

Slope Stability

Code CE-823	Credit Hours 3-0
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Course Description

The course aims at equipping the students with the state of the art software dealing with Slope Stability problems. The understanding of landslide, mudflows, rock slides and rock mechanics as well as preventive and stabilization Strategies. Students will be able to apply the software modules for rectifying issues related to slope and stability. Students will be able to apply gained knowledge in field on Landslides, mudflows for stabilization strategies

Text Book:

1. Duncan, J. M and Wright, S. G. (2005), Soil Strength and Slope Stability, John Wiley & Sons.

Reference Book:

2. Stability and Performance of Slopes and Embankments –II, A 25-year perspective. Vol-1&2, Geotechnical Special Publication, ASCE.
3. Slope Stability 2000, Geotechnical Special Publication, ASCE.
4. Abramson et al. (2001), Slope Stability and Stabilization Methods, John Wiley & Sons.
5. Fang, H.Y (1990); Foundation Engineering Handbook, CBS Publishers.
6. Hoek, E (1981); Rock Slope Engineering, Institute of Mining and Metallurgy.
7. Earth Reinforcement Vol-I&II International conference, Balkema A.A Publishers.
8. Landslides; Analysis and Control, Transportation Research Board Special Report 176 National Academy of Sciences.

Prerequisites: NIL

Assessment System for Theory

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

Teaching Plan

Week No	Topics	Learning Outcomes
1-3	General/Introduction	Course Outline, objectives, teaching plan, assessment method, Examples of Slope Failures, Triggering Factors, Drained and Undrained conditions, Mohr Circle and Stress paths, Drained and Undrained Shear Strength, End of

		construction Stability, Long-Term Stability
4-8	Soil Slope Stability	Limit Equilibrium Procedures, Assumptions, Equilibrium Conditions, Single Free-Body Procedures, Procedures of Slices, Noncircular Slip and Circular Slip Surfaces, Friction Circle Method and Taylor Stability Charts, Ordinary Method of Slices, Simplified Bishop Method, Spencer, Janbu's and Mongerstre-Price Methods, Computer software
9	MID TERM EXAM	
10-14	Rock Slope Stability	Mechanism of rock slope failures in different rock mass types, Modes of failure of slopes in rock masses (Sliding Plane and Wedge, Raveling, Slumping, Toppling, Torsion, Sheet Failure, Rupture, Bursting, and Boulder Fall), Kinematic causes of rock slope failure, Stability analysis procedures, Computer software
15-16	Slope Stabilization and Supports	Geogrid, Geofabric, other natural and economical material, Soil stabilization/anchoring
17	Slope Reliability and Risk Assessment	Probabilistic methods, Probability of slope failure, Limitations
18	End Semester Exams	