

MIPC2003 SURFACE MINING TECHNOLOGY (3-0-0)

Module-I:(6Hours)

Introduction to Surface Mining, Current status and challenges, Understanding rocks, minerals, and deposits, types of surface mining system-applicability, advantages, disadvantages, classification and choice, Surface mining Excavations, and unit operations.

Module-II:(12Hours)

Elements of surface mine planning include the concept of Cut off grade, stripping ratio, boxcut, and its type, the mine opening, formation of benches, bench geometry, bench slope, and overall pitslope, push-back operation, and factors affecting the push-back operation, Stability assessment of pit slopes, and Dumping operations Types of dumps and their formation –Internal and external dumps. Design of Dumps.

Module-III:(10Hours)

Drilling and its type, Drilling Technology for surface blasting. Blasting, types of explosives, classification, and properties of explosives, Technology for surface blasting.

Module-IV:(12Hours)

Surface mining loading equipment, their selection, and limitations such as - Shovels, Surface Miners, Draglines, Bucket Wheel Excavators, Front End Loaders, and Scrappers. Haul road, Type and mode of transport and their selection criteria - Dumpers, Conveyors, and Pipe Line Transport System. Operation, Application, Limitations.

Module-V:(6Hours)

Power System, In-pit water management, pumping system, lighting, and communication infrastructure, Mine waste management, solid waste dump, precaution to be taken against runoff water, Introduction to placer deposits, the effect of surface mining on the environment, and mitigating measures.

Module-VI:(4Hours)

Mine closure plan and different types of mine closure methods.

Books:

1. Surface Mining, G.B.Mishra, Geominetech Publications, Bhubaneswar, 1st edition, 2007
2. Surface Mining Technology, S.K.Das, Lovely Prakashan, Dhanbad, 1st edition, 1994
3. Open Pit Mine Planning and Design, W.Hustrulid and M.Kuchta, Volume-1, A.A.Balkema, 1st Edition, 1995
4. Elements of Mining Technology, Volume-1, D. J. Deshmukh, Denett & Company, 2016