Course Type	Course Code	Name of Course	L	T	P	Credit
DP1	NMNC 508	Geomechanics Lab	0	0	3	1.5

Course Objective

The objective of this practical is to enable the learner to understand the determination of different physico-mechanical properties of the intact rocks and soil as per the suggested methods (ISRM, ASTM, BIS etc.) and also provide an overview of their application in tunnel and underground space design.

Learning Outcomes

Upon successful completion of this course, students will learn the practical aspects of geomechanics pertaining to soil and rocks and will be able to apply in tunnel and underground space design.

Sl. No.	Major Topics	Contact Hours	Learning Outcome
1	Methods for determination of consistency of soil	3	Soil consistency and deformation behaviour for designing any structure in soil; Soil classification and characterization
2	Methods for determination of consolidation and compaction of soil	3	Soil consolidation, compaction and deformation behaviour for designing any structure in soil
3	Methods for determination of shear strength of soil	3	Shear strength of soil for design of tunnels and soil/rock excavations.
4	Determination of porosity/permeability of soil/rock	3	Measurement of soil/rock porosity or permeability for design of soil/rock excavations.
5	Methods for determination of slake durability of rock	3	An index to alteration and relative ranking of rock durability and weatherability of rocks.
6	Methods for determination of triaxial strength of rock	3	Strength and deformability of rock for design of underground structures such as tunnels and caverns etc.
7	Methods for determination of compressive strength of rock	3	Characterization and classification of rocks in design of structures, Strength of rocks in unconfined conditions and their relation to tunnel design
8	Methods for determination of modulus of Elasticity and Poisson's ratio of rock		Characterization and classification of rocks in design of structures, deformability of rocks in unconfined conditions and their relation to tunnel design
9	Methods for determination of tensile strength of rock	3	Tensile strength of rocks in unconfined conditions and their relation to tunnel design
10	Methods for determination of shear strength of jointed rock	3	Shear strength of rocks and rock joints for design of tunnels
11	Demonstration of setup for determination of load and deformation using load cell and extensometer	3	Load and deformation measurement in rock structures
12	Demonstration of multi-point borehole extensometer	3	Measurement and monitoring of displacements and bed separation at

			various depths
13	Demonstration of setup for determination of in-situ stresses using hydrofracturing technique	3	In-situ stress measurement for design of structures (tunnels etc.) in rock
14	Practice & Review	3	
		42	

Text Book:

1. Brown, E. T. Rock Characterization Testing and Monitoring, Oxford: Pergamon.

References Book:

1. Practical Manual and relevant suggested standards (ISRM, BIS, ASTM)