PMI5I102 SURFACE PHENOMENON & FROTH FLOTATION (3-1)
(Professional Core Paper)

Module I **(08 hours)**
Overview of the properties of solid-liquid, solid-gas and gas-liquid interfaces.Electro kinetic (zeta) potential.

Module II **(08 hours)**
Contact angle – its role in froth flotation. Different types of Frothers, Cationic, anionic and other collectors. Activators and depressants, pH regulators and modifiers.Interaction of the different reagents in froth flotation.Need and effects of conditioning.

Module III **(10 hours)**
Froth flotation machines – Bubble column, agitation froth and other types of flotation cells, Design of aeration devices, impellers, casings and air flow rates. Flotation Kinetics.The effects of the reagents, cell design and mode of operation on the flotation rates. Estimation of residence time and total cell volumes required.

Module IV **(10 hours)**
Design and operation of froth flotation circuits.Rougher, scavenger, cleaner and recleaner operations. Pulp densities and hence water requirements for different stages of froth flotation. Maintenance of pulp heights and froth depths in the cells for different stages.Estimation of the effects of the circulating load in the froth flotation circuits.

Text Books:
1. Froth Flotation by A.M.Gaudin - McCraw-Hill, 1957
2. Mineral Processing Technology by Barty A. Wills and Tim Napier Munn - Elsevier 2006

References
1. Handbook of Mineral Dressing by A.F.Taggart - John Wiley and Sons, New York. 1956
2. Mineral Processing Design and Operation by A.Gupta and D.S.Yan -Elsevier 2006
3. Ore Dressing by R.H.Richards (4 volumes) – Engineering & Mining Journal 1909
4. Ore Dressing Principles and Practice by T.Simon – McGraw Hill Co., 1924
5. A Text Book of Ore Dressing by S.J.Truscott – London Macmillan. 1923
6. Handbook of Ore Dressing by A.F.Taggart - John Wiley and Sons, New York. 1956
7. Handbook of Ore Dressing by A.W.Allen – McGraw Hill Co., 1920
8. Complete Technology Book on Mineral Processing by NPSC Board – Asia Pacific Business Press 2008