

MLPC2005 DEWATERING AND DRYING (3-0-0)

Course Objective:

To understand the different laws and principles of solid-liquid separation and their applications in mineral processing.

Module I (6 hrs)

Introduction to dewatering and drying: Need and scope

Flocculation, coagulation and Dispersion: Fundamental factors underlying flocculation and dispersion phenomena. Mechanism of reagent adsorption, factors affecting flocculation and dispersion, Electrokinetic phenomena and the zeta potential, selective flocculation.

Module-II (6 hrs)

Gravity clarification and thickening, Dewatering by sedimentation principles. Different types of clarifiers and thickeners, use in mineral industries.

Module III (6 hrs)

Filtration: Principles and type of filtration, surface filters and depth filters, Pressure filtration and vacuum filtration, Flow through packed beds, factors affecting the filtration, cake washing. Filter media: types and materials

Module IV (6 hrs)

Centrifugal sedimentation: types and principle

Drying: Different types of thermal dryers and their applications

Module V (6 hrs)

Design and selection of clarifier, thickener and filtration unit, Application and practice of dewatering processes in mineral industries.

Books:

1. Tarleton S. and Wakeman R., Solid-Liquid Separation: Equipment Selection and Process Design, Elsevier Science
2. Concha F., Solid-Liquid Separation in the Mining Industry, Springer International Publishing
3. Svarovsky L., Solid-Liquid Separation, Butterworth-Heinemann
4. B. A. Wills and Tim Napier Munn, Mineral Processing Technology, Elsevier 2006

Course Outcome:

CO1: To understand the concept and importance of solid-liquid separation

CO2: To understand and apply the concept of gravity classification and thickening

CO3: To explore the knowledge of thickening and its applications

CO4: To analyze the concept of centrifuging and drying

CO5: To apply the knowledge of solid-liquid separation in designing of thickening and filtration units