



Laboratory Brief Overview

University/Institute: NED University of Engineering and Technology

Department: Metallurgical Engineering

Lab Name: Mineral Processing Lab

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Lab Overview

Welcome to the Mineral Processing Lab, where cutting-edge technologies and innovative research drive advancements in the field of mineral processing. Our lab is dedicated to exploring and optimizing various techniques to extract, separate, and refine valuable minerals from ores. Equipped with state-of-the-art facilities and a team of skilled engineers, we strive to revolutionize the mining industry through our research and development endeavors.

Equipment

Equipment Name	Research / Teaching Applications
Jaw Crusher	A powerful machine used for primary crushing of mineral ores and rocks.
	Key features: Robust construction, adjustable discharge size, and efficient operation.
Ball Mill	A versatile apparatus for grinding and blending materials to various particle sizes.
	Key features: Precise control of milling parameters, batch processing, and reliable performance.
Spiral Classifier	It is used for size classification of fine particles based on settling rates.
	Key features: Rakes lift and separate particles by size, allowing efficient particle sorting.
Magnetic Separator	Equipment used for separating magnetic minerals from non-magnetic ones.
	Key features: Strong magnetic field, adjustable settings, and high separation efficiency.

Flotation cell

It is used for selectively separating hydrophobic minerals from hydrophilic ones.

Key features: Air bubbles, reagents, and agitation create a froth layer to separate minerals.

Academic/Industrial Research Applications:

1- Educational and Practical Training:

The Mineral Processing Lab offers a dynamic learning environment for students pursuing degrees in engineering and related disciplines. Students gain valuable insights into mineral processing through lab experiments, sample analysis, and data interpretation, honing their technical skills and problem-solving abilities.

2- Sustainable Resource Extraction:

In our lab, students research sustainable resource extraction by optimizing processes like froth flotation and magnetic separation. They aim to minimize environmental impact while maximizing mineral recovery, contributing to responsible mining practices and resource preservation.

3- Ore Characterization:

In the Mineral Processing Lab, students gain expertise in ore characterization using advanced techniques. They analyze different ore types, identify mineralogical variations, and optimize processes accordingly to enhance recovery rates and resource utilization.

4- Modeling & Simulation

MODSIM is widely used in mineral processing for creating virtual models of processing plants. It accurately simulates unit operations, equipment configurations, and process parameters. Through simulations and analysis, students can optimize plant performance, evaluate scenarios, and identify bottlenecks or inefficiencies.

5- Process Optimization:

In our lab, students use simulation software to optimize mineral processing processes. By running simulations with different conditions, they identify optimal parameters to improve recovery rates, reduce energy consumption, and enhance process efficiency. This software is a valuable tool for developing strategies to optimize mineral processing plants.