

Department: Mining Engineering

Division: Rock Mechanics

Level and Major: MSc, Rock Mechanics

Course Title: Mechanized Excavation

Number of Credits: 3

Lecturer: Dr. Kourosh Shahriar

Course Goals and Objectives

Gain the ability to research, design and supervise the implementation of specialized projects in the field of tunneling and microtunneling.

Course Topics

- Introduction
- Site Investigations for Mechanized Excavation Projects
- Physical and Mechanical Properties of Rocks, Soils, and Coals
- Rock-Cutting Tools and Theories
- Laboratory Rock-Cutting Tests
- Wear of Cutting Tools
- Road headers
- Impact Hammers
- Hard Rock TBMs
- Soft Ground Tunnel Boring Machines
- Microtunnel Boring Machines and Jacking Forces
- Shaft and Raise Boring Machines
- Large-Diameter Drill Rigs
- Mechanical Excavation in Coal Mines
- Chain Saw Machines
- Emerging Mechanical Excavation Technologies

Reading Resources

- Bilgin, N., Copur, H., Balci, C., Mechanical Excavation in Mining and Civil Industries, 2014 by Taylor and Francis Group, LLC, 355 pages