5398 - MINE ENVIRONMENTAL POLLUTION & CONTROL

Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)			
					Theory		Practical Ex.	Total
Lectures	Practical	Credits						
2	2	4	25	25	3 Hrs	100	50	200

Pre-requisite	Source
3012	MIN

Semester	Theory	Test	Total	TW	PR	Gr Total
	75	25	100	50	—	150

Rationale: Due to the increased demand for raw materials, the mining activity is required to progressively increase. However mining is associated with various environmental impacts which hinders in progress. The need is more stress on sustainable development. The diploma holder in mining engineering should be able to execute the mining activities with environmental consciousness. He should be competent to measure and mitigate pollution.

COURSE CONTENTS	Hrs	Mks
1. INTRODUCTION Brief introduction to environment and ecosystem, objective, goals, guiding principles of environmental education, Environment Education programmes, Environment Education in India and role of Environmental Organisations/ agencies viz: MAB, NGO's, Governmental bodies. Brief idea about environmental effects of explorations, extraction, beneficiation, surface and U/G mining activities. Introduction to ISO – 1400 and use of Biotechnology.	2	10
2. AIR POLLUTION & CONTROL Causes of air pollution in mines and pollutants, definition of SPM, RPM, effects of pollution, control measures, permissible limits, occupational hazards due to air pollutants. Measurement of air quality & related instrumentation (like HVS, etc.). Pollution Control through law. Salient features of the Air Act – 1987.	5	15
3. WATER POLLUTION & CONTROL Causes of water pollution in mines and pollutants, Definition of BOD, COD. Importance of tailing storage, objectives, site subility of tailing storage, design process of tailing facilities. Methods of water quality monitoring and related instrumentation. Instrumentation is limited to PH, Conductivity, TSS, turbidity, two heavy metals calculation. Water management in mines. Introduction to acid mine drainage. Main provisions of The Water Cess Act - 1980	5	15
4. NOISE POLLUTION & GROUND VIBRATION Sources of noise in mines, properties of noise (i.e. loudness & frequency), effects of noise, standards of noise, control of noise, occupational hazards related to noise, monitoring of noise and instrumentation, vibrations, causes, effects, standards, control methods, monitoring of ground vibrations (Blast induced ground and due to moment of HEMM).	4	15
5. REHABILITATION OR RECLAMATION Definition, introduction, principle, methods of rehabilitation, procedure of rehabilitation. Reclamation, introduction, types of reclamation, reclamation plan, content, standards of reclamation, cost of reclamation, afforestation a need & statutory provisions under MCDR. Main provisions of the Forest Act – 1980 and the Forest Rules – 1981, Forest clearance for mining projects.	4	10
6. SOLID WASTE MANAGEMENT IN MINES Definition of solid waste, sources of solid waste in mines, overburden disposal & ore stocking – effects of the same, erosion & sedimentation of solid waste, environmental impacts of mine solid waste, restoration of the waste disposal sites, disposal practices in India.	3	10

	9	25

7. ENVIRONMENTAL PLANNING & EIA

Environmental planning procedures, environmental planning team, types of permits & approvals required for mining projects, Environmental policies. Environmental Impact Assessment, definition, EIA methodology, legislative requirements, stages, financial aspects, levels of assessment, Elements of EIA documents. Environmental Auditing:- Definition, reasons for conducting environmental auditing, types of audits, procedure, outcomes of environmental audits. Other important notifications issued by MOEF (i.e. Environment Audit notification 1992, EIA notification 1994), Main provisions of Environment (Projection) Act – 1986, The Wildlife Act – 1972, National Conservation Strategy – 1992.

Total	32	100

PRACTICALS:

(A minimum of eight practicals should be completed by each student)

1. To measure and calculate suspended particulate matter.
2. To measure and calculate respirable particulate matter.
3. To measure and calculate Biological Oxygen Demand.
4. To measure and calculate Chemical Oxygen Demand.
5. To measure and calculate PH of mine water.
6. To measure and calculate total suspended solids.
7. To measure and calculate total dissolved solids.
8. To measure and calculate the turbidity of mine water.
9. To measure the content of Mg present in mine water.
10. To measure the amount of noise at different locations of mines.
11. To measure the intensity of light.
12. To measure the Blast Induced Vibration.
13. To visit the mine reclaimed site to calculate the plant density.
14. To study the EIA of a mine.

REFERENCE BOOKS:

1. Ecology & Environment by Dr. P. D. Sharma.
2. Best Practice Environment by Environment Protection Agency Management in Mines.
3. Open pit mine planning & Design by W. Hustrulid.
4. Mining Environment & Forests by R. K. Suri.
5. Mining Environment by Dr. B. B. Dhar.
6. The Environment (Protection) Act – 1986.
7. The Air Act – 1981; The Wildlife Act – 1972.
8. The Forest Act – 1980; The Forests Rules – 1981.
9. Environmental Effects of Mining by Earle A. Ripley.
10. Disposal of Solid Waste in Indian Mines, IBM/IC/02 of 1994.