

MINING ENGINEERING – SYLLABUS

i. Mine Surveying:

Levels and Leveling, "theodolite", tacheometry, triangulation, Contouring-Errors and Adjustments- Correlation-Underground Surveying, Curves, Photo Grammetry, Field Astronomy- EDM and Total Station- Introductory GPS.

ii. Geomechanics:

Geo-technical properties frocks-Rock mass classification- Instrumentation and Stress Management techniques- Theories of rock failure- Ground Vibrations-stress distribution around mine openings- Subsidence- Rock bursts and coal bumps- Slope Stability.

iii. Mining Methods:

Surface Mining- Layout, development, loading, transportation and mechanization, continuous surface mining systems-Underground coal mining, Bord and pillar systems, room and pillar mining, long wall mining, thick seam mining methods, highwall mining-underground metal mining-open, supported and caved stoping methods, stope mechanization, ore handling systems.

iv. Mining Machinery:

Generation and transmission of mechanical, hydraulic and pneumatic power-Materials handling: haulages, conveyors, face and development machinery, hoisting systems, pumps, crushers.

v. Surface Environment:

Air, water and soil pollution-Standards of quality, causes and dispersion of contamination, and control, Noise, Land reclamation.

vi. Subsurface Hazards:

Mine Gases. Underground hazards from fires, explosions, dust and inundation- Rescue apparatus and practices- Safety in mines- Accident data analysis- Mine lighting; Mine legislation-Occupational safety, legislative provisions with respect to open cast mining, Mine Economics- Mineral resource classification, Discounted cash flow analysis-Mine valuation; Mine investment analysis-Mineral taxation.

vii. Mine Planning:

Sampling methods, practices and interpretation-Reserve estimation techniques: Basics of geo statistics and quality control, Optimization of facility location-Work, study.

viii. Systems Engineering:

Concepts of reliability, Reliability of simple systems, Maintainability and availability, Linear programming, transportation and assignment problems, Network analysis, Inventory models, Queuing theory- Basics of simulation.