

PROGRAM STRUCTURE OF DIPLOMA IN MINING ENGINEERING

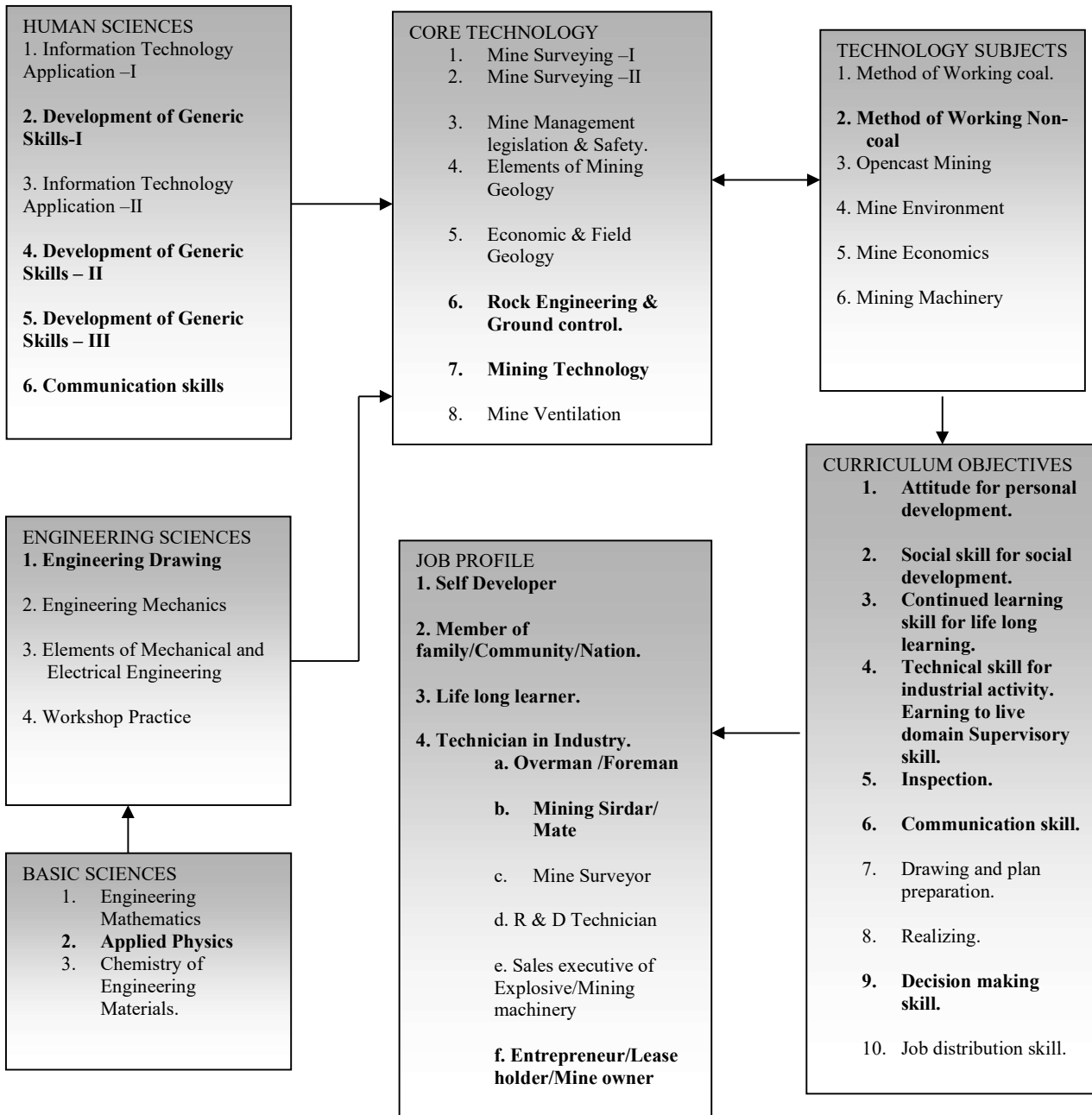
STATE BOARD OF TECHNICAL EDUCATION, JHARKHAND									
COURSE NAME: DIPLOMA IN MINING ENGINEERING									
YEAR/SEMESTER: THIRD YEAR (A)					WITH EFFECT FROM 2011-12 BATCH				
Sr. No.	TEACHING SCHEME			EXAMINATION SCHEME & MAXIMUM MARKS					
	SUBJECT TITLE WITH CODE NO.	TH	PR	PAPER HRS	TH	PR	OR	TW	SW
3.1	Method of Working- Non Coal	4	2	3	100	--	#50	--	50
3.2	Mine Environment	3	2	3	100	--	#50	--	50
3.3	Mine Surveying-II	2	2	3	100	#50	--	--	50
3.4	Mining Machinery	4	2	3	100	--	#50	--	50
3.5	Mine Management Legislation & Safety	4	--	3	100	--	#50	--	50
3.6	Opencast Mining	4	--	3	100	--	--	--	50
3.7	Mine Economics	4	--	3	100	--	--	--	50
3.8	Practical Training Project -II	--	*2	--	--	--	#100	--	--
3.9	Development of Generic Skills III	1	2	--	--	--	--	#50	--
TOTAL		26	12	--	700	50	300	50	100

Institutional Hours per Week: 38 Hrs.
Student Contact Hours per Week (Formal Teaching): 40 Hrs.
Student Centered Activities (Library Studies, Guidance & Counseling, Seminar, Self Learning, Etc.)
Hrs per week: 2 Hrs.
Total Marks: 1200
Abbreviations: TH – Theory, PR- Practical, OR-Oral, TW-Teamwork and SW-Sessional Work.

1. Theory and Practical period of 60 minutes each.
2. Two class tests to be conducted for sessional & total of sessional marks is to be converted to the base of 100 marks.
3. # Practical, Oral, Term work assessment is to be done by external & internal examiner as per the curriculum implementation & assessment norms.
4. Practical Training of 28 weeks shall be started after completion of summer examination.
5. *per batch For Review, Guidance, Seminar in preparation of project report of practical training project work.

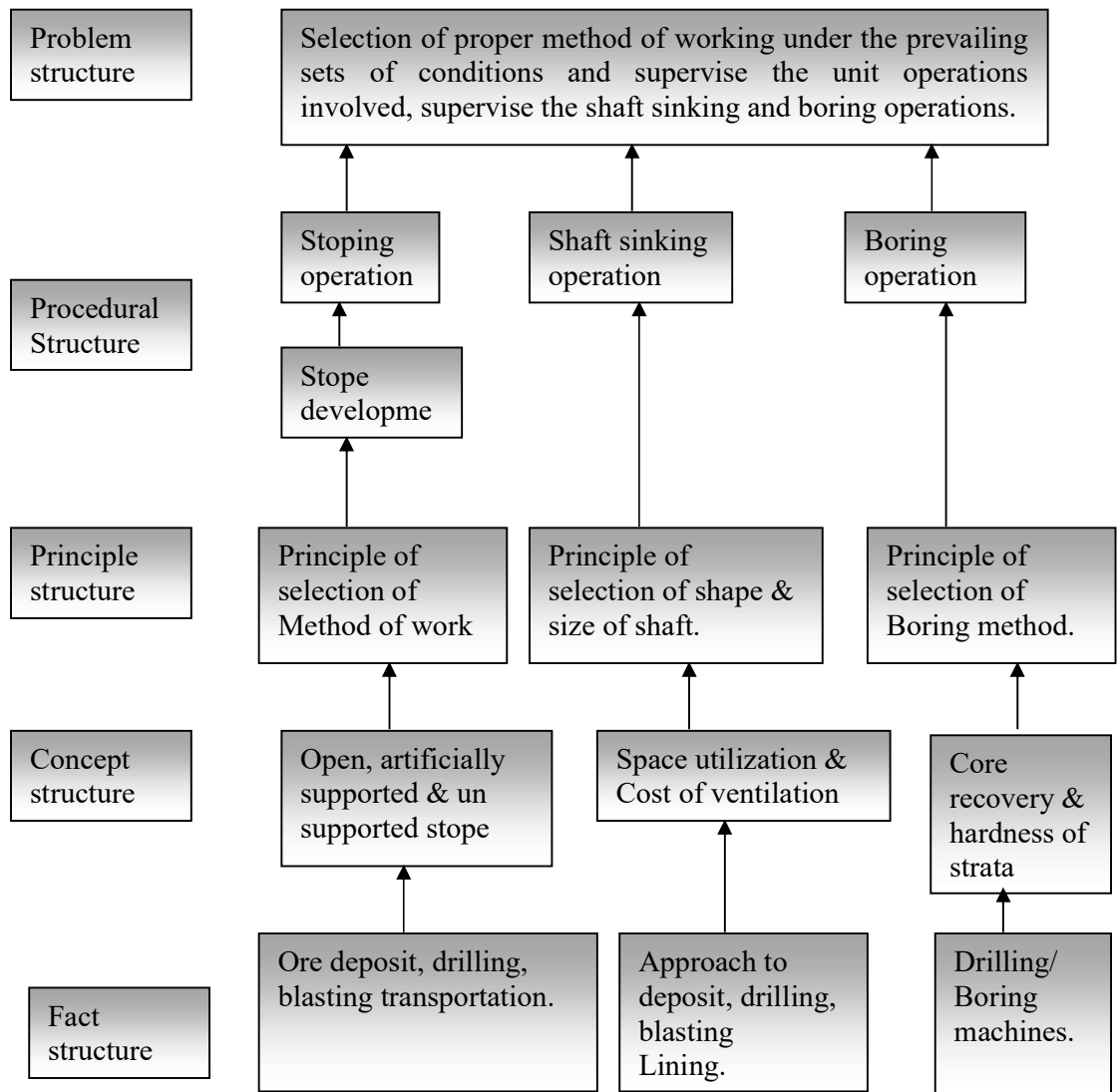
CONTEXT IN THE FORM OF BLOCK DIAGRAM:

SUBJECT AREA – METHOD OF WORKING NON COAL



GRAPHICAL STRUCTURE OF THE SUBJECT AREA - METHOD OF WORKING

NON COAL.



3.1 SUBJECT TITLE: METHOD OF WORKING NON-COAL

YEAR: THIRD YEAR

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME		EXAM SCHEME & MAXIMUM MARKS					
THEORY HRS/WEEK	PRACTICAL HRS/WEEK	PAPER HRS.	TH	PR	OR	TW	SW
4	2	3	100	--	# 50		50

External assessment as per curriculum implementation & assessment norms..

RATIONALE:

After obtaining Diploma in Mining and Mine Surveying many of the students join the metaliferrous mines as foreman. They are required to supervise operations involved in underground metal mines. Also shaft sinking is the unique feature of the mining process and Diploma holder need to supervise the entire process of shaft sinking. The knowledge of underground metal mining, shaft sinking and boring is essential for the student.

OBJECTIVES:

After undergoing the course of study the student shall be able to

1. Supervise development and stoping operations in underground metal mines.
2. Supervise the process of shaft sinking and carryout the supporting, lining of the sinking shaft.
3. Supervise the Boring operation on the site of Boring/Drilling.

DETAILED CONTENTS:

UNIT	CONTENTS	Mark	Hrs.	PRACTICAL CONTENT
1.	<p>UNDERGROUND DEVELOPMENT</p> <p>1.1 Terminology used in metal mines.</p> <p>1.2 Types of ore bodies.</p> <p>1.3 Types of underground opening, location of openings.</p> <p>1.4 Opening up of a mineral deposit by vertical shaft, inclined shaft, Adit.</p> <p>1.5 Level interval, factor considered while deciding level interval/length of back.</p> <p>1.6 Drivage of raises and winzes Driving manually, Modern methods Alimak, long hole method, Drop raising, raise boring.</p> <p>1.7 Common supports in metal mines.</p>	16	20	<p>Preparation of sheet</p> <p>1. Mining Terms.</p>
2.	<p>UNSUPPORTED STOPING METHODS</p> <p>2.1 Classification and choice of stoping Methods.</p> <p>2.2 Open stoping methods, underhand, overhand, Breast stoping, sublevel stoping, Blast hole stoping, VCR , Shrinkage method, their conditions of Applicability, Sequence of Development, stoping operation, Cycle of operations etc. System of removal of ore from stope.</p>	16	25	<p>2. Sublevel stoping method.</p> <p>3. Shrinkage stoping method.</p>
3.	<p>SUPPORTED & CAVING METHODS</p> <p>3.1 Artificially supported methods cut And fill, square set, stulled stoping Methods. Their applicability, stope Preparation, stoping operation, cycle of operation, relative merits and demerits etc.</p> <p>3.2 Caving methods - Top slicing, Sublevel caving and block caving methods, applicability, stope preparation stoping, cycle of operation etc.</p> <p>3.3 PROVISIONS OF MMR 1961 regarding Means of Access and Egress, Ladders and ladder ways.</p>	18	25	<p>4. Cut & fill stoping method</p> <p>5. Caving method (any one)</p> <p>6. Various systems of ore drawing from stope.</p>

UNIT	CONTENTS	Mark	Hrs.	PRACTICAL CONTENT
4.	<p>SHAFT SINKING</p> <p>4.1 Size, shape, Factors considered for location of shaft, marking center, and shaft-centering arrangement.</p> <p>4.2 Ordinary sinking up to rock head, sinking of shaft below rock head-operation of drilling, charging and blasting and mucking operation. Disposal of debris.</p> <p>4.3 Shaft lining: Temporary lining, Permanent lining of shaft: Brick, monolithic, reinforced concrete lining, shaft tubing's etc.</p> <p>4.4 Walling scaffold, rider, ledge formation, underpinning, water garland crib etc.</p>	18	34	<p>7. Temporary lining in shaft.</p> <p>8. Permanent Brick lining in shaft.</p> <p>9. Concrete lining in shaft.</p> <p>10. Shaft tubbings.</p>
5	<p>SPECIAL METHODS OF SHAFT SINKING</p> <p>5.1 Different special methods of shaft sinking, condition of applicability of each method, Description etc.</p> <p>5.2 Widening and Deepening of shaft.</p>	16	20	<p>11. Special method of shaft sinking.</p> <p>12. Widening and deepening of shaft.</p>
6.	<p>BORING</p> <p>6.1 Purpose of boring, classification of boring methods, applicability of boring methods.</p> <p>6.2 Drill Bits for various types of drilling/boring.</p> <p>6.3 Surface arrangement, assembly, working of Rotary boring, Screw and hydraulic feed mechanism.</p> <p>6.4 Core recovery, core barrels, Recover of broken tools, Bits.</p> <p>6.5 Bore hole survey, Deviation of boreholes.</p>	16	20	<p>13. Demonstration of surface arrangement, assembly and working of rotary boring.</p> <p>14. Demonstration of core barrels.</p> <p>15. Demonstration of different types of drill bits used in boring.</p> <p>16. Study of screw feed & hydraulic feed Mechanism.</p>

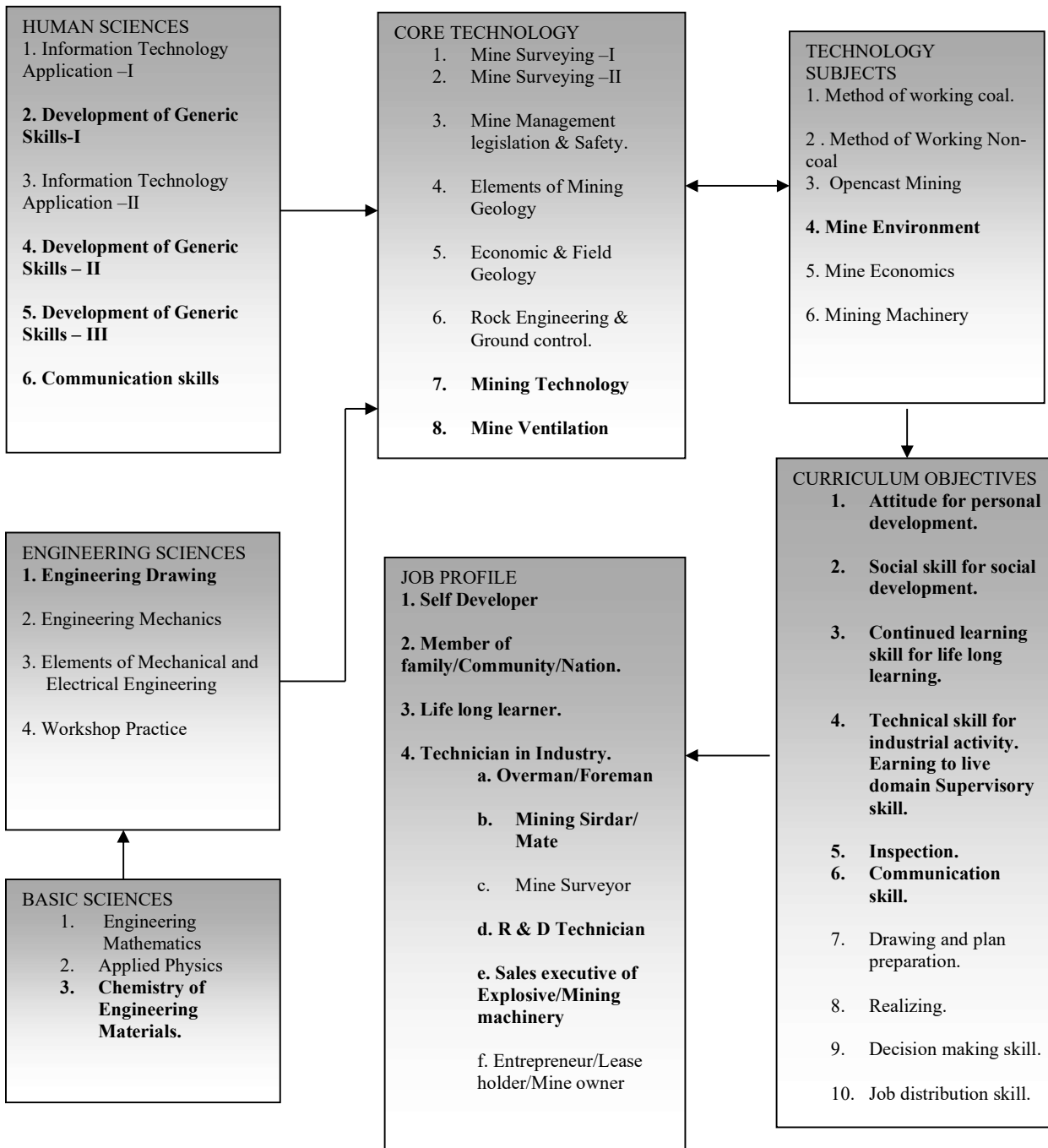
STRATEGY OF IMPLEMENTATION

Conducting theory classes, practical, Industrial visits seminars group discussion, and assignment on different topics shall complete the curriculum for the subject.

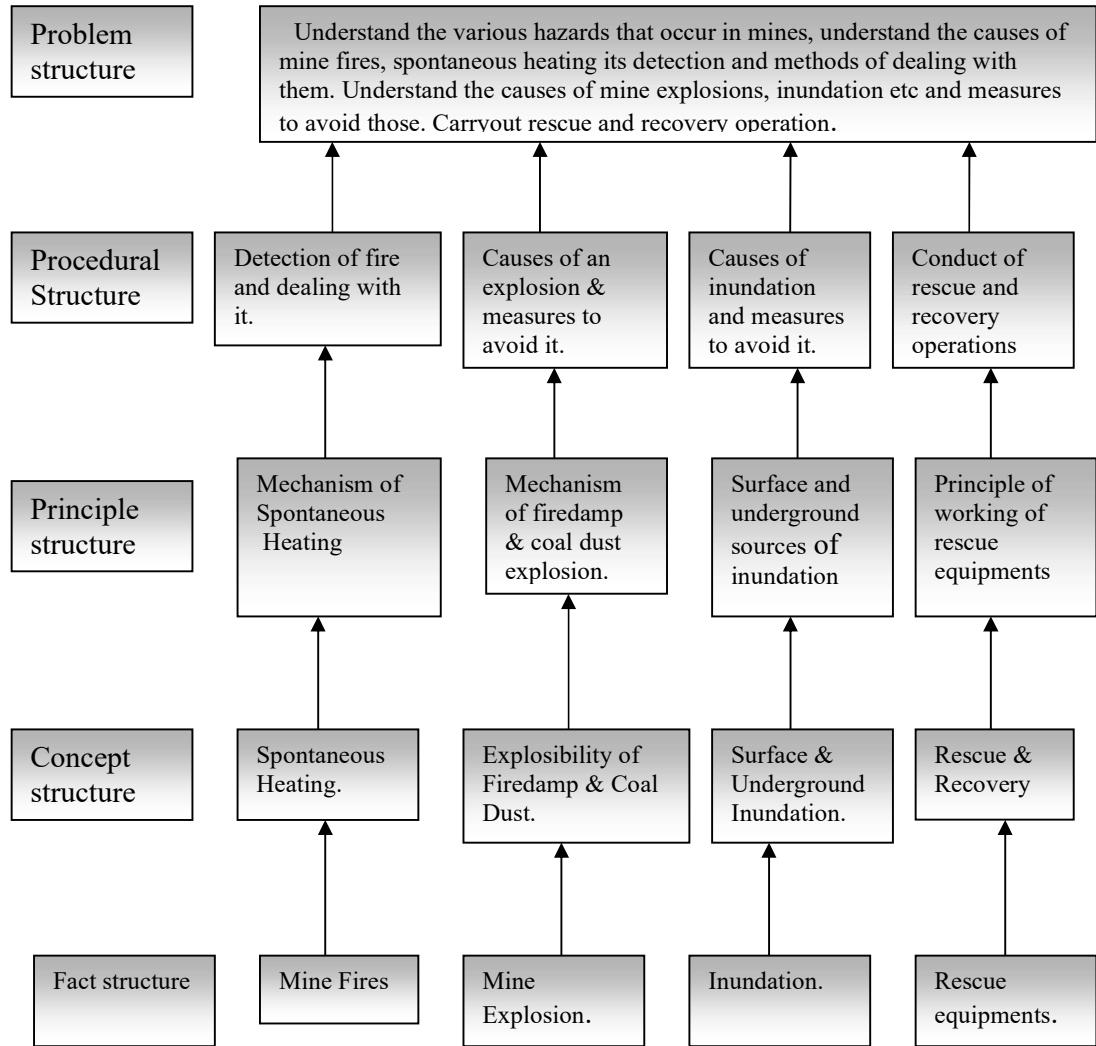
REFERENCE BOOKS:

Author	Title	Year of publication	Publisher
D.J. Deshmukh	Elements of Mining Technology Vol I, II	1995	Central techno publication, Nagpur
G.B. Misra	Surface Mining	1993	Oxford University Press, Calcutta
H.L. Hartman	Introductory Mining Engineering	1987	AWiley-Interscience Publication, Singapore.

**CONTEXT IN THE FORM OF BLOCK DIAGRAM:
SUBJECT AREA – MINE ENVIRONMENT**



GRAPHICAL STRUCTURE OF THE SUBJECT AREA - MINE ENVIRONMENT



3.2 SUBJECT TITLE: MINE ENVIRONMENT
YEAR: THIRD YEAR

TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME		EXAM SCHEME & MAXIMUM MARKS					
THEORY HRS/WEEK	PRACTICAL HRS/WEEK	PAPER HRS.	TH	PR	OR	TW	SW
3	2	3	100	--	# 50	--	50

External assessment as per curriculum implementation & assessment norms..

RATIONALE:

Mining is the hazardous profession involving fires, explosions of firedamp and coal dust, inundation of water are the common hazards which have resulted in calamities causing deaths of large number of miners all over the world. The mining engineer therefore be aware of hazards, their causes and methods of preventing them. However, whenever such calamities do occur rescue and recovery operations are necessary to save the life and property in mines. The mining engineer has to be well acquainted with these operations. The subject of Mine Environment covers topics on these activities.

OBJECTIVES:

After undergoing the course of study the student shall be able to

1. Take precautionary measures against occurrence of the firedamp and coal dust explosions.
2. Take precautionary measures against occurrence of spontaneous heating, its detection and conduct sealing off operations.
3. Detect presence of fire and supervise the fire fighting operations.
4. Ensure safe withdrawal of persons in case of any eventuality of explosion, fire and inundation.
5. Take part in sealing off and reopening operations.
6. After undergoing further training in rescue work, take part in rescue operations.

DETAILED CONTENTS:

UNIT	THEORY CONTENTS	Marks	Hrs	PRACTICAL CONTENT
1	<p>MINE FIRES</p> <p>1.1 Surface fire and underground fires, their causes, detection and prevention. Classification of fires, Portable fire extinguishers their applicability, places of portable fire extinguishers in mines, maintenance of fire extinguishers.</p> <p>1.2 Spontaneous heating: Mechanism of spontaneous Heating, factors governing spontaneous heating, methods for study of spontaneous combustion of coal: crossing point method. Stages of spontaneous heating, Detection of spontaneous heating: Physical or sensory indicators, Precautions for prevention of spontaneous heating.</p> <p>1.3 Model standing orders in event of fire.</p> <p>1.4. Dealing with spontaneous heating & fires: Various methods, Sealing off: selection of site for fire stoppings, construction of fire stopping, fittings to stopping, inspection and maintenance of fire stoppings.</p>	18	20	<p>1. Demonstration of various portable fire extinguishers.</p> <p>2. Determination of crossing point temperature.</p> <p>3. Demonstration of various temporary stoppings.</p> <p>4. Demonstration of preparatory stopping.</p> <p>5. Demonstration of construction of fire stopping and fittings to it.</p>
2.	<p>SAMPLING OF MINE ATMOSPHERE & INTERPRETATION</p> <p>2.1 Sampling from sealed off area: Sampling line, Methods of sampling from behind the fire stopping, frequency of sampling.</p> <p>2.2 Sampling accessible places: water, air displacement method, evacuated sample holder type.</p> <p>2.3 Composition and behavior of gases in sealed off area, interpretation regarding condition of heating: Graham's ratio; interpretation regarding explosibility: Cowards Diagram. Elementary knowledge of gas chromatography.</p> <p>2.4 Reopening of sealed off area: Factors governing decision of reopening, methods of reopening, selection of methods of reopening, precautions to be taken while reopening.</p>	16	20	<p>6. Demonstration of sampling of atmosphere from behind the fire stopping.</p> <p>7. Demonstration of sampling equipments and collection of air samples at accessible places.</p>

UNIT	THEORY CONTENTS	Marks	Hrs	PRACTICAL CONTENT
3	<p>FIRE DAMP EXPLOSION</p> <p>3.1 Introduction, Composition of firedamp Modes of emission of Firedamp, Degree of gassiness, methane layering.</p> <p>3.2 Mechanism of fire damp explosion, Flammability of firedamp, lower and upper limit of explosibility of firedamp, factors governing limits of flammability, lag on ignition. Explosive limits of other flammable gases.</p> <p>3.3 Causes of fire damp explosion and its prevention. Characteristic of firedamp explosion.</p>	16	15	
4	<p>COAL DUST EXPLOSION</p> <p>4.1 Mechanism of Coal Dust explosion, Flammability limits of coal dust, factors governing explosibility of coal dust, Characteristics of coal dust explosion.</p> <p>4.2 Causes of coal dust explosion, Prevention of coal dust explosion.</p> <p>4.3 Generalized stone dusting, Quantity of stone dust, Types and properties of stone dust, stone dusting plan.</p> <p>4.4 Stone dust barriers, types of stone dust barriers, specifications and construction, location of primary and secondary types of barriers. Situations under which barrier may fail, maintenance and care of stone dust barriers. Water barrier, Triggered barrier.</p>	18	20	<p>8. Preparation of sampling & dusting plan in zones & sections.</p> <p>9. Collection of mine dust samples.</p> <p>10. Demonstration of stone dust barrier and maintenance of stone dust barrier.</p>
5.	<p>INUNDATION</p> <p>5.1 Surface and underground causes of Inundation and its prevention.</p> <p>5.2 water dams, bulkhead doors.</p> <p>5.3 Procedure of and precaution while approaching old water logged areas, pattern of bore holes,</p> <p>5.4 Dewatering, burn side safety boring apparatus.</p> <p>5.5 Standard of lighting in underground & opencast mines, cap lamps, its construction, maintenance and care, cap lamp room.</p>	16	15	<p>11. Demonstration of Burnside safety boring apparatus.</p> <p>12. Demonstration of electric cap lamp.</p>
6	<p>MINE RESCUE</p> <p>Introduction, classification of mine rescues apparatus, modern self contained breathing apparatus BG 174, its construction,</p>	16	18	<p>13. Demonstration of Self-contained closed ckt compressed oxygen-breathing apparatus (B.G 174).</p>

UNIT	THEORY CONTENTS	Marks	Hrs	PRACTICAL CONTENT
	<p>application and scope. Common tests of self contained compressed oxygen breathing apparatus.</p> <p>6.2 Chemical oxygen self-rescuers, gas mask, filter self-rescuers: their construction, application and limitations. Fresh air hose type breathing apparatus.</p> <p>6.3 Fresh air base: location, personnel & equipments required. Layout of FAB.</p> <p>6.4 Resuscitation, Modern reviving apparatus</p>			<p>14. Demonstration of Gas mask.</p> <p>15. Demonstration of Filter Self-Rescuer.</p> <p>16. Demonstration of Reviving apparatus.</p>

STRATEGY OF IMPLEMENTATION

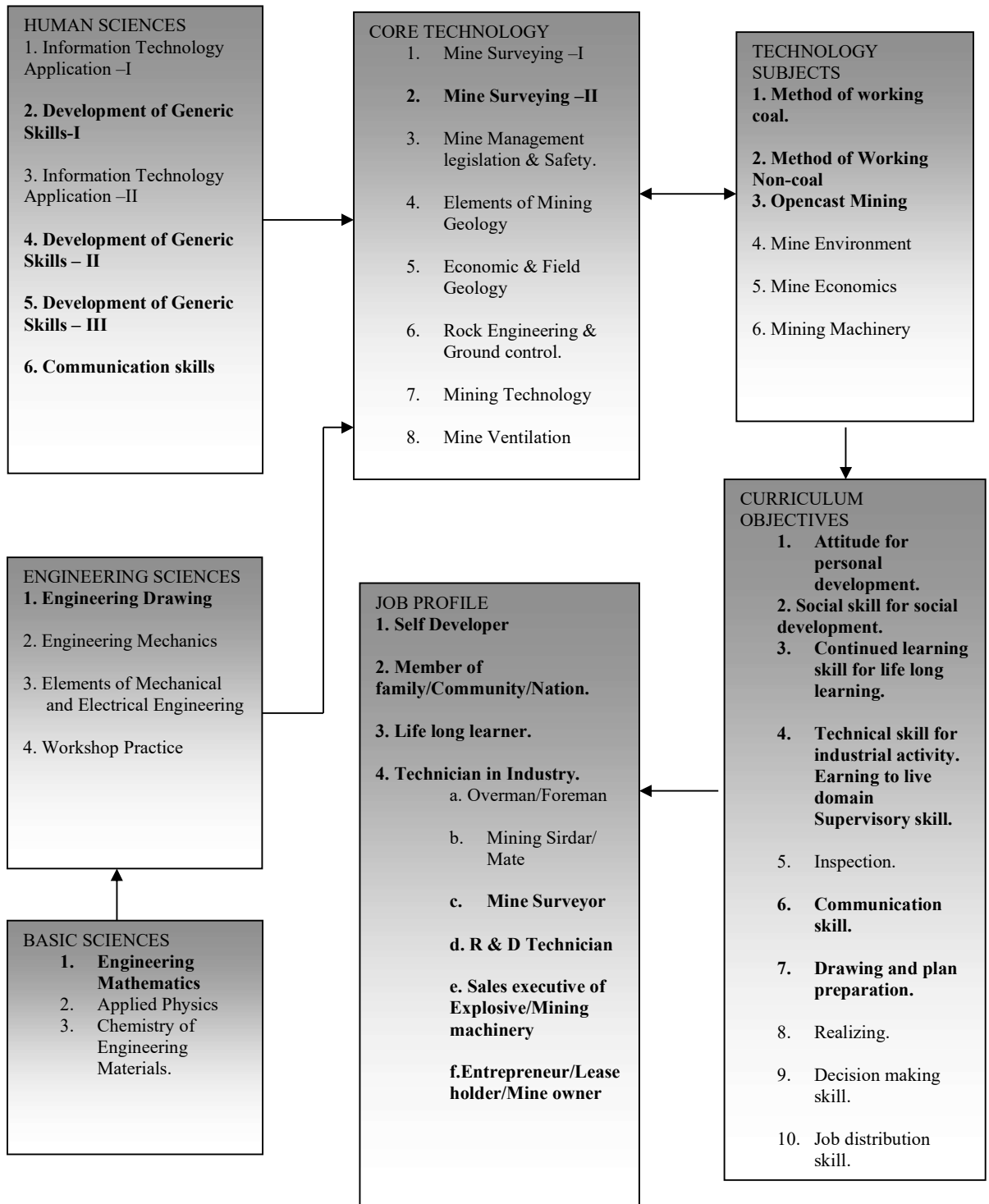
Conducting theory classes, practical, Industrial visits seminars group discussion, and assignment on different topics shall complete the curriculum for the subject.

REFERENCE BOOKS:

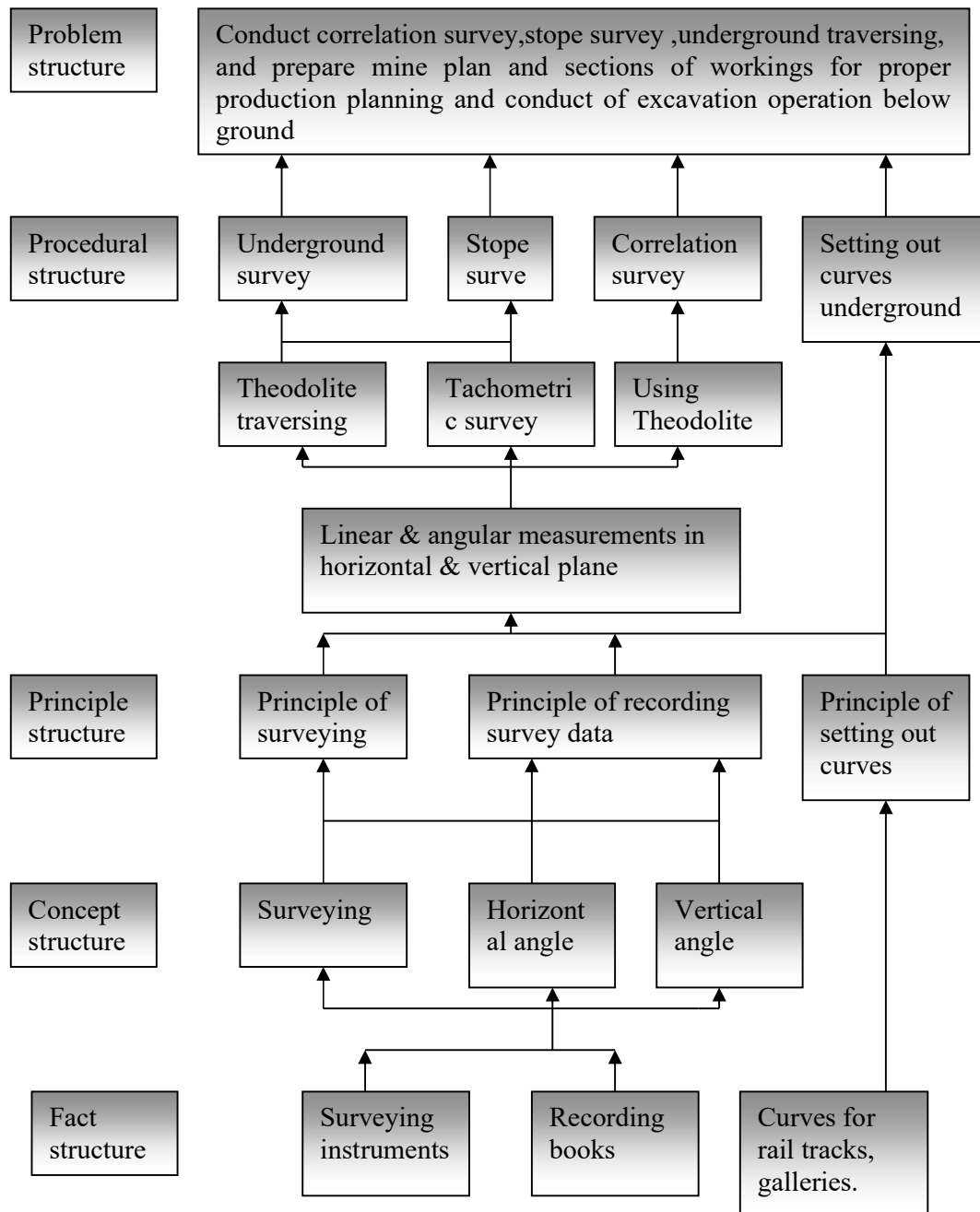
Author	Title	Year of publication	Publisher
D.J. Deshmukh	Elements of Mining Technology Vol II	1995	Central techno publication, Nagpur
G.B. Misra	Mine Environment & Ventilation	1993	Oxford University Press, Calcutta
M.A. Ramlu	Mine Disaster & Mine Rescue	1997	Oxford University Press, Calcutta

CONTEXT IN THE FORM OF BLOCK DIAGRAM:

SUBJECT AREA – MINE SURVEYING - II



GRAPHICAL STRUCTURE OF SUBJECT MINE SURVEYING – II



3.3 SUBJECT TITLE: MINE SURVEYING- II

YEAR: THIRD YEAR

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME		EXAM SCHEME & MAXIMUM MARKS					
THEORY HRS/WEEK	PRACTICAL HRS/WEEK	PAPER HRS.	TH	PR	OR	TW	SW
2	2	3	100	# 50	-	-	50

External assessment as per curriculum implementation & assessment norms..

RATIONALE:

The important job functions of Mine surveyor is to conduct survey below ground in the mines as well as above ground .It is therefore essential to give emphasis on the methods of correlation survey, conduction of correlation survey, conduction of stope survey etc. There is lot of advancement taking place in the field of mine surveying and students need to be acquainted with advanced survey instruments.

OBJECTIVES:

Student will be able to

1. Acquire skills of using theodolite.
2. Conduct correlation survey by various methods.
3. Conduct Stope surveying.
4. Acquire skills of using advanced survey instruments.
5. Develop skills of recording and plotting surveyed data.
6. Carryout and suggest the repairs needed to survey instruments.
7. Solve problems related to dip and faults.

DETAILED CONTENTS:

UNIT	CONTENTS	Mark	Hrs.	PRACTICAL CONTENT
1.	<p>1.1 THEODOLITE</p> <p>1.1.1 Classification of theodolite, definitions and terms used in operating theodolite.</p> <p>1.1.2. Temporary adjustments of transit theodolite. Fundamental axes of theodolite .</p> <p>1.1.3 Measurement of horizontal and vertical angles.</p> <p>1.1.4 Observe magnetic bearing of a line.</p> <p>1.1.5. Use of theodolite for Prolonging a straight line, for lining in, Lay-off horizontal angle.</p> <p>1.1.6. Sources of errors in theodolite work and their elimination. Permissible errors in mine surveying.</p>	16	08	<p>1. Demonstration of theodolite, reading the vernier.</p> <p>2. Temporary adjustments of theodolite & measurement of horizontal angle by repetition method.</p>
	<p>1.2 THEODOLITE TRAVERSING</p> <p>1.2.1 Methods of traversing, by included angles & Deflection angles.</p> <p>1.2.2 Checks in closed & open traverse.</p> <p>1.2.3 Traverse computation: latitude, departure, Consecutive coordinates, independent coordinates, error of closure</p> <p>1.2.4 Adjustment of closed traverse, balancing by Bowditch and transit rule.</p> <p>1.2.5 Gales Traverse table.</p> <p>1.2.6 Permanent adjustments of theodolite. (only relationship of different axis of theodolite)</p>	16	12	<p>3. Measurement of horizontal angle by reiteration method.</p> <p>4. Observation of magnetic bearing of a line by Theodolite by compass attachment.</p>
2.	<p>2.1 GEODETIC TRIANGULATION</p> <p>Basic principles, Triangulation figures, Classification, Base line measurement. Correction to Base line Measurement. (Elementary idea only)</p>	08	04	<p>5. Measurement of deflection angle by Theodolite by taking an open traverse of 4 – 5 sides.</p>
	<p>2.2 TACHEOMETRIC SURVEYING</p> <p>Instruments. Requirement of a tacheometer Tachometric methods : Fixed hair method; Reduction formula for horizontal distance & elevation with horizontal sights .</p>	08	04	<p>6. Prolongation of a survey line with the help of a Theodolite.</p>
	<p>2.3 SETTING OUT CURVES : Classification of curves. Definition of various parts of curves, Elements of simple circular curve, Relation between radius of curve & degree of curve. setting out curves by Linear methods and single theodolite method.</p> <p>2.4 super elevation or cant. Purpose of super elevation</p> <p>2.5 Study and use of Planimeter including digital planimeter</p>	08	08	<p>7. Measurement of Vertical angles using theodolite.</p>

UNIT	CONTENTS	Mark	Hrs.	PRACTICAL CONTENT
3	<p>UNDERGROUND SURVEYS</p> <p>3.1 Marking of underground stations.</p> <p>3.2 Correlation Survey- Direct traversing through incline, by plumbing wires in shaft, coplaning method, weisbach triangle method, Weiss quadrilateral method, Gyro- theodolite method</p>	16	10	<p>8. To Find constants of a given tacheometer.</p> <p>9. Determining the reduced level and horizontal distance of an in accessible object by Tachometer.</p> <p>10. Setting out a simple circular curve by offsets from long chord</p> <p>11. Setting out a simple circular curve by sub cord produced method.</p> <p>12. Setting out a simple circular curve by (single Theodolite method) Rankine's method.</p> <p>13. Demonstration of EDM.</p> <p>14. Demonstration of micro optic theodolite.</p> <p>15. Demonstration of Total station.</p>
4.	<p>STOPE SURVEY</p> <p>4.1 Definition & Purpose of stope survey Classification of stope surveying</p> <p>4.2 Methods of stope surveying Stope survey flat deposit: Tape triangulation, Tie Method, instrumental method Stope survey in steeply inclined deposit. Stope survey in massive ore bodies, irregular in dip & shape.</p>	08	08	

UNIT	CONTENTS	Mark	Hrs.	PRACTICAL CONTENT
5.	ADVANCES IN MINE SURVEYING 5.1 Global Positioning System; Principle, The system, application in Opencast mine surveying, Advantages and Disadvantages. 5.2 Total station; application in distance measurement, angle measurement 5.3 Electronic Distance Measurement; Principle of measurement, types etc. 5.4 Gyro theodolite; principle of gyro, gyro attachments 5.5 Laser plummet	12	10	
6	6.1 DIP AND FAULT PROBLEMS. (simple cases) Introduction, Definition of Dip, Strike Apparent dip, Full dip, Numericals for determining true and apparent dip, strategical thickness of seam. Definition of Fault. Normal fault, Reverse fault. Numerical on fault problems. 6.2 connection of mine plan to national Grid.	08	08	

PROJECT WORK

1. Theodolite traverse survey – A closed traverse of 5 – 6 sides with location of details by plane tabling .Computation by Gales traverse table. plotting of traverse.

Term Work shall consist of a field and level book containing the specified practical, and sheets (imperial size) containing the specified project work .

STRATEGY OF IMPLEMENTATION

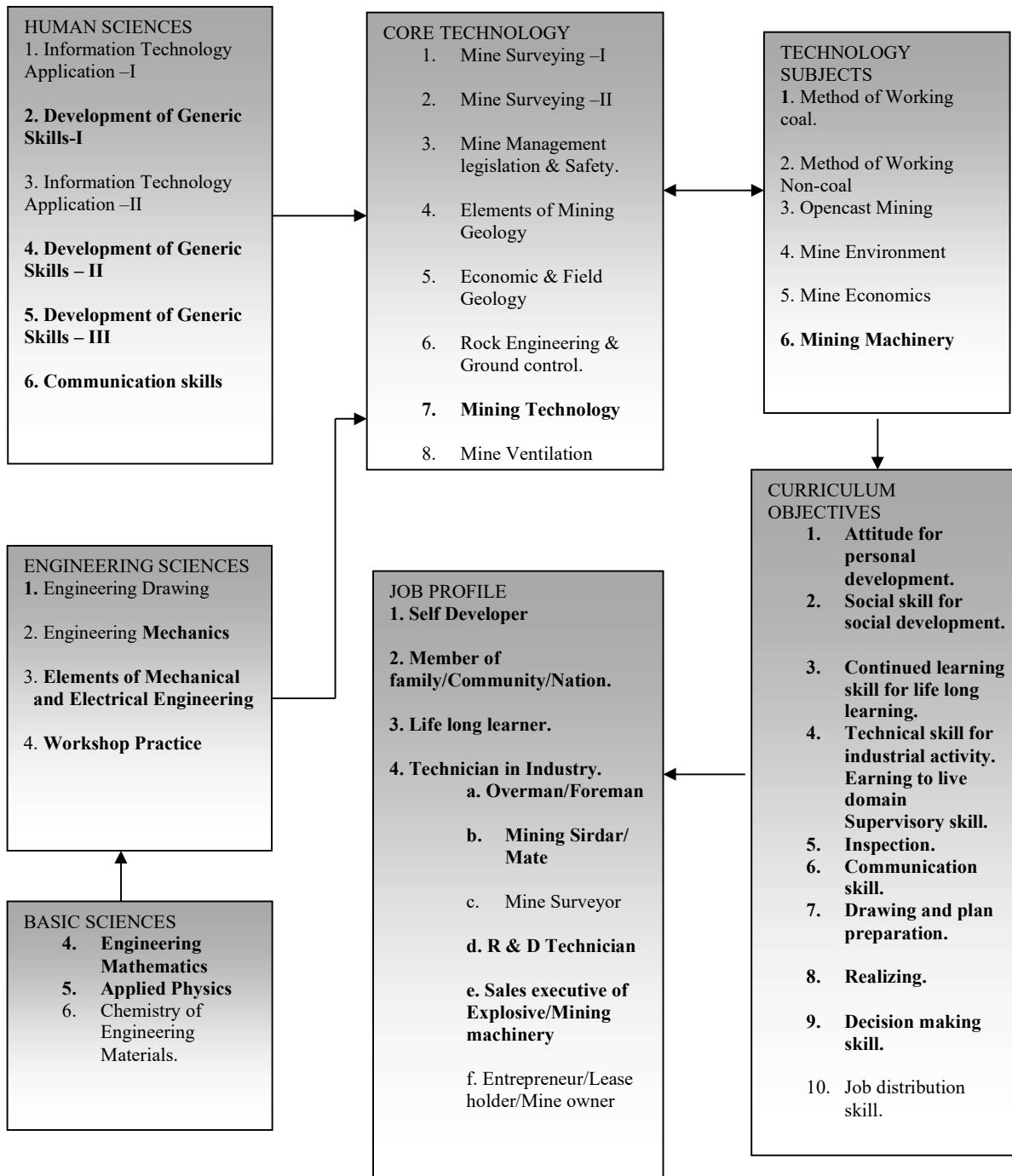
Conducting theory classes, practical, Industrial visits seminars group discussion, and assignment on different topics shall complete the curriculum for the subject.

REFERENCE BOOKS

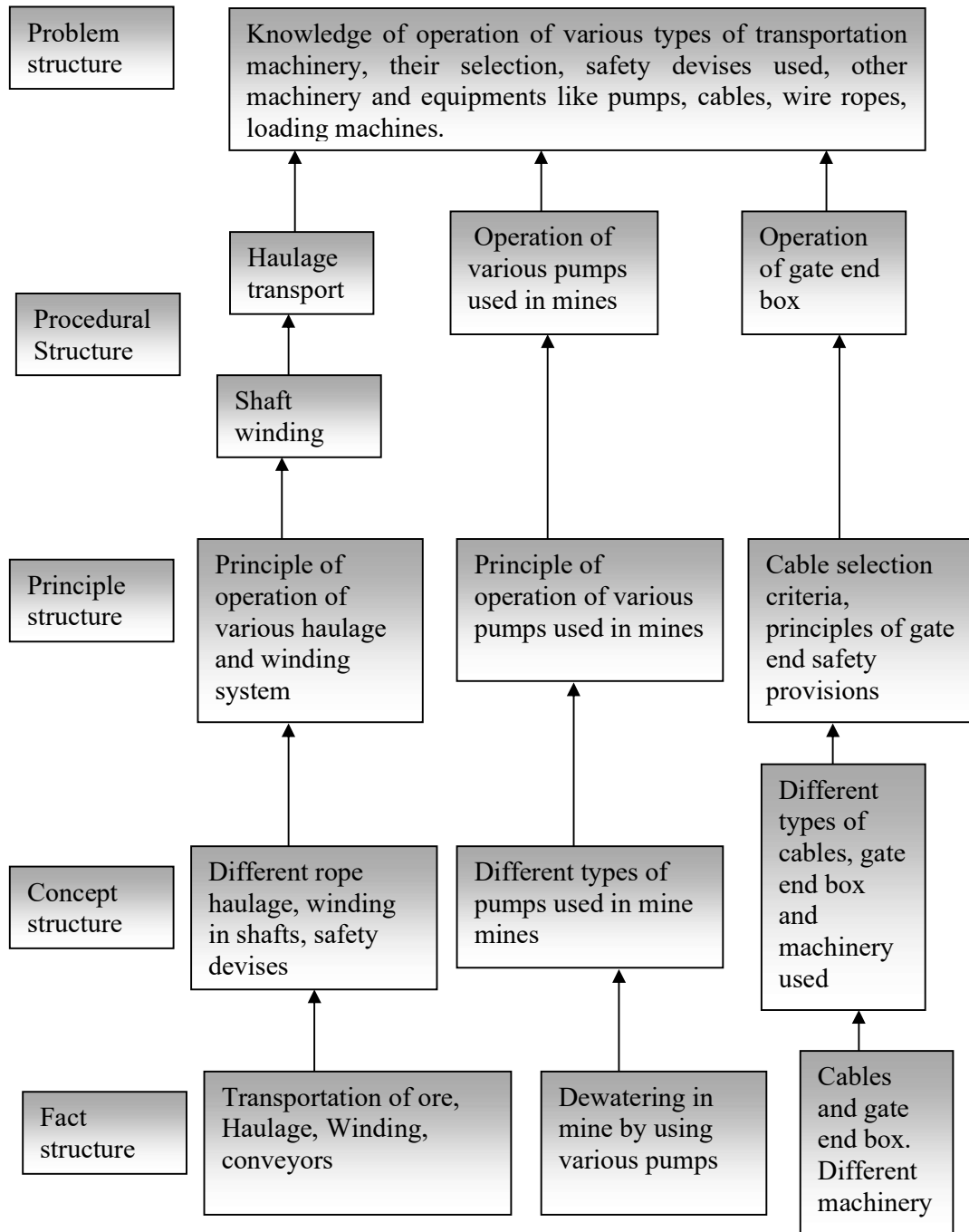
Author	Title	Year of publication	Publisher
T. P. Kanetkar & S. V. Kulkarni	Surveying and leveling Vol. I & II	1995	Pune Vidyapith Griha Prakashan Pune.
B.C. Punmia	Surveying & Levelling		
Amarjit Aggarwal.	Surveying & Levelling	1992	H.Tata International Publication, Delhi- 51

CONTEXT IN THE FORM OF BLOCK DIAGRAM:

SUBJECT AREA – MINING MACHINERY



GRAPHICAL STRUCTURE OF THE SUBJECT AREA – MINING MACHINERY



3.4 SUBJECT TITLE: MINING MACHINERY

YEAR: THIRD YEAR

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME		EXAM SCHEME & MAXIMUM MARKS					
THEORY HRS/WEEK	PRACTICAL HRS/WEEK	PAPER HRS.	TH	PR	OR	TW	SW
4	2	3	100	--	# 50	-	50

External assessment as per curriculum implementation & assessment norms..

RATIONALE:

A large number of mining machineries are used in the mine right from the winding of men and material through shafts, transport of material, wire, power for drilling, cutting and loading of coal on the faces. Pumping operations are also essential to deal with accumulation of water in underground workings. A mining engineer should be aware of the types of machineries available for these operations, their principles of operations and suitability of these equipments under different conditions, so that they can supervise the selection, installation and day-to-day operation and elementary maintenance of these equipments.

OBJECTIVES:

After undergoing the course of study the student shall be able to

1. Supervise the transportation of coal/mineral by different types of rope haulages.
2. Provide and maintain the safety devices to be provided on rope haulages.
3. Supervise the operation of locomotive haulages and different types of conveyers for transportation of mineral/material.
4. Supervise the operation of coal cutting machines and power loaders on the coal faces.
5. Supervise the installation and operation of water pumps for dealing with water in underground mines.
6. Supervise the winding of coal/minerals from underground to surface and movement of coal/mineral on the surface.
7. Supervise installation, maintenance of ropes and attachments; safe operation and understand the methods of dealing with breakdowns.
8. Supervise operations of coalface machineries.

9. Supervise safe installation, maintenance of cables and with the help of electrician under his charge get minor repairs done.
10. Supervise the safe installation and operation of gate and boxes and other electrical appliances/switchgears etc.

DETAILED CONTENTS:

UNIT	CONTENTS	MARKS	HOURS	PRACTICAL CONTENT
1.	<p>TRANSPORT OF ORE</p> <p>1.1 Different types of haulages</p> <p>1.2 Description of each haulage system.</p> <p>1.2.1 Direct rope haulage</p> <p>1.2.2 Endless rope haulage</p> <p>1.2.3 Main and Tail rope haulage</p> <p>1.2.4 Gravity haulage</p> <p>1.3 Calculation of rope haulage</p> <p>1.3.1 Calculation of TTF, Power of the rope</p> <p>1.4 Safety devices used on rope haulage system</p> <p>1.4.1 Stop block/Buffers</p> <p>1.4.2 Back stay</p> <p>1.4.3 Monkey catch</p> <p>1.4.4 Age craft Device</p> <p>1.4.5 Runaway Switch</p> <p>1.4.6 Drop Warwick</p> <p>1.5 Locomotive Haulage different types/ Applicability</p> <p>1.5.1 Diesel locomotive</p> <p>1.5.2 Electric locomotive</p> <p>1.5.3 Air compressed locomotive</p> <p>1.5.4 Battery locomotives.</p> <p>1.6 Definition of draw bar pull, Ideal gradient, Super elevation.</p> <p>1.7 Different Types of Conveyor</p> <p>1.7.1 Chain conveyor</p> <p>1.7.2 Plate conveyor</p> <p>1.7.3 Belt conveyor</p> <p>1.7.4 Condition of Suitability of each type</p> <p>1.7.5 Advantageous and disadvantages</p> <p>1.8 Introduction to Arial Ropeways.</p>	16	28	<p>1. Study of different types of rope haulage</p> <p>2. Demonstration of different models of safety devices uses on rope haulage.</p> <p>3. Demonstration of different types of drum winder models.</p>
2.	<p>WINDING IN SHAFT</p> <p>2.1 Purpose of Winding</p> <p>2.2 Main equipments used for Winding</p> <p>2.2.1 Head gear</p> <p>2.2.2 Headgear pulley</p> <p>2.2.3 Cage/Skip</p>	16	28	<p>4. Demonstration of different parts in cage suspension gear</p>

UNIT	CONTENTS	MARKS	HOURS	PRACTICAL CONTENT
	2.2.4 Winding Rope 2.2.5 Winding drum 2.2.6 Guides 2.2.7 Keps 2.2.8 Suspension Gear 2.2.9 Electric motor 2.3 Different types of winding 2.3.1 Drum winding 2.3.2 Koepe Winding 2.4 Drum winding different types 2.4.1 Cylindrical drum 2.4.2 Conical drum 2.4.3 Cyllindroconical drum 2.4.4 Bicydroconical drum 2.5 Provisions on winding drum 2.5.1 Flanges 2.5.2 Depth indicator 2.5.3 Mechanical Brakes (different types) 2.5.4 Automatic Contrivance 2.6 Angle of fleet 2.7 Guides different types 2.7.1 Rigid guides 2.7.2 Flexible cable 2.8 Causes of cage oscillation 2.9 Cage suspension Gear Rope Capel 2.9.1 D link and bull chain 2.9.2 Safety hook 2.9.3 Triangular distribution plate 2.9.4 Bridle chain 2.10 Different types of keps 2.10.1 Rigid keps 2.10.2 Davies improved keps gear. 2.11 List of safety devices used in winding. 2.12 Characteristics curves 2.13 Smooth winding cycle 2.14 Koepe winding			and their function Different parts a. Reliance rope cable b. D-link c. Safety hook d. Triangular distribution plate e. Bull chain f. Cage.
3.	WIRE ROPES 3.1 Classification of different types of wire ropes 3.1.1 Stranded rope 3.1.2 Non stranded rope 3.2 Different types of stranded rope 3.3 Different types of Non stranded rope 3.4 Lays of rope 3.5 Different definition like Space factor, static load, dynamic load, factor of safety.	16	20	5. Demonstration of different types of Rope sample and their identification 6. Study of Rope splicing method.

UNIT	CONTENTS	MARKS	HOURS	PRACTICAL CONTENT
	3.6 Selection of wire rope 3.7 Care and maintenance in ropes 3.8 Types of deterioration in the ropes 3.9 Testing of wire ropes 3.10 Types of Rope capping 3.10.1 White metal capping (cone socket type capel) 3.10.2 Wedge type capping (Reliance rope capel) 3.10.3 Capping with split capel and rivets (Split capel) 3.11 Recapping 3.12 Rope splicing procedure			
4.	MINE PUMPS 4.1 Sources of water in Mines 4.2 Classification of Mine Pumps 4.3 Reciprocating Pump 4.3.1 Single acting 4.3.2 Double acting 4.3.3 Ram pumps 4.4 Centrifugal Pumps 4.4.1 Turbine Pumps 4.5 Installation of pump 4.6 Operation of pump 4.7 Fitting on pump 4.8 Starting and stopping of pump 4.9 Face pumps 4.10 Characteristics Curves of Centrifugal and turbine pumps. 4.11 Calculations for pump discharge etc. 4.12 Snoring of pump, its prevention. 4.13 Water hammer.	16	20	7. Study of different types of reciprocating pumps 8. Study of different types of Centrifugal pump 9. Study of face pump.
5.	COAL CUTTING MACHINE 5.1 Purpose of coal cutting machine 5.2 Classification of coal cutting Machine. 5.3 Different types of cut 5.4 Different parts of CCM 5.5 Cutting gear arrangements of chain 5.6 Introduction of continuous miner 5.7 Different types of mechanical Loaders.	10	12	10. Study of different types of coal cutting m/c.
6.	ELECTRIC POWER SUPPLY 6.1 Types of cables used in mines 6.2 Permanent cable Different types, construction 6.3 Semi flexible cable	16	24	11. Identification of different types of Electrical power cables used

UNIT	CONTENTS	MARKS	HOURS	PRACTICAL CONTENT
	Different types, construction 6.4 Flexible cable Different types, construction 6.5 Screening of cable 6.6 Cable joint box 6.7 Repair of cable 6.8 Bleeding of cable 6.9 Cable care and maintenance during Use and storage.			in mine.
7.	GATE END BOX 7.1 Construction of gate end box 7.2 Safety provision in gate end box 7.3 Pilot Circuit 7.4 Different circuits for protection	10	12	12. Study of gate and box and its different circuits.

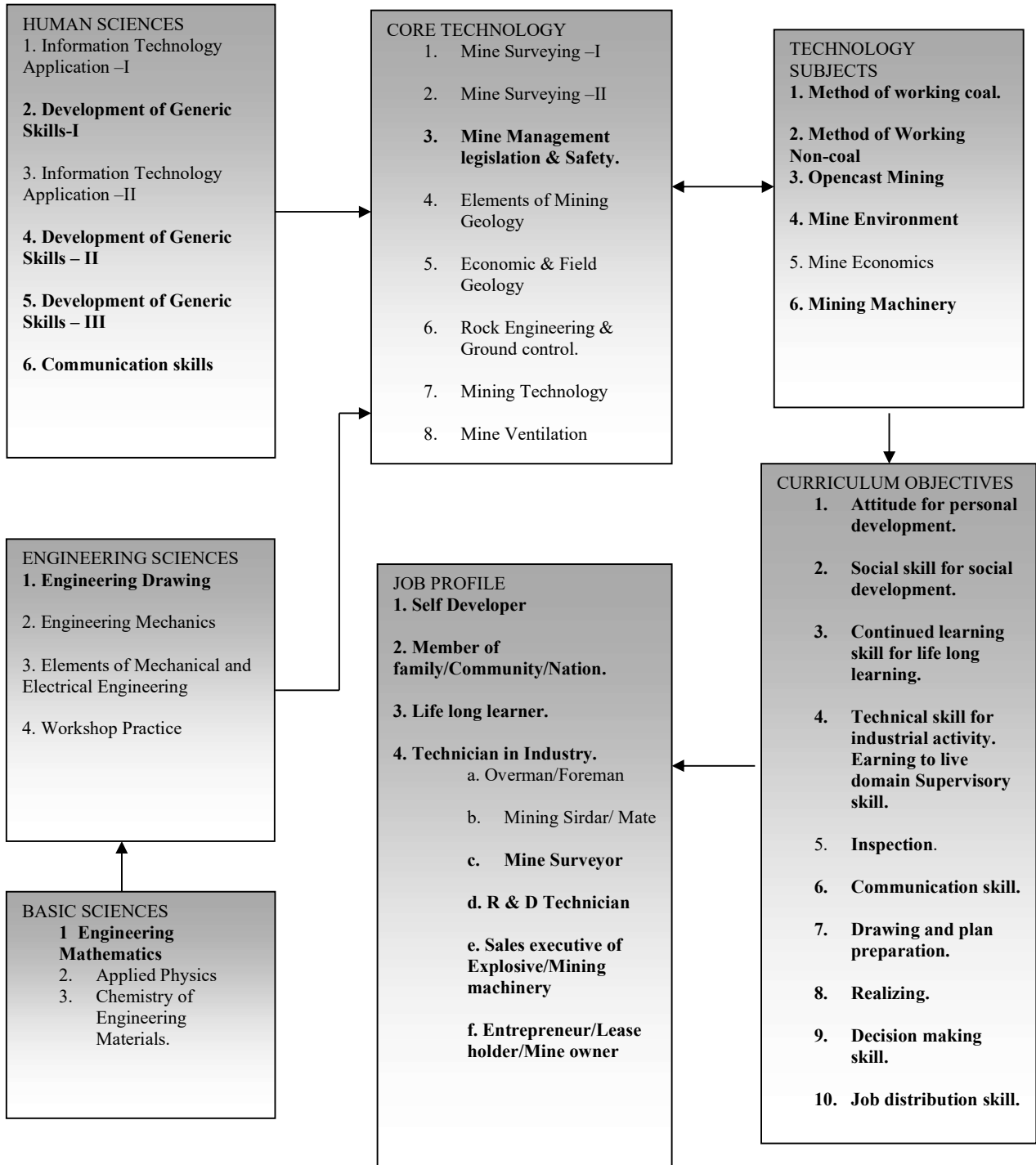
STRATEGY OF IMPLEMENTATION

Conducting theory classes, practical, Industrial visits seminars group discussion, and assignment on different topics shall complete the curriculum.

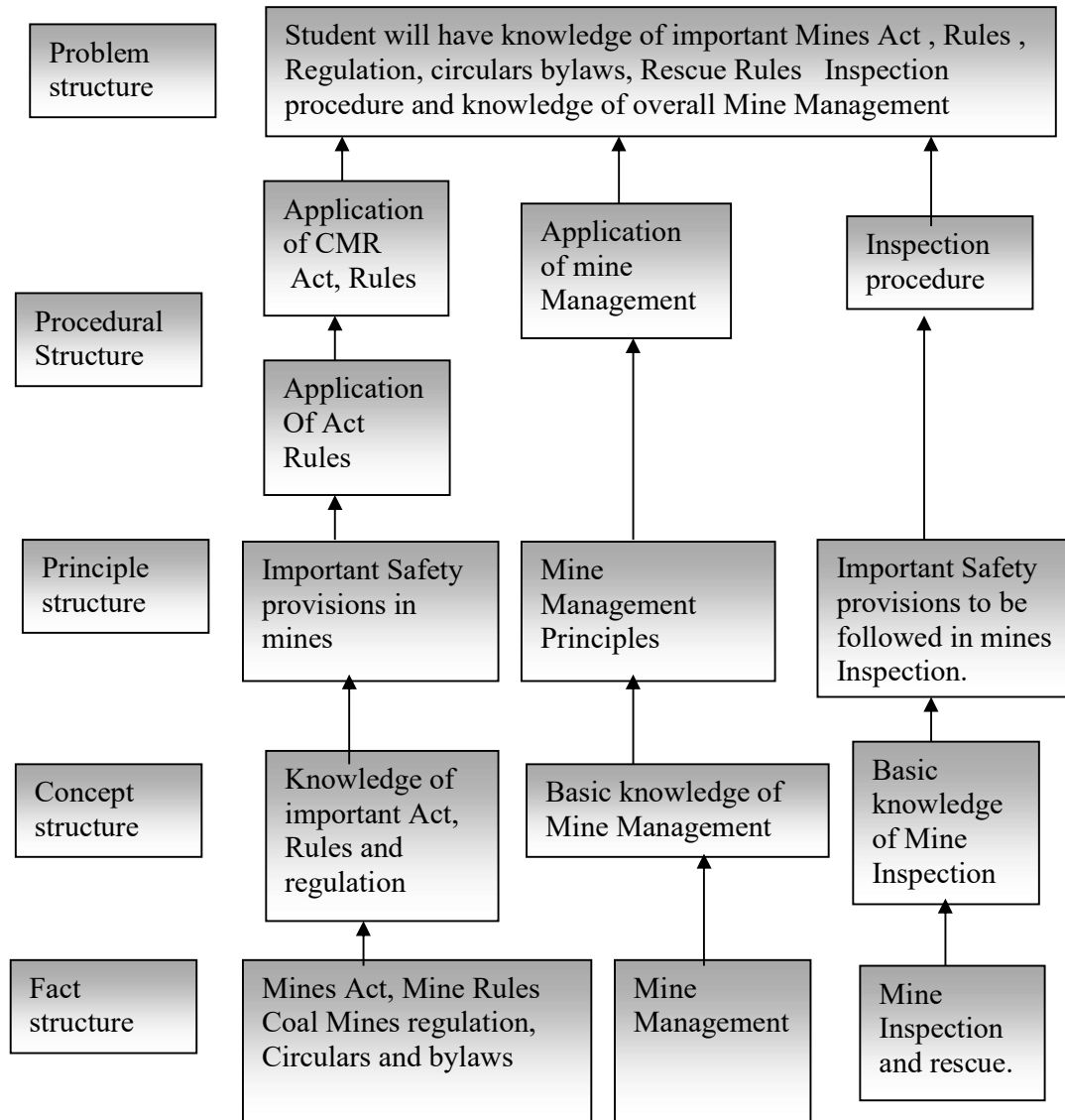
REFERENCE BOOKS

AUTHOR	TITLE	YEAR OF PUBLICATION	PLACE OF PUBLICATION & PUBLISHER
D.J. DESHMUKH	VOL- III	1995	Central techno publication , Nagpur.
S. GHATAK	Mine pump, haulage, winding.	1995	Coal Field Publisher Asansol.

**CONTEXT IN THE FORM OF BLOCK DIAGRAM:
SUBJECT AREA –MINE MANAGEMENT LEGISLATION & SAFETY**



GRAPHICAL STRUCTURE OF THE SUBJECT AREA – MINE MANAGEMENT
LEGISLATION & SAFETY



3.5 SUBJECT TITLE: MINE MANAGEMENT LEGISLATION AND SAFETY

YEAR: THIRD YEAR

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME		EXAM SCHEME & MAXIMUM MARKS					
THEORY HRS/WEEK	PRACTICAL HRS/WEEK	PAPER HRS.	TH	PR	OR	TW	SW
4		3	100	-	# 50	-	50

External assessment as per curriculum implementation & assessment norms..

RATIONALE:

A Mining Engineer must know the provisions contained in the Mines Act, Rules and Regulations, as his prime responsibility is to ensure that the operations under his charge are carried out as per the provisions of these laws. He should also be able to carry out operations taking proper precautions to avoid accidents. He should be able to make inspections of various places under his charge. As a supervisor he shall be required to know the basics of recruitment and training rules applicable to mining industry. The course covers these aspects of legislation, Safety and management, pertaining to certain provisions of the above statute.

OBJECTIVES:

After undergoing the course of study the student shall be able to

1. Provide and maintain the health and sanitary, first aid and medical appliances/facilities as per the provisions of Mines Act & Rules.
2. Supervise and enforce compliance of provisions of Regulations, from subordinate staff as per duties allotted to them under these regulations.
3. Prepare and maintain plans and section as per the provisions of mines regulations.
4. Enforce compliance of provisions related to access and egress under regulations.
5. Supervise and carryout blasting operations and enforce compliance by provisions of regulation related to explosives and blasting.
6. Take precaution and prevent accidents due to fall of roofs explosive and blasting.
7. Carry out day to day supervision in the mine to achieve the production target with Maximum economy and safety.

DETAILED CONTENTS:

UNIT	CONTENTS	MARKS	HOURS
1.	MINES ACT 1.1 Important definition eg. Adolescent, adult, child, Employed, Mine, Open cast working, Relay, Shift, Serious bodily injury. 1.2 Provisions under chapter V, 1.3 Provision for health and safety. 1.4 Provisions regarding leave with wages, Act 49 to 56 1.5 Hours & Limitations of Employment, act 28 to 48.	08	15
2.	MINES RULES 2.1 Provisions regarding health & sanitation, first aid and medical appliances. 2.2 Mines Rules- Provisions connected with leave with wages and over time and welfare amenities. Employment of persons, Rule 46 to 52	08	12
3.	COAL MINES REGULATIONS 3.1 Important definitions. 3.2 Duties and responsibilities of workman, competent person & officials. Provisions of Reg. 38, 39, 43, 44, 45, 46, 48, 56 3.3 Planes and sections Reg. 58, 59, 61, 63 3.4 Means of access & egress. Reg. 66 to 70 3.5 Provisions regarding winding in shaft Reg. 71 to 86 3.6 Transport of men & material Reg. 88, 89, 90, 91, 92, 93, 94, 95 3.7 Mine working Reg. 98 to 115 3.8 Precautions against dangers from the dust, gas & water Reg. 116 to 128. 3.9 Ventilation Reg. 130 to 149 3.10 Provisions regarding lighting and safety lamp – Reg. 150 to 158 3.11 Explosives & Blasting. Reg. 158 to 180 3.12 Provisions regarding machinery, plant & equipments and important provisions under chapter on miscellaneous	24	30
4.	MINE ACCIDENTS 4.1 Types of mine accidents, their classifications, 4.2 Causes of accidents due to fall of roof, explosives and blasting, haulage and winding and their preventions. 4.3 Cause and prevention of accidents due to, fires, explosions and inundations. Safety statistics, safety drive and organization of safety in the mines/area etc.	15	20

UNIT	CONTENTS	MARKS	HOURS
5.	MANAGEMENT Types of business organizations, organization of Coal India Ltd. Supervision qualities of good supervisors, Leadership, functions of industrial leadership, delegation of responsibility Principles of time study, Wage and payment Trade unions, their functions. Strikes and lockouts	15	20
6	Circulars, Bylaws & Standing orders. 6.1 Model standing order in the event of stoppage of main mechanical ventilator. 6.2 Maximum air velocity. 6.3 Systematic support rules for coal mine with Board and pillar method of working. 6.4 Conditions for solid blasting with P5 explosives. 6.5 Precautions for use of Auxiliary fan underground. 6.6 Procedure for dealing with misfire. 6.7 Precautions regarding Blown through shots.	10	25
7	INSPECTION PROCEDURE Procedure of inspection of old working, Haulage roadways, sinking shaft, working shaft, Winding rope, Sealed off area, subsidence and goaf area.	10	10
8	MINES RESCUE RULES Important provisions of coalmines rescue rules. 3.1 Organization & equipment in mines. 3.2 Rescue station. 3.3 Conduct of rescue work.	10	12

STRATEGY OF IMPLEMENTATION

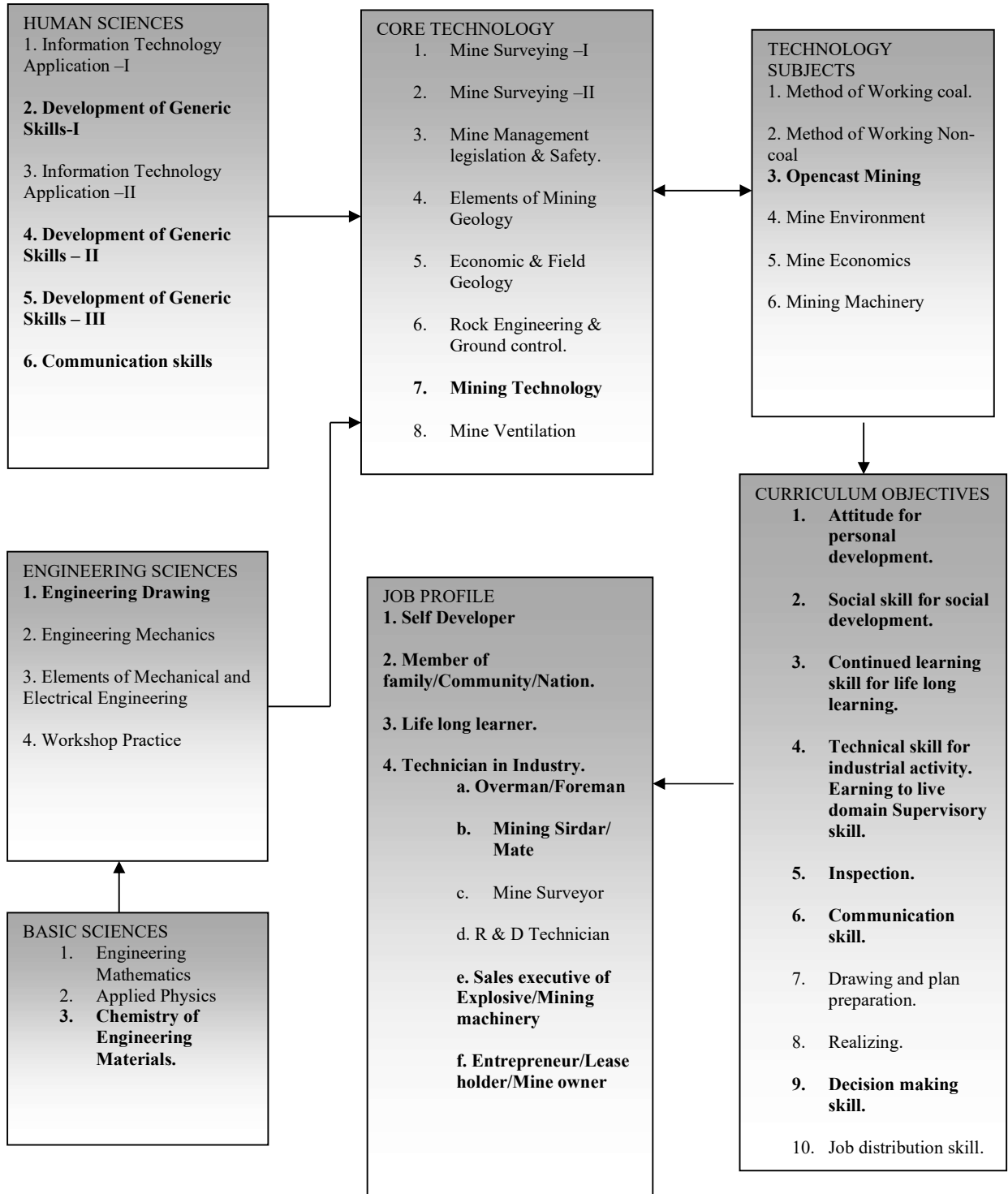
Conducting theory classes, practical, Industrial visits seminars group discussion, and assignment on different topics shall complete the curriculum.

REFERENCE BOOKS

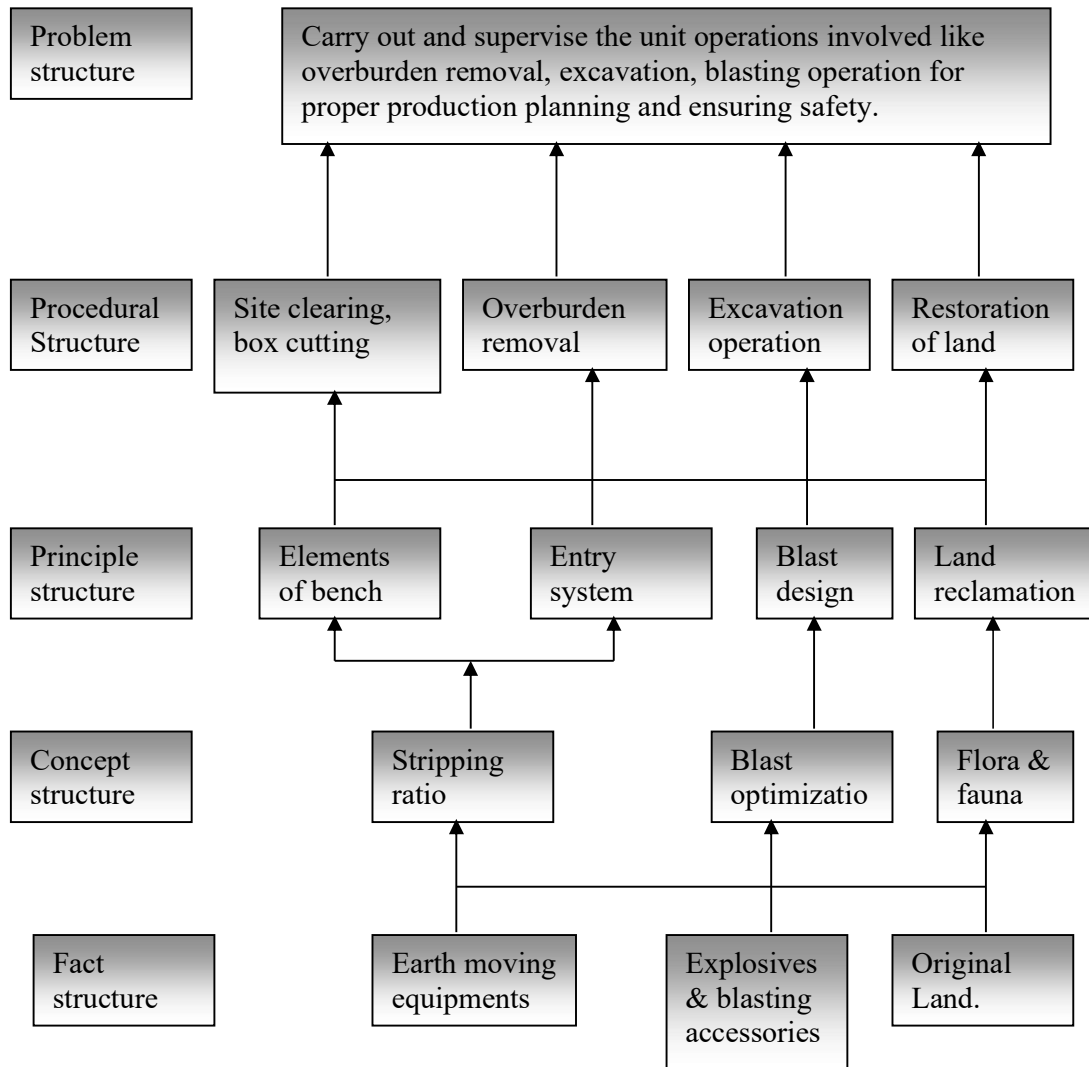
AUTHOR	TITLE	YEAR OF PUBLICATION	PLACE OF PUBLICATION & PUBLISHER
Central Government	Mines Act 1952	Latest Edition	Lovely Prakashan, Dhanbad
Central Government	Mines Rules 1955	Latest Edition	Lovely Prakashan, Dhanbad
Central Government	Coal Mines Regulation 1957	Latest Edition	Lovely Prakashan, Dhanbad
Central Government	DGMS Circulars	Latest Edition	Lovely Prakashan, Dhanbad
S. GHATAK	A Study of Mine Management Legislation and General Safety	JUNE 1992	Shining Printers, Asansol

CONTEXT IN THE FORM OF BLOCK DIAGRAM:

SUBJECT AREA – OPENCAST MINING



GRAPHICAL STRUCTURE OF THE SUBJECT AREA
OPENCAST MINING



3.6 SUBJECT TITLE: OPENCAST MINING

YEAR: THIRD YEAR

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME		EXAM SCHEME & MAXIMUM MARKS					
THEORY HRS/WEEK	PRACTICAL HRS/WEEK	PAPER HRS.	TH	PR	OR	TW	SW
4	-	3	100	-	-	-	50

RATIONALE:

After obtaining Diploma in Mining and Mine surveying Diploma Engineer required to supervise operations involved in opencast mines, the number of opencast mines are increasing to enhance production rate and due to present policy of linking large opencast mines to the super thermal power plant. Thus Diploma engineer must have knowledge of unit operations involved. Type of machineries used their applicability and working, knowledge of explosive used and procedure for carrying out blasting operation in large opencast mines by deep hole blasting. All these are essential aspects are included in subject opencast mining in Third year of the programme.

OBJECTIVES:

After undergoing the course of study the student shall be able to

1. Supervise operations involved in the opencast mining both coal and non coal.
2. Supervise the operations of the equipment used in opencast mines.
3. Select suitable explosive for deep hole blasting in large opencast mines.
4. Supervise/carryout blasting operation to give the optimum results from the blast.
5. Take proper care of environmental aspects, which may get affected due to blasting and other opencast mining activity.

DETAILED CONTENTS:

UNIT	CONTENTS	MARKS	HOURS
1.	<p>INTRODUCTION TO OPENCAST MINING</p> <p>1.7 Classification of surface mining methods, classification based on mechanization.</p> <p>1.8 Factors affecting choice of opencast mining methods, Stripping ratio: Maximum allowable stripping ratio, overall stripping ratio, Break even stripping ratio. Advantages and disadvantages of opencast mining.</p> <p>1.9 Elements of Benches: Height, width, angle of slope, toe, crest, statutory provisions regarding height, width, angle of slope etc.</p>	08	20
2.	<p>OPENING UP OF DEPOSIT</p> <p>2.1 Unit operations involved, site preparation, Box cut, entry system in opencast mines.</p> <p>2.2 Opencast mine layout, factor determining choices of layout, overburden excavation, Disposal of overburden, overcasting etc, sample layouts for lime stone, copper, coal , iron ore deposits, method of work, machines required , manpower, OMS etc.</p>	16	20
3.	<p>OPENCAST MINING MACHINERY</p> <p>3.1 Classification of Excavating equipments, selection, choices of opencast mining machinery.</p> <p>3.2 Excavators shovel, Rope shovel, hydraulic shovel, application, advantages, disadvantages, comparison Rope shovel and hydraulic shovel, operating parameter, output of a shovel. Various attachments to shovel. Specifications. Back hoe, operating parameter, application</p> <p>3.3 Dragline, operating parameters, applicability, working, advantages, disadvantages, comparison with shovel. Specifications.</p>	16	25
	<p>3.4 Bucket wheel and Bucket chain excavators. Application, advantages & disadvantages, operation, working methods by Bucket wheel excavator, terrace cut, Dropping cut etc.</p> <p>3.5 Rippers. Scrappers, bulldozer etc.</p> <p>3.6 Surface miner its application, working. In pit crushing system</p> <p>3.7 Precautionary measures while use of HEMM.</p>	12	15

UNIT	CONTENTS	MARKS	HOURS
4.	<p>OPENCAST EXPLOSIVES</p> <p>4.1 Explosives used in opencast mine, AN/FO, slurry explosive, emulsion explosives, Heavy AN/FO explosive, LOX, their properties, composition etc. Boosters.</p> <p>4.2 Initiation system, non electric initiation system, Raydets, Nonel, exel shock tubes, electronic detonators, etc.</p> <p>4.3 Bulk explosive system, site mixed slurry, site mixed Emulsion, Bulk-loading system. Advantages, comparison. ANFO precautions while mixing, handling and use, Conditions for using bulk explosives.</p>	16	20
5	<p>BLASTING PRACTICE IN OPENCAST MINES</p> <p>5.1 Bench blasting terminology, Blast hole geometry, hole depth, burden, spacing, sub grade drilling, bottom change, column charge, stemming height.. Factors to be considered while blast designing.</p> <p>5.2 Simple numerical on blast design for the bench of surfaces mine.</p> <p>5.3 Single and multiple rows blasting their comparison, Sequence of blasting in single & multiple row. Precautions while charging and firing of holes in deep hole blasting, deck charging, muffled blasting, control blasting techniques, secondary blasting/breaking in opencast mines.</p> <p>5.4 Transport of Explosives in bulk, precautions while drilling and blasting of deep holes.</p>	16	20
6.	<p>ENVIRONMENTAL ASPECTS OF OPENCAST MINING</p> <p>6.1 Environmental aspects of opencast mining Fly rock, ground vibration, air blast their causes & prevention. Noise pollution, water pollution, Degradation of land, land reclamation.</p> <p>6.2 Salient features of environment protection Act, EMP and Environment impact assessment.</p> <p>6.3 Slope stability: Causes of un stability, forms of failure preventive measures.</p>	16	24

STRATEGY OF IMPLEMENTATION

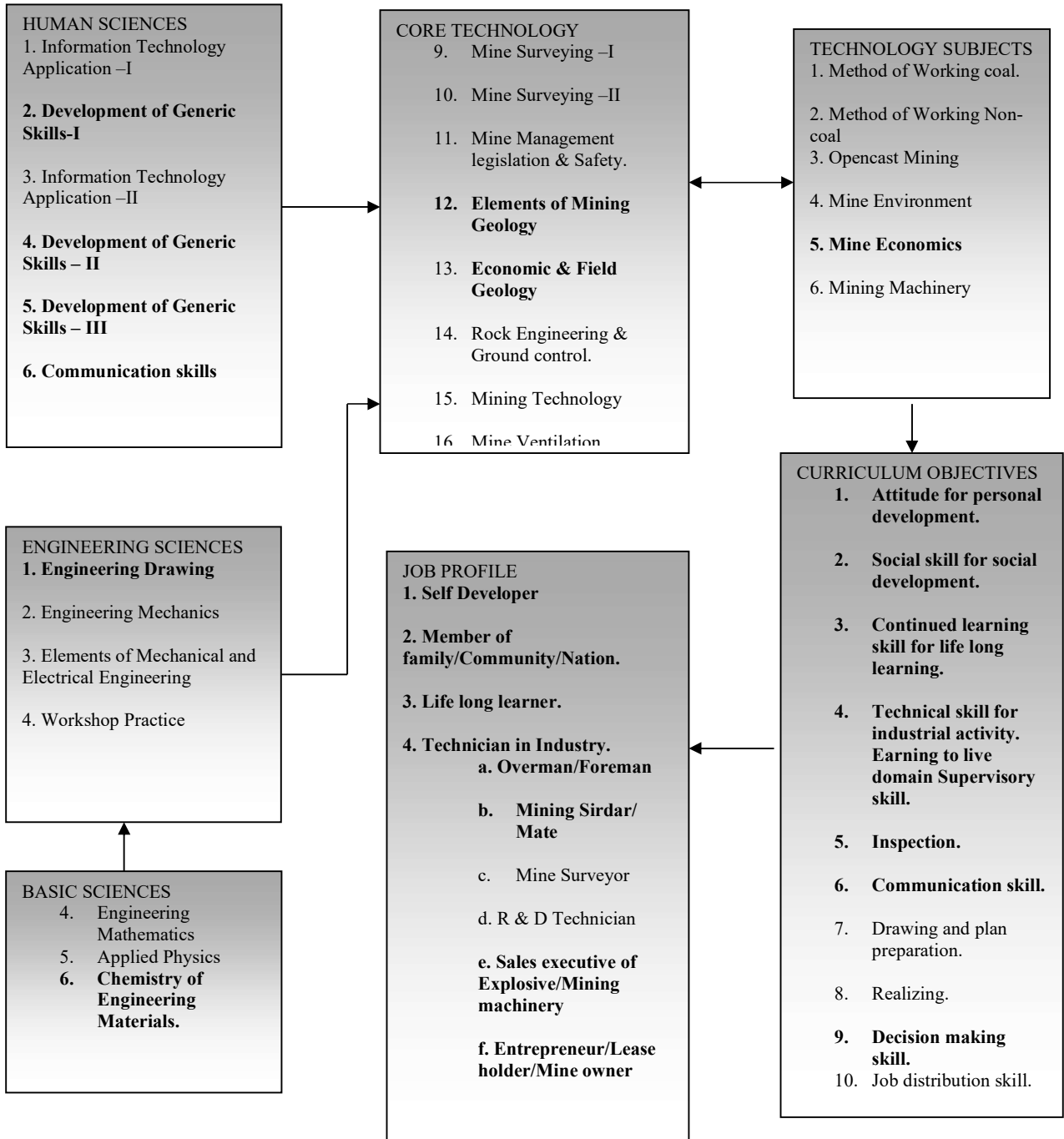
Conducting theory classes, practical, Industrial visits seminars group discussion, and assignment on different topics shall complete the curriculum.

REFERENCE BOOKS

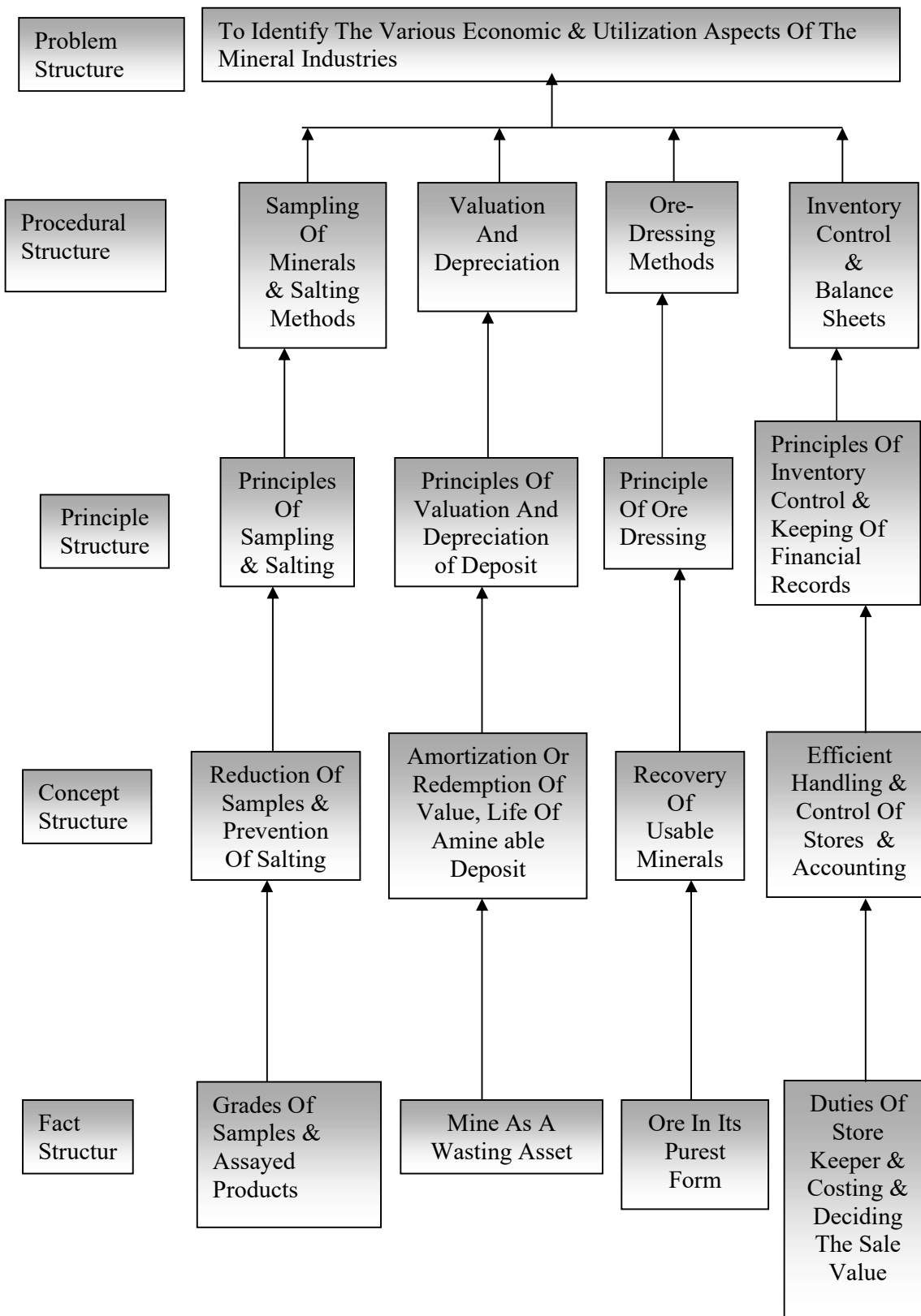
Author	Title	Year of publication	Publisher
G.K. Pradhan	Explosive and Blasting Techniques	1996	Mintech publication Bhubaneswar.
S.K. Das	Surface Mining Technology	1996	Lovely Prakashan Dhanbad.
S.K. Das	Explosives and Blasting Techniques	1993	Lovely Prakashan Dhanbad.
D.J. Deshmukh	Elements of Mining Technology Vol I	1995	Central techno publication, Nagpur
G.B. Misra	Surface Mining	1993	Oxford University Press, Calcutta

CONTEXT IN THE FORM OF BLOCK DIAGRAM:

SUBJECT AREA – MINE ECONOMICS



GRAPHICAL STRUCTURE OF THE SUBJECT AREA - MINE ECONOMICS



3.7 SUBJECT TITLE: MINE ECONOMICS

YEAR: THIRD YEAR

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME		EXAM SCHEME & MAXIMUM MARKS					
THEORY HRS/WEEK	PRACTICAL HRS/WEEK	PAPER HRS.	TH	PR	OR	TW	SW
4	--	3	100	--	-	-	50

DETAILED CONTENTS:

UNIT	CONTENTS	MARK	HOURS
1.	MINERAL INDUSTRY 1.1 Mineral Industries in India. 1.2 Role of Mineral Industries in National Economy. 1.3 Major Economical minerals coal, Iron, Copper, Manganese, Limestone, Lead and Zinc, Gold, Radioactive minerals. Geological formation modes, Locations, Reserve, Uses, Production, Imports, Exports. 1.4 Conservation of Minerals and their substitution including coal. 1.5 National Mineral Policy. 1.6 Incentives provided by government to Mining sector, Concessions in Income Tax. 1.7 Computation & classification of Reserve and Grades.	16	22
2.	SAMPLING 2.1 Principles of Sampling, Methods, Error, Selection of Sampling procedure for Particular deposits. 2.2 Preparation of sample, Coning and Quarter Splitting methods of reduction of samples.	12	18
3.	SALTING 3.1 Salting method of salting, Salting methods by mistakes/errors. Purposeful salting procedures, Safe procedures for collecting sample to guard against purposeful salting. 3.2 Average stoping width, willing width of mining, clear width, Average width, Simple average, Weightage average, Mean values, Mining grade of ore, economical grade, cut off grade of ores, cut off grades of samples and stops.	12	20

UNIT	CONTENTS	MARK	HOURS
04.	<p>VALUATION & DEPRECIATION</p> <p>4.1 Valuation methods of valuation by different methods of annuity. Calculation of different annuities.</p> <p>4.2 Methods of depreciation and calculation Of Depreciation methods of calculations of Redemption values.</p> <p>4.3 Main valuation methods of mining Property which under production. Valuation under different methods. Report Of valuation of small mining property.</p>	16	20
5.	<p>ORE DRESSING</p> <p>5.1 Ore dressing, Important methods of ore Dressing, their classification and their role in Mining Industry.</p> <p>5.2 Preparation of ore for ore dressing, crusher, cone crusher, their construction working limit, size, grading of ore, introduction to (a) Tabling (b) Spanning (c) Gravity (d) Separation (e) Magnetic separation, (f) Floatation cell (g) Sintering, bricating, Pellatisation, nodulation.</p> <p>5.3 Visit to beneficiation plant.</p>	16	22
6.	<p>INVENTORY CONTROL</p> <p>6.1 Inventory control and Store keeping.</p> <p>6.1.1 Category of stores</p> <p>6.1.2 Duties of storekeeper</p> <p>6.1.3 Efficient handling and control of stores.</p> <p>6.1.4 Purchase of stores.</p> <p>6.1.5 Store records</p> <p>6.1.6 ABC analysis.</p>	12	18
7.	<p>MINE LEASING PROCEDURE.</p> <p>7.1. Different Acts, Rules related to Scientific Development, Regulation and Conservation of Minerals.</p> <p>7.1.1 major and minor mineral concessions</p> <p>7.1.2 General Restriction on undertaking mining operation</p> <p>7.1.3 Maximum area for which Mining lease may be granted.</p> <p>7.1.4 Period for which mining lease may be granted</p> <p>7.1.5 procedure for obtaining mining lease</p> <p>7.1.6 Mining Plan</p> <p>As per the MCDR, 1988: MCR, 1960</p> <p>7.2 Procedure of arranging finance for small-scale mining through financial institutes.</p> <p>7.3 Mine Closure plan</p>	16	24

STRATEGY OF IMPLEMENTATION

Conducting theory classes, practical, Industrial visits seminars group discussion, and assignment on different topics shall complete the curriculum.

REFERENCE BOOKS

Author	Title	Year of publication	Publisher
Sparks.	Mine Valuation		
Sulchre	Mine Sampling and Valuation		
Arogyaswami.	Mine Geology		
R.T. Deshmukh	Mine Economics		
IBM.	Elements of Mineral exploration		IBM.
IBM.	Mines & Minerals (Development & Regulation), Act 1957	1957	IBM.
IBM.	Mineral Concession Rules, 1960	1960	IBM.
IBM.	Mineral Conservation & Development Rules, 1988	1988	IBM.

3.9 SUBJECT TITLE: DEVELOPMENT OF GENERIC SKILLS–III

YEAR: THIRD YEAR

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME		EXAM SCHEME & MAXIMUM MARKS					
THEORY HRS/ WEEK	PRACTICAL HRS/WEEK	PAPER HRS.	TH	PR	OR	TW	SW
1	2	-	-	-	-	# 50	-

External assessment as per curriculum implementation & assessment norms..

RATIONALE:

The skills of project management have become important in all types of business and at all levels of work hierarchy. The purpose of Development of Generic Skills - III is to develop the necessary skills, which will make students confident and competent in managing and executing engineering projects. Further, emphasis would be given to ownership of and commitment to change, risk taking and management and improved capability to manage changes introduced in the project.

Student centered case studies and project methods will be employed to develop practical skills pertaining to project management, act as change-agent, and risk management. It is also expected that the content and associated skill development will also be reinforced through other subjects / courses of study at appropriate time and level.

Contents of subject Development of Generic Skills

UNIT	CHAP- TER	CONTENTS	MA- RKS	HO- URS
	1	1.0 Project management 1.1 Introduction 1.2 Organizational structure of the project 1.3 Roles and responsibilities of the Project Staff 2.0 Project life cycle 2.1 Phases and Stages 2.1.1 The division of the <u>time</u> required to accomplish a <u>project</u> into sequential <u>time periods</u>		
	2	1 Project planning, 1.1 Stages of planning 1.2 Work break down structure 2. Scheduling of project 2.1 Critical path of project 2.2 Bar charts, Mile stones and Gantt charts 2.3 Resource identification 2.4 Scheduling for resources such as Money (finance), Physical, Material, Manpower, Information, Energy 2.5 Resource allocation		
	3	1. Risk Management <u>1.1 Overview</u> <u>1.1.1 Definition of Risk</u> 1.1.2 Types of risks and their impact on project. 1.1.3 Risk versus Opportunity 1.1.4 <u>Principles</u> of risk management 1. Global perspective 2. Forward-looking view 3. Open communications 4. Integrated management 5. Continuous process 6. Shared product vision Teamwork 2. P.R.A.M 2.1 Purpose of risk analysis 2.2 Risk management techniques		
	4	1. Teams 1.1 Definition of project Team 1.2 Characteristics of effective Team 1.3 Team dynamics 1.4 Pitfalls in Team		

UNIT	CHAP- TER	CONTENTS	MA- RKS	HO- URS
		1.5 Leadership in Teams		
	5	1. Project Execution, Monitoring and Control 1.1 Launching of project 1.2 Monitoring processes of the project 1.3 Project Control system 1.4 Change control 1.5 Configuration management 1.5.1 Change Requests, Change Proposals and their subsequent approval and disapproval.		
	6	1. Project closure and Review 1.1 Final Report & Project Summary 1.2 Learning from the experience 1.3 Feed back and review from the project team		
	7	1. Vision building 1.1 Need for Vision 1.2 Conduct visioning exercise 1.3 Formulating Vision and Mission 1.4 Owning vision		

REFERENCES

<u>Author</u>	Title	Edition	Year of Publication	Publisher & Address
Trevor L Young	<u>The Hand Book of Project Management</u>	1st	1999	Vinod Vasishtha for Kogan Page India Pvt. Ltd., New Delhi-110002.
Erling S. Andersen, Kristoffer V grude and Tor Haug	Goal Directed Project Management	2nd	1999	Vinod Vasishtha for Kogan Page India Pvt. Ltd., New Delhi-110002.
Trevor L Young	Successful Project Management	1st	2002	Vinod Vasishtha for Kogan Page India Pvt. Ltd., New Delhi-110002.
Robert Heller	Managing Teams	1st	1998	Dorling Kindersley, London, WC2E8PS
B. L. Mathur	Project Management	1st	1994	Arihant Publishing Hours, Jaipur-302004
D. E. Hussey	How to manage organisation change	2nd	2000	Vinod Vasishtha for Kogan Page India Pvt. Ltd., New Delhi-110002.
Richard Hale and Peter Whitlam	Target Setting and Goal Achievement	2nd	1999	Vinod Vasishtha for Kogan Page India Pvt. Ltd., New Delhi-110002.

Overview of subject Development of Generic Skills

Suggested Assignments for DGS III

Chapter	Topic in Brief	Suggested Assignments
1	Project Management	Preparation of a brief Project Report (By the EDP subject Group) on a selected topic like: Civil Group: Construction of a bridge/road/irrigation tank/building etc.
2	Project Planning	Mechanical Group: Automobile Servicing Center/ Heat Treatment shop/Welding shop / Fabrication shop /Tool Room/Preparation of Detergent or soap or perfume or pesticides / Plastic moulding shop etc. Electronics Group: Manufacturing Battery Chargers/Temperature Controllers/Ultra-sonic Stroboscopes, EPABX etc. Electrical Group : Rewinding Shop/Service Center for Home Appliances/manufacturing of Chokes/On-site Servicing Services etc. Computer Group: Hardware / Software based project/Network Security Projects (E.g.: Banking systems, Library Management, Remote Access Control, Solar Tracking etc.) Other Courses shall prepare a report on relevant topics.
3	Risk Management	Preparation of a brief report on Risk Management for the above selected topic.
4	Project Execution, Monitoring, and Control	Preparation of a brief report on the Project Execution, Monitoring and Control of the above selected project
5	Project Closure and Review	Presenting, the report to the class and submitting the feedback.
6	Vision Building	Two exercises for formulating Vision and Mission
7	Teams	Conduct a Group Discussion on any general topic and prepare the minutes of it. Guide the students for personality development. Guide them for various interview techniques through mock interview

Note: - Please note that these suggested assignments are the guidelines to the subject teachers to select assignment topics. However the subject teachers are free to design any assignment relevant to the curriculum. Suitable visits shall be arranged to supplement the Project Management Information.