

Department: Mining Engineering

Division: Mining Exploration and Mineral Processing

Level and Major: BSc, Mining Exploration and Mineral Processing

Course Title: Geophysical Exploration 2

Number of Credits: 2

Prerequisite: Geophysical Exploration 1

Lecturer: Dr. Hamidreza Ramazi

Course Goals and Objectives

Learning Exploratory Geophysical Methods: Electrical methods (RS, IP, SP, and Potential), Electromagnetic methods (EM), Radioactivity, and Geothermal methods

Course Topics

- Geophysical Exploration methods presented in Geophysics II, SP, Resistivity and other Geoelectrical methods, IP, EM, Geothermal, and radioactive methods
- Resistivity Methods: Key words, Instruments
- Geoelectrical Profiling, Electrodes arrays, field operations, data processing and Interpretation, applications
- Geoelectrical Sounding, Electrodes arrays, field operations, data processing and Interpretation, applications, soft wares
- Application of geoelectrical sounding (example in an aquifer) Field operations, data processing and compiling Resistivity Sections, contour maps of: Alluvium Thickness, Bed rock depth, RT
- Potential methods: (Mise-a-la-Masse): Fundaments, Field operation, Data Processing and Interpretation, Applications
- SP method, Fundaments, field operation, data Processing and Interpretation, Applications
- IP method, Fundaments, field operation, data Processing and Interpretation, Applications
- EM methods, Fundaments of EM fields, Instruments
- EM methods, field operation, data Processing and Interpretation
- EM methods: Applications
- Georadar
- Radioactive Methods Fundaments, field operation, data Processing and Interpretation, Applications
- Geothermal Methods: Fundaments, field operation, data Processing and Interpretation, Applications
- Presentation of some case studies

Reading Resources

- Field Geophysics
- Ramazi Hamidreza, 2018, "Applied Geoelectrical Methods" Amirkabir University of Technology Publications