Short Course on

Rock Mechanics in Tunnelling Techniques

23rd September 2024 (Time: 9:30 to 17:00)

Rock Mechanics for Tunneling

Understanding properties of rock and rock mass is essential for any tunneling works. This course will emphasize on the concept and determination of basic rock properties like UCS, modulus of elasticity, Poisson ration, cohesion and friction angle. The importance of RMR, Q and GSI will also be discussed to quantify the properties of rock mass. The concept of ground reaction curve, and design of supports will be discussed in details emphasizing on the application of rock bolts. Apart from NGI support chart will be discussed and several real-life problems will be solved.

Tunneling Techniques

Tunneling, an integral part of the construction and infrastructure development, is the need of the hour. It has assumed an increased momentum in the last decade owing to exponential expansion of infrastructure development projects belonging to Hydroelectric, Rail and Road networks, Urban Mass Transport and various underground services. This is apart from mining tunnels driven for facilitating extraction of huge volumes of minerals. The demand is both local and global and thus the topic assumes significant importance in the current demand scenario. Under such circumstances, it is incumbent to keep the planners, designers and practicing engineers abreast with the latest in the discipline of tunnel excavation. Tunnelling primarily involves two major excavation techniques viz. drilling and blasting, and mechanical excavation using roadheaders and tunnel boring machines. Considering the relevance to both practicing tunnel and mining engineers, academicians and researchers involved in tunnel system design and research, the following topics are proposed to be covered by two experts from IIT(ISM) Dhanbad (presently in IIEST Shibpur on deputation) and CSIR-CIMFR, Nagpur. The lectures and a panel discussion at the end is expected to provide some good takeaways by the participating delegates.

Short Course Schedule

Sl. No.	Topic	Time	Broad Content	Faculty
1.	Rock and Rock Mass Properties	9:30 to 11:00	Mechanical properties of rock and jointed rock mass and their determination	D. Deb
2.	Geo-stresses and Tunnel Support Systems	11:15 to 13:00	Insitu stresses and their measurement, Ground reaction curve and design of tunnel support systems	D. Deb
3.	NATM - Theoretical and Practical Aspects with Use Cases	14:00 to 14:45	Fundamentals of the NATM tunneling and tunnelling through varied rock classes	V.M.S.R. Murthy
4.	TBM Tunnelling - Cutter	14:45 to 15:30	Rock, rockmass, machine design and operating parameters affecting TBM	V.M.S.R. Murthy

	performance and wear		performance and cutter wear with some remedial strategies	
5.	Tunnel Blasting - Planning, Design and Performance Aspects with Use Case	15:45 to 17:00	Understanding the basics of tunnel blast design and defining the best practices for achieving targeted productivity	A K Raina

Who can attend: Planners, designers and practicing tunnel and mining engineers, academicians and researchers are the best fit. Research scholars can also attend as the problems and solutions would be of interest to them.