



Subject Code	Subject Name	Hours per Week			Total
		L	T	P	Credits
EN2BS06	Chemistry-II	3	0	2	4

Unit I

Water: Sources of Water, Hardness of Water, Degree of Hardness, Estimation of Hardness by EDTA method, Problems on Calculation of Hardness, Disadvantages of Hardness, Drinking Water, its Requisites, Purification and Sterilization of Water, Water Pollution- Causes and Effects, Treatment of Industrial Water Discharges.

Unit II

Lubricants: Definition, Classification, Properties of Lubricants- Viscosity, Oiliness, Flash Point, Fire Point, Acid Value, Saponification, Emulsification, Cloud and Pour Point, Artificial Lubricants.

Unit III

Polymers: Definition, Plastics- Classification, Constituents, Preparation, Properties and Uses of Polythene, Bakelite Terylene and Nylon, Rubber- Natural Rubber, Vulcanization, Synthetic Rubbers - Buna - N, Buna-S, Butyl and Neoprene.

Unit IV

Miscellaneous Materials: Refractories -Definition, Classification and Properties, Manufacturing of Portland Cement, Chemistry of Setting and Hardening of Cement, Plaster of Paris.

Unit V

Fuels: Definition, Classification, Calorific Value (HCV and LCV) and Numerical Problems on Calorific Value, Combustion of Fuels, Solid Fuels- Coal and Coke, Liquid Fuels- Petroleum and its Distillation, Cracking, Octane and Cetane Values of Liquid Fuels, , Nuclear Fuels – Introduction to Fission and Fusion Reactions.

Reference Books:

- A) Lee, J. D, Concise Inorganic Chemistry, Oxford University Press
- B) Alberty, R. A., Physical Chemistry, John Wiley and Sons
- C) N. Krishnamurthy, P. Vallinayagam, Engineering Chemistry, PHI Learning Pvt. Ltd.
- D) Kuriacose J.C. and Rajaram J., Chemistry in Engineering and Technology, Tata McGraw Hill.
- E) Engineering Chemistry V.P. Mehta Jain Bros. Jodhpur
- F) Practical Chemistry for Engineers Virendra Singh
- G) Hand book of Technical Analysis Bannerji Jain Bros.Jodhpur
- H) Engineering Chemistry by Jain & Garg.
- I) Engineering Chemistry by Jain & Jain.



List of Practicals (Semester-II)

A Volumetric Analysis:

1. To determine Hardness of given water sample by Complexometric titration.
2. To determine total and mixed Alkalinity of given water sample using phenolphthalein and methyl orange as indicator.
3. To determine strength of unknown FAS solution by redox titration using N-Phenyl anthranilic acid as internal indicator.
4. To determine strength of unknown CuSO_4 solution by iodometric titration using Starch as internal indicator.
5. To determine Chloride content of water sample by Mohr's method (Argentometric titration).

B Fuel Testing :

1. To determine moisture content in given sample of coal by proximate analysis.
2. To determine volatile content in given sample of coal by proximate analysis.
3. To determine ash content in given sample of coal by proximate analysis.
4. To determine percentage carbon content of coal by proximate analysis.
5. To determine calorific value of fuel by Bomb Calorimeter apparatus.
6. To determine penetration number of grease by Cone Penetrometer apparatus.
7. Determination of drop point of grease by drop point apparatus.
8. To determine flash and fire point of given oil sample by Cleveland's open cup apparatus.
9. To determine flash point of given oil sample by Penskey Marten's close cup apparatus.
10. To determine flash point of given oil sample by Abel's Close cup apparatus.
11. To determine Steam emulsification number of given lubricant.
12. To determine Aniline point of given oil sample.
13. To determine Cloud and Pour point of given lubricating sample.
14. To study rate of change of viscosity with temperature of the given lubricating oil by means of Redwood Viscometer no.1
15. To study rate of change of viscosity with temperature of the given lubricating oil by means of Redwood Viscometer no.2

A few suggested projects:

- Testing the hardness, presence of iron, fluoride, chloride etc. depending upon the regional variation in drinking water and the study of causes of presences of these ions above permissible limit (if any)
- Investigation of the foaming capacity of different washing soaps and the effect of addition of sodium carbonate on them.
- Analysis of fruit and vegetable juices for their acidity.