Department: Mining Engineering **Division:** Mining Exploitation

Level and Major: Ph.D., Mining Exploitation

Course Title: Systems Analysis in Mine **Number of Credits:** 3

Lecturer: Dr. S. Ali Mir Hassani

Course Goals and Objectives

The aim is to introduce the modeling and optimization tools to students.

Course Topics

- Introduction to modeling and decision making
- Introduction to linear programming
- Introduction to mixed-integer programming
- Introduction to Nonlinear programming
- Introduction to stochastic programming
- Introduction to system approach, key concepts of system's science and the general theory of systems
- A review of the mathematical modeling process
- Introduction to decision-making theory
- Introduction to mathematical programming and its models
- A review of linear modeling
- An overview of network modeling
- A review of zero-one and complex modeling
- A review of dynamic modeling
- A review of nonlinear modeling
- A review of probabilistic and geometric modeling
- A review of modeling Multi-Criteria Decision-Making Problems
- Introduction to fuzzy set theory and fuzzy mathematical programming

Reading Resources

- Up-to-date articles