

School of Engineering & I.T.

MATS University

Raipur



Syllabus Scheme
(Vth Semester)
For
Bachelor of Technology
Mining Engineering

Subject Code for School of Engineering & I.T. Deptt.

Vth Semester (Mining)

S.No.	Subject Code	Subject Name
1.	BT560	Mine Ventilation
2.	BT561	Mine Management
3.	BT562	Mine Legislation – I
4.	BT563	Mine Machinery – I
5.	BT564	Surface Mining - I
6.	BT565x	Open Elective – II
7.	BT566	Vocational & Industrial Training Evaluation and presentation
8.	BT567	Mine Ventilation Laboratory
9.	BT568	Mine Machinery – I Laboratory
10.	BT569	Surface Mining - I Laboratory

Open Elective-II

Subject Code	Subject Name
BT5651	Environment and Ecology
BT5652	Energy Management
BT5653	Safety Engineering
BT5654	Construction Management
BT5655	Geo-tech Engineering



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Scheme of Teaching & Examination

V - Semester

S.N.	code	Subject	Periods per week			Scheme of marks		Total Credit
			L	T	P	ESE	IM	
1.	BT560	Mine Ventilation	4	0	-	70	30	4
2.	BT561	Mine Management	3	0	-	70	30	3
3.	BT562	Mine Legislation – I	4	0	-	70	30	4
4.	BT563	Mine Machinery – I	4	0	-	70	30	4
5.	BT564	Surface Mining - I	4	0	-	70	30	4
6.	BT565x	Open Elective – II	3	0	-	70	30	3
7.	BT566	Vocational & Industrial Training Evaluation and presentation	-	-	2	30	20	1
8.	BT567	Mine Ventilation Laboratory	-	-	2	30	20	1
9.	BT568	Mine Machinery – I Laboratory	-	-	2	30	20	1
10.	BT569	Surface Mining - I Laboratory	-	-	2	30	20	1
Total			22	0	8	540	260	26

L – Lecture, T – Tutorial, ESE – End Semester Examination,
P – Practical, IM – Internal Marks (Include Class Test & Teacher's Assessments)

Subject Code	Subject Name
BT5651	Environment and Ecology
BT5652	Energy Management
BT5653	Safety Engineering
BT5654	Construction Management
BT5655	Geo-tech Engineering

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Semester: B.Tech. Vth Sem.

Subject: - Mine Ventilation

Total Lecture Periods/Week : 4

Total marks in end semester Exam:100

Minimum Number of Class test to be conducted: 02

Branch: - Mining Engineering

Code : - BT 560

Total Tutorial Periods/Week: 00

Total Practical Periods/Week: 02

Course Objectives:

1. Determine the quantity of air flow in mine roadways and mine ducts.
2. Discuss the mine doors, regulators, stoppings, air crossing and air locks.
3. Explain types of mine fans, their characteristics, suitability and selection of fans
4. Discuss the auxiliary and booster fans, series and parallel operation of fans.
5. Explain ventilation survey in underground mines and computer application in mine ventilation.

Course Outcomes:

1. The students are expected to possess ability to identify, formulate and solve quantity of air flow in mine road ways, equivalent resistance of mines, types of fans used in mines.
2. The students are expected to possess ability to use the techniques, skills, and modern engineering tools necessary for mine ventilation in underground mines.

UNIT I: Theory of Ventilation

Objects and standard of ventilation , Flow of air in ducts and mine roadways, Resistance of air ways, Laws of ventilation, Chezy's and Atkinson's equations, Equivalent resistance and equivalent orifice of mine, Regulations related with above topics .

UNIT II: Natural Ventilation

Definition, Natural Ventilation and its Measurements, Thermodynamics of Natural Ventilation, Distribution and Control of air Current, Doors, Regulators, Stoppings and Their Types, air Crossings, Airlocks.

UNIT III: Mechanical Ventilation

Theory of mine fans, Types of mine fans, their characteristics & suitability, Selection of fans. Auxiliary and booster fans, series and parallel operation of fans, mine characteristic and selection of mine fans, fan drift and ease, forcing and exhaust ventilation, reversal of ventilation, ventilating of headings.

UNIT IV: Ventilation Survey

Objects of ventilation survey, Instruments for the measurement of pressure, velocity and quantity of air.

UNIT V: Ventilation Systems & Planning

Calculation of pressure and quantity requirements, network problems, Hardy-cross method, Ventilation planning and economic analysis, central and boundary ventilation, accessional and declensional ventilation, antitropical , homotropical ventilation

Text Books:

1. Mine Environment . By G.B. Mishra
2. Elements of Mining Tech. Vol.2 by D. J. Deshmukh

Reference Books:

1. H. L. Hartman, Mine Ventilation and Air Conditioning, John Wiley, Paperback edition, 1989.
2. H. L. Hartman, J. M. Mutmansky, R. V. Ramani and Y. J. Wang, Mine Ventilation And Air Conditioning, Wiley-interscience, 3rd Edition, 1997
3. Edition, 1997
4. S. P. Banerjee, Mine Ventilation, Lovely Prakashan, 1st Edition, 2003
5. M. A. Ramlu, Mine Disaster and Mine Rescue, Oxford & IBH, 1999.

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Semester: B.Tech. Vth Sem.

Subject: - Mine Management

Total Lecture Periods/Week : 3

Total marks in end semester Exam: 100

Minimum Number of Class test to be conducted: 02

Branch: - Mining Engineering

Code : - BT 551

Total Tutorial Periods/Week: 00

Total Practical Periods/Week: 02

Course Objective

To choose proper method of sampling for different ore bodies and mineral heaps.

To estimate grade and reserves.

To choose proper method of mine valuation for valuation of any mine and also able to determine the NPV of any mine.

To perform various financial management aspects related with the mine.

Course outcomes:

Apply knowledge of mine economics for understanding, formulating and solving problems related with the mine economics.

Identify analyze and solve financial management problems.

Acquire knowledge and hands-on competence in applying the concepts of management in the development of mine economics

UNIT 1: Evolution of Management

Theory - Principle of Scientific management, Elements of management functions, Planning, Organizing and Control, Levels of Management. Structure and design of organization for mining enterprises.

UNIT 2: Personnel Management

Selection, training and development of human resources, Job evaluation, job analysis, incentive and theories of motivation, Productivity, its concept and measurement, Leadership and Communication.

UNIT 3: Production Management

Determination of norms and standards of operations by work study, work measurements, production planning, Scheduling and control, Queuing theory, short and long term planning, Quality control, introduction to MIS, Material Management

UNIT 4: Industrial Psychology

Its relation with other branches of knowledge, studies of physical factors and their effect on man, Industrial relations, Human relations, trade union movements in India

UNIT 5: Industrial Act and Laws

Industrial Dispute Act, Industrial Trade Union Act, Analysis of industrial disputes, Prevention and settlement of industrial disputes, Payment of wages act, Workmen's compensation act, Contract labour laws. Payment of wages act, Strike & lockout, Illegal strikes & Lock out.

References :

1. Mine Management: V. N. Singh , Print Press Dhanbad
2. Management & Administration: S.K.Gupta
3. Introduction to management: O.P. Khanna , Dhanpat Rai Publication

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Semester: B.Tech. Vth Sem.

Subject: - Mine Legislation I

Total Lecture Periods/Week : **4**

Total marks in end semester Exam: **100**

Minimum Number of Class test to be conducted: **02**

Branch: - Mining Engineering

Code : - BT 562

Total Tutorial Periods/Week: **00**

Total Practical Periods/Week: **00**

Course Objective

- To know the various rules & regulations applicable in different conditions to the mine workers, managers and mine owner.
- To know the responsibility and duties of the various employee of the mine and owner of the mine

Course outcomes:

- Apply knowledge of legislation in mines for the implementation of rules and regulations during their job.
- Work effectively with other engineering and science teams for suggesting any measures against any mine accidents.

_ General Principles of Mining Law, Development of mining legislation in India.

_ Mines Act – 1952 & Mines Rules – 1956

_ Coal Mines Regulations –1957 & Metalliferous Mines Regulation-1961

_ Mine crèche Rules & Pit Head Bath Rule

_ Mine Vocational- training Rules.

References: -

- 1) Legislation in Indian Mines (A critical Appraisal) Vol. II & I By- S. D. Prasad & Prof. Rakesh
- 2) CMR-1957 & MMR-1961 L. C. Kaku.
- 3) Mines Act-1952 & Mines Rules-1955 L. C. Kaku.
- 4) Vocational Training Rules L. C. Kaku.
- 5) Mine Accidents S. J. Kejeriwal

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Semester: B. Tech. Vth Sem.

Subject: - Surface Mining I

Total Lecture Periods/Week : 4

Total marks in end semester Exam:100

Minimum Number of Class test to be conducted: 02

Branch: - Mining Engineering

Code : - BT 564

Total Tutorial Periods/Week: 00

Total Practical Periods/Week: 02

Course Objective

- To choose proper surface mining methods to different mineral deposits depending on their geo-mining conditions.
- To design and analyze basic elements of surface mine.
- To learn various methods of surface mining.
- To choose various methods of transportation in any opencast mine.
- To learn the construction & working of various machineries used in open cast mine.

Course outcomes:

- Apply knowledge of surface mining for understanding, formulating and solving problems related with the opencast mine.
- Acquire knowledge and hands-on competence in applying the concepts in the design and development of opencast mine
- Work effectively with other engineering and science teams.

UNIT I: Open Pit Design and Layouts

Important parameters of Open pit design; Design of Benches, Ultimate pit design, Stripping ratio, Breakeven stripping ratio, Different methods of opening up the deposits; Box cuts, internal and external box cut, Methods of driving Box cuts; Layout of open pits; Layout of waste dumps, unit operations in opencast mining.

UNIT II: Rock Breakage

Theory of Rock Drilling, Different Types of Drill Machines Used in Open Pits; Rotary, Percussive and Rotary Percussive Drilling, Selection of Drill Machines; Computation of Productivity of Drill Machines; Inclined Drilling; Their Advantages and Disadvantages. Introduction to Different Types of Explosives Used in Open Cast Mining.

UNIT III: Site preparation

Dozers, Scrapers, Front-End Loaders etc.; Their Construction, Operation, Suitability and Applicability; Calculation of Their Productivity;

UNIT IV: Loading and Excavation

Different Types of Excavators used in Open Pits; Shovel, Dragline, Hydraulic Excavators, Multi Bucket Excavators, Their Construction, Operation, Suitability and Applicability; Calculation of Their Productivity.

UNIT V: Transport in open pits

Automobile Transport, Rail Transport and Conveyors; Their Suitability; Computation of Their Productivity; Land Reclamation and its Methods. Application of Computers in Open Pit Mining.

References:

1. Surface Mining: G.B. Misra
2. Surface mining equipment: Martin
3. Surface Mining: Pfeleider
4. Mining: Boki
5. SME handbook: Hartman

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Semester: B.Tech. Vth Sem.

Subject: - Mine Machinery I

Total Lecture Periods/Week : 4

Total marks in end semester Exam: 100

Minimum Number of Class test to be conducted: 02

Branch: - Mining Engineering

Code : - BT 563

Total Tutorial Periods/Week: 00

Total Practical Periods/Week: 02

Course Objective

- To choose proper transportation system for shaft, incline and roadways in underground mines depending on the geo-mining conditions of the mineral deposit.
- To calculate and analyze basic element of haulage system and winding system.
- To learn the construction and working of various haulage system and winding system.
- To learn the construction and working of various pumps.

Course outcomes:

- Apply knowledge of mine machinery for understanding, formulating and solving transportation problems in underground mine.
- Acquire knowledge and hands-on competence in applying the concepts in the design and development of transportation systems.
- Work effectively with other engineering and science teams.

UNIT I: HAULAGE

Different systems of rope haulage, rope haulage calculations, Rope cattles and changing the Ropes, safety devices, tubs, haulage road and manholes, locomotive haulage and calculations based on it, track laying, mine cars.

UNIT II: WINDING & SPEED CONTROL

Head gear arrangement, shaft fittings, safety devices, cages & skips, their suspension arrangements. Location of winding engine, Electric winders, winding drums, types of construction, mechanical & electrical breaking, safety devices on winders, Electrical & Electronic methods of speed control, automatic winding, Torque- time & power- time diagram; Pit top and pit bottom arrangements.

UNIT III: PUMPING

Sources of mine water, types of pumps, design calculations, characteristics, operation, and maintenance and selection, pump fittings, special types of pumps used in mines.

UNIT IV: Aerial ropeways

Different types, their constructions & installation, operation & maintenance, design calculation, their layout including rope-tensioning arrangements.

UNIT II: Conveyors

Different types of belt conveyors, their construction, installation, maintenance & design calculations, Shaker conveyor, scraper chain conveyor and armored chain conveyor, their installation & construction maintenance. Safety Devices; Pit top and pit bottom arrangements.

Text Books

1. Elements of Mining Tech. Vol I & Vol III by D. J. Deshmukh
2. Mining Machinery By S. C. Walker

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Semester: B.Tech. Vth Sem.

Subject: - Safety Engineering

Total Lecture Periods/Week : 3

Total marks in end semester Exam: 100

Minimum Number of Class test to be conducted: 02

Course Objective:

To improve knowledge about accidents, cost analysis, Safety in Operation and Maintenance Operational activities and hazards

Course outcomes:

Learners know about all safety knowledge use in mining field.

UNIT – I

Safety Philosophy and principles of Accident prevention Introduction, accident, injury, unsafe act, unsafe condition, reportable accidents, need for safety, break down of accidents, hazardous industries. Theories & Principle of accidents Casualty, cost of accident, computation of cost, utility of cost data. Accident reporting & Investigation Identification of the key facts, corrective actions, classification of facts. Regulation American (OSHA) and Indian Regulation.

UNIT – II

Safety Management Division of responsibility, Location of Safety function, size of safety department, qualification for safety specialist, safety committee – structure and functions.

UNIT – III

Safe Working Condition and Their Development SOP for various Mechanical equipments, Incidental safety devices and methods, statutory of provisions related to safeguarding of Machinery and working condition.

UNIT – IV

Safety in Operation and Maintenance Operational activities and hazards, starting and shut down procedures, safe operation of pumps, Compressor, heaters, reactors, work permit system, entry into continued spaces.

UNIT – V

Safety in Storage and Emergency Planning Safety in storage, handling of chemicals and gases, storage layout, ventilation, safety in chemical laboratories, emergency preparedness on site plan, off site plan, toxic hazard control.

TEXT BOOKS

Safety and Accident Prevention in Chemical Operation – H.H. Fawcett and Wood Personal Protective Equipment – NSC Bombay

REFERENCE BOOKS

Ergonomics - P. Krishna Murthy

Fire Prevention Hand Book – Derek James

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Semester: B.Tech. Vth Sem.

Subject: - Geotech Engineering

Total Lecture Periods/Week : 3

Total marks in end semester Exam:100

Minimum Number of Class test to be conducted: 02

Course Objective:

To improve knowledge about soil, stokes law, effective stress,

Course outcomes:

Learners get knowledge about geotech engineering.

Unit I: INTRODUCTION

Introduction to Geotechnical Engineering; Unique nature of soil; Soil formation and soil types, inter relationship of soil, soil mechanics and geotechnical engineering, aim and scope of soil mechanics. Index Properties of Soil, Basic definitions; phase relations; physical and engineering properties of soil, soil grain and properties, coarse and fine grained soils, Stoke's law, method of fine grained analysis.

Unit II: SOIL CLASSIFICATION AND EFFECTIVE STRESS

Indian standard soil classification system, Purpose of soil Classification, Different System of soil Classification, Field Identification, Principal of Effective Stress and Related Phenomena, Types of soil moisture, principal of effective stress; capillarity; seepage force and quicksand condition,

Unit III: COMPACTION, PERMEABILITY AND SEEPAGE ANALYSIS OF SOIL

Clay mineralogy, soil structure, compaction theory, laboratory compaction tests, method of compaction control, permeability, one dimensional flow, permeability of soil, Darcy's law, laboratory methods of determination, pumping out tests for field determination of permeability, seepage through soils, two-dimension flow problems, confined flow and unconfined flow, flow ness and their characteristics, exit gradient and failure due to piping, criteria for design of filters.

Unit IV: STRESSES DUE TO APPLIED LOADS AND CONSOLIDATION

Stresses due to applied Loads, Boussinesq equation of vertical pressure under concentrated loads, rectangularly loaded area, circular Loaded Area Newmart's Chart, Westergoard's equation, compressibility, effects of soil type, stress history and effective stress on compressibility, consolidation, factors affecting consolidation and compressibility parameters. normally consolidated and over consolidated soils, different forms of primary consolidation equation – transient flow condition, Terzaghi theory of one-dimensional consolidation and time rate of consolidation.

Unit V: Shear Strength and Soil Exploration

Introduction, stress at a point and Mohr's stress circle; Mohr-Columb Failure criterion: Laboratory tests for shear strength determination; shear strength parameters; UU, CU and CD tests and their relevance to field problems; Shear strength characteristics of normally consolidated and reconsolidated clays; Shear strength Characteristics of sands, Soil Exploration, Various Method of field Exploration, Undisturbed Soil Sampling equipments and Field test (Static & Dynamic Penetration Test, PLT), cyclic plate load test and modern electronic test of site characterisation.

Name of Text Books:

Soil Mechanics and Foundation Engineering – B.C. Punmia (Laxmi Publication)

Soil Engineering in Theory and Practice (Vol-II) – Alam Singh (Asia Publishing House, New Delhi)

Name of Reference Books:

Soil Mechanics and Foundation Engineering – S.N. Murthy (Dhanpat Rai Publications)

Basic and Applied Soil Mechanics – Gopal Ranjan & Rao A.S.R. (New Age International, New Delhi, 1998)

Design Aids in Soil Mechanics and Foundation Engineering – S.R. Kaniraj (Tata McGraw Hill, New Delhi)

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Semester: B.Tech. Vth Sem.

Subject: - Environment & Ecology

Total Lecture Periods/Week : 3

Total marks in end semester Exam: 100

Minimum Number of Class test to be conducted: 02

Branch: - Mining Engineering

Code : - BT 5651

Total Tutorial Periods/Week: 00

Total Practical Periods/Week: 00

Course Objective

To learn various kind of pollutants and their causes and preventive measures.

To know the salient features of environmental laws in India.

To know the various types of occupational diseases in the mine.

To measure the level of pollution i.e. Noise level, air pollution level etc..

Course outcomes:

Apply knowledge of pollution control for understanding and solving different types of environmental pollution problem in any mine.

Identify, analyze, control and solve environmental pollution problems.

UNIT I: General:

Environmental segments, environmental degradation, environmental impact assessment. Concept of Ecosystem: Fundamental of Ecology and Ecosystem, components of ecosystem, food-chain, foodweb, trophic levels, energy flow, cycling of nutrients, major ecosystem types (forest, grass land and aquatic ecosystem).

UNIT II: Air Pollution:

Atmospheric composition, energy balance, classification of air pollutants, source and effect of pollutants – Primary (CO, SO_x, NO_x, particulates, hydrocarbons), Secondary [photochemical smog, acid rain, ozone, PAN (Peroxy Acetyl Nitrate)], green house effect, ozone depletion, atmospheric stability and temperature inversion, Techniques used to control gaseous and particulate pollution, ambient air quality standards.

UNIT III: Water Pollution:

Hydrosphere, natural water, classification of water pollutants, trace element contamination of water, sources and effect of water pollution, types of pollutants, determination and significance of D.O., B.O.D., C.O.D. in waste water, Eutrophication, methods and equipment used in waste water treatment preliminary, secondary and tertiary.

UNIT IV: Land Pollution & Noise Pollution:

Lithosphere, pollutants (agricultural, industrial, urban waste, hazardous waste), their origin and effect, collection of solid waste, solid waste management, recycling and reuse of solid waste and their disposal techniques (open dumping, sanitary land filling, thermal, composting). Noise Pollution: Sources, effect, standards and control.

UNIT V: Environmental Biotechnology:

Definition, current status of biotechnology in environmental protection, bio-fuels, bio-fertilize, bio-surfactants, bio-sensor, bio-chips, bio-reactors. Pollution Prevention through Biotechnology: Tannery industry, paper and pulp industry, pesticide industry, food and allied industry.

TEXT BOOKS:

1. Environment and Ecology by Piyush Kant Pandey and Dipti Gupta (Sum India Publication)
2. A Textbook of Environmental Chemistry and Pollution Control by S.S. Dara (S. Chand and Company)

REFERENCE BOOKS:

1. Masters, G.M. Introduction to Environment Engineering and Science (Prentice Hall of India).
2. Environmental Chemistry by A.K. Dey (Eastern Ltd.).
3. Environmental Chemistry by B.K. Sharma (Krishna Prakashan).
4. Nebel B.J. Environmental Science (Prentice Hall of India-1987).
5. Environmental Biotechnology by S.N. Jogdand (Himalaya Publishing House).
6. Introduction to Environmental Biotechnology by A.K. Chatterji (Prentice Hall of India).

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Semester: B.Tech. Vth Sem.

Subject: - Energy Management

Total Lecture Periods/Week : 3

Total marks in end semester Exam:100

Minimum Number of Class test to be conducted: 02

Course Objective: To improve knowledge about energy performance, optimizing input energy requirements.

Course outcomes: Learners know about energy management.

Branch: - Mining Engineering

Code : - BT 5652

Total Tutorial Periods/Week: 00

Total Practical Periods/Week: 00

Unit -01: General Aspects

General Philosophy and need of Energy Management: Definition and Objective of Energy Management, General Principles of Energy Management, Energy Management Skills, Energy Management Strategy. Energy Audit: Need, Types, Methodology and Approach. Energy Management Approach, Understanding Energy Costs, Bench marking, Energy performance, Matching energy usage to requirements, Maximizing system efficiency, Optimizing the input energy requirements, Fuel and Energy substitution.

Unit -02: Procedures and Techniques

Data gathering : Level of responsibilities, energy sources, control of energy and uses of energy get Facts, figures and impression about energy /fuel and system operations, Past and Present operating data, Special tests, Questionnaire for data gathering. Analytical Techniques: Incremental cost concept, mass and energy balancing techniques, inventory of Energy inputs and rejections, Heat transfer calculations, Evaluation of Electric load characteristics, process and energy system simulation. Evaluation of saving opportunities: Determining the savings in Rs, Noneconomic factors, Conservation opportunities, estimating cost of implementation. Energy Audit Reporting: The plant energy study report- Importance, contents, effective organization, report writing and presentation.

Unit -03: Energy Policy Planning and Implementation

Key Elements: Force Field Analysis, Energy Policy-Purpose, Perspective, Contents and Formulation. Format and Ratification, Organizing: Location of Energy Manager, Top Management Support, Managerial functions, Role and responsibilities of Energy Manager, Accountability. Motivating – Motivation of employees, Requirements for Energy Action Planning. Information Systems: Designing, Barriers, Strategies, Marketing and Communicating Training and Planning.

Unit -04: Energy Balance & MIS

First law of efficiency and Second law of efficiency, Facility as an Energy system, Methods for preparing process flow, Materials and Energy Balance diagram, Identification of losses, Improvements. Energy Balance sheet and Management Information System (MIS) Energy Modeling and Optimization.

Unit -05: Energy Audit Instruments

Instruments for Audit and Monitoring Energy and Energy Savings, Types and Accuracy

Reference Books:

1. Energy Management: W.R.Murphy, G.Mckay (Butterworths).
2. Energy Management Principles: C.B.Smith (Pergamon Press).
3. Efficient Use of Energy : I.G.C.Dryden (Butterworth Scientific)
4. Energy Economics -A.V.Desai (Wiley Eastern)
5. Industrial Energy Conservation : D.A. Reay (Pergamon Press)
6. Energy Management Handbook – W.C. Turner (John Wiley and Sons, A Wiley Interscience Publication)

Department of Mining Engineering

List of Experiment

Subject: Mine Machinery Lab

Code: BT-568

Maximum Marks: 50

List of experiments:

1. Study of different types of Rope cable.
2. Study of Clifton pulley.
3. Study of various safety devices on rope haulages.
4. Study of Exhaust conditioner on a diesel locomotive.
5. Study of cage suspension gear.
6. Study of Detaching safety hook.
7. Study of Lilly controller.
8. Study of Turbine Pump.
9. Study of Mono-cable aerial Ropeway & Bi-cable aerial Ropeway
10. Study of Loop take-up and tensioning arrangement of a belt conveyor.
11. Study of pit top and pit bottom arrangements for a belt conveyor.
12. Study of an Armoured face Conveyor.

Department of Mining Engineering

List of Experiment

Subject: Surface Mining Lab

Code: BT-569

Maximum Marks: 50

List of experiments:

1. Study of Drivage of Internal and External Box Cut
2. Determination of Ultimate Pit Slope, Overall Ramp slope and Inter ramp slope and Design of Ultimate pit by manual methods
3. Study of Constructional features of Scrapers and the machine operation
4. Study of Constructional features of Electric Rope Shovel and the machine operation
5. Study of Constructional features of Dragline and the machine operation
6. Determination of Productivity of shovel dumper combination and synchronization of shovel dumper operated face.
7. Study of Dragline side casting operation and drawing of layout of Dragline operated faces
8. Study of Constructional features of Multi bucket Excavators and the machine operation
9. Study of working of Jack Hammer Drilling Machine
10. Study of working of Down the hole Drilling Machine

Department of Mining Engineering

List of Experiment

Subject: Mine Ventilation Lab
Code: BT-567
Maximum Marks: 50

List of Experiments to be performed:

1. Study of installation of axial flow fan.
2. Study of installation of centrifugal flow fan.
3. Study of installation and positioning of booster fan.
4. Study of characteristic curve of different fans and their comparison
5. Study of principal and working of vane anemometer
6. Study of principal and working of velometer.
7. Study of principal and working of pitot tube.
8. Study of central and boundary ventilation system.

Department of Mining Engineering

Subject: Vocational & Industrial Training Evaluation and presentation. **(at least 6 week)**

Code: BT-566

Maximum Marks: 50

Course Objective:

Whatever may be the research and developments in Rock Mechanics, the behaviour of rock is less predictable accurately. Mining Engineering is hence said to be an art more than engineering and the knowledge gained through experience is more valuable.

Instructional Objective:

The training enables the students to experience with the practical applications of the theoretical learning. The outcome at the place of work is always much more than what can be learned in the class room.

Teaching Scheme:

The industrial training phase I will be organised during summer vacation after IV semester examinations for a minimum duration of six weeks. The class shall be divided into batches of 4 or 5 students and sent to pre-determined mines from where the permissions are obtained. Students may camp at the mines or elsewhere and undergo training as per the direction of mine management. Notional teaching scheme: 4 hrs /week Practical for guidance of students.

Examination Scheme:

Students shall maintain a Daily Diary to record their daily activities. They shall collect the necessary data and prepare a detail training report within two months of completion of training. The training Report neatly typed and attached with sketches, diagrams and maps shall be submitted to the department for evaluation and record.

Organisation of Training:

The training places are grouped into four as below and training at any one mine each of two different groups is compulsory.

1. Mechanised Opencast Metal Mines:

Iron ore mines in Goa, Malanjhand Copper Mines of HCL(Madhya Pradesh), Kudremukh Iron Ore Mine(Karnataka), RampuraAgucha Mines of HZL (Rajasthan), Bailadilla Mines of NMDC (Chattisgarh), any other mechanised opencast mines.

2. Mechanised opencast mines in Coal:

Neyveli mines of M/s Neyveli Lignite Corporation, Kusmunda Mines of South Eastern Coalfields Ltd (Bilaspur, M.P.), Ramagundem mines of Singreni collieries co Ltd, mines of Central Coalfields Ltd., any similar mines.

3. Underground Metalliferous Mines:

Mines of Manganese Ore India Ltd., Khethri or Kolihan mines of HCL (Rajasthan), Surda or Rakha mines of HCL (Jharkhand), Dariba or Zawar mines of HZL, Hutti Gold Mines Ltd, any similar underground metal mines.

4. Underground Coal Mines:

Mines of Singreni Collieries Co Ltd (Andhra Pradesh), Mines of Western Coalfields Ltd, Mines of South Eastern Coalfields Ltd.

Essential Contents of Training Report:

1. Name of the mine along with names of owner, agent, manager and other senior officials.
2. Location and a brief history of the mine.
3. Brief geological description along with characteristics of the ore and its marketing scenario.
4. The surface features including mine entries, loading & transport arrangement of ore, disposal of waste, ore beneficiation.
5. Method of working including strata control in underground mines and dump management in opencast mines.
6. Sampling, survey, training and rescue sections.
7. Acknowledgement