

**Department:** Mining Engineering

**Division:** Mining Exploitation

**Level and Major:** Ph.D., Mining Exploitation

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**Course Title:** Ore Body Modeling

**Number of Credits:** 3

**Lecturer:** Dr. Majid Atae Pour

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### **Course Goals and Objectives**

To get familiar with 2D and 3D modeling of mineral resources.

### **Course Topics**

- Modeling Concept and importance, Various types of ore-body models
- Systems and Models, Definition of mineral resources as systems, Resource Variables as Spatial functions
- Database management, Digitizing and digitizers, Data verification
- Data compositing, approaches and process
- Basics of 2D gridding and 3D block modeling
- Modeling steps, data point and grid orientation, grid size and density, grid node addressing
- Overview of estimation algorithms including Nearest Neighbor, Inverse Distance, Triangulation and Kriging
- Analysis of estimation parameters, data filtering, search distance, transformed distance, search rules, duplicate data, sectors, anisotropy
- The model calculation, model visualization in matrices, 2D contour maps, and 3D surfaces
- Ore-body modeling software tools

### **Reading Resources**

- Atae-pour, M (1391), Principles of 2D ore-body modeling, Amirkabir University of Technology Publication