introduction, Selection of materials (Physical properties of phases, chemical properties of phases, Microstructure).		
	10	Effects of temperature on properties Strength, Fracture, Toughness, Grain size.		
	11	Effect of pressure on properties Green density , Compaction, Shrinkage, Fired density		
	12	Effect of microstructure on properties Strength, Elastic Modulus, Hardness.		
4	13	Revision of Unit - 2		
	14	Assignment of Unit – 2		
	15	Processing additives De-flocculants (Particle Charging in liquid suspension, Double Layer formation)		
	16	Coagulation and flocculation.		
5	17	Binders Types of Binders : Clay Binders, Molecular Binders, Vinyl Binders		
	18	Cellulose Binders, Polyethylene Glycol Binders, Waxes		
	19	Plasticizer, Foaming and antifoaming agents		
	20	Lubricants, Preservatives		
6	21	Sessional - 1		

	22	Sessional - 1		
	23	Sessional - 1		
	24	Sessional - 1		
7	25	Revision of Unit – 4		
	26	Assignment of Unit – 4		
	27	Modeling and mould making Plaster of paris, Types of POP		
	28	Mixing of plaster, Model making , Mould making process		
8	29	Revision of Unit – 4, Assignment of Unit – 4		
	30	Production Controls in tile industry : Controls of raw material or bodies		
	31	Post pressing expansion, Pressed tile bending strength (MOR), Drying shrinkage,		
	32	Dried tile Bending Strength, Loss on ignition, firing shrinkage, water absorption		
9	33	Body Preparation Department Controls Residue, Slip density, Slip water Content, Viscosity		
	34	Spray Dried powder controls Moisture content, Bulk density, Particle size distribution		
	35	Press department controls Compression ratio, penetration measurements		
	36	Revision of Unit – 5		
10	37	Assignment of Unit – 5		
	38	Production Controls in tile industry (II) Dried ware controls Moisture content at inlet, Average weight of dry ware, Moisture content of outlet		
	39	Biscuit ware controls Average weight, Water absorption, Bending Strength (MOR), Firing shrinkage,		
	40	Biscuit thermal expansion coefficient		
11	41	Controls in glazing departments Glaze Density, Glaze Viscosity, Glaze Applied weights		
	42	Sessional -2		
	43	Sessional -2		
	44	Sessional -2		
12	45	Finished products controls Average weights, water absorption, Size variation,		
	46	Bending strength, Craze resistance, Resistance to acids, Abrasion resistance		

	47	Revision of Unit – 6		
	48	Assignment of Unit – 6		
13	49	Environmental impact of ceramic industry Introduction		
	50	Pollutants in raw materials for bodies, Pollutants in glazes		
	51	Pollutants in gaseous emission		
	52	Atmospheric pollutions , Bag filters		
14	53	Revision of Unit – 7		
	54	Assignment of Unit – 7		
	55	Safety in Ceramic industry Ceramic laboratory Hazards,		
	56	Ways to avoid accidents Safety check list.		
15	57	Revision of Unit – 8		
	58	Assignment of Unit – 8		
	59	Revision of Unit –6		
	60	Revision of Unit –7		
16	61	Sessional -3		
	62	Sessional -3		
	63	Sessional -3		
	64	Sessional -3		

Lesson Plan

Name of Faculty : M M Eqbal Discipline : Ceramic Engg.

Semester : 5th

Subject : **Ceramics Whiteware Tech. -1**

Lesson Plan Duration :

Work Load (Lecture /Practical) per week in hours: Lecture : 3 Practical NIL

Week	Theory		Practical	
	Lecture Day	Topic (Including assignment/test)	Day	Topic
1	1	Introduction to subject	1	Introduction
	2	Heavy Clay Wares:- Brickware	2	Determination of porosity of a given sample
	3	salt glazed pipes		
2	4	sanitary ware	3	Determination of porosity of a given sample.
	5	earthen ware body	4	Determination of porosity of a given sample
	6	terracotta body		
3	7	stoneware body	5	Determination of density of a given sample.
	8	Revision	6	Determination of density of a given sample
	9	Assignment		
4	10	Fine Ceramics:- Manufacturing, properties & their applications: floor tiles	7	Determination of thermal shock resistance of a given sample.
	11	wall tiles	8	Determination of thermal shock resistance of a given sample.
	12	dental porcelain		
5	13	insulators: Low tension and High tension, electrical porcelain	9	Determination of corrosion resistance of a given sample.
	14	chemical stoneware	10	Determination of corrosion resistance of a given sample.
	15	bone china ware		

6	16	Ist Sessional Test	11	Determination of abrasion resistance of a given sample.
	17	Hotel ware	12	Determination of abrasion resistance of a given sample.
	18	Revision		
7	19	Revision	13	Determination of impact & chipping resistance of a given sample.
	20	Assignment	14	Determination of impact & chipping resistance of a given sample
	21	Properties of ceramic body:- Loss on ignition,		
8	22	Plasticity	15	Determination of acid resistance of a given sample.
	23	thermal shock resistance	16	Determination of acid resistance of a given sample
	24	corrosion resistance		
9	25	abrasion resistance	17	Steatite body preparation.
	26	lead solubility test	18	Steatite body preparation.
	27	Porosity		
10	28	Revision	19	Preparation of lead and Borax frits.
	29	Assignment	20	Preparation of lead and Borax frits.
	30	2 nd Sessional Test		
11	31	Health & safety with glazes & ceramic materials	21	Application and firing of transfer prints.
	32	Health & safety with glazes & ceramic materials	22	Application and firing of transfer prints
	33	labeling of hazardous material,		
12	34	ceramic material hazards,	23	Study the milling of enamel & glaze in pot mill
	35	recommended health & safety proceduers,	24	Study the milling of enamel & glaze in pot mill
	36	recommended health & safety proceduers		

13	37	disposal of materials	25	Application of glaze frit by dipping & spraying.
	38	Revision	26	Application of glaze frit by dipping & spraying
	39	Revision		
14	40	Assignment	27	Study the defects like pinholes, chipping and dunting of fired product.
	41	Defects of Ceramic Body: - Crawling,	28	Study the defects like pinholes, chipping and dunting of fired product.
	42	pinholes, peeling		
15	43	crazing, spit-out, dunting	29	Preparation of clay models like statue, per stands, paper weight
	44	blistering, sulphering,	30	Preparation of clay models like statue, per stands, paper weight
	45	rolling, chipping and their records		
16	46	Revision	31	Revision
	47	Assignment	32	Revision
	48	3 rd Sessional Test		

Lesson Plan

Name of Faculty : Satender Vashishtha Discipline: Ceramic Engg.
 Semester 5th
 Subject : **Soft skills -1**
 Lesson Plan Duration :
 Work Load (Lecture /Practical) per week in hours: Lecture : Practical 2

Week	Theory		Practical	
	Lecture Day	Topic (Including assignment/test)	Practical Day	Topic
1	1		1	Communication Skills – Handling fear and phobia
1	2		2	Communication Skills – Handling fear and phobia
2			3	Communication Skills – Handling fear and phobia
2			4	Communication Skills – Handling fear and phobia
3			5	Resume Writing
3			6	Resume Writing
4			7	Applying for job through email/job portal
4			8	Applying for job through email/job portal
5			9	Interview preparation : Mock Interview
5			10	Interview preparation : Mock Interview
6			11	Interview preparation : Mock Interview
6			12	Interview preparation : Mock Interview
7			13	Group Discussions
7			14	Group Discussions
8			15	Group Discussions
8			16	Group Discussions

9			17	Extempore
9			18	Extempore
10			19	Extempore
10			20	Extempore
11			21	Presentation Techniques
11			22	Presentation Techniques
12			23	Presentation Techniques
12			24	Presentation Techniques
13			25	Developing attitude towards safety
13			26	Developing attitude towards safety.
14			27	Developing attitude towards safety
14			28	Developing attitude towards safety
15			29	Disaster management
15			30	Disaster management
16			31	Disaster management
16			32	Disaster management

Lesson Plan

Name of Faculty : N.K. Singh Discipline Ceramic Engg. Semester :
5th

Subject : **Ceramic Refractory Tech-1**

Lesson Plan Duration :

Work Load (Lecture /Practical) per week in hours: Lecture : 3 Practical NIL

Week	Theory		Practical	
	Lecture Day	Topic (Including assignment/test)	Practical Day	Topic
1	1	Introduction	1	Introduction
	2	Sintering- Sintering process with oxide system	2	Introduction
	3	Manufacturing, properties and uses of: Magnesia.		
2	4	Manufacturing, properties and uses of Zirconia	3	Refractoriness under load determination.
	5	Manufacturing, properties and uses of:Thoria	4	Refractoriness under load determination
	6	Manufacturing, properties and uses of: Insulating bricks,		
3	7	Manufacturing, properties and uses of: Insulating castables	5	Spalling resistance for the refractoreis.
	8	Manufacturing, properties and uses of: Ceramic fibre,	6	Spalling resistance for the refractoreis.
	9	Manufacturing, properties and uses of: glass wool.		
4	10	Preparation of crucibles	7	Conductivity determination for the compacted bricks
	11	Preparation of muffels,	8	Conductivity determination for the compacted bricks
	12	Preparation of saggars,		
5	13	Preparation of fused alumina	9	Conductivity determination for the composite walls.
	14	Preparation of fused magnesia	10	Conductivity determination for the composite walls.

	15	Revision		
6	16	Revision	11	Permeability determination of bricks
	17	Assignment	12	Permeability determination of bricks
	18	First sessional Test		
7	19	Special Refractories- Manufacturing, Properties and uses of : Borides Refractories	13	Shrinkage effect determination on bricks
	20	Manufacturing, Properties and uses of : Borides Refractories	14	Shrinkage effect determination on bricks
	21	Manufacturing, Properties and uses of : Carbides for example SiC		
8	22	Manufacturing, Properties and uses of : Carbides for example SiC	15	Instrumental analysis: X - Ray diffractometry, Flame Photometry & spectroscopy.
	23	Manufacturing, Properties and uses of : Nitrides (Silicon nitride etc .)	16	Instrumental analysis: X - Ray diffractometry, Flame Photometry & spectroscopy.
	24	Manufacturing, Properties and uses of : Nitrides (Silicon nitride etc .)		
9	25	Cermets and composite materials	17	Determination of thermal shock resistance
	26	Titania, Beryllia	18	Determination of thermal shock resistance
	27	Abrasives, Monolithics- Castables,		
10	28	Ramming and Patching mixes,	19	Determination of volume shrinkage by direct & indirect method.
	29	Refractory mortars and cements	20	Determination of volume shrinkage by direct & indirect method.
	30	Revision		
11	31	Assignment	21	Determination of coefficient of thermal expansion.
	32	2 nd Sessional Test	22	Determination of coefficient of thermal expansion.
	33	Application of refractories:-Glass Tank furnace		

12	34	Application of refractories:- Blast furnace	23	Refractoriness determination of various materials
	35	Basic hearth furnace	24	Refractoriness determination of various materials
	36	open hearth furnace		
13	37	Soaking pits	25	Revision
	38	Reheating furnace	26	Revision
	39	Hot metal mixer,		
14	40	Laddles	27	Revision
	41	Steel melting furnace by electricity.	28	Revision
	42	Cement and lime industries		
15	43	Revision	29	Revision
	44	Revision	30	Revision
	45	Assignment		
16	46	3 rd Sessional Test	31	Revision
	47	Previous year question papers discussion	32	Revision
	48	Previous year question papers discussion		