Course Type	Course Code	Name of the Course	L	T	P	Credits
DP	NMNC524	Rock Excavation Lab	0	0	3	1.5

Course Objective

- The primary objective of the course is to introduce students to various rock properties for rock excavation system design

Learning Outcomes

- Upon completion of the course, students will be able to conduct various experiments to determine the key rock and explosive parameters for designing the drilling, blasting and mechanical excavation systems.

Units	Course Content	Contact hours	Learning Outcomes
Unit 1	Sonic velocity in rocks and analysis using software	3	Dynamic elastic constants
Unit 2	Fracture toughness index	3	Fracture toughness
Unit 3	Field seismic velocity and analysis using software	3	Shallow seismic refraction for subsurface characterization
Unit 4	Cerchar hardness index	3	Resistance to indentation, drilling rate estimation
Unit 5	Punch penetration index	3	Rock toughness
Unit 6	Cerchar abrasivity index	3	Wear of cutting tools
Unit 7	Drilling rate index and analysis using software	3	Rock drillability and drill selection
Unit 8	Blast vibration measurement and analysis using software	3	Seismic impacts on structures due to blast induced ground and air vibrations
Unit 9	VOD measurement and analysis using software	3	Explosive selection and performance estimation
Unit 10	Blast design and fragmentation analysis software	3	Blast design simulation and fragmentation assessment through image analysis
Unit 11	Linear cutting rig tests	3	Specific energy estimation in rock cutting
Unit 12	Bit wear index, Abrasion value steel and cutter life index	3	Cutter life determination
	Mini Project	6	
	Total	**42**	

Reference: Lab Manual