

Department: Mining Engineering

Division: Mining Exploration

Level and Major: MSc, Mining Exploration

Course Title: Mine Laboratory Science

Number of Credits: 2

Lecturer: Dr. Amir Reza Azadmehr

Course Goals and Objectives

Introduction to separation and analytical methods of mineral compounds.

Course Topics

- Fundamental of spectroscopy, electromagnetic waves, absorbance and beer law, application of beer law in quantitative analysis
- Molecular spectroscopy and application XRD and XRF in quantitative analysis
- Introduction to SEM
- Fundamentals of spectroscopy and quantitative and qualitative methods
- FTIR spectroscopy and application in quantitative analysis and characterization of functional groups
- RAMAN spectroscopy and application in quantitative analysis and characterization of functional groups
- Application of NMR spectroscopy in inorganic compounds and geochemical process
- Fundamentals of NMR Spectroscopy
- Fundamentals of single-crystal -XRY spectroscopy
- Mossbauer spectroscopy
- Application of EXAFS spectroscopy in the characterization of minerals and inorganic compounds
- Application of single-crystal -XRY spectroscopy in the characterization of minerals and inorganic compounds, ORTP3
- Fundamentals of GC and HPLC methods.
- Application of GC and HPLC methods in characterization of natural compounds
- Application of XPS spectroscopy in the characterization of minerals and inorganic compounds

Reading Resources

- E.A.V. Ebsworth, David W.H. Rankin, structure method in inorganic chemistry, publication 2010.
- D. drago, Analytical Methods in Inorganic Chemistry, publication, 1989
- Richard J. D. Tilley, Crystals and Crystal Structures publication, 2006

- Paramod k Verma, Optical Mineralogy publication, 2009