

<b>5<sup>th</sup> Semester</b>	<b>RML5C002</b>	<b>Surface Phenomenon and Froth Flotation</b>	<b>L-T-P 3-0-0</b>	<b>3 Credits</b>
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**Module I:** (10 hours)

Scope and principle of froth flotation. Overview of the properties of solid-liquid, solid-gas and gas-liquid interfaces, Adsorption, Surface characteristics and analysis. Electrical Characteristics of Interfaces. Electrical Double Layer and Zeta Potential.

**Module II:** (6 hours)

Contact angle: its role in froth flotation. Froth stability, Hydrophobicity, Mechanism of collector and frother action, conditioning.

**Module III:** (8 hours)

Different types of Frothers, Cationic, anionic and other collectors. Activators, depressants, pH regulators and modifiers. Interaction of the different reagents in froth flotation.

**Module IV:** (8 hours)

Froth flotation machines: Mechanical, pneumatic and other types of flotation cells, Electro-flotation, 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 V:** (8 hours)

Design and operation of froth flotation circuits. Rougher, scavenger, cleaner and recleaner operations with examples. Pulp density in froth flotation. Froth depth, bias rate and gas hold-up. Estimation of the effects of the circulating load in the froth flotation circuits, Release Analysis.

**Books:**

- [1] A.M.Gaudin, Froth Flotation, McCraw-Hill
- [2] B. A. Wills and Tim Napier Munn, Mineral Processing Technology, Elsevier 2006
- [3] S. R. Rao, Surface Chemistry of Froth Flotation(Revised edition),Springer Science + Business Media