WEST BENGAL STATE COUNCIL OF TECHNICAL EDUCATION											
TEACHING AND EXAMINATION SCHEME FOR DIPLOMA IN ENGINEERING COURSES											
COURSE NAME: DIPLOMA IN MINING											
DURATION OF COURSE: 6 SEMESTERS											
SEMESTER: FOURTH											
BRANCH: MINING											
SR. NO	SUBJECT	CREDITS	PERIODS			EVALUATION SCHEME					
			L	TU	PR	INTERNAL SCHEME			ESE	PR	Total Marks
						TA	CT	Total			
1.	SPECIAL UNDERGROUND METHODS, ROCK MECHANICS & SUPPORTS	4	4			10	20	30	70		100
2.	SURFACE MINING	4	4			10	20	30	70		100
3.	UNDERGROUND METALLIFEROUS MINING & TUNELLING	4	3	1		10	20	30	70		100
4.	MINING HAZARDS	5	5			10	20	30	70		100
5.	MINING GEOLOGY	3	2	2	2	10	20	30	70	50	150
6.	MINE SAFETY LAB	2			4					100	100
7.	MINE METHODS & SUPPORT LAB	2			4					100	100
8.	DEVELOPMENT OF LIFE SKILL - 2	1			2					50	50
Total:		25	18	3	12	50	100	150	350	300	800

STUDENT CONTACT HOURS PER WEEK:33 hrs

Theory and Practical Period of 60 Minutes each.

L- Lecture, TU- Tutorials, PR- Practical, TA- Teachers Assessment, CT- Class Test, ESE- End Semester Exam.

Syllabus for: **SPECIAL UNDERGROUND METHODS, ROCK MECHANICS & SUPPORTS**

Name of the Course: SPECIAL UNDERGROUND METHODS, ROCK MECHANICS & SUPPORTS (Part II - 2nd semester, Mining Engineering)	
Course Code:	**Semester: FOURTH**
Duration: : 17 weeks	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 4 hrs./week	**Class Test.:20 Marks**
Tutorial: NIL	**Teacher's Assessment : 10 Marks**
Practical: Nil	**End Semester Exam.:70 Marks**
Credit: 4	
Aim:	
Sl. No.	
1.	**To make familiar with the different methods of Mining under different geological conditions.**
2.	**To Impart elementary knowledge regarding Rock Mechanics.**
3.	**To make familiar with the system of Mine Supports**
Objective:	
Sl. No.	**The Students will be able to:**
1.	**Learn about procedures of Mining under different Geo-mining conditions.**
2.	**Learn the behaviour of rock under extraction and required support system thereof.**
Pre-Requisite:	
Sl. No.	
	Basic knowledge in general Mining practices, Physics, Chemistry, Strength of Materials and Engg. Drawing.

MODULAR DIVISION OF THE SYLLABUS

MODULE	TOPIC	LECTURE PERIODS	TUTORIAL PERIODS
1	SPECIAL UNDERGROUND METHOD	16	0
2	ROCK MECHANICS	25	0
3	SUPPORTS	25	0

LECTURE PERIODS: 66 **TUTORIAL PERIODS: 0** **INTERNAL ASSESSMENT: 2** **68**

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1	6	ANY TWENTY	1	1 x 20 = 20	THREE	FIVE, TAKING AT LEAST ONE FROM EACH GROUP	10	10X 5 = 50
B	2	7				THREE			
C	3	10				FOUR			

SPECIAL UNDERGROUND METHODS, ROCK MECHANICS & SUPPORTS

D E T A I L C O U R S E C O N T E N T

GROUP - A

1. **SPECIAL UNDERGROUND METHOD**

1.1 Mining of thick-seams- brief description on the following methods – Horizontal slicing, Blasting gallery & Sub-level caving.

1.2 Horizon mining, conditions, advantages, disadvantages, limitations, and layouts for coal seam.

GROUP - B

2. **ROCK MECHANICS**

2.1 Distribution of forces around a narrow excavation , pressure arch theory in longwall working.

2.2 Angle of draw, subsidence factor , critical area of extraction, factors affecting subsidence, precautionary measures against damage due to subsidence, shaft pillars, size of shaft pillar,-its determination, subsidence survey, subsidence plans and section.

2.3 Rock-mass rating and its application.

GROUP - C

3. **Supports and roof control in mines**

3.1 Properties of various types of roof, testing of roof materials used for support in mines classification of support.

3.2 Seasoning of timber, preservation of timber, setting of props, bars, cogs, side supports, forepoling.

3.3 Support of roadway junction. Clearing up heavy roof-fall, withdrawal of support.

3.4 Definition of different terms like setting load, yield load, bearing capacity, characteristic curve etc. Principles of hydraulic and friction props- their description and comparison, prop free front face.

3.5 Steel arches, screw props, chocks, chock release device.

3.6 Roof bolting, roof-stitching, bamboo bolting, safari-support.

Syllabus for: **SURFACE MINING**

Name of the Course: SURFACE MINING (Part II - 2nd semester, Mining Engineering)	
Course Code:	**Semester: FOURTH**
Duration: : 17 weeks	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 4 hrs./week	**Class Test.:20 Marks**
Tutorial: NIL	**Teacher's Assessment : 10 Marks**
Practical: Nil	**End Semester Exam.:70 Marks**
Credit: 4	
Aim:	
Sl. No.	
1.	**To make familiar with the Surface Mining Technology and its applicability.**
2.	**To Impart knowledge regarding Drilling & Blasting Practice in Surface Mining.**
3.	**To make familiar with the Safety aspects in Opencast Mining.**
Objective:	
Sl. No.	**The Students will be able to:**
1.	**Learn about the Surface Mining practices in sequential manner .**
2.	**Lay out open pit under different Mining conditions.**
Pre-Requisite:	
Sl. No.	
	Basic knowledge in general Mining practices, Physics, Chemistry, and Engg. Drawing.

MODULAR DIVISION OF THE SYLLABUS

MODULE	TOPIC	LECTURE PERIODS	TUTORIAL PERIODS
1,2,3,& 4	INTRDUCTION, MINE OPENING & MACHINERY	22	0
5 & 6	EXPLOSIVE, DRILLING & BLASTING	22	0
7, 8 & 9	LAY OUT, RECLAMATION & SAFETY	22	0

LECTURE PERIODS: 66 TUTORIAL PERIODS: 0 INTERNAL ASSESSMENT: 2 68

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1,2, 3&4	7	ANY TWENTY	1	1 x 20 = 20	THREE	FIVE, TAKING AT LEAST ONE FROM EACH GROUP	10	10X 5 = 50
B	5&6	9				FOUR			
C	7,8 &9	7				THREE			

SURFACE MINING

DETAIL COURSE CONTENT

GROUP - A

1. Introduction , definition, advantages and disadvantages.

2. Opening of a mine: Box cut , Location of Box cut , height & width of bench, factors effecting height & width of bench, Bench Slope, Causes of slope failure and its preventions.

3. Coal : OB thickness ratio , stripping ratio, break-even stripping ratio, Factors controlling break-even stripping ratio and its improvement.

4. Different machinery used in opencast Mines - single bucket & multi-bucket excavator, drills, dumpers , dozers and other auxiliary machinery. Different combination of earth moving machinery & their respective features. Elementary ideas on pipe line transportation. Elementary ideas on transport system by High Angle Conveyor belt.

GROUP - B

5. Explosives used in opencast mines including ANFO, slurry explosives (SMS systems), LOX, Emulsion explosives.

6. Drilling & Blasting practice in opencast mines:
   Vertical holes, Inclined holes, Advantages of Inclined holes, Spacing, Burden, Subgrade Drilling, Hole Depth.

   Blast Design Parameters- Bench height, Blast hole diameter, Burden, Spacing, Hole depth, Subgrade, Stemming, Hole Inclination, Blast Size (Length & Width).

   Blasting accessories, Charging of blast holes, Procedure of blasting, Danger Zone, Blasting shelter.

   Deck charging, Muffle Blasting, Single row & multi row blasting using relays, blasting with non electric detonator and shock tube based system.

   Controlled blasting techniques, Precautions necessary for blasting in hot holes . Safety measures during the approach and progress of an electric storm. Sleeping Holes.

GROUP - C

7. Opencast layout with Shovel-Dumper combination etc.

8. Land Reclamation : Objectives , Method.

9. Safety aspects in opencast mining :
   Accidents in Opencast mines - cause wise and place wise(Elementary ideas only) – Preventive measures (Elementary ideas only).

   Precautionary measures to control ground vibration due to blasting in Opencast mines, Problems of fly rock – causes of fly rock – control of fly rock.

   Safety measures in Haul Road, Safety measures in Spoil bank.

   Illumination in Opencast Mine.

Name of the Course: UNDERGROUND METALLIFEROUS MINING & TUNELLING (Part II - 2nd semester, Mining Engineering)	
Course Code:	**Semester: FOURTH**
Duration: : 17 weeks	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 3 hrs./week	**Class Test.:20 Marks**
Tutorial: 1 hrs./week	**Teacher's Assessment : 10 Marks**
Practical: Nil	**End Semester Exam.:70 Marks**
Credit: 4	
Aim:	
Sl. No.	
1.	**To make familiar with the different methods of entries to open a underground Metal Mine.**
2.	**To Impart elementary knowledge regarding driving, Raising & Sampling.**
3.	**To make familiar with different operation technique under different geo-mining conditions.**
Objective:	
Sl. No.	**The Students will be able to:**
1.	**Learn about different approaches to underground ore bodies .**
2.	**Learn the different underground methods of operation practised in Metal Mining Industry.**
Pre-Requisite:	
Sl. No.	
	Basic knowledge in general Mining practices, Engg. Drawing & 3D concepts.

MODULAR DIVISION OF THE SYLLABUS

MODULE	TOPIC	LECTURE PERIODS	TUTORIAL PERIODS
1,2 & 3	INTRDUCTION, DRIVING & RAISING	17	5
4 & 5	BLASTING & SAMPLING	10	3
6	STOPING METHODS	22	9

LECTURE PERIODS: 49	TUTORIAL PERIODS: 17	INTERNAL ASSESSMENT: 2	68

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1,2 & 3	8	ANY TWENTY	1	1 x 20 = 20	THREE	FIVE, TAKING AT LEAST ONE FROM EACH GROUP	10	10X 5 = 50
B	4 & 5	5				THREE			
C	6	10				FOUR			

UNDERGROUND METALLIFEROUS MINING & TUNELLING

D E T A I L C O U R S E C O N T E N T

GROUP - A

1. Geological conditions effecting metalliferrous deposit. Mode of entry - Adit, Vertical Shaft & Incline, Comparison between Vertical Shaft & Incline,.
2. Application of stone drifting, method of driving drift, different pattern of shot holes for blasting - Burn Cut, Choromon Cut & Wedge Cut.
3. Development of underground metalliferrous deposits - Different raising methods - Open raising, Double Compartment Raising, Drop raising, Alimak Raising & Bore hole raising.

GROUP - B

4. Blasting Practices for Drives, Cross cuts & Raise in underground Metal Mines.
5. Metal Mine Sampling. Different sampling methods -Salting, Assay, Assay Map, Coning & Quartering.

GROUP - C

6. Classification of stoping methods. Different stoping methods - underhand stoping, overhand stoping, breast stoping, Shrinkage stoping, Cut & fill stoping, Post-pillar method of stoping, Sub-level stoping. Their Application, Preparation, working, merits & demerits.

   The elementary ideas on Square-set stoping and Top Slicing.

Syllabus for: **MINING HAZARDS**

Name of the Course: MINING HAZARDS (Part II - 2nd semester, Mining Engineering)	
Course Code:	**Semester: FOURTH**
Duration: : 17 weeks	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 5 hrs./week	**Class Test.:20 Marks**
Tutorial: NIL	**Teacher's Assessment : 10 Marks**
Practical: Nil	**End Semester Exam.:70 Marks**
Credit: 5	
Aim:	
Sl. No.	
1.	**To make familiar with the possible sources of hazards in Mines. .**
2.	**To Impart knowledge regarding Rescue and Recovery operation in Mines.**
3.	**To make familiar with the environmental pollution due to Mining.**
Objective:	
Sl. No.	**The Students will be able to:**
1.	**Learn about explosion hazards and remedial measures in Mines. .**
2.	**Identify possible sources of danger like Fire, Inundation and pollution with remedial measures in Mines.**
Pre-Requisite:	
Sl. No.	
	Basic knowledge in general Mining practices, Physics, Chemistry, and Engg. Drawing.

MODULAR DIVISION OF THE SYLLABUS

MODULE	TOPIC	LECTURE PERIODS	TUTORIAL PERIODS
1 & 2	FIRE DAMP & MINE FIRE	28	0
3 & 4	EXPLOSION & INUNDATION	28	0
5, 6 & 7	RESQUE, LIGHTING & POLLUTION	27	0

LECTURE PERIODS: 83 TUTORIAL PERIODS: 0 INTERNAL ASSESSMENT: 2 85

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1&2	8	ANY TWENTY	1	1 x 20 = 20	THREE	FIVE, TAKING AT LEAST ONE FROM EACH GROUP	10	10X 5 = 50
B	3&4	8				THREE			
C	5,6 & 7	7				FOUR			

MINING HAZARDS

DETAIL COURSE CONTENT

GROUP - A

1. Firedamp.

1.1 Emission of Firedamp in U/G working – gradual exudation, outburst, blowers.

1.2 Methane roof layering.

1.3 Methane Drainage.

2. Mine Fires

2.1 Spontaneous heating – different stages, determination of proneness by crossing point. Factors governing proneness to spontaneous combustion, symptoms of spontaneous heating, detection of spontaneous heating, preventive measure.

2.2 Fires – causes of Mine fires, preventive measure, dealing with mine fires method of sealing off , different types of stoppings –construction and purpose, pressure balancing, re-opening a sealed off area, method of collection of air samples from sealed off area and from mine atmosphere.

2.3 Dealing with fires in coal pillars and in coal stacks.

2.4 Different types of fire extinguishers.

GROUP - B

3. Explosions.

3.1 Fire damp explosion- Limits of explosibility and various factors which influence it, cause of firedamp explosion, preventive measure.

3.2 Coal dust explosion- causes, factors affecting explosibility of coal dust and preventive measure. Stone dust barriers, water barriers, and triggered barrier

3.3 Sampling procedure of roadway mine dusts, apparatus used and organisation.

4. INUNDATION.

4.1 Causes of inundation by surface and underground water, preventive measures, causes of inundation in opencast mines.

4.2 Barriers, water dams, construction and calculation of thickness of dam, approaching water logged workings, long-hole boring by burn side boring apparatus.

GROUP - C

5. Mine rescue & Recovery work.

5.1 Self contained portable breathing apparatus. Gas musk, smoke helmets, self rescuer, reviving apparatus.

5.2 Fresh air base, selection & training of persons for rescue, rescue organisation in mines.

6. Mine Lighting.

Problems of lighting in mines, construction and working principles of cap lamps, topping up operation and charging of cap lamp, lamp room layout and organisation.

7. Environmental pollution due to Mining

Air pollution due to dust, smoke, fumes, and gasses, water pollution due to mining, land damage and land degradation, damages on forest – effects of flora and fauna, noise pollution , vibration damages, damage due to air blast over pressure, global warming and green house effect, radioactive emission, cultural degradation and damage to local inhabitants.

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Syllabus for: **MINING GEOLOGY.**

Name of the Course: MINING GEOLOGY (Part II - 2nd semester, Mining Engineering)	
Course Code:	**Semester: FOURTH**
Duration: : 17 weeks	**Maximum Marks: 100 + 50 (Practical) = 150**
Teaching Scheme	**Examination Scheme(Theoretical + Practical)**
Theory: 2 hrs./week	**Class Test.:20 Marks**
	Teacher's Assessment : 10 Marks
	End Semester Exam.:70 Marks
Tutorial: 2 hrs./week	
Practical: 2 hrs./week	**Continuous Internal Assessment: 25 marks.**
	External Assessment: 25 marks.
Credit: 4	

Sl. No.	**Aim:**
1.	To make familiar with the basic Geology of the Earth.
2.	To Impart elementary knowledge regarding Stratigraphy.
3.	To make familiar with the various mineral and coal deposits in India.
Objective:	
Sl. No.	**The Students will be able to:**
1.	Learn about different geological features in details.
2.	Learn the details Coalfields and various mineral deposits from the point of view of structural and economic geology.
Sl. No.	**Pre-Requisite:**
	Basic knowledge in Physics, Chemistry, and Engg. Drawing.

MODULAR DIVISION OF THE SYLLABUS

MODULE	TOPIC	LECTURE PERIODS	TUTORIAL PERIODS
1	BASIC GEOLOGY	9	10
2	STRATIGRAPHY	9	10
3 & 4	ECONOMIC GEOLOGY & MAPPING	14	14

LECTURE PERIODS: 32	TUTORIAL PERIODS: 34	INTERNAL ASSESSMENT: 2	68

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1&2	7	ANY TWENTY	1	1 x 20 = 20	THREE	FIVE, TAKING AT LEAST ONE FROM EACH GROUP	10	10X 5 = 50
B	3&4	7				THREE			
C	5,6 & 7	9				FOUR			

MINING GEOLOGY

D E T A I L C O U R S E C O N T E N T

GROUP - A

1. Basic Geology

1.1 Brief idea about origin ,age & interior of the earth.

1.2 Branches of geology

1.3 Physical geology –definition of weathering, erosion and denudation.

1.4 Definition of Crystal ,Rock & Mineral. Norms of crystal system, physical properties of mineral, important rock forming & economic mineral.

1.5 Petrology-kinds of rock, their classification, forms of rock, characteristics with example.

1.6 Structural geology-

a) Primary structure, definition of bedding, cross-bedding, current- bedding, graded bedding, ripple marks. Utility of studying primary structure.

b)Secondary structure- definition of dip, strike, fold, fault, joint & unconformity.

GROUP - B

2. Stratigraphy

2.1 Stratigraphy; Principles of stratigraphy; Physiographic sub-divisions of India; Geological time scale –including Indian system;

2.2 Precambrian stratigraphy(in brief) of the following regions of Indian sub-continent;

a) Karnatak

b) Rajasthan

c)Singbhum

2.3 Stratigraphy of Gondwana system with special reference to lower Gondwana coal fields.

GROUP - C

3. **Economic Geology**

3.1 Definition of ores, Ore minerals, Gangue minerals, Tenor, Grade, Metallogenic epoch , Metallogenic province.

3.2 Brief idea about the different processes of formation of mineral deposits.

3.3 Indian occurrences & ore minerals of the following mineral deposits; Iron, Manganese, Gold, Copper, Lead-Zinc, Bauxite, Petroleum.

3.4 Brief geological idea about the following mineral deposits in India;

a) Singbhum Copper & Iron ore deposit,

b) Manganese deposit of Madhya Pradesh.

c) Gold deposit of Karnataka.

3.5 Coal : Definition- Coal, Rank and grade of coal. Origin and formation of coal. Indian occurrences of coal. Difference between Lower-Gondwana and Tertiary Coals., effects of intrusives of coal bearing horizons.

3.6 Brief geological idea about the

a) Jharia Coalfield.

b) Ranigunj Coalfield.

4. **Geological Mapping and Prospecting**.

4.1 Definition- Contour map and Geological map. Recognition of the following structures: Horizontal, inclined and vertical beds, Folds, Faults, Unconformities, Dykes, silts on geological maps.

4.2 Geological prospecting -Brief knowledge about Loaming, Huishing, Probing, Trenching, Trial pits, Diamond drilling and churn drilling. Name of the different geophysical prospecting methods only.

MINING GEOLOGY LAB

D E T A I L C O U R S E C O N T E N T

1. Megascopic study of Minerals:

Study of important Mineral in hand specimen in the laboratory under naked eyes with some minor aids:-

Study of important “Rock- forming Minerals” including some ore- minerals

2. Megascopic study of Rocks

Study of Rocks in hand specimen under naked eyes with some minor aids
Study of important common igneous rocks of acid-intermediate-basic & ultra basic varieties.

Study of common varieties of sedimentary rocks particularly those occurring in the coalfields.

3.Geological Maps

(a) study of different codes and symbols generally shown in the geological maps of the “coalfields” and to recognise different stages thereof and some structures by their colours.
(b) Recognise- simple folds, faults, unconformity igneous intrusions on geological maps of coalfields.
(c) To draw section from simple geological maps having simple structures(above mentioned)
(d) Description of simple type of geological maps.

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Syllabus for: **MINE SAFETY LAB**

Name of the Course: MINE SAFETY LAB (Part II - 2nd semester, Mining Engineering)	
Course Code:	**Semester: Fourth**
Duration: : 17 weeks	**Maximum Marks: 100 (Practical)**
Teaching Scheme	**Examination Scheme(Practical)**
Theory: Nil	**Continuous Internal Assessment: 50 marks.**
Tutorial: Nil	**External Assessment: 50 marks.**
Practical: 4 hrs./week	**End Semester Exam. [theory]: Marks: Nil**
Credit: 2	
Aim:	
Sl. No.	
1.	**To make familiar with Fire stopping, stone dust barrier and water dam etc..**
2.	**To make familiar with different rescue apparatus.**
Objective:	
Sl. No.	**The Students will be able to:**
1.	**Understand the constructional procedure of Fire stopping, stone dust barrier and water dam.**
2.	**Learn the use of different rescue apparatus in different situation.**
3.	**Learn about the constructional features of Cap lamp and its charging and storing system.**
Pre-Requisite:	
Sl. No.	
1.	**Basic knowledge in Mining, Physics, Chemistry & Engineering Drawing.**

MINE SAFETY LAB

DETAIL COURSE CONTENT

1. Study and sketch of fire stopping with fittings.
2. Study and sketch of stone dust barriers.
3. Study and sketch of brick and cement concrete dams.
4. Study and sketch of Cap lamp.
5. Study and sketch of colliery Lamp room.
6. Study and sketch of different Rescue apparatus.

Syllabus for: **MINE METHODS & SUPPORT LAB**

Name of the Course: MINE METHODS & SUPPORT LAB (Part II - 2nd semester, Mining Engineering)	
Course Code:	**Semester: Fourth**
Duration: : 17 weeks	**Maximum Marks: 100 (Practical)**
Teaching Scheme	**Examination Scheme(Practical)**
Theory: Nil	**Continuous Internal Assessment: 50 marks.**
Tutorial: Nil	**External Assessment: 50 marks.**
Practical: 4 hrs./week	**End Semester Exam. [theory]: Marks: Nil**
Credit: 2	
Aim:	
Sl. No.	
1.	**To make familiar with different methods of Mining in underground.**
2.	**To make familiar with different stoping method..**
3.	**To make familiar with different support system used in underground Mines.**
Objective:	
Sl. No.	**The Students will be able to:**
1.	**Learn Bord & Pillar and Longwall method working in details.**
2.	**Learn to prepare Opencast lay-out.**
3.	**Learn underground tunnelling and stoping method applied in underground Metal Mining.**
Pre-Requisite:	
Sl. No.	
1.	**Basic knowledge in Method of Mining, Metal Mining, Physics, Chemistry & Engineering Drawing.**

MINE METHODS & SUPPORT LAB

D E T A I L C O U R S E C O N T E N T

1. Study of Bord & Pillar development workings.
2. Study of Bord & Pillar depillaring with stowing.
3. Study of Long-wall workings - Advancing & Retreating.
4. Study of Opencast layout with Shovel-Dumper combination.
5. Study of Under-ground Tunneling.
6. Study of Under-ground Stoping methods.
7. Study of roofbolts :- different types.
8. Study of safary supports, Roof stiching.

Syllabus for: **Development of Life Skills - II**

Name of the Course: Development of Life Skills - II (Part II - 2nd semester, Mining Engineering)	
Course Code:	**Semester: Fourth**
Duration: : 17 weeks	**Maximum Marks: 50 (Practical)**
Teaching Scheme	**Examination Scheme(Practical)**
Theory: Nil	**Continuous Internal Assessment: 25 marks.**
Tutorial: Nil	**External Assessment: 25 marks.**
Practical: 2 hrs./week	**End Semester Exam. [theory]: Marks: Nil**
Credit: 2	

UNITS	CONTENTS	Hours
Unit - 1	Interpersonal Relation Importance, Interpersonal conflicts, Resolution of conflicts, Developing effective interpersonal skills - communication and conversational skills, Human Relation Skills (People Skills) Sessional Activities : Case Studies: 1. from books 2. from real life situations 3. from students' experiences Group discussions on the above and step by step write of any one or more of these in the sessional copies.	5
Unit - 2	Problem Solving I) Steps in Problem Solving (Who? What? Where? When? Why? How? How much?) 1. Identify, understand and clarify the problem 2. Information gathering related to problem 3. Evaluate the evidence	5

	4. Consider feasible options and their implications **5. Choose and implement the best alternative** **6. Review** **II) Problem Solving Technique** **1. Trial and Error, 2. Brain Storming 3. Thinking outside the Box.** **Sessional Activities :** **Case Studies:** **1. from books** **2. from real life situations** **3. from students' experiences** **Group discussions on the above and step by step write of any one or more of these in the sessional copies.**	
Unit - 3	**Presentation Skills** **Concept, Purpose of effective presentations,** **Components of Effective Presentations:** **understanding the topic,** **selecting the right information,** **organising the process interestingly,** **Good attractive beginning,** **Summarising and concluding,** **adding impact to the ending,** **Use of audio-visual aids - OHP, LCD projector, White board,** **Non-verbal communication:** **Posture, Gestures, Eye-contact and facial expression,** **Voice and Language - Volume, pitch, Inflection, Speed, Pause, Pronunciation,** **Articulation, Language** **Handling questions - Respond, Answer, Check, Encourage, Return to presentation** **Evaluating the presentation - Before the presentation, During the presentation,** **After the presentation.** **Sessional Activities :**	**5**

	Prepare a Presentation (with the help of a Powerpoint) on a Particular topic. The stude nts may refer to the Sessional activity (sl. No. 8) of the Computer Fundamental syllabu s of Semester 1.For engineering subject-oriented technical topics the co-operation of a subject teacher may be sought. Attach handout of PPT in the sessional copy.	
Unit - 4	**Looking for a Job** **Identifying different sources announcing Job vacancies,** **Skim, scan and read advertisements in detail,** **write efficacious CVs,** **write covering letters to accompany CVs,** **write Job Application Letters - in response to advertisements and self-applications** **Sessional Activities :** **Write an effective CV and covering letter for it.** **Write a Job Application letter in reponse to an advertisement and a Self Application Le tter for a job.**	**5**
Unit - 5	**Job Interviews** **Prepare for Interviews:** **Intelligently anticipating possible questions and framing appropriate answers,** **Do's and don'ts of an interview (both verbal and non-verbal),** **Group Discussion:** **Use of Non-verbal behaviour in Group Discussion,** **Appropriate use of language in group interaction,** **Do's and don'ts for a successful Group Discussion.** **Sessional Activities :** **Write down the anticipated possible questions for personal interview (HR) along with t heir appropriate responses** **Face mock interviews. The co-operation of HR personnels of industries may be sough t if possible.** **Videos of Mock Group Discussions and Interviews may be shown.**	**5**
Unit - 6	**Non-verbal - graphic communication** **Non - verbal codes: A - Kinesics, B - Proxemics, C- Haptics, D - Vocalics, E- Physical** **appearance, F- Chronemics, G - Artifacts**	**4**

	Aspects of Body Language	
Unit - 7	**Formal Written Skills:** **Memos, E-mails, Netiquettes,** **Business correspondence - Letter of enquiry, Letter of Placing Orders, Letter of Complaint.** **Sessional Activities :** **write a memo,** **write an effective official e-mail,** **write a letter of enquiry, letter of placing orders, letter of complaint**	**5**