

## Mineral Processing Training 2019-20: Course Structure

**Phase I: Introductory Course on Mineral Processing- Duration 3 days**

**Phase II: Mineral Processing Course on Selected Topics- Duration 3 days**

### **Phase I:**

Day 1	Pre-Lunch	<b>Introduction to Mineral Processing</b> Grade-Recovery Curve, Basic calculations on mineral processing, Metallurgical Process assessment Mass Balance: two product formula, three product formula
	Post Lunch	<b>Ore Characterization</b>  <b>Sampling</b> Steady state operation, Sampling technique, Sample Size, Sample preparation and processing  <b>Particle size distribution</b>
Day 2	Pre-Lunch	<b>Crushers</b> Jaw, Gyratory, Cone and Roll Crushers, various designs available and their Selection Criterion, HPGR
	Post Lunch	<b>Grinding Mill</b> AG Mill, SAG Mill, BALL Mill, Calculations
Day 3	Pre-Lunch	Hydro cyclone and Screen (operating principle, design criteria, applications, selections & sizing based on applications)
	Post Lunch	Comminution Circuit, Grinding Circuit -SABC Circuit, HPGR Circuit, Example of processing circuits Iron ore, Cu ore circuit, Chrome ore, manganese ore, lead-zinc ore

**Phase II:**

Day 4 Crushers and HPGR	Pre-Lunch	Parameters effecting crusher performance and efficiency. Understanding of Crusher Gradation curves.
	Post Lunch	Current industrial challenges on using crushers. Design parameters and features for designing crushers.
Day 5 Classifier, Hydrocyclones and Screens	Pre-Lunch	Design features of Industrial Classifier: Mechanical & Centrifugal Classifier Hydrocyclone performance, Partition curve, Reduced efficiency curve, efficiency parameter; cut size, water bypass and sharpness of separation Hydrocyclone flow sheet development and Hydrocyclone circuits
	Post Lunch	Capacity, Performance analysis of Industrial screens, Factors effecting screen performance, Modeling of Screening process Screens application in Crusher Circuit, Grinding circuit Illustrative examples
Day 6 Plant Engineering, Slurry Transportation and Process Flow Diagram	Pre Lunch	Process flow development for the following circuits: sand washing plant, iron ore, copper ore beneficiation plant, crushing & screening, coal washing and detained analysis of data
	Post Lunch	Slurry transportation: Classification of slurry into different flow regime such as Newtonian/non Newtonian & pressure drop calculations for highly viscous & non-Newtonian fluids (Bingham plastic, pseudo plastic, dilatant etc.)