

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

SCHEME OF TEACHING AND EXAMINATION

B.E. VI SEMESTER MINING ENGINEERING

S. No.	Board of Study	Subject Code	Subject	Periods per week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
				L	T	P	Theory/Practical				
							ESE	CT	T		
1	Mining Engg.	339611 (39)	Blasting Engg.	4	1	-	80	20	20	120	5
2	Mining Engg.	339612 (39)	Mine Environment - II	3	1	-	80	20	20	120	4
3	Mining Engg.	339613 (39)	Mine Machinery - II	3	1	-	80	20	20	120	4
4	Mining Engg.	339614 (39)	Mine Legislation - II	3	-	-	80	20	20	120	3
5	Mining Engg.	339615 (39)	Mineral Dressing	4	1	-	80	20	20	120	5
6	Refer Table -1		Professional Elective-I	3	1	-	80	20	20	120	4
7	Mining Engg.	339621 (39)	Blasting Engg. Lab	-	-	2	40	-	20	60	1
8	Mining Engg.	339622 (39)	Mine Environment -II Lab	-	-	4	40	-	20	60	2
9	Mining Engg.	339623 (39)	Mineral Dressing Lab	-	-	4	40	-	20	60	2
10	Mining Engg.	339624 (39)	Mining Machinery - II Lab	-	-	2	40	-	20	60	1
11	Management	300625 (36)	Managerial Skills	-	-	2	-	-	40	40	1
12			Library	-	-	1	-	-	-	--	-
Total periods 40 per week				20	5	15	640	120	240	1000	32

L – Lecture, T – Tutorial,
P – Practical, ESE- End Semester Exam, CT- Class Test,
TA – Teacher’s Assessment

Note : Industrial Training of twelve weeks is mandatory for B.E. students. It is to be completed in two equal parts. The first part must have been completed in summer after IV sem. The second part to be completed during summer after VI sem. after which students have to submit a training report which will be evaluated by college teachers during B.E. VII sem.

Table –1

Professional Elective - I			
S.No.	Board of Studies	Code	Name of Subject
1	Mining Engg.	339631 (39)	Mine Management
2	Mining Eng.	339632 (39)	Small Scale & Dimensional Stone Mining

Note (1) – **1/4th of total strength of students subject to minimum of twenty students is required to offer an elective in the college in a Particular academic session .**

Note (2) – **Choice of elective course once made for an examination cannot be changed in future examinations.**

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: B.E. VI Sem.

Subject: Blasting Engg.

Total Theory Periods: 50

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 02

Branch: Mining Engg.

Code: 339611 (39)

Total Tutorial Periods: 12

UNIT 1 COMMERCIAL EXPLOSIVES

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

UNIT 2 INITIATION SYSTEM & BLASTING ACCESSORIES

Detonators of various types, Detonating cord, Safety fuse, Detonating relays, Non electric initiation and Blasting accessories

UNIT 3 SURFACE BLAST DESIGN

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

UNIT 4 UNDERGROUND BLAST DESIGN

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

UNIT 5 ROCK BREAKAGE MECHANISM

Breakage mechanism, rock fragmentation, Factors affecting rock fragmentation, Back break, over break, Fly rock, Ground Vibration , Noise, Control Blasting Techniques

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 Vivekanand Technical University, Bhilai

Semester: B.E. VI Sem.

Subject: Mine Environment - II

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 02

Branch: Mining Engg.

Code: 339612 (39)

Total Tutorial Periods: 12

UNIT 1: 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 evasee, forcing and exhaust ventilation, reversal of ventilation, ventilation of headings.

UNIT 2: VENTILATION SURVEY

Object of ventilation survey, instruments for the measurement of pressure, velocity, and quantity of air.

UNIT 3: VENTILATION SYSTEMS AND PLANNING

Calculation of pressure and quantity requirements, network problems, Hardy-Cross method, ventilation planning and economic analysis, central and boundary ventilation, accessional and descensional ventilation, antitropical, homotropical ventilation.

UNIT 4: MINE DUST

Classification, physiological effects, measurement of dust concentration, dynamics of small particles, sampling of air borne dust, prevention and suppression of dust

UNIT 5: 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 open cast workings.

Text Books:

1. Mine Env. By G.B. Mishra
2. Elements of Mining Tech. Vol.2 by D. J. Deshmukh
3. U/G Mine Env by Mcpherson

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: B.E. VI Sem.

Subject: Mine Machinery - II

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Minimum number of class tests to be conducted: 02

Branch: Mining Engg.

Code: 339613 (39)

Total Tutorial Periods: 12

- UNIT 1. **Arial ropeways –****
Different types, their constructions & installation, operation & maintenance, design calculation, their layout including rope-tensioning arrangements.
- UNIT 2. **Conveyors –****
Different types of belt conveyors, their construction, installation, maintenance & design calculations.
- UNIT 3.**Shaker conveyor, scraper chain conveyor and armored chain conveyor, their installation & construction maintenance. Safety Devices; Pit top and pit bottom arrangements.
- UNIT 4. **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 5. **HYDRULIC 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 Vivekanand Technical University, Bhilai

Semester: B.E. VI Sem.
Subject: Mine Legislation -II
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 02

Branch: Mining Engg.
Code: 339614 (39)
Total Tutorial Periods: nil

- Principal Provisions of Mines & Minerals (Regulation & Development) Act
Coal Mines Conservation & Development Act.

- Mineral Concession Rules, Indian Electricity Rules related to mining activity.

- Byelaws & D.G.M.S. Circulars.
Mines Rescue Rules

- Mine Accident, their classification, and causes & preventive measures, Cost of accident,
Preparation of Inquiry report.

- Safety Campaign, Causes of major mining accidents those have occurred in India &
Suggested remedial measures.

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
- 6) Mines Rescue Rules
- 7) Indian Electricity Rules

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: B.E. VI Sem.
Subject: Mineral Dressing
Total Theory Periods: 50

Branch: Mining Engg.
Code: 339615 (39)
Total Tutorial Periods: 12

Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 02

UNIT 1: Introduction, definition, scope and economic justification, main steps in ore dressing operations, general preliminary mineralogical investigations, comminution-crushing-principles of crushing, reduction jaw crushers, gyratory crushers, cone crushers, rolled crushers, gravity stamps their classifications and applications, grinding-principles of grinding units, application and classification of ball mills, rod mills, tube mills and pebble mills.

UNIT 2: 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, Stoke's law, Reynold's Number, different types of classifiers, hydraulic and pneumatic classifiers, sampling-importance of sampling and methods used.

UNIT 3: GRAVITY CONCENTRATION
Jigging, Flowing film concentrators like spirals and shaking tables, heavy media separation-theory, applications and limitations of methods.

UNIT 4: FLOATATION
Physico-chemical principles, function of various floatation reagents, important machines, their principles, and working, floatation of sulphide, oxide and non sulphide ores.

UNIT 5: ELECTROSTATIC AND MAGNETIC SEPARATION
Principle and operation and field of application, Pelletisation of low grade iron ore, Drying and dewatering - thickening, filtration and drying. 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.

Text Books

1. Ore Dressing by Gaudin
2. Ore Dressing by B. A. Wills

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: B.E. VI Sem.
Subject: Mine Management
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 02

Branch: Mining Engg.
Code: 339631 (39)
Total Tutorial Periods: 12

- UNIT 1:** **Evolution of Management Theory** - Principle of scientific management, Elements of management functions, Planning, Organizing and Control. 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 motivation, Productivity, its concept and measurement.
- UNIT 3:** **Production Management** - Determination of norms and standards of operations by work study, work measurements, production planning, scheduling and control, Queing theory, short and long term planning, Quality control, introduction to MIS.
- 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.

References :

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|----|-----------------------------|---|-------------|
| 1. | Mine Management | : | V. N. Singh |
| 2. | Management & Administration | : | S.K.Gupta |
| 3. | Introduction to management | : | O.P. Khanna |

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: B.E. VI Sem.
Subject: Small Scale & Dimensional Stone Mining
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 02

Branch: Mining Engg.
Code: 339632 (39)
Total Tutorial Periods: 12

- UNIT 1** A Scenario of small scale mining in India, Definition of small mine, strength and weaknesses of small scale mining, Problems and difficulties of small scale mine owners, minerals- major & minor, royalty, dead rent, cess etc.
- UNIT 2** Development of small scale mine, preparation of mine plan, extraction, development of benches, drilling & blasting practice in small scale mining, cutting techniques & transportation.
- UNIT 3** Small scale mining of limestone, sandstone, gypsum, talc, soapstone etc., extraction techniques and procedure.
- UNIT 4** Dimensional stone mining of granite, marble, black stone etc., extraction techniques and procedure.
- UNIT 5** Environmental Impact of small scale mining, Environmental management plan, Env. Protection measures.

Reference Books :

1. An Introduction to Mineral Economics by K.K. Chhaterjee.
2. Proceedings of the National Seminar on Small Scale Mining 2001 By MBM Engg. College, Jodhpur

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: B.E. VI Sem.
Subject: Blasting Engg. Lab
Total Theory Periods: 28
Total Marks in End Semester Exam: 40

Branch: Mining Engg.
Code: 339621 (39)

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 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

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: B.E. VI Sem.
Subject: Mine Environment – II Lab
Total Theory Periods: 50
Total Marks in End Semester Exam: 40

Branch: Mining Engg.
Code: 339622 (39)

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.
9. Study of gravimetric dust sampler
10. Study of thermal precipitator dust sampler

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: B.E. VI Sem.
Subject: Mineral Dressing Lab
Total Theory Periods: 50
Total Marks in End Semester Exam: 40

Branch: Mining Engg.
Code: 339623 (39)

List of Experiments to be performed :

1. Study of Jaw crusher
2. Study of roll crusher
3. Study of grinding mills
4. Study of Akin's 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 washability curves

Chhattisgarh Swami Vivekanand Technical University, Bilai

Semester: B.E. VI Sem.
Subject: Mining Machinery – II Lab
Total Theory Periods: 28
Total Marks in End Semester Exam: 40

Branch: Mining Engg.
Code: 339624 (39)

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. Study of an Armoured face Conveyor.
7. Study of Various Koepe 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 Vivekanand Technical University, Bilai (C.G.)

Semester: VI
Subject: Managerial Skills
Total Practical Periods: 28
Total Marks in End Semester Exam: 40
Minimum number of class test to be conducted: 2

Branch: Common to all Branches
Code: 300625 (36)
Total Tut Periods: NIL

Unit-I

Managerial Communication Skills: Importance of Business Writing: writing business letters, memorandum, minutes, and reports- informal and formal, legal aspects of business communication, oral communication- presentation, conversation skills, negotiations, and listening skills, how to structure speech and presentation, body language.

Unit-II

Managerial skills: Leadership: Characteristics of leader, how to develop leadership; ethics and values of leadership, leaders who make difference, conduct of meetings, small group communications and Brain storming, Decision making, How to make right decision, Conflicts and cooperation, Dissatisfaction: Making them productive.

Unit-III

Proactive Manager: How to become the real you: The journey of self-discovery, the path of self-discovery, Assertiveness: A skill to develop, Hero or developer, Difference between manager and leader, Managerial skill check list, team development, How to teach and train, time management, Stress management, Self assessment.

Unit-IV

Attitudinal Change: Meaning of attitude through example, benefits of positive attitude, how to develop habit of positive thinking, what is fear? How to win it? How to win over failure? How to overcome criticism? How to become real you? How to Motivate?

Unit-V

Creativity – a managerial skill, Trying to get a grip on creativity.
Overview of Management Concepts: Function of Management: Planning, organizing, staffing, controlling.

Text & Reference Books:

1. Basic Managerial skills for all by E.H. McGrawth, Prentice Hall India Pvt Ltd,2006
2. How to develop a pleasing personality by Atul John Rego, Better yourself bools, Mumbai, 2006
3. The powerful Personality by Dr. Ujjawal Patni & Dr. Pratap Deshmukh, Fusion Books, 2006
4. How to Success by Brian Adams, Better Yourself books, Mumbai, 1969