



DRILLING AND BLASTING TECHNOLOGY

PROF. KAUSHIK DEY

Department of Mining Engineering
IIT Kharagpur

INTENDED AUDIENCE : Mining engineering, Civil Engineering, Geology

INDUSTRIES APPLICABLE TO : All Mining Companies (CIL, HZL, TataSteel, HCL, Cement Companies etc.), Civil sectors carrying tunneling (L&T, HCC, Afcons, NHPC etc)

COURSE OUTLINE :

Drilling and Blasting is the most popular and predominant rock excavation technique. The main advantage of this technique is that it can be universally applicable if it is designed suitably. This course will cover the basics of Rock geology related to drilling application, the fundamentals of drilling and blasting process during rock excavation in surface and sub-surface excavation and also its engineering as well as economic feasibility.

ABOUT INSTRUCTOR :

Prof. Kaushik Dey is an Assistant Professor, Department of Mining Engineering Indian Institute of Technology, Kharagpur, India. He has obtained B.E. (Mining), M. Tech (Opencast Mining) and Ph.D.(Mining) and worked in the field of Tunneling and Mining sector for few years. Prior to join I. I. T. Kharagpur, Dr. Kaushik Dey was a Lecturer in Mining at National Institute of Technology, Rourkela and Assistant Professor in Mining at Indian School of Mines, Dhanbad. His research area includes excavation of rock by blasting or by mechanical cutting. He has published around thirty five research papers.

COURSE PLAN :

Week 1: Rock Geology, Mechanism of Rock Drilling and Drillability

Week 2: Drilling Machines, Selection of Rock Drill and its accessories

Week 3: Special Drilling Method and economics of drilling

Week 4: Explosives and accessories

Week 5: Explosive properties and explosive-rock interaction

Week 6: Rock blasting methods and designs

Week 7: Super alloys: Alloy design, Microstructure and Properties

Week 8: Safety, Environmental impact and economics of rock blasting

Week 9: Special blasting techniques – 1: Techniques of boulder blasting, Deck charging techniques, Consideration of rockmass conditions for surface and underground blasting

Week 10: Special blasting techniques – 2 : Controlled blasting techniques, Cast blasting techniques, Hot hole blasting techniques, Underwater blasting, Demolition blasting

Week 11: Blast induced ground vibration and structural damages : Basics of vibration and blast vibration, Measurement of blast vibration and analysis, Vibration predictors, Structural damage and ground vibration

Week 12: Safety in rock blasting and tutorials : Safety essentials in blasting process, SOP and SWP, Environmental impacts, gasses and noise, Tutorial for surface and underground rock blasting