

Department: Mining Engineering

Division: Mining Exploration

Level and Major: MSc, Mining Exploration

Course Title: Advanced Structural Geology

Number of Credits: 2

Lecturer: Dr. Hossein Hassani

Course Goals and Objectives

Learning and Understanding the Structural Geology and Structural Methods in Mining Engineering.

Course Topics

- Advanced Stress and Strain, components and equations
- Ductile and Brittle Deformation
- Non-tectonic Structures: Landslide, Primary Structures, Gravity, and weight Structures
- Thrust tectonics and mining resources, 2D and 3D cross-section of thrust regions, kinematic models of thrust and shear zones
- Inversion tectonics, Wrench tectonic, Transpression zone, Transtension zone and Transform
- Diapirism: mechanism of diapirism, Various models of diapirism associated with the mining and hydrocarbon resources
- Plate tectonic and mining resources
- Stereographic advanced techniques in solving the structural issues and exploration, rotating structure, solving the problems of depth and thickness, dip and strike of planar and linear structures on the surface and depth
- Balance sectioning in the mining and hydrocarbon areas
- Dimensional calculation of depth and thickness, structural contour mapping on surface and depth
- Structural analysis of mineral and hydrocarbon zones using satellite digital data processing

Reading Resources

- Basic Methods of Structural Geology, 2011, S. Marshak and G. Mitra, Translated by M. Pourkermani
- Structural Geology and Interpretation of Maps, 1997, R. Weijermars, Translated by H. Hassani and H. Sarkheil
- Stereographic Projection Techniques, 2008, P. R. Leyshon and R. Lisle, B and H press, Britannia