**Scheme of Teaching and Examination for**

**3rd year of three years Diploma in Mining Engineering**

Duration of Semester : **28 Weeks**

Student Contact Hours : **30 Hrs + 06 Hrs**

Total Marks : **1600**

Effective from : 2017 -18 Session

| Sl. No. | Name of Subject | Subject Code | Subject | Teaching Scheme | | | Examination Scheme | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Hours of Exam | Full Marks of Subject | Final Exam / committee marks | Internal Assessment | Pass Marks Final / Ext. Exam | Pass Marks in Subjects |
| 1. | Underground Coal Mining | M301 | Theory | 3 | - | - | 3 | 100 | 80 | 20 | 26 | 40 |
| 2. | Mining Methods - Non Coal | M302 | Theory | 3 | - | - | 3 | 100 | 80 | 20 | 26 | 40 |
| 3. | Mine Environment & Safety Engineering | M303 | Theory | 3 | - | - | 3 | 100 | 80 | 20 | 26 | 40 |
| 4. | Mining Machinery - II | M304 | Theory | 3 | - | - | 3 | 100 | 80 | 20 | 26 | 40 |
| 5. | Mine Management Legislation and Safety | M305 | Theory | 3 | - | - | 3 | 100 | 80 | 20 | 26 | 40 |
| 6. | Mine and Mineral Economics | M306 | Theory | 3 | - | | 3 | 100 | 80 | 20 | 26 | 40 |
| 7. | Mine Environment Lab | M307 | Practical | - | - | 2 | 4 | 100 | 80 | 20 | | 40 |
| 8. | Mining Machinery – II Lab | M308 | Practical | | | 2 | | 100 | 80 | 20 | | 40 |
| 9. | Mine Design Lab | M309 | Practical | | | 2 | | 100 | 80 | 20 | | 40 |
| 10 | Practical Training Project – II | M310 | Sessional | - | - | * | | 200 | 120 | 80 | - | 100 |
| 11 | Metal Mining Methods | M311 | sessional | - | - | 2 | - | 200 | 120 | 80 | - | 100 |
| 12 | Project | M312 | Sessional | - | - | 2 | | 200 | 120 | 80 | - | 100 |
| 13 | Development of Generic Skills & Professional Practices - II | M314 | Sessional | | | 2 | | 100 | 60 | 40 | | 50 |
| | **Total Hours of Teaching per week :** | | | **18** | | **12** | | **1600** | | | | |

L : Lecture, T : Tutorial P : Practical

* Per batch review, guidance and preparation of project report of practical training project work.

S.S. Mishra 06th Mar, 19

Note: 1. Period of Class hours should be of 1 hrs duration as per AICTE norms.

2. Remaining Hrs every week has been marked for students for Library and Student Centered Activities.

3. Practical / Sessional examinations will be held at parent institution.

4. Board will depute examiner for Practical examination.

5. Regarding sessional examination the parent institution will form a three member committee and this committee will examine the sessional records and hold viva of the examinee for 60 % marks allotted to the subject. Marks for remaining 40 % will be provided by the Faculty concerned on the basis of evaluation of each job / work throughout the semester.

6. Practical Training of 12 weeks shall be started after completion of 2nd year annual examination (Mandatory training for the partial fulfilment of Diploma).

06.03.19

**Course Name** : **Three years Diploma in Mining Engineering**
**Year** : **Third**
**Subject Title** : **Underground coal mining method**
**Subject Code** : **M301**

**Teaching and Examination Scheme:**

| Teaching Scheme* | | | Examination Scheme | | | | | |
|---|---|---|---|---|---|---|---|---|
| L | T | P | Full Marks | External Exam Marks | Internal Exam Marks | External Pass Marks | Total Pass Marks | Duration of External Exam |
| 3 | 0 | 0 | 100 | 80 | 20 | 26 | 40 | 3 hrs. |

*Duration of year is considered 28 weeks

**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. Board 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.

**Course outcome**

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. Plan for extraction of coal by board and pillar method
3. Supervise the Mining of coal by board and pillar method and get the development and depillaring operations carried out with safety.
4. Employ suitable support system to strata control
5. Supervise the Mining of coal by long wall methods.
6. Select the appropriate method for thick seam mining
7. Supervise operation in difficult areas and of mining of contiguous seams.
8. Predict and Measure the subsidence by suitable instrument
9. Take steps to avoid the effects of surface subsidence due to mining operation.

| unit | content | hours | marks |
|---|---|---|---|
| 1 | 1.1 Factors influencing Choice of Mining methods<br>1.1.1 Classification of method of working | 10 | |

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|---|---|---|---|
| | **1.2 board and pillar method of coal mining**<br>1.2.1 Variant of board and pillar method<br>1.2.2 Classification of Board and pillar mining method<br>1.2.3 Design of board and pillar method<br>Size of panel, barrier, pillar<br>Width of boards<br>1.2.4 Mining Process<br>Cyclic and Continuous mining<br>1.2.5 Development<br>Development by blasting off the solid, coal cutting Machine, Gathering arm loader and shuttle cars<br>1.2.6 Extraction of pillars<br>Problems in the extraction of pillars<br>Principles of pillar extraction<br>Splitting of pillars<br>Factors influencing choice of pillar extraction<br>Extraction of pillar in Thick and steep seam with caving<br>Extraction of pillar in Thick and steep seam with stowing<br>1.2.7 Room and pillar mining<br>The vermelles method<br>The Slant Method<br>The Sub level Method<br>1.2.8 Manpower calculation and O MS<br>1.2.9 open and close panel system<br>1.2.10 line of extraction and numbering of pillars<br>1.2.11 Advantage and disadvantage of Board and Pillar method<br>1.2.12 Precaution while working near restricted area<br>1.2.13Working near fire area<br>1.2.14 working below waterlogged area<br>1.2.15 working below depillared goaf | | |
| 2 | **Longwall method**<br>2.1 Applicability<br>2.2 Design of Longwall panel<br>2.3 factors affecting length of Longwall face, barrier width, gate road length<br>2.4 Longwall advancing<br>2.5 Longwall retreating<br>2.6 Cyclic Longwall<br>2.7 non cyclic Longwall<br>2.8 different machine used<br>2,4 layout of DERD manpower calculation<br>2.5 Thick seam working with Longwall top slicing and sub level<br>2.6 Longwall caving and stowing | 10 | |

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|---|---|---|---|
| 3 | **Mining of thick coal seam**<br>3.1Choice of method of thick coal seam<br>Slice mining<br>Main slicing Method<br>3.2 Inclined Slicing<br>3.3 Horizontal slicing<br>3.4 Diagonal slicing<br>3.5 Transversely inclined slicing<br>3.6 Sublevel Caving<br>3.7 Working steep and moderately thick seam<br>3.8 The Velenjee Method<br>3.9 Descending shield method of mining | 10 | |
| 4 | Subsidence in coal mines<br>4.1 Theories of subsidence<br>4.1.1 Vertical and Normal theories<br>4.1.2 Dome theory<br>4.1.3 Beam or plate theory<br>4.1.4 Trough theory<br>4.1.5 Continuum theory<br>4.1 .6 Particulate theory<br>4.2 Mechanics of development of subsidence<br>4.3 Engineering parameter of subsidence<br>Angle of Drew<br>Angle of fracture<br>4.4 Prediction of subsidence<br>4.5 Prevention of subsidence damage<br>4.6 Measurement of subsidence<br>4.7 Routine measurement<br>4.8 Instruments<br>4.9 Measuring Techniques | 10 | |
| 5 | Strata Control in coal mines<br>5.1 Characteristic of coal measure strata<br>5.2 Theories of Mechanics of strata behaviors<br>5.3 Effect of mining parameter in strata control<br>5.4 Roof Fall and fracture due to mining<br>Board and pillar working<br>Long wall working<br>5.5 roof support<br>5.5.1 Timber support<br>5.5.2 Steel support<br>5.5.3 Power support<br>5.5.4 Roof bolt | 10 | |

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| | 5.6 Goaf control<br>5.6.1 caving<br>5.6.2 strip packing<br>5.6.3 solid packing | | |

Sessional

1. Study 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.
5. Study of Requirements and preparation before starting depillaring operation.
6. Study of Systematic supports in depillaring area.
7. Surface Arrangements for sand stowing.
8. Design of panel for working a seam liable to spontaneous combustion based on incubation period.
9. PREPARATION OF SHEETS
    1. Development by any one method of board and pillar working.
    2. Depillaring layout, showing extraction methods of a stook.
    3. Contiguous working of coal seam.
    4. Arrangement at the S.D.L. face.
10. PREPARATION OF DRAWING SHEETS :
    1. Any one – long wall method of working.
    2. A face layout for double drum Shrearer at long wall face.
    3. Precaution to reduce/avoid surface subsidence.

## REFERENCE BOOKS


| Author | Title | Publisher |
|---|---|---|
| T.N. Singh | Underground winning of coal | Oxford and IBM |
| S.K. Das | Modern coal mining Technology | Lovely Prakashan, Dhanbad |
| D.J. Deshmukh | Elements of mining technology | Central techno publication ,Nagpur |
| R.D. Singh | Principles and practice of modern coal mining | New age International (p) limited, New delhi |

**Course Name** : **Three years Diploma in Mining Engineering**
**Year** : **Third**
**Subject Title** : **MINING METHODS – NON COAL**
**Subject Code** : **M302**

**Teaching and Examination Scheme:**

| Teaching Scheme* | | | Examination Scheme | | | | | |
|---|---|---|---|---|---|---|---|---|
| L | T | P | Full Marks | External Exam Marks | Internal Exam Marks | External Pass Marks | Total Pass Marks | Duration of External Exam |
| 3 | 0 | 0 | 100 | 80 | 20 | 26 | 40 | 3 hrs. |

*Duration of year is considered 28 weeks

After obtaining Diploma in Mining Engineering 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.

**COURSE OUTCOMES:**

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

1. Supervise development operations in metal mines
2. Supervise stopping operations in underground metal mines
3. Select appropriate method of shaft sinking
4. Supervise the process of shaft sinking and carryout the supporting, lining of the sinking shaft
5. Supervise the Boring operation on the site of Boring / Drilling
6. Demonstrate surface arrangement, assembly and working of rotary boring
7. Demonstrate operation of core barrels
8. Perform Bore hole survey
9. Demonstrates various mining operations using mining models

10. Integrate compliance with regulations

| nit | Content | act Hours | arks |
|---|---|---|---|
| 1. | **UNDERGROUND DEVELOPMENT**<br>1.1 Terminology used in metal mines<br>1.2 Types of ore bodies<br>1.3 Types of underground opening, location of openings<br>1.4 Opening up of a mineral deposit by vertical shaft, inclined shaft, Adit<br>1.5 Level interval, factor considered while deciding level interval/length of back<br>1.6 Drivage of raises and winzes<br>Driving manually, Modern methods Alimak, Long hole method, Drop raising, Raise Boring.<br><br>mmon supports in metal mines | | |
| 2. | **PPORTED STOPING METHODS**<br><br>ssification and choice of stoping Methods<br><br>pen stoping methods, underhand, overhand, Breast g, sublevel stoping, Blast hole stoping, VCR , Shrinkage d, their conditions of applicability, Sequence of pment, stoping operation, Cycle of operations etc. System oval of ore from stope | | |
| 3. | **SUPPORTED & CAVING METHODS**<br>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.<br><br>3.2 Caving methods - Top slicing, Sublevel caving and block caving methods, applicability, stope preparation stoping, cycle of operation etc.<br><br>3.3 PROVISIONS OF MMR 1961 regarding Means of | | |

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| | Access and Egress, Ladders and ladder ways | | |
| 4. | **SHAFT SINKING**<br>4.1 Size, shape, Factors considered for location of shaft, marking center, and shaft-centering arrangement<br>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<br>4.3 Shaft lining: Temporary lining, Permanent lining of shaft: Brick, monolithic, reinforced concrete lining, shaft tubing's etc.<br>4.4 Walling scaffold, rider, ledge formation, underpinning, water garland crib etc. | | |
| 5. | **L METHODS OF SHAFT SINKING**<br>5.1 Different special methods of shaft sinking, condition of applicability of each method, Description etc.<br>dening and Deepening of shaft | | |
| 6. | **BORING**<br>6.1 Purpose of boring, classification of boring methods, applicability of boring methods<br>6.2 Drill Bits for various types of drilling/boring<br>6.3 Surface arrangement, assembly, working of Rotary boring, Screw and hydraulic feed mechanism<br>6.4 Core recovery, core barrels, Recover of broken tools, Bits<br>6.5 Bore hole survey, Deviation of boreholes | | |

**REFERENCE BOOKS**

| Author | Title | Publisher |
|---|---|---|
| DJ Deshmukh | Elements of Mining Technology Vol I, II | Central techno publication, Nagpur |
| HL Hartman | Introductory Mining Engineering | AWiley- Interscience Publication, Singapore |
| Cummins & Givens | SME Mining Engineering Handbook, Vol. I & II | A.I.M.M. New-York |

Subject Title: Mine Environment & Safety Engineering.

**Subject Code : M303**

Year: 3rd Year Mining [Teaching and Examination Scheme)

**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 | CONTENTS |
|---|---|
| 1 | **MINE FIRES**<br>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.<br>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.<br>1.3 Model standing orders in event of fire.<br>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. |
| 2 | **SAMPLING OF MINE ATMOSPHERE & INTERPRETATION**<br>2.1 Sampling from sealed off area: Sampling line, Methods of sampling from behind the fire stopping, frequency of sampling.<br>2.2 Sampling accessible places: water, air displacement method, evacuated sample |

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| | holder type.<br>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.<br>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. |
| 3 | **FIRE DAMP EXPLOSION**<br>3.1 Introduction, Composition of firedamp Modes of emission of Firedamp, Degree of gassiness, methane layering.<br>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.<br>3.3 Causes of fire damp explosion and its prevention. Characteristic of firedamp explosion |
| 4 | **COAL DUST EXPLOSION**<br>4.1 Mechanism of Coal Dust explosion, Flammability limits of coal dust, factors governing explosibility of coal dust, Characteristics of coal dust explosion.<br>4.2 Causes of coal dust explosion, Prevention of coal dust explosion.<br>4.3 Generalized stone dusting, Quantity of stone dust, Types and properties of stone dust, stone dusting plan.<br>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. |
| 5 | **INUNDATION**<br>5.1 Surface and underground causes of Inundation and its prevention.<br>5.2 water dams, bulkhead doors.<br>5.3 Procedure of and precaution while approaching old water logged areas, pattern of bore holes,<br>5.4 Dewatering, burn side safety boring apparatus.<br>5.5 Standard of lighting in underground & opencast mines, cap lamps, its construction, maintenance and care, cap lamp room |
| 6 | **MINE RESCUE**<br>Introduction, classification of mine rescues apparatus, modern self contained breathing apparatus BG 174, its construction, application and scope. Common tests of self contained compressed oxygen breathing apparatus. 6.2 Chemical oxygen self-rescuers, gas mask, filter self-rescuers: their construction, application and limitations. Fresh air hose type breathing apparatus. 6.3 Fresh air base: location, personnel & equipments required. Layout of FAB. 6.4 Resuscitation, Modern reviving apparatus |

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 |

**Course Name** : **Three years Diploma in Mining Engineering**
**Year** : **Third**
**Subject Title** : **MINING MACHINERY - II**
**Subject Code** : **M304 & M308**

**Teaching and Examination Scheme:**

| Teaching Scheme* | | | Examination Scheme | | | | | |
|---|---|---|---|---|---|---|---|---|
| L | T | P | Full Marks | External Exam Marks | Internal Exam Marks | External Pass Marks | Total Pass Marks | Duration of External Exam |
| 3 | 0 | 0 | 100 | 80 | 20 | 26 | 40 | 3 hrs. |
| Practical (M308) | | 2 | 100 | 80 | 20 | - | 40 | 4 hrs. |

*Duration of year is considered 28 weeks

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.

## COURSE OUTCOMES:

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 for transportation of mineral/material
4. Supervise the operation of different types of conveyers for transportation of mineral/material

5. Supervise the operation of coal cutting machines and power loaders on the coal faces
6. Supervise the installation and operation of water pumps for dealing with water in mines
7. Supervise the winding of coal/minerals from underground to surface and movement of coal/mineral on the surface.
8. Supervise installation, maintenance of ropes and attachments; safe operation and understand the methods of dealing with breakdowns.
9. Supervise operations of coalface machineries
10. Select most appropriate electrical cable for list of activities
11. Clarify assembly instructions of joint box
12. Provide and maintain the electrical appliances / switchgears etc.
13. Supervise the safe installation and operation of gate and boxes
14. Integrate compliance with regulations

| Unit | Content | Contact Hours | Marks |
|---|---|---|---|
| 1. | **TRANSPORT OF ORE**<br>1.1 Different types of haulages<br>1.2 Description of each haulage system.<br>1.2.1 Direct rope haulage<br>1.2.2 Endless rope haulage<br>1.2.3 Main and Tail rope haulage<br>1.2.4 Gravity haulage<br>1.3 Safety devices used on rope haulage system<br>1.3.1 Stop block/Buffers<br>1.3.2 Back stay<br>1.3.3 Monkey catch<br>1.3.4 Age craft Device<br>1.3.5 Runaway Switch<br>1.3.6 Drop Warwick<br>1.4 Locomotive Haulage different types / Applicability<br>1.4.1 Diesel locomotive<br>1.4.2 Electric locomotive<br>1.4.3 Air compressed locomotive<br>1.4.4 Battery locomotives.<br>1.5 Definition of draw bar pull, Ideal gradient, | | |

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| | Super elevation<br>1.6 Different Types of Conveyor<br>1.6.1 Chain conveyor<br>1.6.2 Plate conveyor<br>1.6.3 Belt conveyor<br>1.6.4 Condition of Suitability of each type<br>1.6.5 Advantageous and disadvantages<br>1.7 Introduction to Arial Ropeways | | |
| 2. | **WINDING IN SHAFT**<br>2.1 Purpose of Winding<br>2.2 Main equipments used for Winding<br>2.2.1 Head gear<br>2.2.2 Headgear pulley<br>2.2.3 Cage/Skip<br>2.2.4 Winding Rope<br>2.2.5 Winding drum<br>2.2.6 Guides<br>2.2.7 Keps<br>2.2.8 Suspension Gear<br>2.3 Different types of winding<br>2.3.1 Drum winding<br>2.3.2 Koepe Winding<br>2.4 Drum winding different types<br>2.4.1 Cylindrical drum<br>2.4.2 Conical drum<br>2.4.3 Cylindroconical drum<br>2.4.4 Bicydroconical drum<br>2.5 Provisions on winding drum<br>2.5.1 Flanges<br>2.5.2 Depth indicator<br>2.5.3 Mechanical Brakes (different types)<br>2.5.4 Automatic Contrivance<br>2.6 Angle of fleet<br>2.7 Guides different types<br>2.7.1 Rigid guides<br>2.7.2 Flexible cable<br>2.8 Causes of cage oscillation<br>2.9 Cage suspension Gear Rope Capel<br>2.9.1 D link and bull chain<br>2.9.2 Safety hook<br>2.9.3 Triangular distribution plate<br>2.9.4 Bridle chain<br>2.10 Different types of keps<br>2.10.1 Rigid keps | | |

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| | 2.10.2 Davies improved keps gear.<br>2.11 List of safety devices used in winding.<br>2.12 Characteristics curves<br>2.13 Smooth winding cycle<br>2.14 Koepe winding | | |
| 3. | **MINE PUMPS**<br>4.1 Sources of water in Mines<br>4.2 Classification of Mine Pumps<br>4.3 Reciprocating Pump<br>4.3.1 Single acting<br>4.3.2 Double acting<br>4.3.3 Ram pumps<br>4.4 Centrifugal Pumps<br>4.4.1 Turbine Pumps<br>4.5 Installation of pump<br>4.6 Operation of pump<br>4.7 Fitting on pump<br>4.8 Starting and stopping of pump<br>4.9 Face pumps<br>4.10 Characteristics Curves of Centrifugal and turbine pumps.<br>4.11 Calculations for pump discharge etc.<br>4.12 Snoring of pump, its prevention.<br>4.13 Water hammer. | | |
| 4. | **COAL CUTTING MACHINE**<br>5.1 Purpose of coal cutting machine<br>5.2 Classification of coal cutting Machine.<br>5.3 Different types of cut<br>5.4 Different parts of CCM<br>5.5 Cutting gear arrangements of chain<br>5.6 Introduction of continuous miner<br>5.7 Different types of mechanical Loaders. | | |
| 5. | **ELECTRIC POWER SUPPLY**<br>6.1 Types of cables used in mines<br>6.2 Permanent cable Different types, construction<br>6.3 Semi flexible cable Different types, construction<br>6.4 Flexible cable Different types, construction<br>6.5 Screening of cable<br>6.6 Cable joint box | | |

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| | 6.7 Repair of cable<br>6.8 Bleeding of cable<br>6.9 Cable care and maintenance during<br>Use and storage | | |
| 6. | **GATE END BOX**<br>7.1 Construction of gate end box<br>7.2 Safety provision in gate end box<br>7.3 Pilot Circuit<br>7.4 Different circuits for protection | | |

**PRACTICAL:**

1 Study and sketch of different types of rope haulage
2 Demonstration of different models of safety devices uses on rope haulage
3 Demonstration of different types of drum winder models
4 Demonstration of different parts in cage suspension gear and their function
5 Sketches of different parts
   a. Reliance rope cable
   b. D-link
   c. Safety hook
   d. Triangular distribution plate
   e. Bull chain
   f. Cage.
6 Study of Rope splicing method
7 Study of different types of reciprocating pumps
8 Study of different types of Centrifugal pump
9 Study of face pump
10 Study of different types of coal cutting m/c
11 Identification of different types of Electrical power cables used in mine
12 Study of gate and box and its different circuits

**REFERENCE BOOKS**

| AUTHOR | TITLE | PUBLICATION |
|---|---|---|
| DJ DESHMUKH | VOL- III | Central Techno Publication, Nagpur. |
| S GHATAK | Mine Pump, Haulage, Winding | Coal Field Publisher Asansol |

Subject Title: Mine Management, Legislation & Safety

**Subject Code : M305**

Year: 3rd Year Mining

**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 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 |
|---|---|
| 01 | MINES ACT 1952<br>1 .1 Important definition eg. Adolescent, adult, child, Employed, Mine, Open cast working, Relay, Shift, Serious bodily injury.<br>1 .2 Provisions under chapter V,<br>1 .3 Provision for health and safety.<br>1 .4 Hours & Limitations of Employment, Act 28 to 48.<br>1.5 Provisions regarding leave with wages, Act 49 to 56 |

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|---|---|
| 02 | MINES RULES 1955<br>2.1 Provisions regarding health & sanitation, first aid and medical appliances.<br>2.2 Mines Rules- Provisions connected with leave with wages and over time and welfare amenities. Employment of persons, Rule 46 to 52 |
| 03 | COAL MINES REGULATIONS 2017<br>3.1 Important definitions.<br>3.2 Duties and responsibilities of workman, competent person & officials. Provisions of Reg. 38, 39, 40, 41,42,43, 44, 45, 46,47, 48, 49,50,53, 56<br>3.3 Plans and sections Reg. 64, 65, 68, 69<br>3.4 Means of access & egress. Reg.70 to 75<br>3.5 Provisions regarding winding in shaft Reg. 76 to 90.<br>3.6 Transport of men & material Reg. 92 to 103<br>3.7 Mine working Reg. 104 to 132<br>3.8 Precautions against dangers from the dust gas & water Reg. 133 to 152.<br>3.9 Ventilation Reg. 153 to 173<br>3.1 0 Provisions regarding lighting and safety lamp – Reg. 174 to 182<br>3.1 1 Explosives & Blasting. Reg. 183 to 207<br>3.1 2 Provisions regarding machinery, plant & equipments and important provisions on miscellaneous regulations. |
| 04 | MINE ACCIDENTS<br>4.1 Types of mine accidents, their classifications,<br>4.2 Causes of accidents due to fall of roof, explosives and blasting, haulage and winding and their preventions.<br>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. |
| 05 | MANAGEMENT<br>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 |
| 06 | GENRAL SAFETY<br>Circulars, Bylaws & Standing orders.<br>6.1 Philosophy of safety , unsafe acts and conditions<br>6.2 Accident investigation, precaution and monitoring<br>6.3 Systematic support rules for coal mine with Board and pillar method of working.<br>6.4 Conditions for solid blasting with P5 explosives.<br>6.5 Precautions for use of Auxiliary fan underground.<br>6.6 Procedure for dealing with misfire.<br>6.7 Precautions regarding Blown through shots.<br>6.8 Model standing order in the event of stoppage of main mechanical ventilator.<br>6.9 Maximum air velocity. |
| 07 | INSPECTION PROCEDURE :<br>Procedure of inspection of old working, Haulage roadways, sinking shaft, working shaft, |

| | |
|---|---|
| | Winding rope, Sealed off area, subsidence and goaf area. |
| 08 | MINES RESCUE RULES :<br>Important provisions of coal mines rescue rules. 3.1 Organization & equipment in mines. 3.2 Rescue station. 3.3 Conduct of rescue work |

**REFERENCE BOOKS:**

| AUTHOR | TITLE | YEAR OF PUBLICATION | PLACE OF PUBLICATION & PUBLISHER |
|---|---|---|---|
| Central Government | Mines Act 1952 | Latest Edition | Lovely Prakashan |
| Central Government | Mines Rules 1955 | Latest Edition | Lovely Prakashan |
| Central Government | Coal Mines Regulation 2017 & MMR1961 | Latest Edition | Lovely Prakashan |
| Central Government | Mine Rescue Rule 1985 | Latest Edition | Lovely Prakashan |
| Central Government | DGMS Circulars | Latest Edition | Shining Printers, Asansol |
| B.K. Kejriwal | Safety in mines, Kejriwal, BK | Latest Edition | Lovely Prakashan |

**Course Name** : **Three years Diploma in Mining Engineering**
**Year** : **Third**
**Subject Title** : **Mineral and Mine economics**
**Subject Code** : **M306**

**Teaching and Examination Scheme:**

| Teaching Scheme* | | | Examination Scheme | | | | | |
|---|---|---|---|---|---|---|---|---|
| L | T | P | Full Marks | External Exam Marks | Internal Exam Marks | External Pass Marks | Total Pass Marks | Duration of External Exam |
| 3 | 0 | 0 | 100 | 80 | 20 | 26 | 40 | 3 hrs. |

*Duration of year is considered 28 weeks

**Rationale**

Minerals are the basic resources for development of nation. Mineral have been long in use since from prehistoric age. Modern world is mostly dependent on mineral whether it be as Fertilizer for food; coal, petroleum, natural gas and atomic energy as source of power or countless other use in life like automobile, airplane, ships, communication, chemical all are derived from mineral .Minerals are backbone in raising the standers of living of mankind. Minerals occurs in earth crust. Feasibility of Exploration and mining of minerals Involve economic aspect..Loss and profit of mining operation depends upon various factors which is to be known before setting mining industries .Permission to start and close of Mining are govern by laws and legislation framed by government. Failure and success of mining can be estimated by knowing mine economic in the early stage of mining.

**COURSE OUTCOMES:**

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

11. List mineral industries in India
12. Classify mineral resources
13. Analyzed mineral inventory of India
14. Describe mineral legislation in India and National mineral policy.
15. Discuss conservation, consumption and substitute of minerals
16. Explain method of sampling and selection of sampling procedure
17. Preparation of samples for computation of reserve and grade
18. Asses the Environment Impact of mining

19. Calculate valuation and depreciation of mining
20. Evaluate mine leasing procedure.
21. Preparation of ores for ores dressing, and outline various method of ore dressing.

| Unit | Content | Contact Hours |
|---|---|---|
| | | |
| 1 | **Indian mineral industries scenario**<br>1.1 **Indian mineral industries at a glance-**<br>Mineral Production, Production of Metals & Alloys ,Foreign Trade, Average Daily Employment in Mines, Consumption of Minerals, Productions of Mineral-based Products<br>**1.2 Mineral laws and legislation in India**<br>1.2.1 Mines & Minerals (Development & Regulation) Act, 1957with all amendments<br>1.2.2 Mineral Concession Rules, 1960 with all amendments<br>1.2.3 Mineral Conservation & Development Rules,1988 with all amendments<br>1.2.4 National Mineral Exploration Trust Rules, 2015<br>Mines & Minerals (Contribution to District Mineral Foundation) Rules, 2015<br>1.2.5 Minerals (Evidence of Mineral Contents) Rules, 2015<br>1.2.6 Mineral (Auction) Rules, 2015<br>1.2.7 Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession<br>Rules, 2016 with all amendments<br>1.2.8 Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016<br>1.2.8 Mineral Conservation and Development Rules, 2017<br>**1.3 National Mineral Policy**<br>NMP 1993<br>Huda committee 2005<br>NMP 2008<br>**1.4 Mineral resource and reserve-National and International classification system**<br>1.4.1 JORC Code<br>1.4.2 UNFC code<br>**1.5 Outlines of National Mineral Inventory**<br>Location, geology , exploration , physicochemical analysis, reserve/resource estimates, parameters of estimation, end-use grade, etc. classification adopted and categorization of reserves/resources along with terminologies and codes assigned to as per UNFC .of minerals in inventory | 10 |

| | | |
|---|---|---|
| | **1.6 Mineral conservation and substitution** | |
| 2 | **Sampling**<br>principal<br>Estimation of sample size<br>Equipment for sampling<br>Types of sampling<br>Processing of sampling<br>Error and precaution<br>**Salting of sample**<br>Method of salting<br>Precaution against salting | 5 |
| 3 | **Reserve and Grade**<br>Method for computation of reserve- Geometric and Graphic Method<br>Averaging assays-erratic high assay<br>Method of calculation of Average grade | 5 |
| 4 | **Valuing mining properties**<br>**4**.1 Valuation of operating mines<br>4.1.1 Purpose of valuation<br>4.1.2 Basis of valuation<br>4.1.3 Factor determining value<br>4.1.3.1 Annual profit<br>4.1.3.2 Grade of ore<br>4.13.3 Price of product<br>4.1.3.4 Cost of production<br>4.1.3.4.1 Direct and indirect costs<br>4.1.3.4.2 Accounting<br>General expenses<br>Depreciation<br>Depletion<br>Developing cost<br>4.1.3.4.3 Rate of production<br>4.1.4 life<br>4.1.4.1 ore reserve<br>4.1.5 present value of future earning<br>4.1.5.1 Compound interest method<br>4.1.5.2 Hoskold method<br>4.1.5.3 Comparison of method<br>4.1.5.4 Discount for hazard<br>4.1.5.5 deferment | 5 |
| 5 | **Mine Taxation**<br>Principles of mine taxation<br>The Four R<br>Basic principles<br>Mining Taxation structure<br>Mineral sector taxation method | 4 |
| 6 | **Royalty**<br>Concept of Royalty and its Definition | 2 |

| | | |
|---|---|---|
| | Royalty Regime in India<br>Royalty on Coal<br>Royalty for Minor Minerals<br>Administration of Royalty<br>Dead Rent | |
| 7 | **Mine leasing procedure**<br>**Final mine closure plan** | 2 |
| 8 | **Inventory Control**<br>Category of stores<br>Duties of storekeeper<br>Control of store<br>Store record<br>ABC analysis | 2 |
| 9 | **Environment aspect of mining**<br>Environment and sustainable development<br>Air pollution<br>Noise pollution<br>Water pollution<br>Environment Impact Assessment(EIA)<br>Component of EIA<br>Process Of EIA<br>Methodology of EIA | 5 |
| 10 | **Ore dressing or beneficiation**<br>Definition<br>Method of ore dressing<br>Preparation of ore for ore dressing | 5 |

## REFERENCE BOOKS


| Author | Title | Publisher |
|---|---|---|
| K K Chatterjee | An introduction to Mineral economics | New age International Publisher |
| R T Desmukh | Mineral and Mine Economics | |
| IBM | Element of mineral exploration | IBM |
| RNP Arogyaswamy | Courses in mining Geology | Oxford and IBH |
| H E McKinstry | Mining Geology | Asia Publishing House , New Delhi |

**Subject: Mine Environment Lab:**

**Subject Code : M307**

**Rationale:**

Theory of environment engineering has to be demonstrated into practices. Hands-on-experience are essential to study different fittings, rescue apparatus and equipments used in mine environment.

**Objectives:**

- Demonstration of equipments and fitting used in mine environment
- Study of rescue apparatus
  List of Experiments (any 10)

1. Demonstration of various portable fire extinguishers.

2. Determination of crossing point temperature.

3. Demonstration of various temporary stoppings.

4. Demonstration of preparatory stopping.

5. Demonstration of construction of fire stopping and fittings to it

6. Demonstration of sampling of atmosphere from behind the fire stopping.

7. Demonstration of sampling equipments and collection of air samples at accessible places.

8. Preparation of sampling & dusting plan in zones & sections.

9. Collection of mine dust samples.

10. Demonstration of stone dust barrier and maintenance of stone dust barrier.

11 . Demonstration of Burnside safety boring apparatus.

12. Demonstration of electric cap lamp.

13. Demonstration of Self-contained closed ckt compressed oxygen breathing apparatus (B.G 1 74).

1 4. Demonstration of Gas mask.

15. Demonstration of Filter Self-Rescuer.

16. Demonstration of reviving apparatus.

17. Mock rehearsal during disaster in mines

18. Investigation of fire in nearby mines

19. Quality circle in safety of mines

20. local Visit to rescue station/room

**Subject: Mine Design Lab:**

**Subject Code : M309**

Rationale:

Mining has to be planned and designed with due regards to economics, techniques, environment, safety and conservation. To make the mining production feasible with stated parameters, the skill of mining layout and design is required for mining technician.

Objectives:

1. to transfer the skill of mine layout and design
2. brain storming session for appropriate mining planning
3. dissemination of attitude for apt mine design

List of Experiments (any 10)

1. Layout of manual bord and pillar method
2. Layout of mechanised bord and pillar method (LHD/SDL/Continuous minersetc)
3. Layout of long wall advancing method.
4. Layout of long wall retreating method.
5. Layout of manual surface iron/bauxite ore mine with an output of 1000tonne /day.
6. Layout of shovel-dumper combination/dragline/bucket wheel excavator.
7. Layout of open cast slope failure in Indian Coal Mines.
8. Formation of benches in open cast mines as per coal mine regulations
9. Pit top and Pit bottom layout of coal mine
10. Pit top and bottom layout of metal mine
11. Manpower calculation and OMS in assumed mine
12. Open & closed system of power support
13. Design of caving v/s stowing coal mining
14. Design of supported v/s unsupported metal mining
15. Design of non-cyclic v/s cyclic mining
16. Top slicing and sub level caving layout
17. Techno-economic analysis of mining
18. Calculation of stripping ratio and pit limit
19. Design of Haul roads
20. Design of box cut
21. Design of air circulation/distribution in underground mines

**Course Name** : **Three years Diploma in Mining Engineering**
**Year** : **Third**
**Subject Title** : **METAL MINING METHODS (Sessional)**
**Subject Code** : **M311**

**Teaching and Examination Scheme:**

| Teaching Scheme* | | | Examination Scheme | | | | | |
|---|---|---|---|---|---|---|---|---|
| L | T | P / S | Full Marks | External Exam Marks | Internal Exam Marks | External Pass Marks | Total Pass Marks | Duration of External Exam |
| 0 | 0 | 2 | 200 | 120 | 80 | - | 100 | - |

*Duration of year is considered 28 weeks

After obtaining Diploma in Mining Engineering many of the students join the metaliferrous mines, works as R & D Technician, Entrepreneur / Lease holder / Mine owner. They are also 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 right kind of knowledge and skill is essential for the student.

## COURSE OUTCOMES:

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

1. Select suitable method for metalliferous deposits for given geological, physic-mechanical properties of rock
2. Demonstrate layout of metal mining methods
3. Supervise stopping operations in underground metal mines
4. Demonstrate appropriate method of shaft sinking
5. Supervise the process of shaft sinking and carryout the supporting, lining of the sinking shaft
6. Demonstrate Boring operation on the site of Boring / Drilling
7. Demonstrate surface arrangement, assembly and working of rotary boring
8. Demonstrate operation of core barrels

9. Perform Bore hole survey
10. Integrate compliance with regulations

SESSIONAL:

1. Various terms, factors influencing selection of method of work and classification of underground methods
2. Application of Vertical Crater Retreat (VCR) method of mining in moderate strength of wall rocks (in raising)
3. Design of Shrinkage stoping method
4. Design of Cut and fill methods used in different Indian deposits
5. Designing sub-level stoping for an ore body width varying 10-15 mts.
6. Designing Square-set stoping for excavation of manganese ore deposit
7. Design of Caving method (any one)
8. Designing an underground metalliferous mine on given geological, physic-mechanical properties of rock
9. Comparison of various stoping methods
10. Various systems of ore drawing from stope
11. Listing of problems related to mining at greater depth
12. Application of leaching technique in ore mining
13. Special method of shaft sinking
14. Temporary lining in shaft
15. Permanent Brick lining in shaft
16. Concrete lining in shaft
17. Demonstration of surface arrangement, assembly and working of rotary boring
18. Demonstration of core barrels
19. Demonstration of different types of drill bits used in boring
20. Performing Bore hole survey

**REFERENCE BOOKS**

| Author | Title | Publisher |
|---|---|---|
| DJ Deshmukh | Elements of Mining Technology Vol I, II | Central techno publication, Nagpur |
| HL Hartman | Introductory Mining Engineering | AWiley- Interscience Publication, Singapore |
| Cummins & Givens | SME Mining Engineering Handbook, Vol. I & II | A.I.M.M. New-York |

**Course Name : Three years Diploma in Mining Engineering**
**Year : Third**
**Subject : Project**
**Subject : M312**

**Teaching and Examination Scheme:**

| Teaching Scheme* | | | Examination Scheme | | | | | |
|---|---|---|---|---|---|---|---|---|
| L | T | P | l Marks | rnal Exam Marks | rnal Exam Marks | ernal Pass Marks | tal Pass Marks | uration of ernal Exam |
| 0 | 0 | 2 | 200 | 120 | 80 | - | 100 | - |

Course outcome

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

1. Prepare a report of a problem in mining area.
2. Identify the problems related to mining by visiting the project area.
3. Suggest appropriate method to resolve the problems.
4. Competent to visualize the problem in the form of report.

Content:

1. Each student has to submit a project report (other than practical training report) under the guidance of a supervisor (Lecture) from the institute.
2. The topic of project will be deicide by the supervisor.
3. The topic of project will cover the micro study or investigation or innovation concern to unsolved/unseen problems of mining.
4. Project may be also concern to fulfill the gap between curriculum and industry.
5. Project may be aim to skilling the students with research aptitude by adopting Cognitive and Psychomotor domain of learning.
6. Supervisor will examine the report of project submitted by the student. The evaluation of project will be in the light of learning domain. That is Cognitive and Psychomotor.
7. Framing the title of project, supervisor has to decide the objective or outcomes of project on the basis of element of learning domain.

Subject Title : Development of Generic Skills and Professional Skills – II
Subject Code : 314
Full Marks : 100

**CONTENTS:**

## A. Development of Life Skills Portion

**Rationale**:

In today's competitive world, the nature of individual and organizations is changing at very rapid speed. In this situation the responsibility of diploma holder is not unique. After completing his course work he has to face the world and seek meaningful employment also. Merely having knowledge is not sufficient these days. He has to show his communicative skill also. As such the individual skills with capability to show his strength and communicate his willingness new skills for further advancement with to impart his ability and acquiring has to be displayed and learned.

This subject will develop the student as an effective individual to grab the available situation and be member of the unseen team in which he may be put in . It will develop the abilities and skills to perform at highest degree of quality as an individual as well as a member of core group or team. Such skills will enhance his capabilities in the field of searching, assimilating information, managing the given task, handling people effectively, solving challenging problems.

**Objectives:** The students will be able to:

1. Develop acumen to face interview.
2. Lead in the group discussion and set goals and targets for others
3. Develop team spirit i.e. concept of working in teams
2. Apply problem solving skills for a given situation
3. Use effective presentation techniques
4. Apply techniques of effective time management
5. Apply task management techniques for given projects
6. Enhance leadership traits
7. Resolve conflict by appropriate method
8. Survive self in today's competitive world
9. Follow moral and ethics
11. Convince people to avoid frustration

**SOCIAL SKILLS**

1. Social understanding for group discussion, imaginative thinking and develop free ideas.
2. SWOT Analysis – Concept, and know himself in details. Learn how to make use

of SWOT.

3. **Inter personal Relation:-** How to effectively counter arguments of others without hearting their feeling Sources of conflict and conflict resolution, Ways to enhance interpersonal dependence and relations.
4. **Problem Solving**

**I) STEPS IN PROBLEM SOLVING,**

1) Identify and clarify the problem,
2) Information gathering related to problem,
3) Evaluate the evidence,
4) Consider alternative solutions and their implications,
5) Choose and implement the best alternative,
6) Review

**II) Problem solving technique**.(any one technique may be considered)

1) Trial and error
2) 2) Brain storming
3) 3) Lateral thinking

**5. Presentation Skills**

Body language --
Dress like the audience, Posture, Gestures, Eye contact and facial expression. STAGE FRIGHT,
Voice and language – Volume, Pitch, Inflection, Speed, Pause, Pronunciation, Articulation, Language, Practice of speech. Use of presentation aids, Summarizing the facts

**6. Group discussion** –

Introduction to group discussion, Ways to carry out group discussion, Parameters— Contact, body language, analytical and logical thinking, decision making

**7. INTERVIEW TECHNIQUE**

Necessity, Techniques to influence interviews and giving directions, Tips for handling common questions.

**8. Working in Teams**

Understand and work within the dynamics of a groups.
Tips to work effectively in teams,
Establish good rapport, interest with others and work effectively with them to meet

common objectives,
Tips to provide and accept feedback in a constructive and considerate way ,
Leadership in teams, Handling frustrations in group.

**9. Task Management**

Introduction, Task identification, Task planning, organizing and execution, Closing the task

**BOOKS:**

| Sr. No | Title of the book | Author | Publisher |
|---|---|---|---|
| 1 | Adams Time management | Marshall Cooks | Viva Books |
| 2 | Basic Managerial Skills for All | E.H. Mc Grath , S.J. | Pretice Hall of India |
| 3 | Body Language | Allen Pease | Sudha Publications Pvt. |
| 4 | Creativity and problem solving | Lowe and Phil | Kogan Page (I) P Ltd |
| 5 | Decision making & Problem Solving | by Adair, J | Orient Longman |
| 6 | Develop Your Assertiveness | Bishop , Sue | Kogan Page India |
| 7 | Make Every Minute Count | Marion E Haynes | Kogan page India |
| 8 | Organizational Behavior | Steven L McShane and Mary Ann Glinow | Tata McGraw Hill |
| 9 | Organizational Behavior | Stephen P. Robbins | Pretice Hall of India, Pvt Ltd |
| 10 | Presentation Skills | Michael Hatton ( Canada – India Project) | ISTE New Delhi |
| 11 | Stress Management Through Yoga and Meditation | -- | Sterling Publisher Pvt Ltd |
| 12 | Target setting and Goal Achievement | Richard Hale ,Peter Whilom | Kogan page India |
| 13 | Time management | Chakravarty, Ajanta | Rupa and Company |
| 14 | Working in Teams | Harding ham .A | Orient Longman |

**INTERNET ASSISTANCE**

1. http://www.mindtools.com
2. http://www.stress.org
3. http://www.ethics.com
4. http://www.coopcomm.org/workbook.htm

5. http://www.mapfornonprofits.org/
6. http://www.learningmeditition.com http://bbc.co.uk/learning/courses/
7. http://eqi.org/
8. http://www.abacon.com/commstudies/interpersonal/indisclosure.html
9. http://www.mapnp.org/library/ethics/ethxgde.htm
10. http://www.mapnp.org/library/grp_cnfl/grp_cnfl.htm
11. http://members.aol.com/nonverbal2/diction1.htm
12. http://www.thomasarmstron.com/multiple_intelligences.htm
13. http://snow.utoronto.ca/Learn2/modules.html
14. http://www.quickmba.com/strategy/swot/

## B. Professional Practices Portion

**Rationale:**

Most of the diploma holders join industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests.

While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.

The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process.

**Activities to be undertaken:**

Students are expected to undertake these activities:

1. Acquire information from different sources ( Print and electronic) on the topics of specialization and related to the subjects of II nd and final year. The class is to be divided in groups of not more than five to six students in a group and all groups are to be allotted topic of their choice. The topic should not be repeated to other group for originality of work to be performed by the group. This activity will develop interdependence and leadership among the students.

2. Prepare notes for given topic at point no 1. The notes will be in form of a project report, having all the sections of report. The report should not be of 30 – 50 pages.

3. Prepare presentation and Present the learning and finding on given topic in a seminar. The presentation should be prepared in Power Point module having more than 25 slides. All students should be asked to deal with suitable parts decided by the group itself.

4. Interact with peers to share thoughts. After the final presentation the students should be encouraged to interact with the faculty members, students' fellows and other experts for suggestions and advanced and structured learning.

5. Undertake industrial visit of their area and choice. Prepare a report on industrial visit. Expert lectures on the topic selected may be invited for the students and these expert lectures also the students should be asked to prepare a report and present the same in seminar or have a group discussion before the expert and faculty members.

6. Develop entrepreneurial traits. Students group may be asked to have a field survey and product assessment and analysis for a product of their choice. Prepare a report for all the inputs of their requirement and submit it for evaluation.

7. To prepare for start ups. Expert lectures for exploring this option may be arranged as this is also a viable option and much talked about option for self employment and avail the encouragement by the government.

Based on the above rationales students will advised to develop traits under guidance of dedicated faculty members / mentors.