

**Department:** Mining Engineering

**Division:** Mineral Processing

**Level and Major:** MSc, Mineral Processing

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**Course Title:** Biotechnology in Mineral Processing

**Number of Credits:** 2

**Lecturer:** Dr. Mehdi Irannajad

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### **Course Goals and Objectives**

Biotechnology in mineral processing Microorganisms: characteristics and various types.

### **Course Topics**

- Microorganisms: characteristics and various type- Mineral biotechnology-Biological leaching
- Bacterial leaching
- Chemolithoautotroph
- Copper, Uranium, Gold, Refractory gold ores leaching
- Thiobacillus ferrooxidans
- Leptospirillum ferrooxidans
- Thiobacillus thiooxidans
- Bioleaching Applications
- Application of heterotrophic microorganisms in mineral biotechnology
- Mineral biotechnology of sulphides
- Biobeneficiation of mineral raw materials
- Mineral biotechnology: microbial aspects of mineral beneficiation, metal extraction, and environmental control

### **Reading Resources**

- Mineral biotechnology: microbial aspects of mineral beneficiation, metal extraction, and environmental control, S. Komar Kawatra and K. A. Natarajan, 2001, 263 pages, Society for Mining, Metallurgy, and Exploration
- Mineral biotechnology: microbial aspects of mineral beneficiation, metal extraction, and environmental control, S. Komar Kawatra and K. A. Natarajan, 2001, SME
- Microbial aspect of mineral beneficiation, metal extraction and environmental control, SK Kawatra, KK Natarajan - Mineral Biotechnology, 2001