Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (VI)**	Branch: **Mining Engineering**
Subject: **Mine Ventilation –II**	Course Code: **C039611(039)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **100 / 35**	L: 3 T: 1 P: 0 Credits: 4
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

Course outcome**:** Students will be able to:

1	Explain the dust concentration measurement in mines and select suitable preventive measures to control it.
2	Explain the illumination measurement in mines, standards of illumination in mines.
3	Explain miners' occupational diseases its symptoms, causes and preventive measures.
4	Classify the mine accidents and to take preventive steps to minimize the mine accidents.
5	Investigate mine accident and prepare the mine accident enquiry report.

UNIT I: MINE DUST

Classification, physiological effects, measurement of dust concentration, dynamics of small particles, sampling of air borne dust, duration and interval of sampling, different method of sampling, prevention and suppression of dust, Air cleaning methods, design of enclosures for conveyor, transfer points etc.

UNIT II: MINE ILLUMINATION

Types of portable lamps, their maintenance and examination, lamp room design and Organization Percentage and Accumulation test, light from mains, photometry and Illumination survey, standards of illumination for underground and opencast Workings.

UNIT III : HEALTH AND MINE OCCUPATIONAL DISEASES

Health of Mine employee, first aid and ambulance, comfort condition. Various mine occupational diseases, their causes, nature and preventive measures. Rules related with health of the mine workers

UNIT IV MINE ACCIDENTS

Accident and its classification, various causes of mine accidents in opencast mine and Underground mine, Preventive measure to control these accidents, relation between accident and efficiency, cost of accident: direct and indirect cost. Various major accidents occurred in Indian coal mines.

UNIT V ACCIDENT ENQUIRY

Notice of accident, criteria for preparation of enquiry report, preparation of accident enquiry reports ie..roof fall, coal dust, explosion, fire damp explosion, fire, inundation and open cast mine accidents

Text Books:

1. Mine Environment by G.B. Mishra

2. Elements of Mining Tech. Vol.2 by D. J. Deshmukh

3. Underground Mine Environment by Mcpherson

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (VI)**	Branch: **Mining Engineering**
Subject: **Mine Machinery -II**	Course Code: **C039612(039)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **100 / 35**	L: 3 T: 1 P: 0 Credits: 4
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

Course outcome**:** Students will be able to:

1	Explain the constructional features and workings of different types of aerial ropeways and calculate the capacity parameters of the aerial ropeways.
2	Explain the constructional features and workings of belt conveyors and determine its capacity.
3	Explain the constructional features and workings of chain conveyors and determine its capacity.
4	Select the suitable winding system for an underground coal mine.
5	Calculate the Motor power for a winding system.

UNIT I: AERIAL ROPEWAYS:
Different types of aerial ropeways: their constructions, installation, operation & maintenance, design calculation, their layout including rope-tensioning arrangements.

UNIT II: BELT CONVEYORS:
Construction, handling & maintenance of belt, Different types of belt conveyors: their construction, installation, maintenance & design calculations. Belt-tensioning Devices. Sequence controlling device.

UNIT III: CHAIN CONVEYORS: Shaker conveyor, scraper chain conveyor and armored chain conveyor, their installation & construction maintenance. Safety Devices; Pit top and pit bottom arrangements with conveyor system.

UNIT IV: SKIP & KOEPE WINDING

Skip types & Construction, pit top & pit bottom arrangements, advantages and disadvantages Types of koepe Winder,Koepe wheel, floating platforms, two winders working in the same shaft, winding with side by side and up and down sheaves, advantages and disadvantages Multi rope winding. Calculation of H.P.

UNIT V: HYDRAULIC TRANSMISSIONS:

Fundamental of hydrostatic compression, hydraulic fluids, hydraulic pumps, motors, cylinders and accumulators, different types of valves, hydraulic coupling and torque converters, Application in mines, Advantages of hydraulic transmission.

Text Books

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

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (VI)**	Branch: **Mining Engineering**
Subject: **Mineral Dressing**	Course Code: **C039613(039)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **100 / 35**	L: 3 T: 1 P: 0 Credits: 4
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

Course outcome: Students will be able to:

1	Explain the scope and role of mineral dressing and select the suitable crusher and grinding mill for any ore and minerals.
2	Explain various concentration methods and select the suitable concentration method for coal, bauxite, iron, copper, and sulphide ores / minerals.
3	Explain the various stages of dewatering.
4	Draw the flow chart for processing of coal, bauxite, iron, copper, and sulphide ores / minerals.

UNIT I: SIZE REDUCTION

Introduction, definition, scope and economic justification, main steps in ore dressing operations, general preliminary mineralogical investigations, **C**omminution: crushing-principles of crushing, Types of crusher, reduction jaw crushers, gyratory crushers, cone crushers, roll crushers, their classifications, applications merits & demerits. Grinding; principles of grinding, application and classification of ball mills, rod mills, tube mills and pebble mills.

UNIT II : SIZING

Object of sizing, scale of sizing, laboratory sizing, screening and classification, different type of screens, their mode of operations and application and limitation, Classification-principles of classification, movement of solids through fluids, Stroke's law, Reynolds's Number, different types of classifiers, hydraulic and pneumatic classifiers, Sampling- Importance of sampling and sampling methods.

UNIT III: GRAVITY CONCENTRATION

Jigging: - principle &applicability condition of jigging, various types of jigs flowing film concentrators: - spirals, shaking table and Wilfley table. Heavy media separation:- Principle, applications and limitations of methods. Various types of HMS separator

UNIT IV: SPECIAL SEPARATION METHODS

Froth Flotation Method:- principles of froth flotation , function of various floatation reagents, important machines, their principles, and working, floatation of sulphide, oxide and non sulphide ores. Electrostatic and magnetic separation method: Principle and field of application, their merits and demerits.

UNIT V: DEWATERING

Drying and dewatering: - thickening, filtration and drying. Different types of thickener, filter &drier.

Coal washing- Simplified flow sheets for beneficiation of coal and typical ores of copper, lead, zinc, iron and manganese ores with special reference to Indian deposits, Pelletisation of low grade iron.

Text Books

1. Ore Dressing by Gaudin

2.Ore Dressing by B. A. Wills

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (VI)**	Branch: **Mining Engineering**
Subject: **Pollution control in Mining**	Course Code: **C039631(039)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **100 / 35**	L: 2 T: 1 P: 0 Credits: 3
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

Course outcome: Students will be able to:

1	Classify the different types of pollution and explain the salient features of environmental laws in India.
2	Explain the sources of air pollution and its consequences.
3	Explain the sources and controlling measures of water, noise and soil pollution.
4	Plan the mine closure for any opencast coal mine.
5	Plan the land reclamation of any opencast coal mine.

UNIT 1: ENVIRONMENTAL POLLUTION

Introduction and classification of environmental pollution, ecological conservation. Salient features of the environmental laws in India, Occupational disease.

UNIT 2: AIR POLLUTION

Air pollution due to various gases and suspended particulate materials, causes, consequences, Green House effect, Ozone Depletion, Acid Rain, Preventive Measures against air pollution, dust sampling equipments.

UNIT 3: WATER POLLUTION

Water pollution, its causes and preventive measures, acid-mine drainage, water pollution in mines and mineral beneficiation plants, water treatment & purification schemes in brief.

UNIT 4: LAND POLLUTION

Land pollution: its causes and preventive measures, Land scape pollution and land reclamation, methods of land Reclamation, Mine closure plan.

UNIT 5: NOISE POLLUTION

Pollution due to noise and its consequences, Sources of noise, permitted level of noise, noise produced by different machinery, control and safety measures, measurement of noise level.

Reference Books :

1. Air & Water Acts
2. Forest Conservation acts
3. Legislation in Indian Mines – A Critical appraisal by Rakesh and Prasad
4. Env. Impact of Mining By Down and Stokes

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (VI)**	Branch: **Mining Engineering**
Subject: **Blasting Engineering**	Course Code: **C039632(039)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **100 / 35**	L: 2 T: 1 P: 0 Credits: 3
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): **03 Hours**

Course outcome: Students will be able to:

1	Select suitable explosive for OB and coal blasting.
2	Explain the various blasting accessories.
3	Design blast hole for opencast and underground coal mine.
4	Explain the breakage mechanism, various blasting nuisance and their remedial measures.

UNIT I COMMERCIAL EXPLOSIVES

Type of explosives, Various Commercial Explosives and their properties, Bulk Explosive Systems, Selection of explosive. Testing, Transportation and Handling of explosives and related regulations.

UNIT II INITIATION SYSTEM & BLASTING ACCESSORIES

Various types of Exploder and Detonators. Detonating cord, Safety fuse, Detonating relays Non electric initiation and blasting accessories

UNIT III SURFACE BLAST DESIGN

Factors affecting blast design, Selection of various blast parameters Burden, Spacing, Stemming, Sub-grade drilling, Depth of hole, Bench height, Diameter of hole, Safe charge calculation, Charging, Drilling patterns, Inclined hole drilling, Secondary blasting.

UNIT IV UNDERGROUND BLAST DESIGN

Various cut patterns, U/G blast design, Series & Parallel connection of detonators, Precautions during blasting,

UNIT V ROCK BREAKAGE MECHANISM

Breakage mechanism, rock fragmentation, Factors affecting rock fragmentation. Adverse effects of Blasting: Back break, over break, Fly rock, Ground Vibration and Noise, Controlled Blasting Techniques and other remedies to the blasting nuisances.

References:

1.Explosives and Blasting Technology: G.K.Pradhan
2.Surface Blast Design: C.J.Konya
3. Rock Blasting: Sushil Bhandari
4. Indian Explosive Act 1884
5.Legislation in Indian Mines – A Critical Appraisal: Rakesh and Prasad

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (VI)**	Branch: **Mining Engineering**
Subject: **Mine Ventilation -II Lab**	Course Code: **C039621(039)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **40 / 20**	L: 0 T: 0 P: 2 Credit(s): 1

Course outcome: Students will be able to:

1	Demonstrate the various dust samplers.
2	Demonstrate the portable lamp and lamp room design.
3	Measure the methane percentage.
4	Explain the various occupational diseases.
5	Prepare enquiry report related with inundation, roof fall, explosion etc.

List of Experiments to be performed:

1. Study of gravimetric dust sampler

2. Study of thermal precipitator dust sampler

3. Study of konimeter dust sampler

4. Study of portable lamps.

5. Study of lamp room design.

6. Measurement of methane percentage

7. Study of various occupational diseases

8. Study of enquiry report related with inundation of any mine

9. Study of enquiry report related with fire damp explosion of any mine

10. Study of enquiry report related with roof fall / other accidents of any mine

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (VI)**	Branch: **Mining Engineering**
Subject: **Mineral Dressing Lab**	Course Code: **C039622(039)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **40 / 20**	L: 0 T: 0 P: 2 Credit(s): 1

Course outcome: Students will be able to:

1	Demonstrate the constructional features and workings of jaw crusher, grinding mill (rod and ball mills)
2	Demonstrate the construction features, workings, merits and demerits of some of the concentrators like spiral classifier, rake classifier, shaking tables, spiral concentrator, flotation cell.
3	Demonstrate the construction features, workings, merits and demerits of some of the dewatering devices like thickeners & continuous drum filter.

List of Experiments to be performed:

1. Study of Jaw crusher
2. Study of roll crusher
3. Study of grinding mills
4. Study of Spiral/Rake classifier
5. Study of shaking table
6. Study of Mineral jig.
7. Study of spiral concentrator
8. Study of floatation cell
9. Study of thickeners'
10. Study of continuous drum filter

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (VI)**	Branch: **Mining Engineering**
Subject: **Pollution control in Mining Lab**	Course Code: **C039623(039)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **40 / 20**	L: 0 T: 0 P: 2 Credit(s): 1

Course outcome: Students will be able to:

1	Classify the different types of pollution and explain the salient features of environmental laws in India.
2	Explain the sources of air pollution and its consequences.
3	Explain the sources and controlling measures of water, noise and soil pollution.
4	Plan the mine closure for any opencast coal mine.
5	Plan the land reclamation of any opencast coal mine.

List of Experiments to be performed:

1. Study of High Volume Dust Sampler
2. Study of gas chromatograph
3. Study of noise measuring instruments
4. Measurement of noise
5. Study of noise controlling techniques
6. Study of vibration measuring instruments
7. Measurement of vibration
8. Study of land reclamation methods
9. Preparation of EIA
10. Prepare EMP for a mining project

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (VI)**	Branch: **Mining Engineering**
Subject: **Blasting Engineering Lab**	Course Code: **C039624(039)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **40 / 20**	L: 0 T: 0 P: 2 Credit(s): 1

Course outcome: Students will be able to:

1	Measure the ground vibration and VOD.
2	Handle blasting software and apply in blast hole design for underground and opencast coal mine & metal mines.
3	Analyze fragmentation of blasted materials.
4	Explain the various blasting tools
5	Explain the bulk explosive system

List of Experiments to be performed:

1. Measurement of ground vibration by seismograph
2. Development of predictor equation from the recorded data
3. Measurement of VOD by VOD mate and its analysis
4. Study of various fragmentation assessment techniques
5. Handling of wipfrag software
6. Design of blast for Underground coal face
7. Design of blast for underground metal mine
8. Design of blast for bench blasting
9. Study of various blasting tools
10. Study of bulk explosive systems
11. Study of various initiation systems.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (VI)**	Branch: **Mining Engineering**
Subject: **Mining Machinery – II Laboratory**	Course Code: **C039625(039)**
T**otal / Minimum-Pass Marks** (End Semester Exam): **40 / 20**	L: 0 T: 0 P: 2 Credit(s): 1

Course outcome: Students will be able to:

1	Demonstrate the constructional features and workings of different types of aerial ropeways.
2	Demonstrate the constructional features and workings of belt conveyor and armoured face conveyor.
3	Demonstrate the constructional features of koepe winder.
4	Demonstrate the skip and prepare pit top and pit bottom arrangements for a Skip.
5	Demonstrate the workings of hydraulic Couplings and Torque Converters.

List of Experiments to be performed:

1. Study of Monocable aerial Ropeway.
2. Study of Bicable aerial Ropeway.
3. Study of Loop take-up and tensioning arrangement of a belt conveyor.
4. Study of pit top and pit bottom arrangements for a belt conveyor.
5. Study of Belt Conveyor
6. Studies of Armored face Conveyor.
7. Study of Various Koepe winder Arrangements
8. Study of various types of skips.
9. Study of pit top and pit bottom arrangements for a Skip.
10. Study of hydraulic Couplings and Torque Converters.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: **B.Tech (VI)**	Branch: **Humanities**
Subject: **Technical Communication & Soft Skills**	Course Code: **C000601(046)**
Total Marks (Internal Assessment): 10	L: 0 T:0 P: 2 Credit(s): 0
Internal Assessments to be conducted: 02	Duration (End Semester Exam): **NA**

UNIT-1 Communication Skills-Basics: Understanding the communicative environment, Verbal Communication; Non Verbal Communication & Cross Cultural Communication, Body Language & Listening Skills; Employment Communication & writing CVs, Cover Letters for correspondence .Common errors during communication, Humour in Communication.

UNIT-2 Interpersonal communication: Presentation, Interaction and Feedbacks, Stage Manners, Group Discussions (GDs) and facing Personal Interviews, Building Relationships, Understanding Group Dynamics- I, Emotional and Social Skills, Groups, Conflicts and their Resolution, Social Network, Media and Extending Our Identities.

UNIT- 3 Vocational skills: Managing time: Planning and Goal setting, managing stress: Types of Stress; Making best out of Stress, Resilience, Work-life balance, Applying soft-skills to workplace.

UNIT-4 Mindsets and Handling People: Definitions and types of Mindset, Learning Mindset, Developing Growth Mindset, Types of People, How to Lead a Meeting, How to Speak Effectively in Meetings, Behavior & Roles in Meetings, Role Play: Meeting.On Saying "Please", How to say "NO".

UNIT-5Positive Pschycology: Motivating oneself, Persuasion, Survival Strategies, Negotiation, Leadership and motivating others**,** controlling anger**,** Gaining Power from Positive Thinking.

Text Books:

1. Petes S. J., Francis. Soft Skills and Professional Communication. New Delhi: Tata McGraw-Hill Education, 2011.
2. Stein, Steven J. & Howard E. Book. The EQ Edge: Emotional Intelligence and Your Success. Canada: Wiley & Sons, 2006.
3. Dorch, Patricia. What Are Soft Skills? New York: Execu Dress Publisher, 2013.

Reference Books:

- Kamin, Maxine. Soft Skills Revolution: A Guide for Connecting with Compassion for Trainers, Teams, and Leaders. Washington, DC: Pfeiffer & Company, 2013.
- Peale Norman Vincent. The Power of Positive Thinking: 10 Traits for Maximum Result. Paperback Publication. 2011.
- Klaus, Peggy, Jane Rohman& Molly Hamaker. The Hard Truth about Soft Skills. London: Harper Collins E-books, 2007.

Course Outcomes

1. Learn to listen actively to analyse audience and tailor the delivery accordingly.
2. Increase their awareness of communication behaviour by using propriety-profiling tool.
3. Master three "As" of stressful situation: Avoid, Alter, Accept; to cope with stressors and create a plan to reduce or eliminate them.
4. Develop growth mind-set and able to handle difficult person and situations successfully.
5. Develop technique of turning negativity into positivity and generate self-motivation skills.