Shri G.S. Institute of Technology and Science Indore
Department of Applied Chemistry and Chemical Technology
Proposed Lecture Plan
Subject: CH 91108: CHEMISTRY OF ENGINEERING MATERIALS

Period No.	Description of topics to be taught	Reference/ Remark
	Unit –I Water treatment	
1.	Source, Types of impurities and their effects	
2.	Hardness-meaning, definition, types, units of hardness and Hardness Determination and Expression	1.Palanna O.P., Engineering Chemistry(Mc Graw Hill) 2. Rajaram & Kuriacose, Chemistry in Engineering and Technology Vol.-II (Mc Graw Hill.) 3. D. Braun, Polymer Synthesis: Theory & Practice:Fundamentals, Methods, Experiments (Springer). 4. De A.K., Environmental Chemistry (Pearson Education). 5. Ambasta B.K., Chemistry for Engineers (University Science Press). 6. Dara S.S., Engineering Chemistry (S. Chand publishing). 7. Agrawal C.V., Chemistry of Engineering Materials. (B.S. Publications). 8. Maheswaramma K.S., Engineering chemistry (Pearson Education)
3.	Boiler troubles-Sludge & scale formation, causes, effects and control measures.	
4.	Softening methods:-(1)External methods (a) Lime-Soda method, principal, types (b) Ion-Exchange method, principal, types, procedure	
5.	Alkalinity and its determination by complex metric titration and neutralization titration	
6.	Numerical-based problems of each method and IS specification for water	
7.	Analysis and treatment of water for industrial and Domestic purposes, Municipal Water treatment methods of disinfection and breakpoint chlorination.	
8.	Effect of impurities in water used in different industries, eg. steam generation, textile industries, leather tanning, paper etc.	
	Unit –II Fuels	
9.	Classification, calorific value & its determination,	
10.	Analysis of solid fuel, pulverized coal, carbonization of coal, criteria of metallurgical coke, manufacture of coke	
11.	Petroleum distillation cracking, cracked and synthetic gasoline,	
12.	Gaseous fuels- natural gas, LPG, coal, gas, producer gas, water gas,carbureted water gas,	
13.	Introduction to nuclear fuels,	
14.	Numerical problems based on combustion	
15.	Numerical problems based on calorific value.	
16.	knocking, anti knocking compounds, power alcohol	
	Unit –III (a) Lubricants	
17.	Principles of lubrication, study of solid, semi solid, liquid and synthetic lubricants	
18.	Lubricating emulsions, properties and selection of lubricants.	
	(b) Corrosion	
19.	Introduction, theories of corrosion,	
20.	Factors affecting rate of corrosion, protection against corrosion,	
21.	Types of corrosion	

22.	Ethics for corrosion prevention	
23.	Industrial practices to prevent corrosion.	
24.	Use of inhibitors, use of pure metal and alloys and Ethics for corrosion prevention	
	Unit –IV (a) Polymers	
25.	Classification of polymers, types of polymerization,	
26.	Mechanisms of polymerization	
27.	Structure-property relationships,	
28.	Polymer materials of industrial importance - plastics, Rubbers and synthetic _fibers.	
	(b) Cement & Mortars	
29.	Portland cement, composition, specifications,	
30.	Manufacture, setting, lime and mortars, testing of cement,	
31.	Cementing materials and puzzolana cement	
	(c)	
32.	Chemistry and manufacture of silicates, porcelains and glasses	
	Unit –V (a) Environment and Pollution	
33.	Environment, pollution of atmosphere, hydrosphere and lithosphere, process of its control.	
34.	Chemistry for green environment- basic concepts and significance	
	(b) Refractories	
35.	Classification	
36.	Properties of Acidic, Basic and Neutral refractories	
37.	Testing of refractories	
38.	Application in industries	
39.	Chemical composition	
40.	Old Question Papers -Discussion	