



SURFACE MINING TECHNOLOGY

PROF. KAUSHIK DEY

Department of Mining Engineering
IIT Kharagpur

INTENDED AUDIENCE : UG and PG Mining Engineering students

INDUSTRIES APPLICABLE TO : All mining companies including CIL, SAIL, NALCO, HZL, HCL, CEMENT SECTORS etc

COURSE OUTLINE :

Surface mining is the most popular mining technology. However, it is being challenged due to dearth of near surface deposits and socio-environmental constraints. With the invention of large scale equipment, innovative technologies and strategic planning surface mining can be carried out at a larger depth also with profit. Basic knowledge of surface mining is thus important for the mining engineers. This course is thus designed to provide the basic surface mining technology to the students.

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) prior to work in the field of Tunneling and Mining sector for few years. Prior to join I. I. T. Kharagpur, Dr. Kaushik Dey was an Assistant Professor in Department of Mining Engineering at National Institute of Technology, Rourkela and at Indian School of Mines, Dhanbad. His research area includes excavation of rock by blasting or by mechanical cutting, mining operations, surface mining, whole body vibration etc. He has published around thirty five research papers in different journals apart from many others presented in the national/international conferences.

COURSE PLAN :

- Week 1:** Introduction to Surface Mining, Current status and challenges, Understanding rocks, minerals and deposits
- Week 2:** Cut off grade, Surface mining phases and surface mining systems, Surface mining Excavations and unit operations.
- Week 3:** Drilling and blasting for surface mines
- Week 4:** Shovel and dumper operation for surface mining excavations
- Week 5:** Operation of Dozer and dragline
- Week 6:** Operation of continuous surface miner
- Week 7:** Operation of bucket wheel excavator and bucket chain excavator
- Week 8:** Transportation system for surface mines and expit transportation
- Week 9:** Design and maintenance of haul roads
- Week 10:** Stability assessment of pit slopes and dump designs
- Week 11:** Sea bed mining, dimensional stone mining
- Week 12:** Safety Environment and mine closure