Introduction to Rock Mechanics

Course Code	Credit Hours
CE- 425	3-0

Course Description

The course deals with Rock mechanics and its application in civil engineering projects.

Text Book:

1. Sivakugan, N. Shukla, S.K. & Das, B. (2013) Rock Mechanics, An introduction. CRC Press, Taylor & Francis Group
2. Goodman R. E (1989), Introduction to Rock Mechanics, John Willey.
3. Hoek, E & Brown, E.T (1980), Underground Excavations in Rock, Spon Press.
4. Singh, B., & Goel, R. K. (1999). Rock mass classification: a practical approach in civil engineering (Vol. 46). Elsevier.
5. Debasis, D., & Kumar, V. A. (2016). Fundamentals and applications of rock mechanics. PHI Learning Pvt. Ltd.
6. De Vallejo & Ferrer (2011). Geological engineering. CRC press.

Reference Book:

1. Hoek, E., & Brown, E. T. (1997). Practical estimates of rock mass strength. International journal of rock mechanics and mining sciences, 34(8), 1165-1186.

Prerequisites :

CE-324 SM-II and CE-121 Engineering Geology.

ASSESSMENT SYSTEM FOR THEORY

	Without Project (%)	With Project/Complex Engineering Problems (%)
Quizzes	15	10-15
Assignments	10	5-10
Mid Terms	25	25
Project	-	5-10
End Semester Exam	50	45-50

ASSESSMENT SYSTEM FOR LAB

Lab Work/ Psychomotor Assessment/ Lab Reports	70%
Lab Project/ Open Ended Lab Report/ Assignment/ Quiz	10%
Final Assesment/ Viva	20%

Teaching Plan

Week No	Topics/Learning Outcomes
1-3	Introduction, rock origin, geologic exploration, structural geology, rock coring,
4-5	Discontinuities
6-8	Rock test: Point load strength index test, Brazilian indirect tensile strength test, Schmidt hammer test, Uniaxial compressive strength test, Direct shear strength, Triaxial test, Slake durability test
9	**Mid Semester Exam**
10-13	Rock Classification Rock quality designation (RQD), Rock Mass Rating (RMR), Q-system, Geological Strength Index (GSI)
13	Spherical projection, intersection of a plane and a sphere, equal area projection, equal angle projection, projections of great circles on horizontal planes, polar & equatorial stereonets,
14-15	Rock slope stability, slope failure mechanisms, kinematic analysis
16	Strength and Deformation Characteristics of Rocks
17-18	End Semester Exa,

Practical: Nil.