Lesson Plan

Name of Faculty : ASHWANI KUMAR
Discipline : CERAMIC ENGINEERING
Semester : 5th
Subject : MODERN CERAMICS
Lesson Plan Duration : 15 WEEKS
Work Load (Lecture /Practical) per week in hours : Lecture : 3 Practical 0

	Theory	
Week	**Lecture Day**	**Topic (Including assignment/test)**
1	1	Introduction to subject
1	2	Introduction to new ceramics, scope & classification.
1	3	Superconductivity:- Phenomenon & properties of superconductors, Meissner effect.
2	4	Examples of high temperature ceramic super conductors, application of super conductors
2	5	Nuclear Ceramics:- Nuclear energy,
2	6	Ceramics materials used in nuclear reactors: fuel elements, moderators,
3	7	control rods, structural parts, irradiation effect, disposal of nuclear waste
3	8	**Revision of Unit 1**
3	9	**Ferrites:** Definition of ferrites, Classification: Hard and soft ferrites with examples, Definition of hard and soft ferrites,
4	10	Comparison between hard and soft ferrites.
4	11	Manufacture of soft & hard ferrite with a flow chart.
4	12	Manufacture of soft & hard ferrite with a flow chart.
5	13	**Sessional test 1 as per HSBTE academic calendar**
5	14	Difference between hard isotropic and hard anisotropic ferrite. Properties and application of soft and hard ferrites.
5	15	Ceramic capacitors: - Definition, properties and uses of Ceramic substrates and capacitor dielectrics in electronics.
6	16	Manufacturing of ceramic capacitors: Multilayer capacitors.
6	17	**Revision of unit 2**
6	18	**Assignment I (Unit 1 and 2)**
7	19	Ceramic sensors: Properties,
7	20	manufacturing and applications of Resistors, Varistors and Thermistors.
7	21	Definition and application of oxygen sensor, NOx sensor and knock sensors.
8	22	Bio and Dental Ceramics: Bio-Ceramics:- Definition of Bio-ceramics,
8	23	Types of Bio Ceramics – Bioinert, Biodegradable & Bioactive ceramics with examples.
8	24	Elementary idea about preparation, properties and applications..
9	25	Dental Ceramics: Definition of dental ceramics, manufacturing of artificial teeth, properties and application
9	26	**Revision**
9	27	**Sessional test 2 as per HSBTE academic calendar**
10	28	Definition and mechanism of membrane for filtration, classification of separation process,
10	29	comparison between organic and inorganic membranes. General preparation of ceramic membrane with their applications.
10	30	Working principle of Piezoelecticity, Ferroelectric and
11	31	Working principle of pyroelectric ceramics,
11	32	Properties and field of application.
11	33	PZT and PLZT based materials
12	34	**Revision**
12	35	**Assignment II (Unit 3 &4)**

12	36	**Wear Resistant Materials** Definition of abrasive (grain) grinding wheel, raw materials (Bauxite, corundum & carborundum),
13	37	manufacturing, properties and Uses of grinding wheels.
13	38	Types of ceramic cutting tools. Grinding media for tumbling (ball or tube) mills, Types of grinding media (Al2O3, SiAlON, TiC, WC)
13	39	Uses.
14	40	Properties and applications of Ball bearing based on TiC, WC, Si3N4
14	41	**Revision**
14	42	**Assignment of Unit III(Unit 5)**
15	43	**3rd sessional Test as per hsbte academic calendar**
15	44	**Revision & question answer session**
15	45	**Revision & question answer session**