

**ANNEXURE – I  
SYLLABUS FOR THE EXAMINATION FOR FIRST CLASS MANAGER'S  
CERTIFICATE OF COMPETENCY  
MINE MANAGEMENT, LEGISLATION AND GENERAL SAFETY**

**MINE MANAGEMENT**

**Introduction:** Evolution of management; theory and practice; principles of scientific management; elements of management function; planning; organization and control; structure and design of organization for mining enterprises.

**Personal Management and Organizational behavior Selection:** Selection, training and development of human resources for mining enterprises; leadership; study of traditional leader behaviour; autocratic, democratic and Laissez-Faire behaviours; conflict management; conflict in organization; sources of conflict; dealing with conflict; organizing for conflict resolution; conflict and growth; individual motivation; two way personal communication.

**Production Management:** Determination of norms and standards of operations by work study, analysis of mine capacities and capability; production planning, scheduling and control; short term and long term planning; productivity; concepts and measurements; application of Ergonomics in mine operation.

**Financial Management:** Capital budgeting; techniques for mining project evaluation; payback period and IRR; methods of cost analysis and cost control; break-even charts; working capital management; ERP (Enterprise Resources Planning).

**Mining Environment:** EIA (Environment Impact Assessment), EMP (Environment Management Plan), ETP (Effluent Treatment Plant), STP (Sewerage Treatment Plant), threat to environment from underground and surface mining, means of mitigation, treatment of pollutants, monitoring systems, water management; mine closure plan; R&R (rehabilitation and re-settlement). RFCTLARR Act, 2013 and laws related to forest land. Technical and biological reclamation and top soil management.

**Economic Impact of Mining:** Economics of mining effect on community –before, during and after mining; corporate social responsibility (CSR).

**Materials Management for mining sector:** ABC analysis, Inventory Management.

**Behavioural Sciences for Management:** Conflict management; conflict in organization; sources of conflict; dealing with conflict; organizing for conflict resolution; conflict and growth; Individual motivation; two way personal communication.

**Industrial Accident:** Study of human factors of industrial accidents; their causes and remedies.



## LEGISLATION

**Health and Safety Laws:** The Mines Act, 1952; Mines Rules 1955, Coal Mine Regulation, 2017, Mines Rescue Rules, 1985, provisions of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010 applicable to mines; Mine Vocational Training Rules, 1966, other rules and legislation as applicable to opencast coal mines.

## GENERAL SAFETY

**Safety in Mines:** Duty of Care, Occupational hazards of mining, causes and prevention of accidents and their classification; accident statistics; frequency rate and severity rates; cause-wise analysis, basic causes of accident occurrence; investigation into accidents and accident report; in-depth study into various causes of accidents, measures for improving safety in mines; TRAP (take responsibility in accident prevention); cost of accident; SMP (Safety Management Plan); Elements of SMP, Preparation of SMP, Standard Operating Procedure (SOP) and Hazard Management Plans in opencast mines, dealing with accidents and emergencies in opencast mines, Causes of accident or incident,

Accident Investigation methods and steps, Accident / Incident reporting, contribution of human elements in mine safety,

Workers participation in safety management;

ISO and safety audit; safety conferences; tripartite and bipartite committees;

Role of information technology in safety management.

**Risk Management:** Theory and application, baseline, continuous and issue based risk assessment, how they are applied to technical areas, hazard identification, risk assessment techniques, Work Place Risk Assessment and Control (WRAC), Job Safety Analysis (JSA), Risk Matrix, Risk Management Options, Hierarchy of controls, Control Effectiveness, means of managing (minimizing or eliminating) risk, computer application and simulations, manager's role in risk management, due diligence, application of risk assessment and risk management with reference to due diligence, Concept of Triggered Action Response Plan (TARP).

**Airbone dust:** Generation, dispersion, measurement and control; suppression and treatment of mine dust; sampling and analysis of mine dust, Hazards due to dust in mines.

**Mine fires:** Cause of mine fires, spontaneous combustion, dealing with mine fires; firefighting organization; fires in quarries over developed pillars; coal stack and waste dump fires, Hazards due to extraction of developed pillars, its mitigation, Hazards due to extraction of fiery seam or hot strata.

**Inrush of water:** Hazards and risk of mining operations, surface and underground, near water bodies or unconsolidated mass and its mitigation

**Hazards due to Extreme weather condition in opencast mines and its mitigation**

## **Occupational hazards in mining and precautions**

**Biological Hazards, Chemical Hazards**

**Working at heights**

**Mine Gases:** Generation, Properties and Effects, Detection of Mine Gases, Methanometers and Multi Gas Detectors, Gas Chromatograph, Flame Safety Lamps

**Mine explosions:** Methane and Coal dust explosions, Explosion in quarries over developed pillars, Water gas explosion.

**Disaster management:** Emergency services, equipments and procedures, emergency control rooms, rescue and recovery; procedure and responsibilities, safety of persons engaged in emergency response, investigations and reports; assessment of damage, mine rescue; mine gases and their physiological effects; rescue equipments; resuscitation and reviving apparatus; selection and training for rescue work.

**First aid and ambulance**

**Notified and occupational diseases:** Silicosis and pneumoconiosis, physiological aspects of breathing in dust laden atmosphere; dust sampling and sampling instruments; methods of counting and analysis; other mines diseases and their symptoms; preventions and treatment.

**Lighting:** General principles of artificial lighting; lighting standards and their assessment.

**Sanitation and health in mines**

**Safety related issues in** Crushing, coal handling and transport system.

MINING GYAN

