



# INTRODUCTION TO MINERAL PROCESSING

**PROF. ARUN KUMAR MAJUMDER**

Department of Mining Engineering  
IIT Kharagpur

**TYPE OF COURSE** : Rerun | Elective | UG/PG

**COURSE DURATION** : 12 Weeks (24 Jan' 22 - 15 Apr' 22)

**EXAM DATE** : 23 Apr 2022

**INTENDED AUDIENCE:** Mining, Chemical & Metallurgical Engineering, Geology.

**PRE-REQUISITES :** +2 Science

**INDUSTRIES APPLICABLE TO :** Tentatively all mining companies like: NMDC, CIL, SAIL, IREL, UCIL, HZL, HCL, GMDC, APMDC, MPSMC, RSMML, HINDALCO etc. and equipment manufacturing companies like Weir Minerals, Tega Industries, METSO, FL-Smidth, AllMinerals etc.

**COURSE OUTLINE :**

Mineral processing is the first process that most ores undergo after mining in order to provide a more concentrated material for the procedures of extractive metallurgy. Although the primary operations are comminution and concentration, but there are other important operations in a modern mineral processing plant, including sizing, sampling and bulk material handling. This course is intended to provide a detailed understanding of the afore-mentioned operations.

**ABOUT INSTRUCTOR :**

Arun Kumar Majumder is an Associate Professor in the Department of Mining Engineering of IIT Kharagpur. He is a PhD in Mineral Processing from the University of Queensland, Australia. Prior to joining the Department of Mining Engineering at IIT, Kharagpur in 2010, he had served AMPRI (CSIR), Bhopal since 1990 at various levels.

He has carried out extensive and in-depth modeling work on complex coal and mineral processing unit operations. These models are developed based on sound fundamental concepts and they have strong industrial relevance too. The most significant aspect of his work is the identification of many problems at their roots first and then providing solutions elegantly.

He has set up a new mineral engineering laboratory at IIT, Kharagpur with financial supports from industries. He is in the editorial boards of three international journals, has authored one book, has more than hundred publications and is currently the reviewer of many international journals of repute. He has filed one international and one Indian patent as of now.

In recognition of his contributions in the areas of coal and mineral processing, various professional bodies have honored him with 12 awards so far.

**COURSE PLAN :**

**Week 1:** Importance of Mineral Processing

**Week 2:** Particle Characterization

**Week 3:** Comminution 1

**Week 4:** Comminution 2

**Week 5:** Industrial Screening

**Week 6:** Movement of Solids in Fluids

**Week 7:** Hydrocyclone

**Week 8:** Gravity Concentration

**Week 9:** Flotation

**Week 10:** Bulk Material Storage and Handling

**Week 11:** Slurry Transportation

**Week 12:** Iron Ore Washing