

Rock Mechanics-II

Code CE-830	Credit Hours 3-0
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Course Description:

The course aims to provide an in-depth knowledge of rock mechanics and an understanding of rock strength. It deals with stability measures and enhancement of rock strength by exposing students to various means/measures to construct tunnels and other infrastructures in rock strata.

References/Textbooks:

1. Goodman, R. E. (1989). Introduction to Rock Mechanics. John Willey & Sons, PA, USA.
2. Hoek, E. (1990). Underground Excavations in Rock, Spon Press, London, UK.
3. Hoek, E. (1981). Rock Slope Engineering, The Institute of Mining and Metallurgy, Spon Press, London, UK.
4. Legget, R.F and Hatheway, A.W. (1988). Geology and Engineering, McGraw Hill, Book Company, New York, USA.

Prerequisites:

Nil

Assessment system for theory

Quizzes	10-15%
Assignments	5-10%
Mid Terms	25-30%
Project	0-10%
ESE	45-50%

Teaching plan

Weak No.	Topics	Learning outcomes
1	Introduction	General Aspects of the Course with Covered Topics
2-6	Shear Strength	Rock Stability and Shear Strength, Rock Excavation, Slopes and Review of Shear Strength of Rock Joints, Peak and Residual Strength of Rock Joints. Strength Variations due to Irregularities, Rock Bridges. Strength of Joint Fillings.
6-8	Slope Stability Analysis	Stabilization and Monitoring of Slopes, Design and Construction of Slopes and Cuts
9	MID TERM EXAMS	
10 - 12	Rock Excavation and Stability	Blasting - Single Hole, Quarry Type, Controlled Blasting, Perimeter, Control, Vibrations, Rock Support, Bolts Dowels, Tie Backs and Facing, Excavation Support Systems.
13-16	Tunnelling	Rock Properties and Tunnel Behavior, Components of Tunnels, Type of Tunnels and Tunneling Problems, Tunnelling Ground Conditions and Their Relation to Rock Properties, State of Stress, Excavation of Tunnels (Traditional and Classical Methods), Tunnelling Boring Machines (TBM), The Convergence Confinement Method,

		Exploration, Observations and Control, Ventilation systems. Rock Classes and Tunnelling Methods.
17	Quality Control	Monitoring Techniques
18	END TERM EXAMS	