



**Course Name:**

Rock Mechanics

<b>Course Number:</b> 20-445	<b>Credit:</b> 3
<b>Program:</b> Graduate	<b>Course Type:</b> Technical Selective
<b>Prerequisite:</b> -	<b>Corequisite:</b> -

**Course Description (Objectives):**

The overall objective of this course is to familiarize students with the fundamental principles of rock mechanics and its applications in geotechnical engineering. Students will learn about basic definitions, failure criteria, rock mass strength parameters, and design principles in rock engineering.

**Course Content (outline):**

- Chapter 1: Methods of geotechnical investigation and exploration in rock engineering
- Chapter 2: Mechanical and physical properties of rocks and methods for determining them
- Chapter 3: In-situ stresses, their causes, and methods of determination
- Chapter 4: Engineering classification of rock masses
- Chapter 5: Failure criteria and behavioral models of rock masses
- Chapter 6: Shear strength of rock material and rock masses, and determination of geomechanical and strength parameters of rock masses
- Chapter 7: Methods for graphical and geometric analysis of rock masses (stereographic analysis)
- Chapter 8: Design in rock engineering
- Chapter 9: Applications of rock mechanics in slopes, foundations, and rock abutments
- Chapter 10: Field visits and study of several implemented projects in Iran and around the world

**References:**

- Goodman, R. E. (2010), Introduction to Rock Mechanics, Wiley India
- Jaeger, J. and Cook, N.G. (2007), Fundamentals of Rock Mechanics, Wiley-Blackwell
- Brady, B. H.G and Brown, E.T. (1985), Rock Mechanics for Underground Mining, Springer