

## PROGRAM STRUCTURE OF DIPLOMA IN MINING ENGINEERING

STATE BOARD OF TECHNICAL EDUCATION, JHARKHAND									
COURSE NAME: <b>DIPLOMA IN MINING ENGINEERING</b>									
YEAR/SEMESTER: <b>SECOND YEAR (A)</b>					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
2.1	Method of Working COAL	3	2	3	100	--	#50		50
2.2	Economic & Field Geology	3	2	3	100	#50	--		50
2.3	Engineering Mechanics	2	2	3	100	@50	--		50
2.4	Mine Surveying –I	2	2	3	100	#50	--	--	50
2.5	Rock Engineering & Ground control	3	2	3	100		#50		50
2.6	Mine Ventilation	3	2	3	100		#50	--	50
2.7	Elements of Mechanical & Electrical Engineering	2	2	3	100	--	--	@50	50
2.8	Practical Training Project -I	--	*2	--	--	--	#100		--
2.9	Information Technology Application – II	--	2	--	--	--	--	#50	--
2.10	Development of Generic Skills - II	1	2	--	--	--	#100	--	--
	<b>TOTAL</b>	<b>19</b>	<b>20</b>	<b>--</b>	<b>700</b>	<b>150</b>	<b>350</b>	<b>100</b>	<b>100</b>

Institutional Hours per Week: 39 Hrs.

Student Contact Hours per Week (Formal Teaching): 40 Hrs.

Student Centered Activities (Library Studies, Guidance & Counseling, Seminar, Self Learning, Etc.)

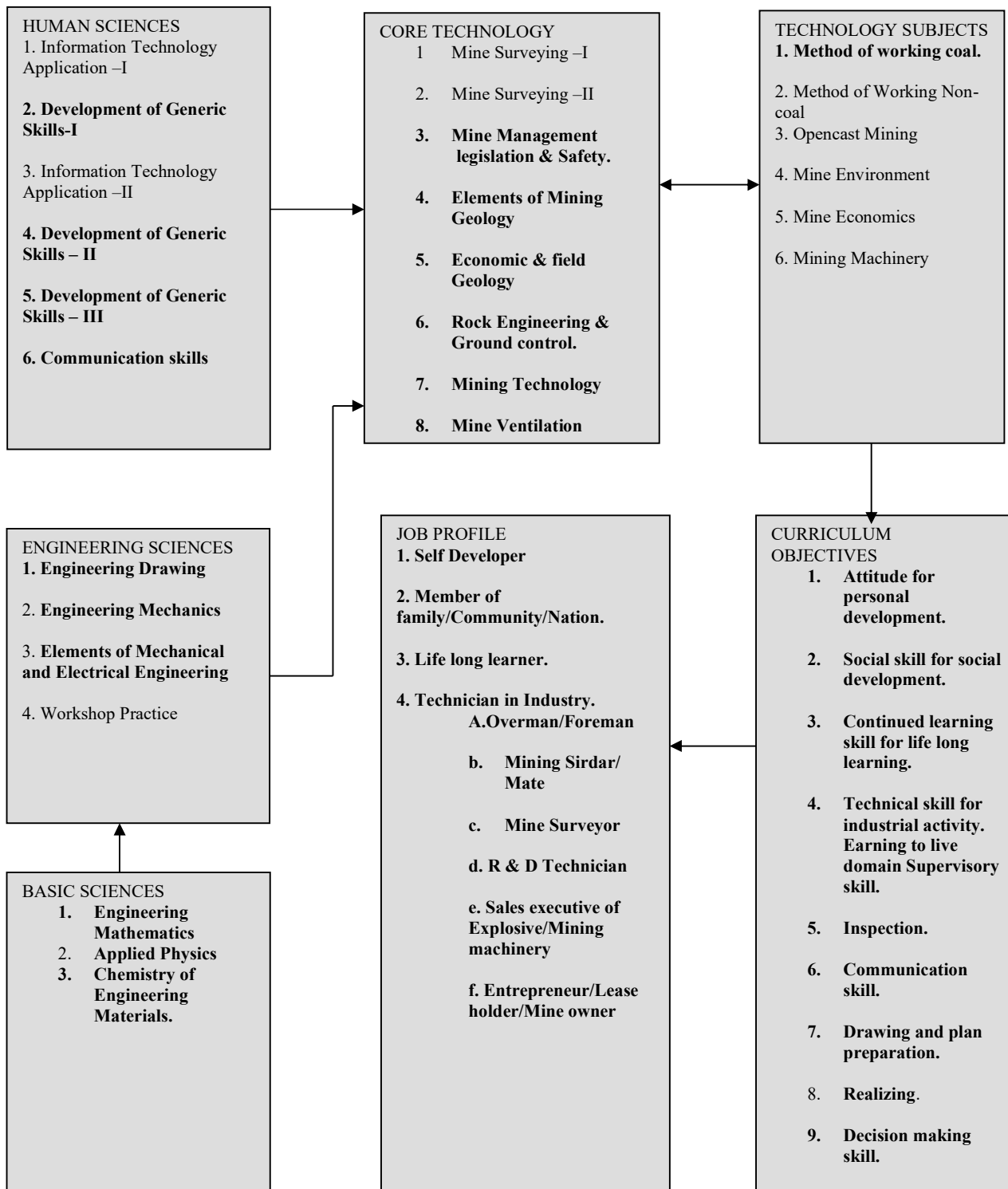
Hrs per week: 1 Hrs.

Total Marks: 1400.

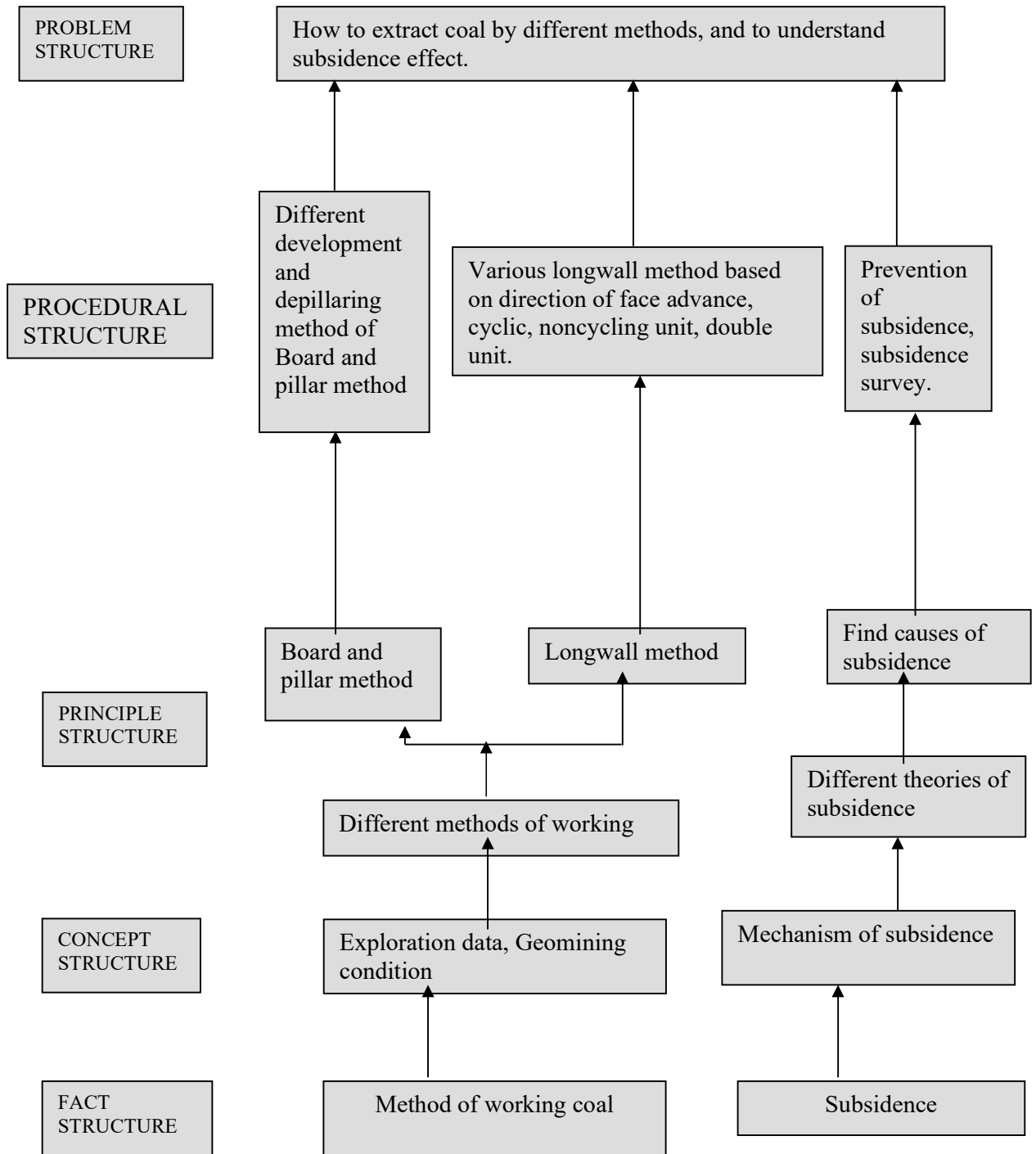
Abbreviations: TH – Theory, PR- Practical, OR-Oral, TW-Term work and SW-Sessional Work.

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.
3. @ Practical, Oral, & term work assessment is to be done by subject teacher as per continuous assessment norms.
4. #Practical, Oral, Term work assessment is to be done by external & subject teacher as per the curriculum implementation & assessment norms..
5. Practical Training of 12 weeks shall be started from 2<sup>nd</sup> week of May. (Mandatory training towards the partial fulfillments of Diploma.) Student will bear the expenses of training.
6. \*Per batch For Review, Guidance, seminar in preparation of project report of practical training project work.
7. Subject at Sr. no 2.9 is common to ME

**CONTEXT IN THE FORM OF BLOCK DIAGRAM:  
SUBJECT AREA –METHOD OF WORKING COAL.**



**GRAPHICAL STRUCTURE OF SUBJECT AREA- METHOD OF WORKING COAL.**



**2.1 SUBJECT TITLE: METHOD OF WORKING -COAL**

**YEAR: SECOND YEAR**

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

**TEACHING AND EXAMINATION SCHEME:**

# External assessment as per Curriculum implementation & assessment norms..

**RATIONALE:**

Most of the students/pass outs from this institute join the Coal Mining Sector after their diploma course. As such it is very important that the students have knowledge about the common methods of working coal with special reference to Indian Coal Mining. This subject is introduced to understand Methods of Mining of Coal e.g. Bord and Pillar working , development and depillaring, Long wall methods both advancing and retreating, special methods for working under special difficult situation and of contiguous seams etc.

**OBJECTIVES:**

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

1. Select suitable method of working the coal, based on different factors and geological conditions.
2. Supervise the Mining of coal by bord and pillar method and get the development and depillaring operations carried out with safety.
3. Supervise the Mining of coal by long wall methods.
4. Supervise operation in difficult areas and of mining of contiguous seams.
5. Take steps to avoid the effects of surface subsidence due to mining operation.

## DETAILED CONTENTS:

UNIT	CONTENTS	MARKS	HOUR	PRACTICAL CONTENT
1.	<b>Mine Supports.</b> Steel support, Steel arches, 1.1 Yielding supports, Friction props, and hydraulic props, description, applicability and comparison. . 1.2 Powered support 1.3 Fore poling 1.4 Long wall face support 1.5 Withdrawal of support from goaf	16	16	1. Demonstration of Friction props, its construction, setting and withdrawal. 2. Study of Hydraulic props its construction, setting and withdrawal. 3. Study of Fore poling method of support. 4. Study of Withdrawal of support from the goaf.
2.	<b>Working of coal. Board and Pillar Method</b> 2.1 classification of method of working 2.1 Conditions for selection of method of working 2.2 Board and pillar applicability advantages and disadvantages 2.3 Calculation of percentage of extraction 2.4 Design of panel 2.5 Different layout classification 2.6 SDL chain conveyor layout 2.7 Continuous miners 2.8 LHD layout 2.9 Manpower calculation and OMS 2.10 Open & closed panel system.	22	20	5. Study of Requirements and preparation before starting depillaring operation. 6. Study of Systematic supports in depillaring area. 7. Surface arrangements for sand stowing. 9. Design of panel for working a seam liable to spontaneous combustion based on incubation period.
	2.11 Preparatory arrangements before depillaring 2.12 Line of extraction and numbering of pillars 2.13 Systematic support rules 2.14 Different types of pillar extraction methods 2.15 Caving 2.16 Stowing 2.17 Thick seam working	18	20	<b>PREPARATION OF SHEETS</b> 1. Development by any one method of board and pillar working. 2. Depillaring layout, showing extraction methods of a stook.

UNIT	CONTENTS	MARKS	HOUR	PRACTICAL CONTENT
	2.18 Precautions while working near restricted areas. 2.19 Working near fire area 2.20 Working below waterlogged area 2.21 Working below depillared goaf 2.22 Contiguous working of seams 2.23 Layout and case study	12	10	3. Contiguous working of coal seam. 4. Arrangement at the S.D.L. face.
3.	<b>Long wall Mining</b> 3.1. Applicability 3.2. Design of long wall panel 3.3. Factors affecting length of long wall face, Barrier width, gate road length 3.4. Long wall advancing 3.5. Long wall retreating 3.1 Cyclic long wall 3.2 Non cyclic long wall 3.3 Different machines used 3.4 Layout of DERD manpower calculation 3.5 Thick seam working with long wall Top slicing and sub level caving 3.6 Long wall caving and stowing	20	30	PREPARATION OF DRAWING SHEETS: 1. Any one-long wall method of working. 2. A face layout for double drum Shearer at long wall face.
4.	<b>Subsidence in Mining.</b> 4.1 Theories of subsidence, 4.2. Different definition related to subsidence 4.3. Different factors affecting subsidence 4.4 precautions to be taken on surface in subsidence area 4.5 measurement of subsidence and preservation of record,	12	12	7. Precautions to reduce/avoid surface subsidence.

**Note: All practical shall be completed by showing them audiovisual aids/ models etc. Industrial visit may be conducted wherever possible.**

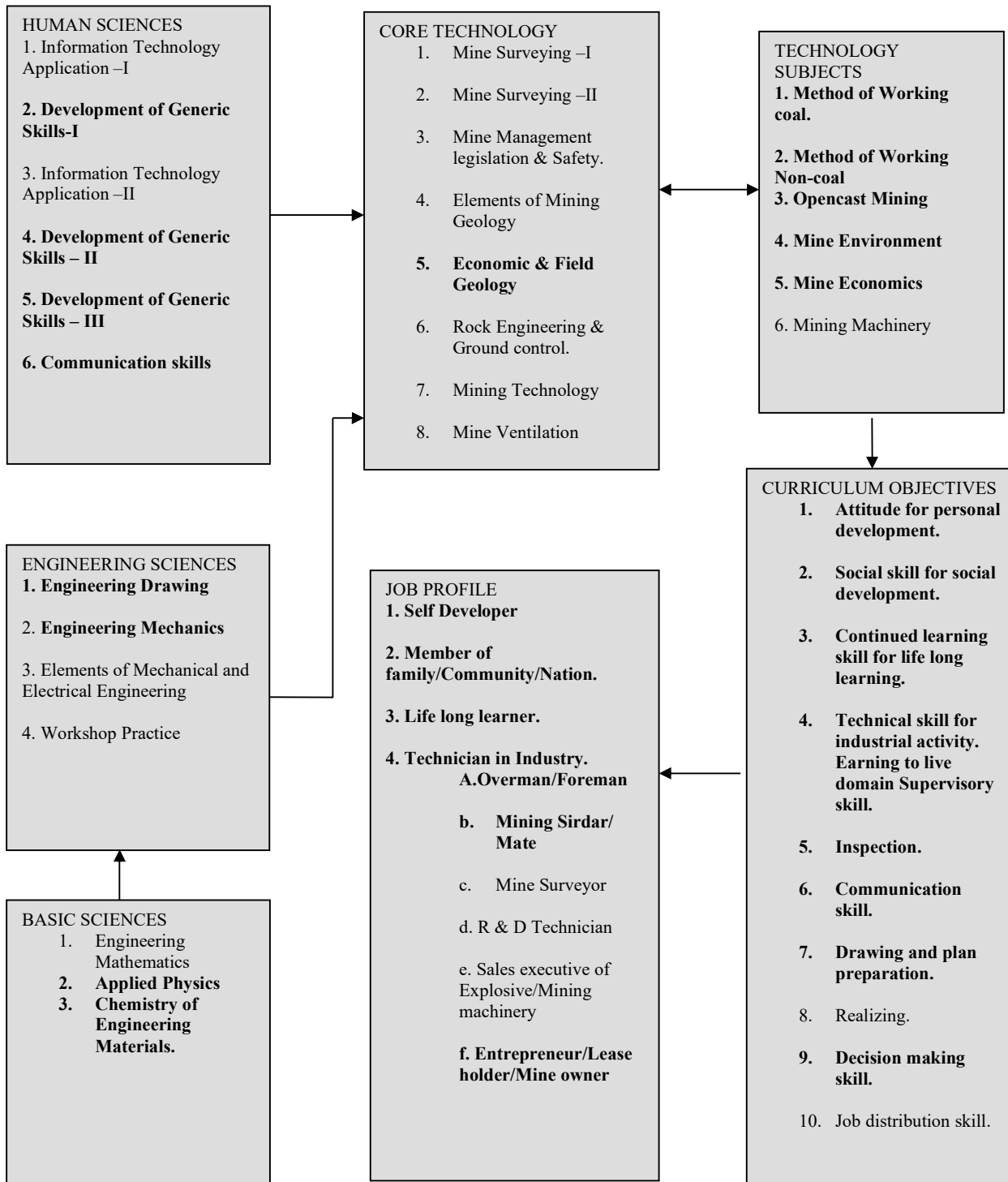
#### **STRATEGY OF IMPLEMENTATION**

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

**REFERENCE:**

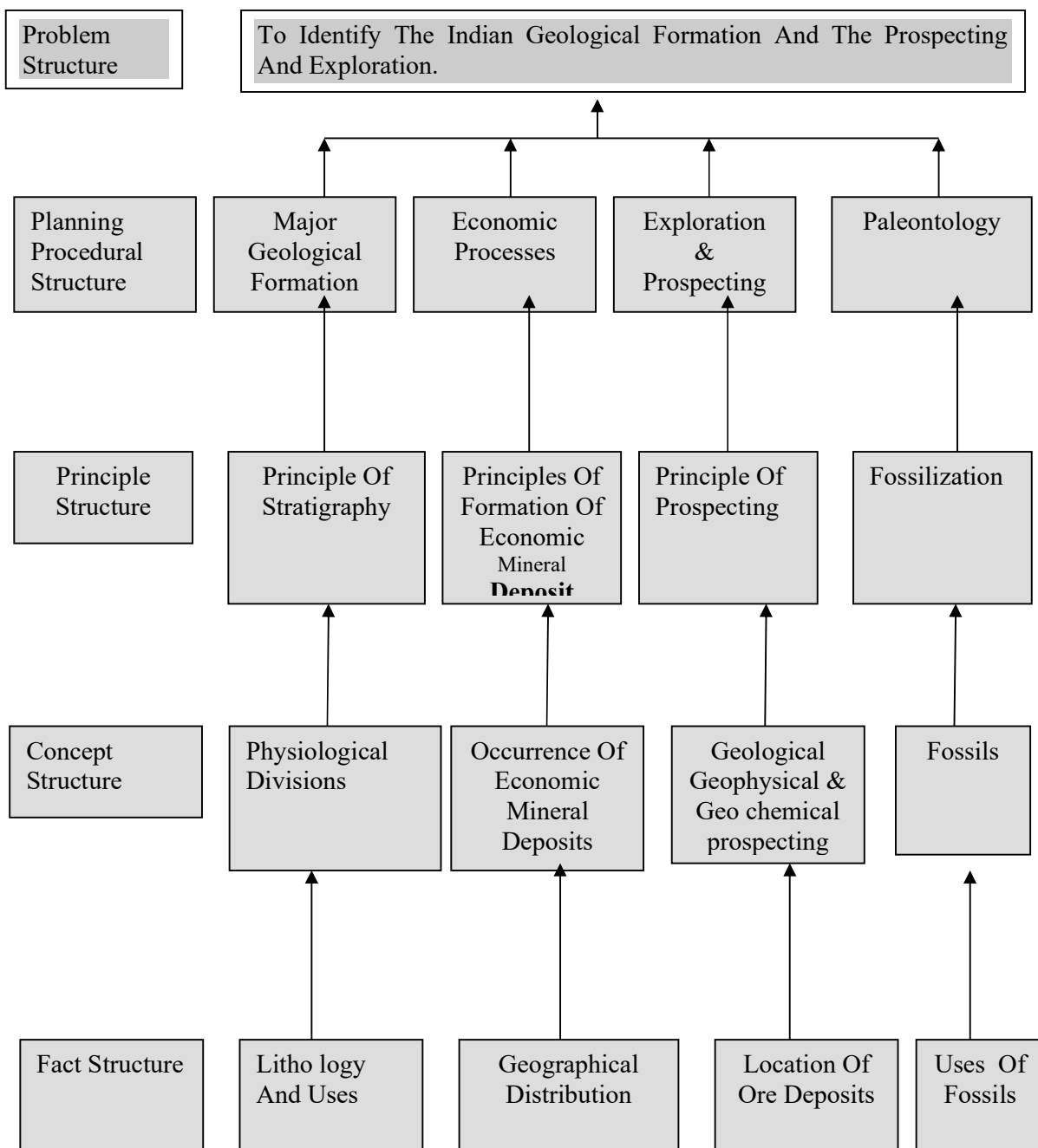
Author	Title	Year of publication	Publisher
T.N.Singh	Underground Winning of Coal	1991	Oxford and IBH publishing co.
S.K. Das	Modern Coal Mining Technology	1992	Lovely prakashan Dhanbad
D.J. Deshmukh	Elements of Mining Technology Vol I	1995	Central techno publication, Nagpur

**CONTEXT IN THE FORM OF BLOCK DIAGRAM:  
SUBJECT AREA – ECONOMIC & FIELD GEOLOGY.**





**GRAPHICAL STRUCTURE OF THE SUBJECT AREA-ECONOMIC & FIELD GEOLOGY**



**2.2 SUBJECT TITLE: ECONOMIC & FIELD GEOLOGY****YEAR: SECOND 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 &amp; assessment norms..

**DETAILED CONTENTS:**

UNIT	CONTENTS	MARKS	HOURS	PRACTICAL CONTENT
1.	<b>Geomorphology</b> 1.1 Processes of formation of landforms.	06	08	
2.	<b>Paleontology</b> 2.1 Classification of Animal & Plant kingdom 2.2 Mode of preservation of fossils. 2.3 Uses of fossils.	10	10	1) Identification of fossils (Any Five)
3.	<b>Stratigraphy</b> 3.1 Principles of Stratigraphy 3.2 Geological Time-scale. 3.3 Physiographic Divisions of India. 3.4 Major geological formations of India. 3.4.1 Archean & Dharwar System with Economic importance. 3.4.2 Cuddapah system with economic importance. 3.4.3 Vindhyan System with economic importance. 3.4.4 Gondwana super group with economic importance. 3.4.5 Deccan traps.	16	16	
4.	<b>Economic Geology</b> 4.1 Elements of Economic geology. 4.2 Process of ore formation of economic Mineral deposits with examples. 4.3 Study of Metaliferrous deposits of India – Fe, Cu, Mg, Al, Au, Pb & Zn 4.4 Metallogenetic /Mineralogenetic Provinces of India.	12	16	2. Identification of ore minerals & non metallic minerals

UNIT	CONTENTS	MARKS	HOURS	PRACTICAL CONTENT
5.	<b>Petroleum Geology</b> 5.1 Properties & Uses of Petroleum. 5.2 Origin of Petroleum. 5.3 Occurrence of Petroleum in India.	08	08	
6.	<b>Geology Mapping</b> 6.1 Field equipments required for geological Mapping. 6.2 Collection of samples. 6.3 Toposheet. 6.4 Completion and Tracking of outcrop. 6.5 Borehole problem.	10	12	3. Completion of Outcrops Maps (Minimum Six) 4. Solution of borehole problems 5. Toposheet interpretation
7.	<b>Exploration &amp; Prospecting</b> 7.1 Geological 7.1.1 Geophysical 7.1.2 Geochemical Methods of prospecting. 7.2 Geographical information system & Remote sensing.	12	16	
8.	<b>Engineering Geology</b> Geology of Dam sites & Associated Reservoirs, tunnels, Hill slopes and Rock cuttings.	10	10	
9.	<b>Grand water- Hydrology</b> 9.1 Occurrence of ground water 9.2 Geological work done by ground water. 9.3 Porosity, permeability. 9.4 Ground water provinces of India.	16	12	

### STRATEGY OF IMPLEMENTATION

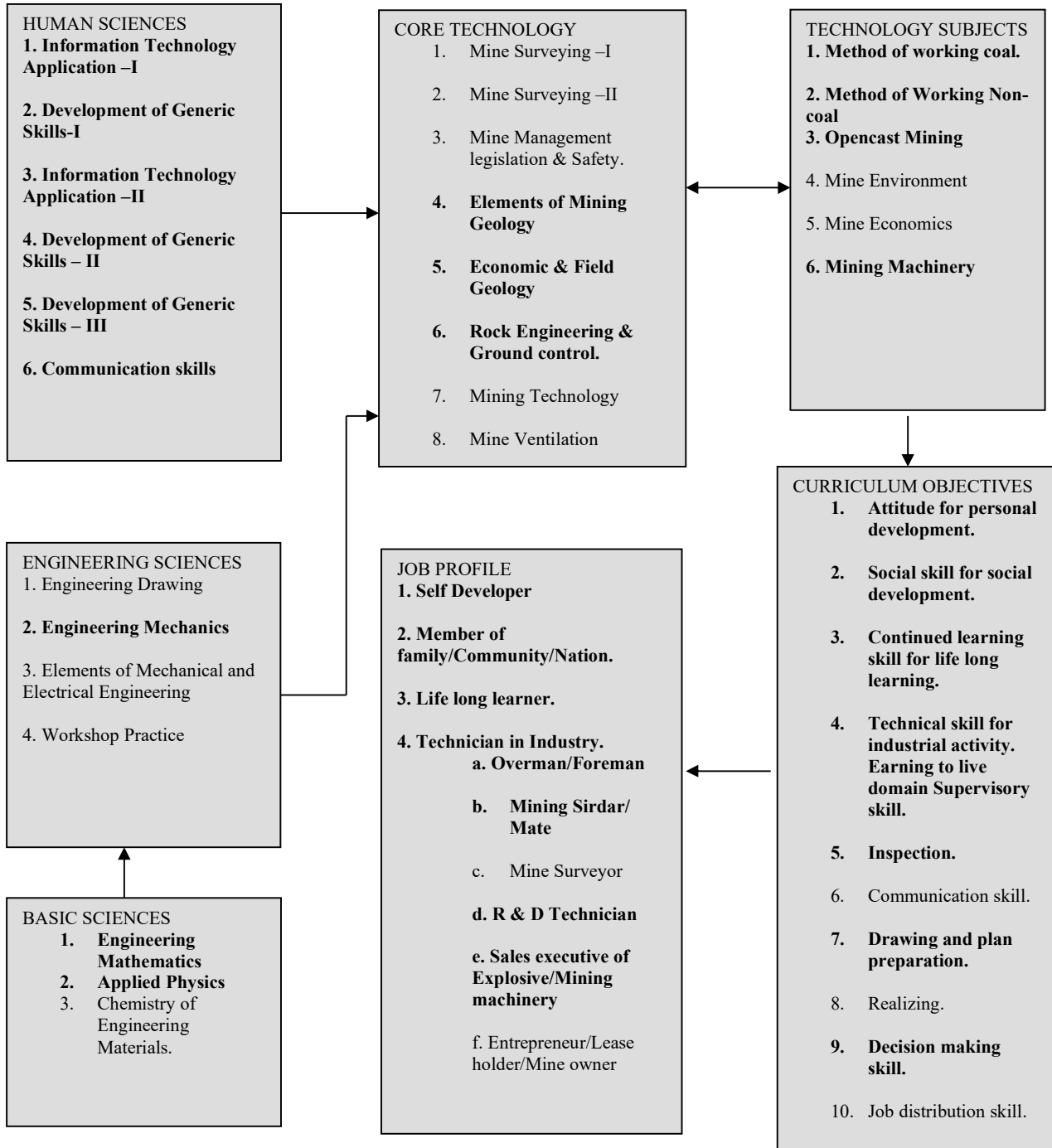
Conducting theory classes, practical, Industrial visits seminars group discussion, and assignment on different topics shall complete the curriculum for the subject.

### REFERENCES:

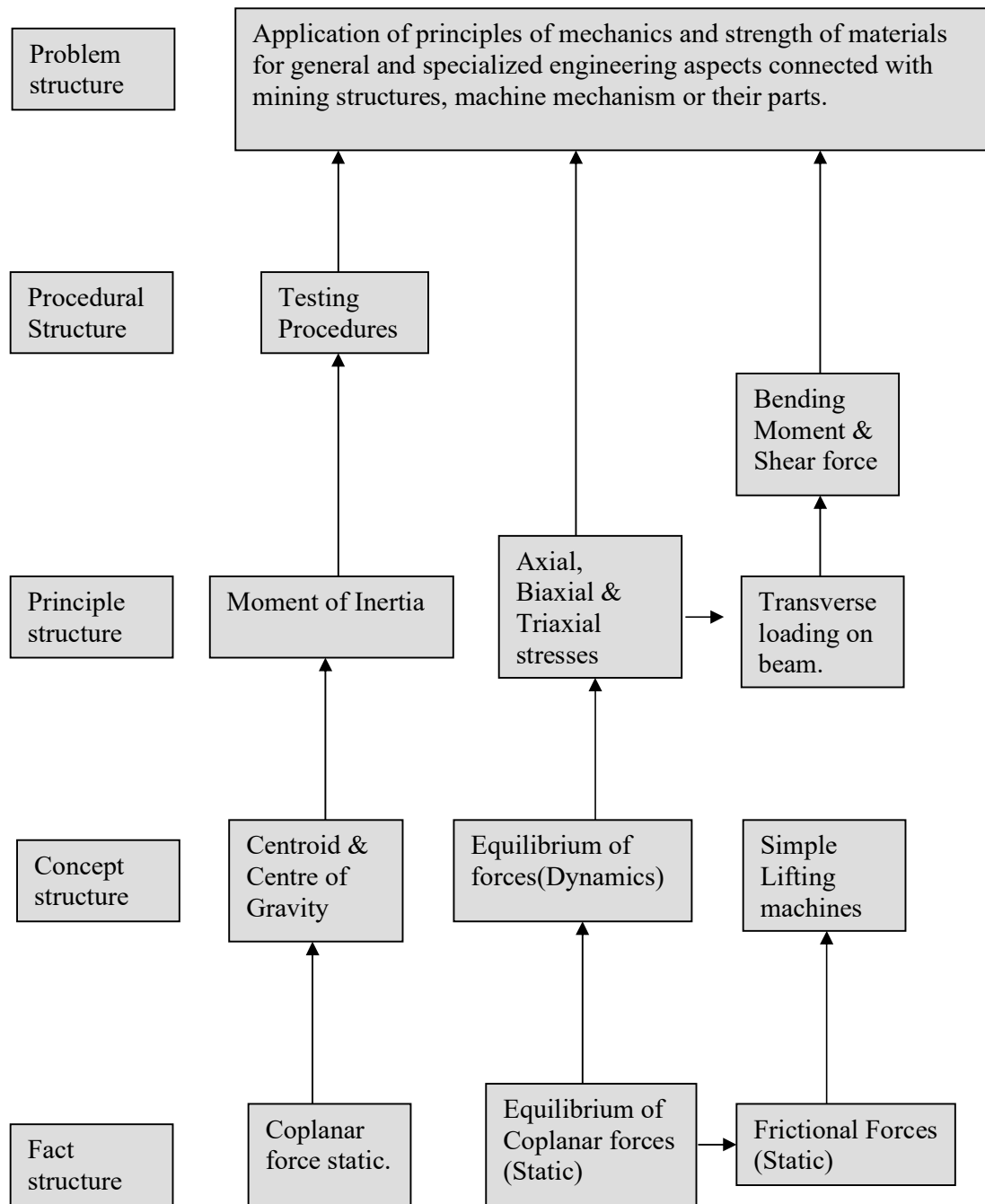
Author	Title	Year Of Publication	Place Of Publication & Publisher
P.K. Mukherjee	A text book of Geology	1986	The world press pvt. Ltd. Calcutta.
A.K. Dutta	Physical Geology	1962	A. K. Bose Ranchi.
F.H. Lahee	Field Geology		

## CONTEXT IN THE FORM OF BLOCK DIAGRAM:

### SUBJECT AREA –ENGINEERING MECHANICS



**GRAPHICAL STRUCTURE OF SUBJECT AREA- ENGINEERING MECHANICS**



**2.3 SUBJECT TITLE:        ENGINEERING MECHANICS**

**YEAR:                        SECOND YEAR**

**TEACHING AND EXAMINATION SCHEME:**

@ Internal assessment as per curriculum implementation & assessment norms..

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

**RATIONALE:**

Mechanics mainly deals with problems connected with motion or equilibrium of material and bodies and resulting interaction between them. Its purview come varieties of general and specialized engineering discipline connected with mining structures, machine mechanism or their parts.

Basic understanding of the concept and principles involved in mechanics is essential. Application of the principles to engineering situation relevant to mining should be emphasized.

**OBJECTIVES:**

The student shall be able to

1. Understand the concept and principles of machines.
2. Apply the principles to solve engineering problems.

**DETAILED CONTENTS:**

UNIT	CONTENTS	MARKS	HOURS	PRACTICAL CONTENT
1.	<b>Basic Concept</b> Introduction of Engineering Mechanics, Rigid bodies, Basic and derived units, Kinetics and Kinematics, Scalar and Vector quantities, System of units, International system of units.	04	02	
2.	<b>Force, Resolution &amp; composition of forces</b> 2.1 Definition of force, unit of force, Effect of force, Absolute and gravitational unit, characteristics of a force, System of forces, Coplanar and on Coplanar forces, concurrent and non-concurrent forces, parallel forces. 2.2 Laws of forces, parallelogram law of forces, triangle laws of forces, law of polygon of forces, principles of physical impedance of forces, Principle of transmissibility. 2.3 Composition of forces, Resolution of forces, forces acting in various quadrants. 2.4 Definition of moments and its units in S.I. system, Types of moments, Definition of Couple, Types of Couple, Varignon's theorem of moments, Resultant & Equilibrant force.	12	08	1. Verification of Law of Polygon Of forces.  2. Study of forces in the members of JIB-CRANE.

UNIT	CONTENTS	MARKS	HOURS	PRACTICAL CONTENT
3.	<p><b>Equilibrium</b></p> <p>3.1 Definition of Equilibrium Laws of Equilibrium, Analytical condition of equilibrium, Graphical conditions of equilibrium, Finding reaction of simply supported, overhang beams graphically, Free body diagrams, equilibrium of parallel forces &amp; non parallel forces.</p> <p>3.2 Lami's Theorem and its application</p> <p>3.3 Beam reactions –Definition of beam, span. Types of beams, simply supported beam carrying concentrated loads and uniformly distributed loads.</p>	08	08	<p>3. Verification of Lami's theorem.</p> <p>4. Verification of Equilibrium of parallel forces on beam.</p>
4.	<p><b>Friction</b></p> <p>4.1 Concept of friction, Importance of friction in engineering. Useful and harmful effects of friction, Types of friction, Laws of friction, Limiting Equilibrium, Limiting friction, Coefficient of friction, Angle of friction, Angle of repose, Relation between co-efficient of friction and Angle of friction.</p> <p>4.2 Equilibrium of bodies on level surface, Inclined plane with external forces acting in various directions. (Numerical)</p>	08	08	<p>5. Comparison of Co-efficient of friction between different surfaces.</p>
5.	<p><b>Centroid and Center of Gravity</b></p> <p>5.1 Introduction, Difference between centroid and center of gravity, Method of finding out Centroid and center of gravity of regular figures such as Triangle, Rectangle, Circle, Semicircle, Trapezoidal.</p> <p>5.2 Center of gravity Solids, Sphere, Hemisphere, Cone, Frustum of cone, Pyramid Cylinder and hollow Solids.</p>	08	06	



UNIT	CONTENTS	MARKS	HOURS	PRACTICAL CONTENT
6.	<p><b>Kinetics</b></p> <p>6.1 Introduction of Kinetics, Definition of mass, Momentum and Impulse their units in S.I. system.</p> <p>6.2 Newton's Laws of motion, Law of conservation of momentum.</p> <p>6.3 Application of laws of motion and impulse momentum principle in</p> <p>6.3.1 Motion of two connected bodies tied by a light inextensible string.</p> <p>6.3.2 Motion of lift.</p> <p>6.3.3 Collision of bodies.</p> <p>6.3.4 Motion of trains/wagons on horizontal and inclined planes. (Simple numerical)</p>	08	08	
7.	<p><b>Work, Power, Energy</b></p> <p>7.1 Definition of work, unit of work, work done by torque, work done by force parallel to motion, force inclined to motion, work done by variable force, Graphical representation of work, Work done against friction, Work done against gravity, Work done on inclined plane.</p> <p>7.2 Definition of power, units in S.I. system, Power of different machines, Power developed by torque.</p> <p>7.3 Definition of Energy, units in SI system, Different forms of energy, potential energy, Kinetic energy, Law of conservation of energy, Work-energy principle (simple numerical shall be asked in examination)</p>	10	08	

UNIT	CONTENTS	MARKS	HOURS	PRACTICAL CONTENT
8.	<p><b>Simple Lifting Machines</b></p> <p>8.1 Concept of machine, Definition of load, Effort, Mechanical advantage, Velocity ratio, Input of machines, Output of machine. Efficiency of machine, Reversible and non-reversible machine.</p> <p>8.2 Ideal machine, Friction in machine, law of machine, maximum mechanical advantage, Maximum Efficiency.</p>	06	05	<p>6. Simple Wheel and Axle.</p> <p>7. Differential Axle and Wheel.</p> <p>8. Simple Screw jack.</p> <p>9. Two sheave and three sheave pulley block.</p> <p>10. Single Purchase Crab.</p> <p>11. Double Purchase Crab.</p> <p>12. Worm and Worm wheel</p>
9.	<p><b>Transmission of power by Belt and Rope</b></p> <p>9.1 Types of belts, Velocity ratio, Follower, driver, slip.</p> <p>9.2 Friction in belt, ratio of tension in belt, power transmitted by belt &amp; ropes.</p>	06	03	
10	<p><b>Strength oh materials.</b></p> <p>10.1 Concept of elastic, plastic and rigid bodies.</p> <p>10.2 Concept of axial loads, axial stresses (Compressive &amp; tensile), axial strains, lateral strain, piossons ratio, volumetric strain, Composite section under axial load, modular ratio. Concept of bi axial &amp; triaxial stresses. Definition of bulk modulus. Concept of temperature stresses.</p> <p>10.3 Elastic constants, concept of shear load, shear stresses &amp; shear strain, modulus of rigidity, relation between 'E', 'C' and 'K'.</p>	08	06	<p>13. Study of U.T.M.</p> <p>14. Tension test on mild steel.</p>

UNIT	CONTENTS	MARKS	HOURS	PRACTICAL CONTENT
11.	<p><b>Moment of Inertia.</b></p> <p>11.1. Concept of moment of inertia, moment of inertia for plane areas such as rectangle, triangle, circle, semicircle and quarter circle.</p> <p>11.2. Parallel axis and perpendicular axis theorem, moment of inertia of composite sections.</p>	04	04	
12.	<p><b>Shear force &amp; bending moment.</b></p> <p>12.1. Concept of shear force and bending moment. Definition sign convention. Relation between bending moment, shear force and rate of loading.</p> <p>12.2. Shear force &amp; bending moment diagrams for simply supported beams, overhanging beams, and cantilever beams subjected to point loads and uniformly distributed loads, point of contraflexure.</p>	08	06	15. Drawing S.F. D. & B.M.D. for six problems (Simply supported & cantilever beams with different types of loading). On A2 size drawing sheet.

### STRATEGY OF IMPLEMENTATION

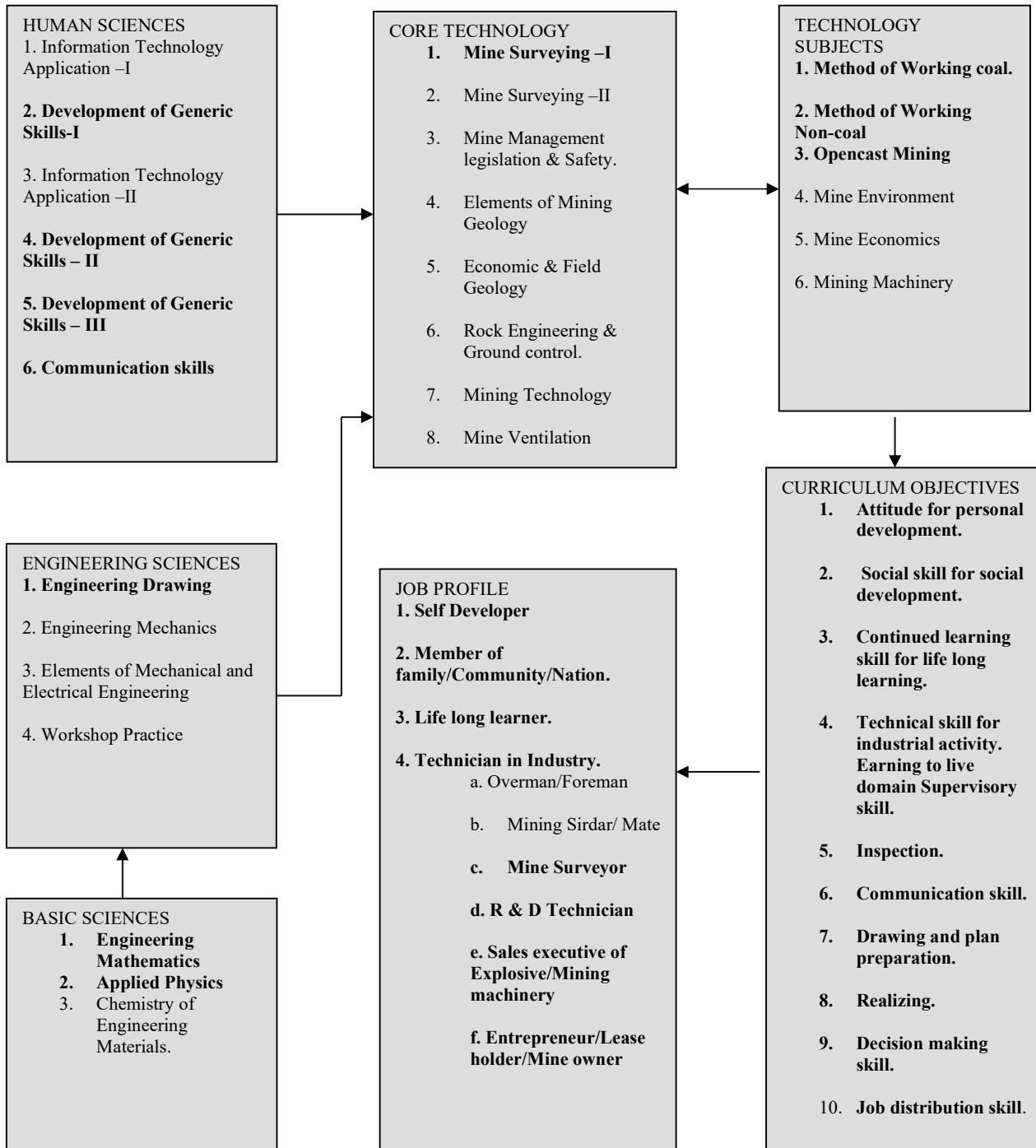
Conducting theory classes, practical, Industrial visits seminars group discussion, and assignment on different topics shall complete the curriculum for the subject.

### REFERENCES:

AUTHOR	TITLE	YEAR OF PUBLICATION	PLACE OF PUBLICATION & PUBLISHER
Khurmi	Strength of materials.	1988	New delfi S. Chand & co.
Timoshenko & Young	Engg Mechanics	1990	New york: McGraw Hills.
Singer	Engineering Mechanics	1987	London: Harper & Row.
Ramanutham	Applied Mechanics	1983	Delhi : Dhanpat rai & sons.

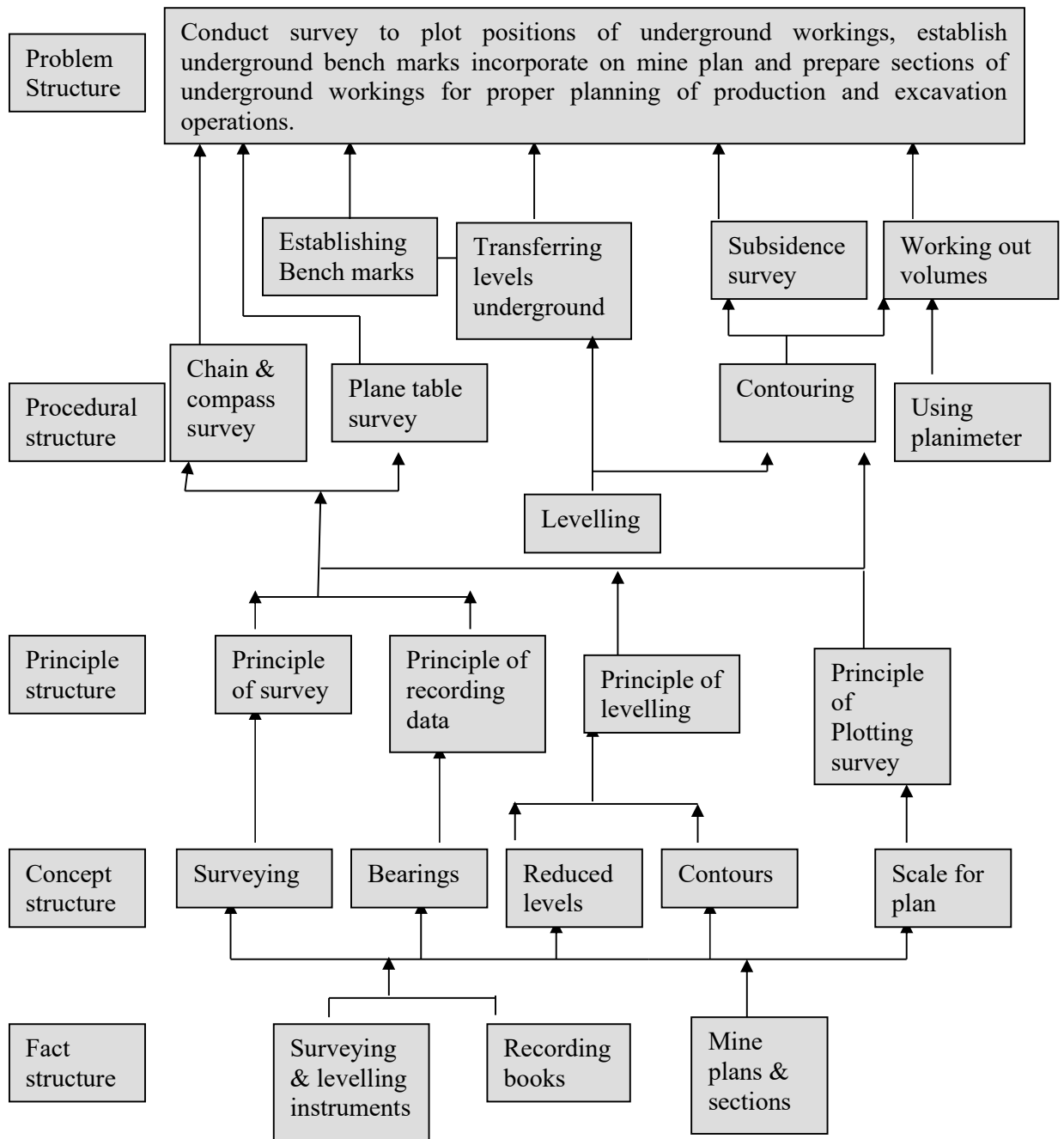
CONTEXT IN THE FORM OF BLOCK DIAGRAM:

**SUBJECT AREA – MINE SURVEYING - I**



**GRAPHICAL STRUCTURE OF SUBJECT AREA – MINE SURVEYING – I**

**2.4 SUBJECT TITLE: MINE SURVEYING – I**



**2.4 SUBJECT TITLE: MINE SURVEYING – I**

**YEAR: SECOND 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 include the activities of detailed surveying, plotting of survey data and setting out works.

It is therefore essential to give emphasis on the development of skills on using various survey instruments and their application in underground mines for preparation plans & sections of workings. In addition, for providing basic principles of surveying and levelling, it is necessary to arrange appropriate field exercises and small projects.

**OBJECTIVES:**

Student will be able to

3. Acquire skills of using various survey instruments.
4. Develop skills of preparation of mine plan & section.
5. Understand and apply principles and method of survey to conduct subsidence survey.
6. Carryout and suggest the repairs needed to survey instruments.
7. Understand and apply various statutory provisions of regulation while preparing mine plan & section.

**DETAILED CONTENTS:**

UNIT	CONTENTS	Ma rks	Hrs	PRACTICAL CONTENT
1.	<p><b>INTRODUCTION TO SURVEYING</b></p> <p>1.1 Definition of surveying, objects of surveying, Plane and Geodetic surveying. Classification &amp; Basic principles of surveying.</p> <p>Chain Surveying :</p> <p>1.2 Principle of chain surveying. Equipments in chain surveying, cross staff , optical square its principle and use.</p> <p>1.3 Different operations in chain surveying, Ranging: direct &amp; reciprocal ranging. Line ranger structure, principle of working and its use. Chaining: Chaining on flat &amp; slopping ground, obstacle in chaining(No numerical). Errors in chaining. Offsetting.</p>	08	05	<p>1. Demonstration of measuring chain, tape, ranging rod, peg, arrow, optical square, line ranger.</p> <p>2. Laying and ranging a chain line and taking offsets by tape on either side.</p> <p>3. Chain and cross-staff survey for finding out area of a given field.</p>
2.	<p><b>COMPASS SURVEYING</b></p> <p>2.1 The Prismatic &amp; Surveyors compass, their Comparison.</p> <p>2.2. Bearing of a line: Definitions: True &amp; Magnetic Meridian; True and Magnetic bearings, Fore &amp; Back bearings, Declination. Whole circle bearing system &amp; Quadrantal Bearing system. Conversion of bearings from one system to other. Calculation of angles from bearings. Calculation of bearings from angles.</p> <p>2.3. Local attraction: Sources, detection &amp; its elimination. Magnetic Dip &amp; Magnetic declination. Calculation of True bearings.</p> <p>2.4. Traversing with compass: Closed and open traverse; Plotting a compass traverse; Checks for open &amp; closed traverse; Closing error, Graphical adjustment of closing error.</p>	16	15	<p>4. Perform temporary adjustment of prismatic compass and observing fore &amp; back bearing and calculation of included angles from observed bearings.</p> <p>5. Measure fore &amp; back bearing of five sided closed traverse, identify stations affected by local attraction and calculate corrected bearings</p>

UNIT	CONTENTS	Marks	Hrs	PRACTICAL CONTENT
3.	<p><b>PLANE TABLE SURVEYING</b></p> <p>3.1 Introduction, Plane table and its accessories, Temporary adjustments of Plane table, centering, levelling, orienting the plane table by method of back sighting by method of magnetic needle.</p> <p>3.2 Methods of plane tabling Radiation, Intersection, Traversing, Resection method.</p> <p>3.3 Advantages &amp; disadvantages of plane table survey, Errors in plane table survey.</p>	16	08	<p>6. Demonstration of plane table and accessories, temporary adjustment, locating points by radiation.</p> <p>7. Methods of plane Tabling- orientation of plane table by back sighting and locating details by intersection method.</p>
4.	<p><b>LEVELLING</b></p> <p>4.1 Definitions of the terms used in Levelling. Concept of datum, Back sight, Foresight stations, change point, height of instrument. Dumpy and tilling level Construction and temporary adjustments. Levelling staff, their types. balancing of back sight and Fore sight distances. Holding and Reading the staff, simple and differential levelling, and booking of readings.</p> <p>4.2 Reduction of levels by Collimation system and by Rise &amp; fall system. arithmetic check, computation of missing readings.</p>	20	16	<p>8. Demonstration of Dumpy level and tilting level.</p> <p>9. Carrying out, Temporary adjustments of dumpy level and conduct simple levelling, recording readings in levelling book and apply arithmetic check.</p>
	<p>4.3 Classification of levelling: Differential, Reciprocal, and Fly levelling, Profile levelling, cross sectioning. Plotting of a profile and cross section.</p> <p>4.4 Difficulties in levelling, common mistakes in levelling. Permanent adjustments of Dumpy &amp; Tilling level. Automatic level (General idea only)</p> <p>4.5 Transferring levels underground: Measurement of depth of vertical shaft. Establishing u/g bench mark in relation to surface bench mark.</p> <p>4.6 Marking center &amp; grade line of drift. Marking Highest flood level.</p> <p>4.6 Study and use of Abney level Auto set level, Temporary adjustments.</p>	12	12	<p>10. Differential levelling with Dumpy level- recording in level book, reduction of levels by both methods, apply arithmetic check.</p> <p>11. Fly levelling for carrying benchmark at a station at least 300 m away by tilting level.</p> <p>12. Demonstration of auto level.</p>



UNIT	CONTENTS	Marks	Hrs	PRACTICAL CONTENT
5.	<p><b>CONTOURING</b></p> <p>5.1 Introduction and concept, definitions, purpose, Characteristic of Contour line, contour interval, factors affecting contour interval, Horizontal equivalent. Methods of Locating contours Direct method, Indirect method. Interpolation of contours by estimation, arithmetical and by graphical method. Plotting of contour maps. Uses of contour map.</p> <p>5.2 Measurement of areas &amp; volumes by Simpson's and Trapezoidal, prismatic rule, measurement of stock of coal, overburden mines.</p>	16	08	
6.	<p><b>6.1 SUBSIDANCE SURVEY</b> Subsidence monitoring, data required for subsidence studies, parameters required during monitoring, layout of survey lines, survey stations, measurement techniques and Instrumentation, Measurement of displacement, slope and subsurface movement, frequency of subsidence measurement</p> <p><b>6.2 PLANS &amp; SECTIONS (Provisions of CMR 1957)</b> General requirements of mine plan, Types of plan, copies of plans &amp; sections to be submitted, plans &amp; sections to be submitted after abandonment and discontinuance, list of plans, sections and instruments and their storage, Preparation of plans by surveyors.</p> <p><b>6.3 Duties and responsibility of Mine Surveyors.</b></p>	12	08	

### PROJECT WORK

1. Chain and compass traverse survey - minimum five-sided traverse with location of details, Calculation of included angles and plotting.
2. Plane Table Survey of a small campus – for 5-sided traverse.
3. Profile leveling and sectioning Approx. 150 m long and 30 m wide.
4. Block contouring – block of 200 m X 200 m. with spot level at 10m X 10m. plotting contours with contours interval 0.5 to 1.0 m. by interpolation .

The term work shall consist of a field and level book containing the specified practical, and sheets. (Half imperial size). The profile and cross sectioning plotting to be done on graph sheet. (1/2 imperial size).

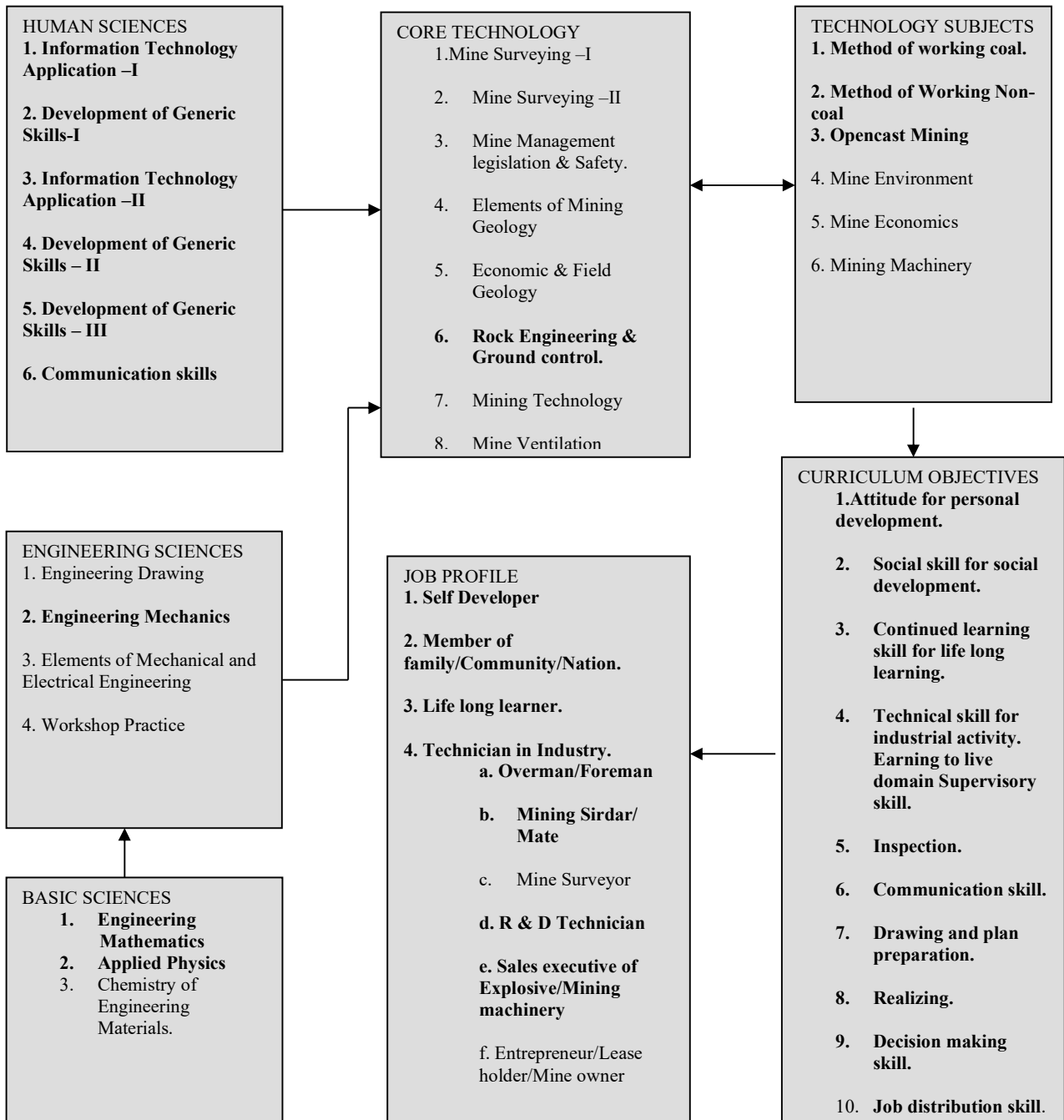
**STRATEGY OF IMPLEMENTATION:**

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

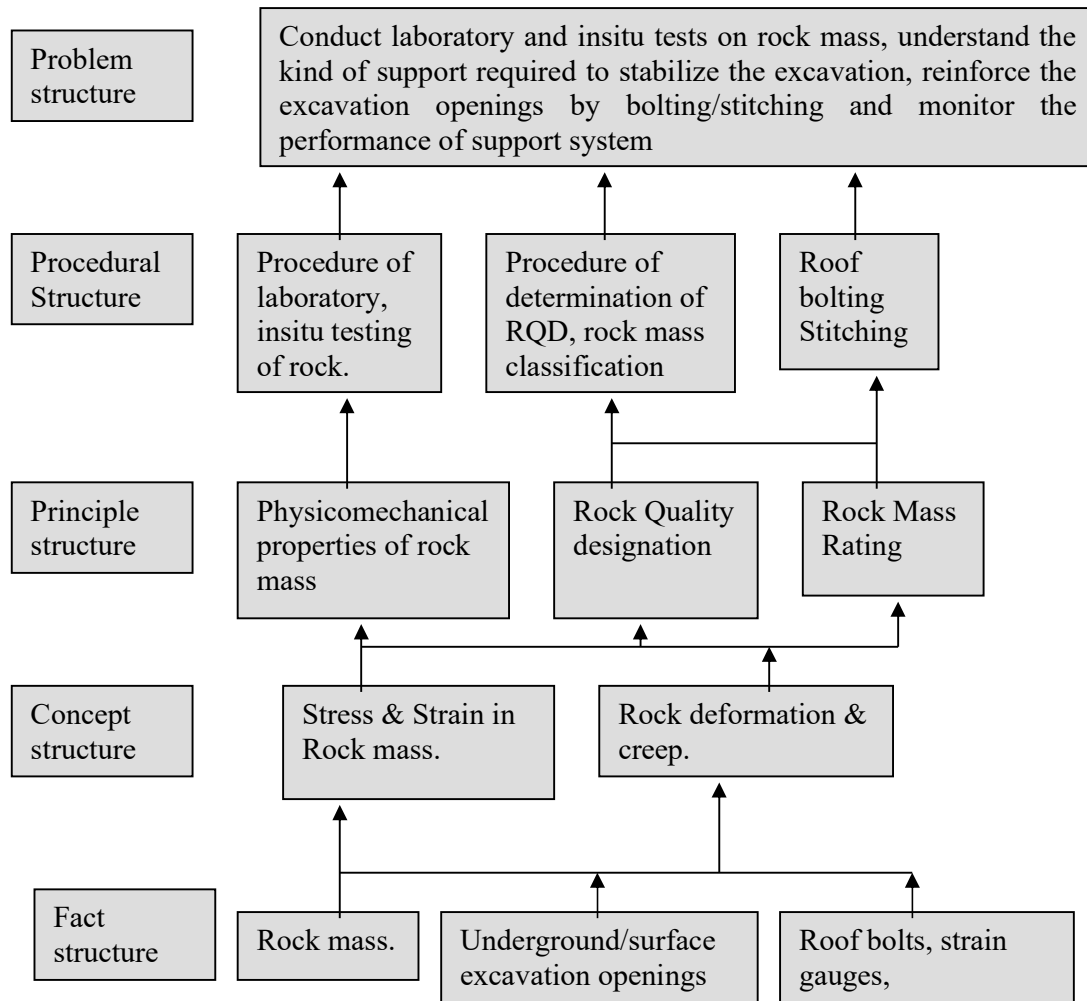
**REFERENCE BOOKS :**

<b>Author</b>	<b>Title</b>	<b>Year of publication</b>	<b>Publisher</b>
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 – ROCK ENGINEERING & GROUND CONTROL**



**GRAPHICAL STRUCTURE OF SUBJECT AREA- ROCK ENGINEERING & GROUND CONTROL**



**2.5 SUBJECT TITLE:      ROCK ENGINEERING AND GROUND CONTROL**

**YEAR:                        SECOND**

**TEACHING AND EXAMINATION SCHEME:**

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

# External assessment as per curriculum implementation & assessment norms..

**RATIONALE:**

The Diploma holder in Mining and Mine surveying must have knowledge of Rock engineering as the underground opening are subject to accumulation of stress which make opening unstable, therefore he must understand the kind of support required to stabilize the opening. He also required to work as technical asst. in various Technical and Research Institutes, therefore he must have knowledge of different properties of rock and procedure of determining the properties of rock in laboratory and insides the mine. The mining engineer should have knowledge of Rock burst, bumps, precautions measure and methods of prediction etc.

**OBJECTIVES:**

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

1. Classify to rock mass.
2. Identify the kind of support required to the excavation.
3. Conduct different laboratory test to determine properties of rock.
4. Carryout monitoring, predict and supervise and carryout preventive measures for rock burst, bumps etc.
5. Carryout and supervise roof bolting and stitching operation.

## DETAILED CONTENTS:

UNIT	CONTENTS	Ma rk	Hrs	PRACTICAL CONTENT
1.	<p><b>INTRODUCTION TO ROCK MECHANICS</b></p> <p>1.1 Concept of stress and strain in rock, stress due to weight of strata, vertical lateral stresses. Stress due to tectonic and orogenic force, Residual stresses, Induced stresses.</p> <p>1.2 Field stresses, modulus of elasticity poissons number, Poissons ratio stress fields.</p> <p>1.3 Introduction to elementary rock mass classification based on strength, hardness, RQD, Bieniawski RMR classification.</p>	16	18	<p>1. Preparation of rock sample for laboratory testing.</p> <p>2. Determination of uniaxial compressive strength of a rock sample.</p> <p>3. Determination of tensile strength (Brazilian test) Of a rock sample.</p>
2.	<p><b>ROCK MASS PROPERTIES</b></p> <p>2.1 Strength Properties: Compressive strength, Tensile Strength, Shear Strength, Flexural Strength.</p> <p>2.2 Strength Indices- Point Load Strength index, Impact Strength index, Protodykonov strength index. Rebound hardness, insitu stress by flat jack</p> <p>2.3 Cohesion, Young's modulus, poissons ratio, angle of internal friction.</p> <p>2.4 Porosity, Density, Moisture content permeability.</p> <p>2.5 Material Characteristics: Brittle material, Ductile material, Elastic material, Plastic material.</p> <p>2.6 Time dependent properties: creep, Creep curve, factors contributing Creep. Deformation, weatherability.</p>	16	20	<p>4. Determination of shear strength. of a rock sample.</p> <p>5. Demonstration of triaxial cell.</p> <p>6. Determination of point load strength index.</p> <p>7. Determination of Protodykonov strength index.</p> <p>8. Determination of impact strength index.</p>
3.	<p><b>ROCK TESTING</b></p> <p>3.1 Uniaxial compressive strength, Tensile strength – Brazilian test, Bending test. Shear strength test- punch shear test, Direct shear test on Rock cube, Triaxial method.</p> <p>3.2 Determination of strength indices- point load strength index, Protodykonov strength index, impact strength index.</p>	20	20	<p>9. Demonstration of use of flat jack for insitu stress determination.</p>

UNIT	CONTENT	Marks	Hrs	PRACTICAL CONTENT
4.	<p><b>ROCK BRUST AND BUMPS</b></p> <p>4.1 Rock burst, Bumps, causes controlling measures, factors affecting proneness to rock burst/Bumps.</p> <p>4.2 Pillar Design- factors considered. Pillar design by tributary area approach, determination of factor of safety.</p>	16	16	
5.	<p><b>MONITORING GROUND MOVEMENT</b></p> <p>5.1 Classification of field instrumentation for ground control and rock mechanics studies.</p> <p>5.2 Borehole shear tester.</p> <p>5.3 Closure meters: Telescopic closure meter, Tape closure meter/ extensometer, and Remote indicating closure meter.</p> <p>5.4 Borehole Extensometer: Rod type; Magnetic type.</p> <p>5.5 Stress Meter.</p> <p>5.6 Bolt meter.</p> <p>5.7 Rock Bolt Pull Out Tester.</p> <p>5.8 Load Cell.</p> <p>Their application, working principle Construction etc.</p>	16	16	<p>10. Demonstration of closure Meters</p> <p>11. Demonstration of extensometer.</p> <p>12. Demonstration of load Cell.</p>
6.	<p><b>GROUND CONTROL</b></p> <p>6.1 Theories of mechanics of strata behavior: Dome or arch theory, Beam theory.</p> <p>6.2 Function of roof bolts.</p> <p>6.3 Principle of Action Roof Bolts.</p> <p>6.4 Varieties of Roof Bolts: Slot and Wedge, Expansion shell Grouted Roof Bolts Resin Roof Bolts.</p> <p>6.5 Anchorage Testing of Roof Bolts.</p> <p>6.6 Bolt density.</p> <p>6.7 Code of practice for roof bolting in underground mines.</p> <p>6.8 Roof stitching Principle of Roof stitching.</p> <p>6.9 Cable Bolting.</p>	16	18	<p>13 Demonstration of various Rock bolts.</p> <p>14. Study of anchorage testing of rock bolts.</p> <p>15. Demonstration of cable bolting.</p>

## **STRATEGY OF IMPLEMENTATION**

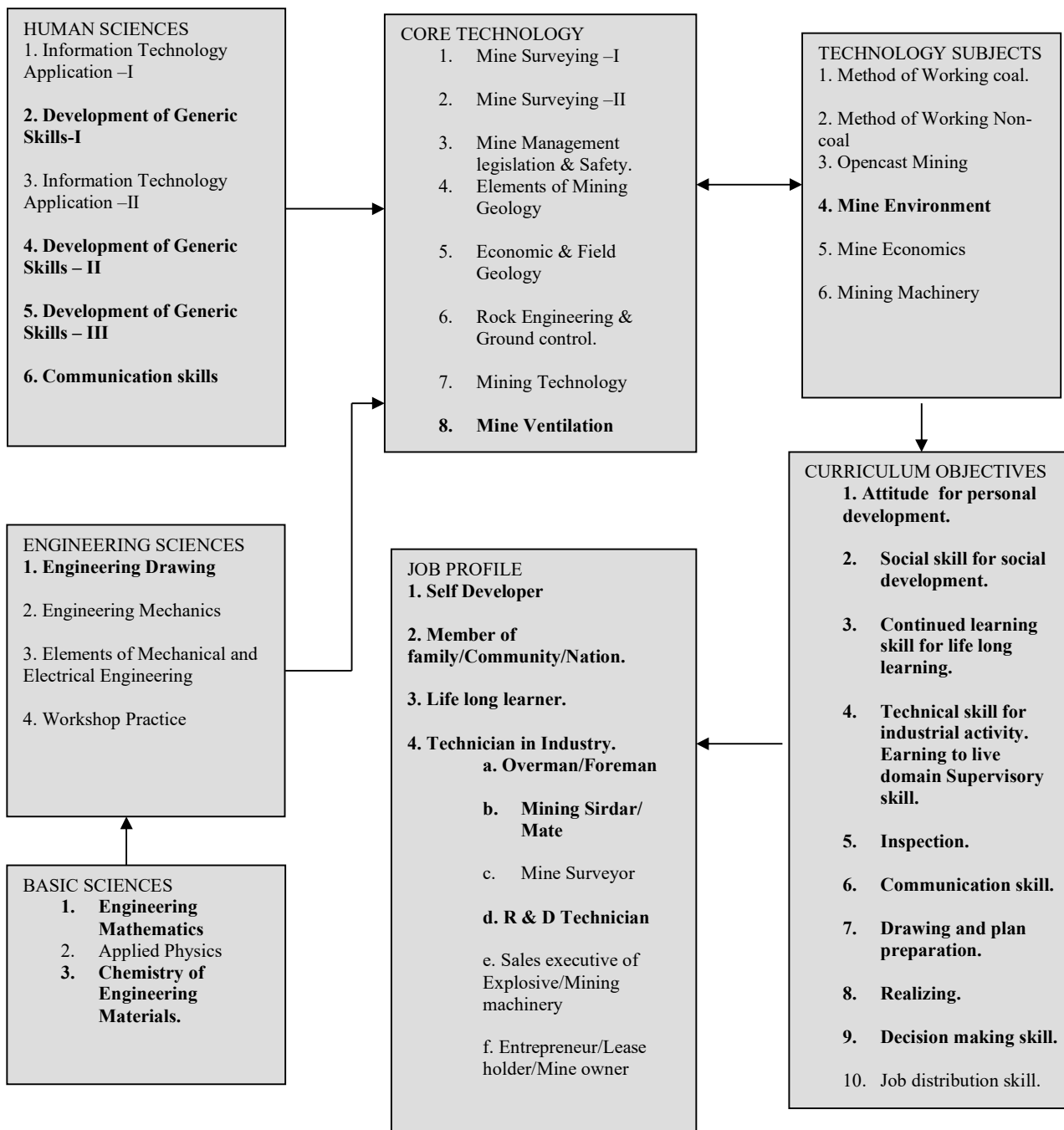
Conducting theory classes, practical, Industrial visits seminars group discussion, and assignment on different topics shall complete the curriculum for the subject.

## **REFERENCE BOOKS**

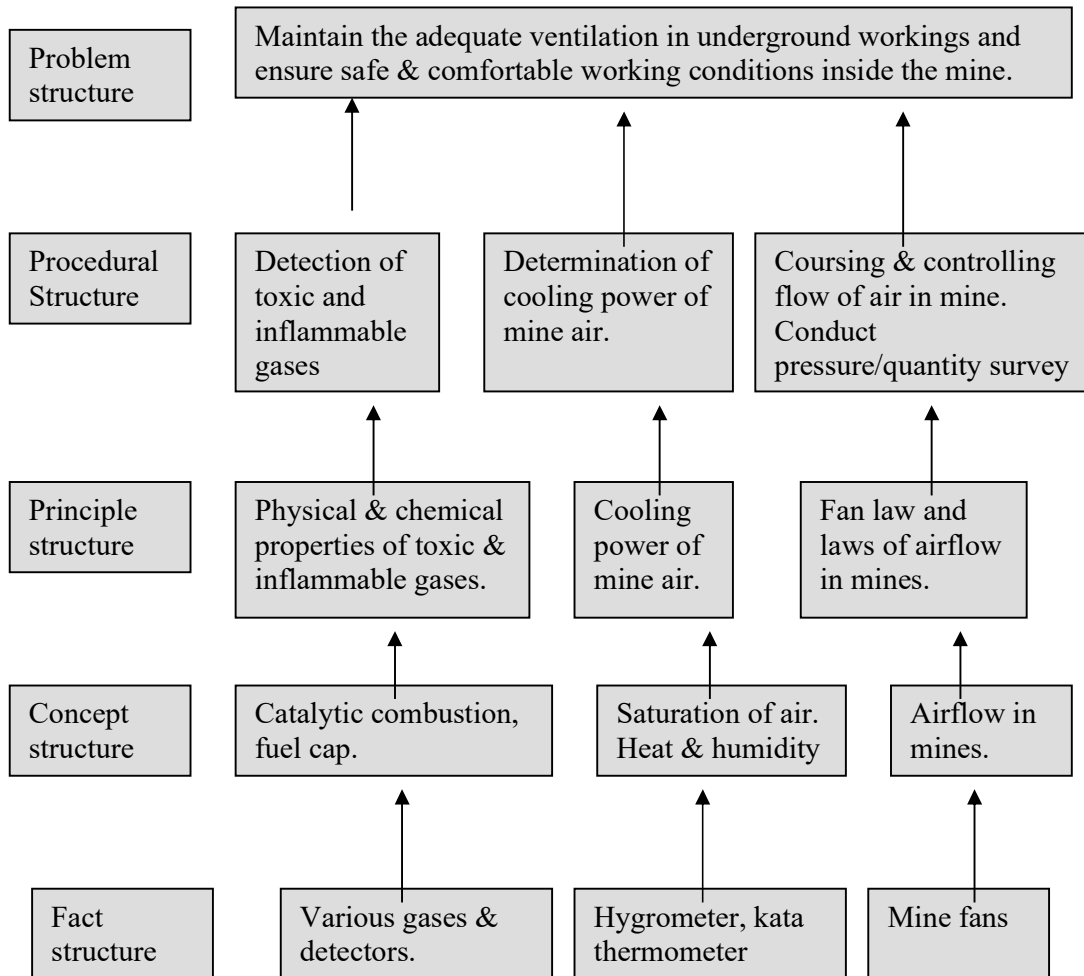
Author	Title	Year of publication	Publisher
D.J. Deshmukh	Elements of Mining Technology Vol I	1995	Central techno publication, Nagpur
S.K. Das	Modern Coal mining Technology	1994	Mintech publication Bhubaneswar.
B.S. Verma	The elements of mechanics of mining ground	1981	Tuhin & Co. Lucknow
Dr. B.P. Verma	Rock Mechanics for Engineers.	1989	Khanna Publication Delhi.



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



**GRAPHICAL STRUCTURE OF SUBJECT AREA**  
**MINE VENTILATION**



**2.6 SUBJECT TITLE: MINE VENTILATION**

**YEAR: SECOND 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:**

The underground working is devoid of the natural air. As such to make the working places safe for the persons to work and pass it is necessary to circulate the air artificially through the mine working. A mining engineer must know the principles of how the flow of air can be created, regulated, controlled and monitored. They must also know the effect of the heat and humidity, condition and means of measuring and controlling the same. Number of mine gases is produced in the mine, which has got dangerous and toxic properties. The mining engineer should have knowledge of source of these gases their measurement detection and dealing with these aspects of knowledge essential for mining engineer.

**OBJECTIVES:**

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

1. Take measurement of quantity of air, pressure, humidity and cooling power of the mine air, and take corrective action if these do not meet the desired standards.
2. Detect presence of inflammable and toxic/noxious gases in the mine and take precautions to remove the some and make the working places safe.
3. Provide and maintain ventilation appliances in their districts so as to ensure compliance with standards of ventilation prescribed.
4. Generally appreciate the ventilation system of a mine as a whole and importance of maintaining safe and comfortable working conditions inside the mine.

**DETAILED CONTENTS:**

UNIT	CONTENTS	Mark	Hrs.	PRACTICAL CONTENT
1.	<p><b>MINE AIR</b></p> <p>1.4 Different Gases / Damps found in mines, Definition of damps, their threshold limits, physiological effects, source of production and detection, Degree of gassiness of seam.</p> <p>1.5 Flame safety lamps, its principle, construction, safety features, and comparison. Detection of Methane by flame safety lamp,</p> <p>1.6 MSA Methanometer its principle of working, construction. Principle of other method of detection of methane (description of equipment not required)</p>	16	18	<p>1. Demonstration of co-detector and measurement of carbon monoxide using Co-detector.</p> <p>2. Demonstration of MSA Methanometer and measurement of methane using Methanometer.</p> <p>3. Dismantling &amp; assembling of different types of Flame safety lamps.</p> <p>4. Detection of Methane using flame safety lamp.</p>
2.	<p><b>MINE CLIMATE</b></p> <p>2.1 Purpose and standards of ventilation, standards for minimum &amp; maximum velocity of air for different locations.</p> <p>2.2 Pressure, ventilating press, watergauge.</p> <p>2.3 Temperature, sources of heat in mines.</p> <p>2.4 Moisture content of mine air relative humidity, wet bulb temperature, measurement of relative humidity.</p> <p>2.5 Cooling power of mine air, determination of cooling power, methods of improving cooling power of mine air, effect of heat and humidity on miners.</p>	12	18	<p>5. Demonstration of whirling hygrometer and determination of relative humidity using whirling hygrometer.</p> <p>6. Demonstration of Kata thermometer and determination of cooling power by Kata thermometer.</p> <p>7. Demonstration of water gauge and measurement of fan water gauge.</p>
3.	<p><b>NATURAL VENTILATION</b></p> <p>3.1 Natural ventilation Pressure, geothermic gradient, Factors causing NVP, Effect of seasonal changes on direction of Natural ventilation, limitation of Natural ventilation.</p> <p>3.2 Motive column, calculation of natural ventilation pressure.</p>	12	14	

UNIT	CONTENTS	Mark	Hrs.	PRACTICAL CONTENT
4	<p><b>ARTIFICIAL VENTILATION</b></p> <p>4.1 Different types of fans used in mines: centrifugal &amp; axial flow, their principle of working, Exhaust &amp; forcing type. Purposes of evasee &amp; volute casing. Reversal of air current, and characteristics curves of fans. Fans in series and parallel,</p> <p>4.2 Comparison between axial flow &amp; Centrifugal fan; exhaust &amp; forcing Fan.</p> <p>4.3 Fan laws, Manometric efficiency overall efficiency, theoretical depression produced by fan.</p> <p>4.4 Numerical on fan laws.</p>	18	20	<p>8. Demonstration of centrifugal mine fan.</p> <p>9. Demonstration of Reversal arrangement of centrifugal mine fan.</p> <p>10. Demonstration of Axial flow fan.</p>
5.	<p><b>DISTRIBUTION &amp; COURSING OF AIR IN MINES</b></p> <p>5.1 Laws of air flow in Mines, Atkinson's formula splitting, advantages &amp; disadvantages, Numerical on splitting, equivalent orifice. Numerical on equivalent orifice.</p>	12	20	
	<p>5.2 Ventilation appliances, Auxiliary ventilation: Different methods, advantages &amp; disadvantages, hazards associated with auxiliary ventilation, precautions required.</p> <p>5.3 Booster fan: purpose, dangers associated, Precautions before installation. Numerical on Booster fan,</p> <p>5.4 Ascensional and Descensional ventilation, Advantages and disadvantages.</p>	14		<p>11. Demonstration of various ventilation devices.</p> <p>12. Demonstration of vane Anemometer and determination of quantity by Anemometer.</p> <p>13. Demonstration of velometer and measurement of air velocity by velometer.</p> <p>14. Demonstration of Inclined manometer and pitot static tube and determination of velocity pressure.</p> <p>15. Study of ventilation plan and conventional signs used in it.</p>

UNIT	CONTENTS	Mark	Hrs.	PRACTICAL CONTENT
6.	<b>VENTILATION SURVEY</b> 6.1 Scope and importance of ventilation survey, survey interval and location of survey station, ventilation plan. 6.2 Measurement of quantity & pressure difference, anemometer, pitot static tube, Manometer. 6.3 Conduct of Pressure & quantity survey, precautions during and before conducting ventilation survey.	16	18	

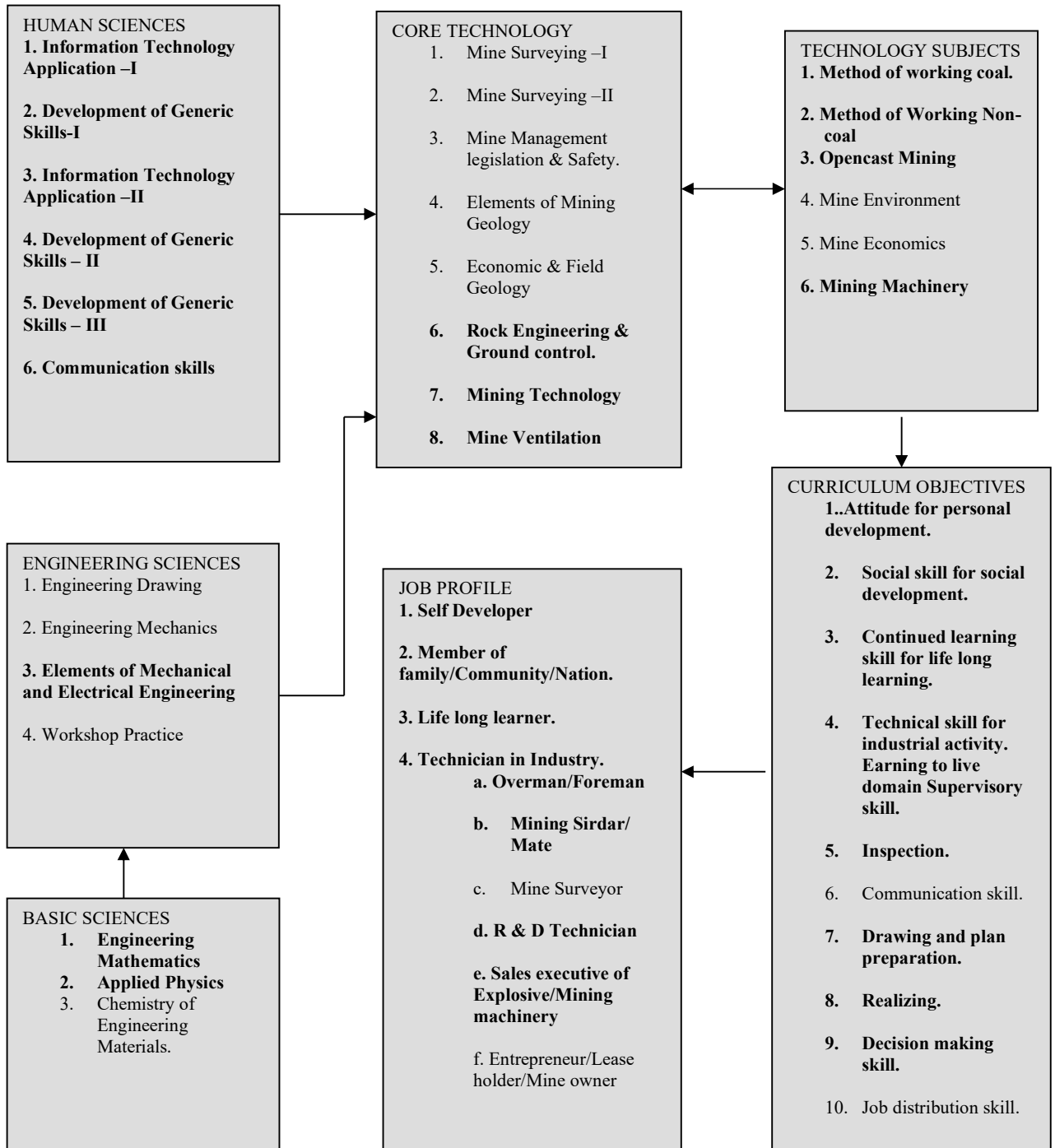
### **STRATEGY OF IMPLEMENTATION**

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

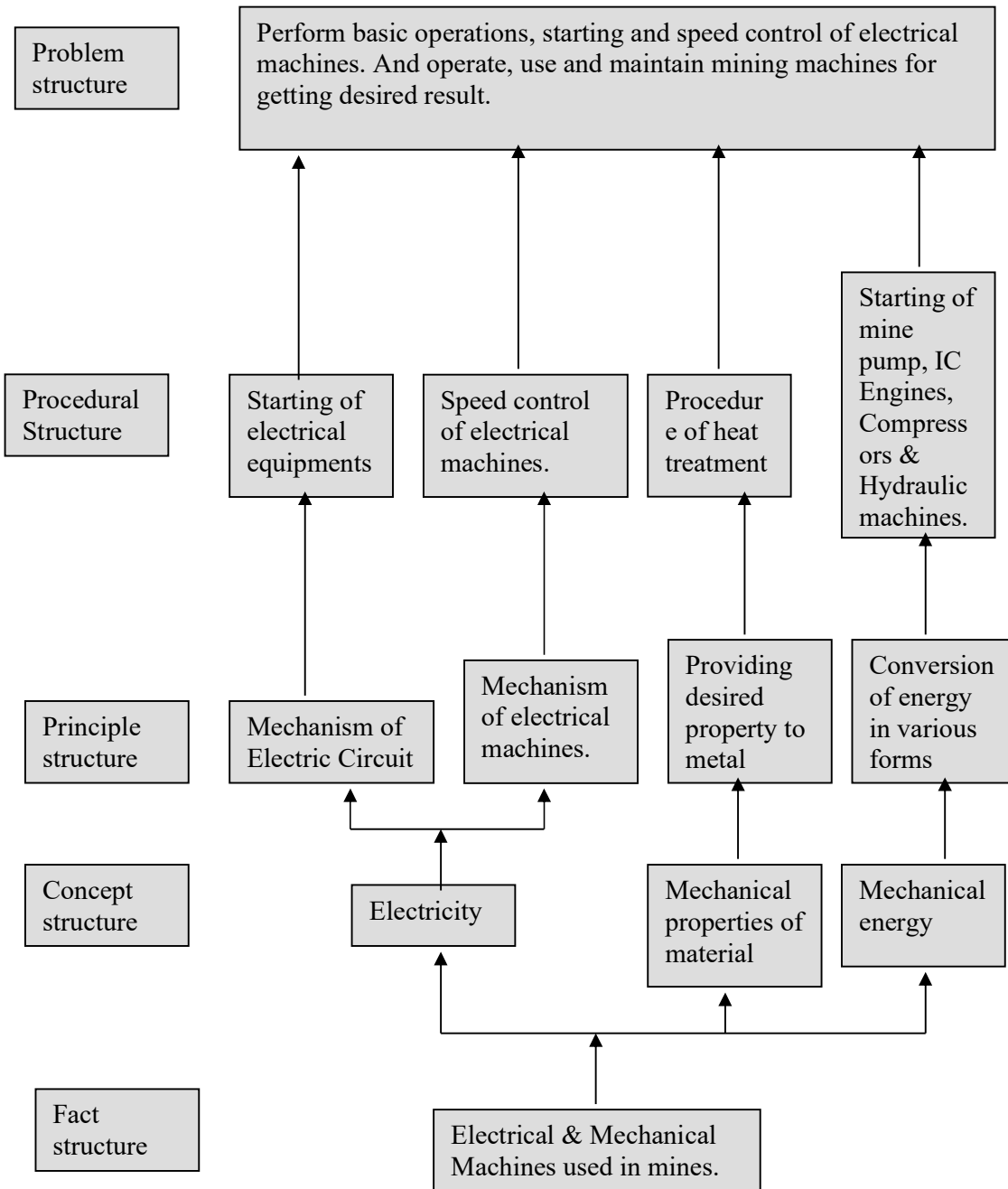
### **REFERENCE BOOKS**

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 – ELEMENTS OF MECHANICAL &  
 ENGINEERING ELECTRICAL**



**GRAPHICAL STRUCTURE OF SUBJECT AREA- ELEMENTS OF ELECTRICAL  
& MECHANICAL ENGINEERING.**





**2.7 SUBJECT TITLE:       ELEMENTS OF MECHANICAL & ELECTRICAL ENGINEERING**

**YEAR:                        SECOND**

**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

@ Internal assessment as per curriculum implementation & assessment norms..

**RATIONALE:**

The mining engineers working in the mines need to have understanding of electrical engineering, as the most of the drives used in mines are electrical. Hence he must know starting, working and different controls of electrical equipments.

Similarly the mining engineer required to operate, maintain different machines hence knowledge of internal combustion engines,, machine components, working brakes etc is essential. It is also expected that they shall be conversant with pneumatically & hydraulically operated equipments, engineering materials etc. The content of the course is framed keeping in view above important needs of the mining engineer.

**OBJECTIVES:**

Course is so designed, that students shall be able to:

1. Have general knowledge of electrical supply system.
2. Understand basic principles of motors, transformers, instruments etc.
3. Connect above equipments to supply.
4. Understand and implement different units and standards of measurements.
5. Understand the working of I.C. Engines
6. Understand the working of different types of compressors.
7. Select appropriate engineering materials required for various machines components.

**DETAILED CONTENTS:**

UNIT	CONTENTS	MARK	HOUR	PRACTICAL CONTENT
<b>SECTION – A</b>				
1.	<p><b><u>Electric Circuit</u></b></p> <p>Resistance, Current, Voltage, Work, Power and Energy Ohm’s Law AC Current – Three phase &amp; Single phase Storage Batteries- Constructing &amp; working</p>	08	04	<p>1. Measurement of Resistance by voltmeter, Ammeter method.</p> <p>2. Magnetization curve of DC machine.</p>
2.	<p><b><u>D.C. Machine</u></b></p> <p>Construction &amp; principles of operating, Magnetization and load characteristics of series, shunt and compound generators and motors. Motor starter , speed control and their field of applications.</p>	10	08	<p>3. Load characteristics of DC shunt generator</p> <p>4. Load characteristics of DC series generator.</p>
3.	<p><b><u>AC Motors</u></b></p> <p>Construction and principles of operation, Different types of A.C motors, methods of starting and speed control of Induction motor, Universal motor.</p>	10	08	<p>5. Speed control of DC shunt motor.</p>
4.	<p><b><u>Single phase Transformer</u></b></p> <p>Construction and principles of operation , types of transformers, Efficiency and Regulations, Auto transformer</p>	06	08	<p>6.Speed-load Characteristics of Induction motor</p>

UNIT	CONTENTS	MARK	HOUR	PRACTICAL CONTENT
5.	<p><b><u>Power Supply System</u></b></p> <p>Transmission &amp; distributing of Electrical power by overhead lines and cables Types of cables, layout of underground cables, shaft cables protection system and switchgear for mines like Relays, circuit breaker and fuses.</p> <p>Earthing and types of earthing Indian Electricity Rules General and with special reference to mines.</p>	16	08	<p>7. Voltage and current ratios of transformer</p> <p>8. Determination of efficiency and regulating of transformer.</p> <p>9. Study of DC shunt motor starter to understand normal principles of working.</p> <p>10. Study of Induction motor starters to understand normal principles of working.</p>
<b><u>SECTION - B</u></b>				
6.	<p><b><u>Units and Dimensions</u></b></p> <p>Units of pressure, Volume, Temperature, Work, Power, Energy in SI system only and their dimensions</p>	04	02	
7.	<p><b><u>Engineering Materials</u></b></p> <p>Chemical composition, properties and uses of following ferrous Metals: Cast iron, steel, Wrought iron, manganese steel, nickel steel, chromium steel, nickel-chromium steel, stainless steel.</p> <p>Non ferrous: Aluminum, copper, nickel, bronze, brass, copper nickel alloys, Aluminum alloys etc.</p>	06	05	
8.	<p><b><u>Brakes &amp; Clutches</u></b></p> <p>Brakes : Classification, Construction &amp; working of block brakes, internal expanding brakes, hydraulic brakes, vacuum brakes (no numerical problems)</p> <p>Clutches : Construction &amp; working of plate clutches, cone clutches, centrifugal clutch, claw clutch (no numerical problems)</p>	06	05	<p>1. Demonstration of different types of brakes.</p> <p>2. Demonstration of different types of clutches. And their working.</p>

UNIT	CONTENTS	MARK	HOUR	PRACTICAL CONTENT
9.	<p><b><u>Internal Combustion Engine</u></b>            Classification, Otto cycle, Diesel cycle.            Two stroke &amp; four stroke petrol engine .            Two stroke &amp; four stroke Diesel engine .            Different systems like fuel injection, fuel ignition for petrol &amp; diesel engines.</p>	12	06	3. Demonstration of petrol engine ( Two stroke & four stroke cycle engine.)  4. Demonstration of Diesel engine (four stroke cycle engine.)
10.	<p><b><u>Air compressor.</u></b>            Classification, Definitions of different terms such as inlet pressure, discharge pressure, capacity, theoretical power, break power, free air delivery.            Compressor efficiencies, Working of reciprocating Compressor. Single stage &amp; multistage. Linter cooling, After cooling, Conditions of maximum efficiency, Uses of compressed air (no derivation and proof of formula.) Rotary compressor: Roots blower, vane type blower, screw compressor, turbo blower, turbo compressor, centrifugal &amp; axial flow compressor (no derivation of formula.)</p>	12	08	5. Demonstration of Reciprocating air compressor.  6. Demonstration & application of Rotary compressor.
11.	<p><b><u>Hydraulics &amp; Hydraulic machines.</u></b>            Properties of fluid, components of hydraulic circuits and their symbols, constructional details and working of hydraulic of shaper and hydraulic press.            Types of pumps. Working principle of centrifugal pump, working principle of reciprocating pump. Uses of pumps in mining industry.</p>	06	07	7. Study of hydraulic circuit of shaper machine.  8. Study of hydraulic circuit of hydraulic press.  9. Demonstration of Centrifugal pump & its components.  10. Demonstration of Reciprocating pump & its components.
12.	<p><b><u>Heat treatment of iron &amp; steel.</u></b>            Normalizing, annealing, hardening or quenching, tempering, case hardening of steel.</p>	04	03	.

## **STRATEGY OF IMPLEMENTATION**

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

## **REFERENCES:**

<b>Author</b>	<b>Title</b>	<b>Year Of Publication</b>	<b>Place Of Publication &amp; Publisher</b>
Edward Huges	Electrical Technology		
H. Cotton	Electrical Technology	1984	C.B.S. Publisher
B.L. Theraja	Electrical Technology	2000	S.Chand
P.L.Ballaney	Thermal Engineering		
Avner	Engineering Metallurgy		Mcgraw Hill
R.S.Khurmi	Theory of Machines	1999	S.Chand

**2.9 SUBJECT TITLE: I. T. APPLICATIONS - II**  
**YEAR: SECOND 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	-	-	-	-	# 50	-

# External assessment as per curriculum implementation & assessment norms..

**RATIONALE:**

The market driven economy demands frequent changes in product design, also the data collection, analysis & retrieval at much faster rates. Computers being the inevitable part in an engineers life due to its inbuilt characteristics which helps him to do various task with acceleration. Thus operating skills required for data management, computer aided design & drafting operations, handling of printers & plotters etc., which are the backbone of any engineering life structure. Keeping in view the tasks to be performed by an Engineer working at various levels to cater the basic requirements of his professional career following necessary areas should known to the Diploma Engineer.

**DETAILED CONTENTS:**

	Contents	Mark s	Hour s
<b>UNIT-1</b>	MS-ACCESS		
Chapter 1	<p><b>Data Base Basics:</b>            Concept of database, concept of DBMS,            Terminology used: Table, Field, Record, Query, Form, Report.</p> <p><b>Practice:</b>            Decide fields for</p> <ol style="list-style-type: none"> <li>1. Employee database table</li> <li>2. Student database table</li> <li>3. Library books database table</li> </ol>		

	<b>Contents</b>	<b>Mark s</b>	<b>Hour s</b>
<b><u>Chapter 2</u></b>	<p><b>Table:</b>            Creating structure of table, Adding various fields, Decide the field type (Text, Number, Yes/No, Date, Memo), Decide Field properties (Like Field Size, Default value, Validation Rule), Saving Table.            Concept of primary key.            Modifying Table structure: Adding / Deleting fields, Changing Field names, data types, and properties            Adding data to table: Entering data, Adding, deleting and editing records.            Sorting the table in data sheet view.            Finding records.            Filtering records: Filter by selection.            Printing table: Print Preview and Print.</p> <p><b>Practice:</b>            Create Employee, Student, Library books table and perform above-mentioned activities.</p>		
<b><u>Chapter 3</u></b>	<p><b>Queries:</b>            Creating query in design view. Adding table, Selecting fields, Running the query, Specifying a sort order.            Specifying criteria, Adding Calculated fields.</p> <p><b>Practice:</b>            Create and run queries on above tables.</p>		
<b><u>Chapter 4</u></b>	<p><b>Forms:</b>            Use of form. Creating simple form using form wizard. Adding / modifying / finding data, navigating records using the form.</p> <p><b>Practice:</b>            Create and use forms for above tables.</p>		
<b><u>Chapter 5</u></b>	<p><b>Reports:</b>            Creating simple reports using report wizard. Reports based on tables/ queries. Modifying Report Header. Save, Preview, Print reports.</p> <p><b>Practice:</b>            Create and print reports for above tables/ queries.</p>		
<b><u>Chapter 6</u></b>	<p><b>INTRODUCTION TO VB 6.0</b>            VB Environment                Menu Bar, Toolbars, Tool Box                Project explorer                Properties window                Form designer                Form layout            VB The language                Variable , Constants                Arrays                Procedures, Functions                Control Flow Statements</p>		

	<b>Contents</b>	<b>Mark s</b>	<b>Hour s</b>
	Looping , nesting Managing Forms Form Basics Form Events Form Properties Form Methods Using Active X Controls Working with Controls Using Control Arrays Managing Menus Creating and modifying menu at Design time Programming menu commands Shortcut Keys Menus at runtime Drag & Drop operations Drag mode property Drag Drop & Drag Over Method Mouse Conflicts		



	<b>Contents</b>	<b>Mark s</b>	<b>Hour s</b>
<b>Chapter 7</b>	<b>VALIDATING AND PROCESSING USER INPUTS</b> Overview , Importance , Types of validation Implementing Form level validations Keyboard Handler Enabling & Disabling ^s based i/p Implementing field level validations Text box Properties Using Events Validate Event Masked edit Box		
<b>Chapter 8</b>	<b>USING DEBUGGING TOOLS</b> Types of errors & debug menu Types of errors Debug menu Testing the application Immediate window Using debug and local window Setting watch expression Implementing error handler How VB Handles the runtime error VB error handler VB error handling options How VB handles the runtime error Disabling the error handler Inline error handling Centralized error handling		
<b>Chapter 9</b>	<b>DATABASE CONNECTIVITY</b> How VB access data Data access interface Relational database concepts Introduction to OLE DB & ADO What is OLE DB How OLE DB relates to ADO SQL Statements ADO Data Control Using ADO Connecting to data source Binding controls Using form wizard Coding ADO Creating record set Adding records in record set Modify , Delete , Search		

**IMPLEMENTATION STRATEGY:**

- Institute should have MS Access97 (or later version)
- No separate theory classes are recommended, however theory should be covered in practical sessions.
- Use of LCD projector is recommended for effective teaching- learning process.
- Practical examination of 50 marks is recommended.

**• REFERENCES**

Author	Title	Edition	Year of Publication	Publisher & Address
Greg Perry	MS OFFICE 2000	1 <sup>ST</sup>	1998	Techmedia
MCS D	MSCS Training Guide – VB 5.0	Ist	Reprint	Techmedis Publication
Evangelos Petroustos	Mastering Visual Basic 6.0	Ist	Reprint	BPB Publication
IDG	Visual Basic 6 Programming, Black Book	Ist	Reprint	IDG Books India Pvt. Ltd.

**2.10 SUBJECT TITLE: DEVELOPMENT OF GENERIC SKILLS – II**

**YEAR: SECOND YEAR**

**TEACHING AND EXAMINATION SCHEME:**

TEACHING SCHEME		EXAM SCHEME & MAXIMUM MARKS					
THEORY HRS/WEEK	PRACTICAL HRS/WEEK	PAPER HRS.	TH	PR	OR	TW	SW
01	02	--	--	--	# 100	--	--

# External assessment as per curriculum implementation & assessment norms..

**RATIONALE:**

This subject is classified under human science subjects. It is intended to develop the abilities of the students to work in a group, manage groups, search the required information in the group and manage the task in group effectively and efficiently.

**DETAILED CONTENTS :**

CHAPTER	CONTENTS
<b>CHAPTER-1</b>	<b>GROUPS</b> 1.1 Introduction 1.2 Why Groups? 1.3 Group Formation 1.4 Group think and its pitfalls 1.5 Group Dynamics
<b>CHAPTER-2</b>	<b>COMMUNICATION IN GROUPS</b> 2.1 Communication 2.2 Cooperation 2.3 Collaboration 2.4 Teams and How to make them effective <b>Practice:</b> Two assignments on chapter 1 and 2
<b>CHAPTER-3</b>	<b>LEADERSHIP AND SOCIETY</b> 3.1 Society 3.2 Social Structure 3.3 Changing pattern in Society and their impact on interpersonal relation
<b>CHAPTER-4</b>	<b>INTERPERSONAL SKILLS</b> 4.1 What is conflict 4.2 Resolution of conflict 4.3 Sources of interpersonal conflict interpersonal conflict-Transactional Analysis, Johari window 4.4 Strategies for resolving interpersonal conflict negotiations

CHAPTER	CONTENTS
	<b>Practice:</b> Two assignments on chapter 3 and 4
<b>CHAPTER-5</b>	<b>FRUSTRATION</b> 5.1 What is frustration 5.2 Causes of frustrations 5.3 Effects of frustration 5.4 Solutions for avoiding frustrations <b>Practice:</b> One assignments on this chapter
<b>CHAPTER-6</b>	<b>ORAL COMMUNICATION</b> 6.1 Use of appropriate language 6.2 Body language 6.3 Voice, Tone 6.4 Explaining, Justifying, convincing 6.5 Expressing an opinion 6.6 Arguing out a matter 6.7 Persuasive skills 6.8 Pronunciation and diction <b>Practice:</b> Two assignments on this chapter
<b>CHAPTER-7</b>	<b>LISTENING SKILLS</b> 7.1 Taking down notes 7.2 listening to different points of view in a group 7.3 relating views of different persons <b>Practice:</b> Two assignments on this chapter
<b>CHAPTER-8</b>	<b>TIME MANAGEMENT IN GROUP</b> 8.1 Time Management Skills In Group For Completion Of Project 8.2 what factors lead to time loss,How can it be avoided 8.3Time matrix 8.4 Urgent Vs Important jobs <b>Practice:</b> Two assignments on this chapter
<b>CHAPTER-9</b>	<b>STRESS MANAGEMENT IN GROUP</b> 9.1 Stresses in group work 9.2 How to control emotions 9.3 Strategies to overcome the stress 9.4 Understanding importance of good health to avoid stress <b>Practice:</b> Two assignments on this chapter

CHAPTER	CONTENTS
<b>CHAPTER-10</b>	<b>ETHICS</b> 10.1 What are ethics 10.2 How ethics helps to ensure positive interpersonal relations 10.3 Personal value system 10.4 Personal quality primer <b>Practice :</b> One assignments on this chapter
<b>CHAPTER-11</b>	<b>SWOT ANALYSIS</b> 11.1 Concept of SWOT analysis 11.2 How to SWOT analysis <b>Practice :</b> One assignments on this chapter

**Note :**

### REFERENCES

**Web Resources:** [www.mindtools.com](http://www.mindtools.com)  
[www.samcerto.com](http://www.samcerto.com)  
[www.stress.org.uk](http://www.stress.org.uk)  
[www.coopcomm.org/workbook.htm](http://www.coopcomm.org/workbook.htm)  
[www.mapnp.org/library/grp\\_skill/theory/theory.htm](http://www.mapnp.org/library/grp_skill/theory/theory.htm)

### Print Material:

Author	Title	Edition	Year of Publication	Publisher & Address
<b>Fred Luthans</b>	Organisational Behavior	Sixth	1992	McGraw Hill
Kenneth a kiewra Nelson F. Dubois	Learning to learn	-	1998	Allyn and Bacon
E.H. Megrath	Basic managerial skills for all	Third	1989	Prentice hall of India Ltd.
P.D. Kulkarni & B.B. Sharama	Independent study techniques	-	1986	T.T.T.I. Chandigarh
Dr.R.L.Bhatia	Managing Time	First	1994	Wheeler Publishing
Tim Hindle	Manage Your Time	“	1998	Dring Kindersley
Elizabeth Hierney	101 ways to better communication	1 <sup>st</sup> Edition	2001	Kogan Page
Glenn Parker	Team Building	First	2002	Viva Books Pvt Ltd. Mumbai
Elizabeth M. Christopher	Leadership Training	First	2002	Viva Books Pvt Ltd. Mumbai