

Chhattisgarh Swami Vivekananda Technical University, Newai

Name of the Program: Master of Technology

Semester: M.Tech.3rd sem

Subject: Environmental Aspects Of Mining

Total Marks in End Semester Exam: 100

Minimum number of Class Tests: 2

Branch: Mining Engineering

Course Code: 5039311(039)

L: 3 T: 1 P: 0 Credits: 4

Unit 1

Introduction: Sustainable development, environmental carrying capacity - concepts & principles; Environmental impacts of mining and associated activities.

Ecology: Introduction to ecology, ecosystem structures and functions.

Unit 2

Air pollution: Atmospheric composition and meteorology; Sources of air pollution – point and non-point; Emission factors; Control measures – extraction, suppression and consolidation of dust.

Noise and vibration: Basic concepts, sources, monitoring and control measures.

Unit 3

Water pollution: Global hydrological cycle; Self-purification mechanism, sources of water pollution, important parameters–pH, turbidity, oil & grease, nitrates, DO, BOD, COD; Eutrophication, deoxygenation, acid mine drainage and heavy metal pollution– preventive and control measures.

Unit 4

Land environment: Land degradation due to mining; Physical and biological reclamation.

Environmental administration: Laws related to mining environment; EIA of mining projects.

Unit 5

Land Acquisition & Revenue: Concepts: Related laws and regulations.

Corporate Social Responsibility: Concepts and principles.

Mine closure: Concepts and principles.

Chhattisgarh Swami Vivekananda Technical University, Newai

Name of the Program: Master of Technology

Semester: M.Tech. 3rd sem

Subject: Planning and Design of Mine Ventilation Systems

Total Marks in End Semester Exam: 100

Minimum number of Class Tests: 2

Branch: Mining Engineering

Course Code: 5039312(039)

L: 3 T: 1 P: 0 Credits: 4

Unit 1

Ventilation Requirements in Mines: Various systems of mine ventilation. Short- term and long-term ventilation planning.

Unit 2

Ventilation Network Analysis: Computation of volume flow using equivalent resistance and direct analysis methods. Application of Kirchhoff's laws to solve ventilation network. Linear graph theory – formation of meshes, Hardy-Cross iteration method, convergence of network analysis algorithm. Concept of compressibility of air in mine ventilation.

Unit 3

Heat Transfer: Heat transfer in mine airways due to conduction, convection and radiation, heat transfer at wet surfaces, sources of heat in longwall working panels and computation of heat load in mines. Design of auxiliary ventilation system for long heading and longwall panel.

Unit 4

Recirculation of Mine Air: Concept of controlled recirculation, design of controlled recirculation system for long heading and working panel. Application of tracer gas in mine ventilation system study – concept, desirable properties, estimation of air quantity using tracer gas technique, application in leakage and recirculation study.

Unit 5

Design of Methane Drainage Systems: Methane Control for Underground Coal Mines, Prediction and Control of Methane Emissions on Longwalls and Bord & pillar mining, Design of Methane Drainage Systems.