DIPLOMA WING

# RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA , BHOPAL

## SCHEME OF STUDIES & EXAMINATIONS (IMPLEMENTED FROM SESSION : JULY 2023)

| SCHEME | NAME OF BRANCH | BRANCH CODE | SEMESTER |
|---|---|---|---|
| OCBC JULY 2022/2023 | MINE SURVEYING | M11 | FOURTH (IV) |

| S.N. | PAPER CODE | SUBJECT CODE | SUBJECT NAME | THEORY COMPONENT | | | | | | | | PRACTICAL COMPONENT | | | | | TOTAL CREDITS | TOTAL MARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | HRS PER WEEK | CREDITS | TERM WORK | | | | THEORY PAPER | | HRS PER WEEK | CREDITS | LAB WORK | PRACTICAL EXAM/VIVA | | | |
| | | | | | | QUIZ/ASSIGNMENT | MID TERM TEST* | | TOTAL | MARKS | DURATION | | | | MARKS | DURATION | | |
| | | | | | | | I | II | | | | | | | | | | |
| 1 | 7577 | 401 | MINE SURVEYING - II | 3 | 3 | 10 | 10 | 10 | 30 | 70 | 03 Hrs. | 6 | 3 | 20 | 30 | 03 Hrs. | 6 | 150 |
| 2 | 7578 | 402 | MINING TECHNOLOGY - II | 3 | 3 | 10 | 10 | 10 | 30 | 70 | 03 Hrs. | 2 | 1 | 20 | 30 | 03 Hrs. | 4 | 150 |
| 3 | 7579 | 403 | GEOLOGY - II | 3 | 3 | 10 | 10 | 10 | 30 | 70 | 03 Hrs. | 2 | 1 | 20 | 30 | 03 Hrs. | 4 | 150 |
| 4 | 7580 | 404 | MINE ENVIRONMENT - II | 3 | 3 | 10 | 10 | 10 | 30 | 70 | 03 Hrs. | 0 | 0 | 0 | 0 | 0 | 3 | 100 |
| 5 | 7581 | 405 | MINE SAFETY AND LEGISLATION - II | 3 | 3 | 10 | 10 | 10 | 30 | 70 | 03 Hrs. | 0 | 0 | 0 | 0 | 0 | 3 | 100 |
| 6 | 7582 | 411 | BASIC CIVIL ENGINEERING OR | 3 | 3 | 10 | 10 | 10 | 30 | 70 | 03 Hrs. | 0 | 0 | 0 | 0 | 0 | 3 | 100 |
| | 7379 | 412 | CONSTRUCTION MANAGEMENT | | | | | | | | | | | | | | | |
| 7 | | | MINOR PROJECT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 20 | 30 | 03 Hrs. | 2 | 50 |
| 8 | | | ESSENCE OF INDIAN KNOWLEDGE AND TRADITION | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | | | LIBERARY /SEMINAR/VISITS etc. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL | | | | 20 | 18 | | | | 180 | 420 | | 16 | 7 | 80 | 120 | | 25 | 800 |

**NOTE -** (1)* Two Best,out of Three Mid Term Tests (Progressive Tests) Marks should be entered here.

| GRAND TOTAL OF CREDITS | GRAND TOTAL OF MARKS |
|---|---|
| 25 | 800 |

DIPLOMA WING

**RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL**

DIPLOMA IN MINE SURVEYING (M11)

*SEMESTER IV*

| | | |
|---|---|---|
| COURSE TITLE | : | MINE SURVEYING - II |
| PAPER CODE | : | 7577 |
| SUBJECT CODE | : | 401 |
| TREORY CREDITS | : | 03 |
| PRACTICAL CREDITS | : | 03 |

**Course Objectives:**

Following are the objectives of this course:

- To understand Trigonometric & Shaft Surveying.
- To prepare a contour plan & sketch.
- To understand the concept of plane table with resection method.
- To understand the constructional detail of theodolite and its traversing method.

**Course Contents**

**Unit–I Trigonometric Levelling and Shaft Surveying**

- Introduction, Base of object accessible and Base of the object inaccessible.
- Determination of height of an elevated object above the ground when its base and top are visible but not accessible.
- Determination of elevation of an object from angles of elevation from three instrument station in one line.
- Numerical problems in trigonometric levelling.
- Fleet angle.
- Shaft Depth Measurement.
- Centre Mark of Sinking Shaft.
- Checking Verticality of Sinking Shaft.
- Surveying for Deviation of shaft.
- Surveying for Headgear and winding drum.

**Unit–II Contouring**

- Introduction, Contour interval, Contour equivalent.
- Characteristic of contours
- Method of locating contours.
- Interpolation of contours.
- Contour gradient and uses of contour maps.
- Planimeter and its use.

**Unit–III Plane Table Surveying**

- Introduction and accessories.
- Working Operation and precise plane table equipment.
- Method of plane tabling – Radiation, Intersection, Traversing and Resection.
- Resection by Two Point Problem.
- Resection by Three-Point Problem- Mechanical, Graphical and Lehmann's.
- Error in plane tabling.

**Unit–IV Theodolite**

- Introduction, Definition and Terms.
- Relationship between axis and Temporary adjustment.
- Measurement of horizontal angles- General, Repetition, and Reiterating.
- Measurement of vertical angle.
- Permanent adjustment of theodolite – Plate Level, Line of Sight, Horizontal Axis and Altitude Level.
- Sources of error in Theodolite work.

**Unit–V Traverse Surveying**

- Introduction
- Chain traversing, Chain & Compass traversing (Loose-needle Method).
- Traversing by fast-needle Method – Direct method with Transiting, Direct method without transiting and back bearing method.
- Traversing by direct observation of angles.
- Locating detail with transit & tape, Checks in closed traverse.
- Plotting a traverse survey.
- Consecutive co-ordinates: Latitude and Departure.
- Independent co-ordinates, Closing Error,
- Balancing of traverse & its method- Bowditch's, Transit, Graphical and Axis.
- Gales Traverse Table, Degree of accuracy.
- Traverse Surveying Calculation of Consecutive co-ordinates: Latitude and Departure, Independent co-ordinates and Closing Error.
- Length of closing line.
- Area and volume calculation of traverse.

**Suggested learning resources:**


1. Punmia, B.C,; Jain, Ashok Kumar; Jain, Arun Kumar, SurveyingI, Laxmi Publications, New Delhi.
2. Basak ,N.N., Surveying and Levelling ,McGrawHill Education, New Delhi.
3. Kanetkar, T.P.; Kulkarni, S.V., Surveying and Levelling volume I, Pune Vidyarthi Gruh Prakashan.
4. Duggal, S.K., Survey I, McGrawHill Education, New Delhi.
5. Saikia ,MD.; Das. B.M.; Das. M.M., Surveying, PHILearning, New Delhi.
6. Subramanian, R., Fundamentals of Surveying and Levelling, Oxford University Press. New Delhi.
7. Rao,P.Venugopala Akella, Vijayalakshmi, Textbook of Surveying, PHILearning New Delhi.
8. Bhavikatti, S.S., Surveying and Levelling, Volume1, I.K.International, New Delhi.
9. Arora KR, Surveying Vol.I, Standard Book House.
10. Mine Surveying and Levelling Vol. I & II-S..Ghatak


**Course outcomes:**

After completing this course, student will be able to:

- Measure the reduce level (R.L.) by trigonometric method.
- Sketch & draw the contour lines.
- Prepare the plan with plane table surveying.
- Familiar with theodolite constructional detail & its traversing method.

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# MINE SURVEYING - II LAB

**Course Objectives:**

Following are the objectives of this course:

- To understand Trigonometric & Shaft Surveying.
- To prepare a contour plan & sketch.
- To understand the concept of plane table with resection method.
- To understand the constructional detail of theodolite and its traversing method.

**List of Practicals to be performed**

1. Determination of height of an elevated object above the ground when its base and top are visible but not accessible.
2. Determination of elevation of an object from angles of elevation from three instrument station in one line.
3. Sketch the Fleet angle in surveying of Headgear and winding drum.
4. To draw the contour line of mountain, pond, valley, hanging cliff, vertical cliff, etc.
5. Sketch & describe the direct method of contouring.
6. Sketch & describe the direct method of contouring.
7. Prepare the plan with Interpolation of contours.
8. Working Operation and precise plane table equipment.
9. Method of plane tabling – Radiation, Intersection, Traversing and Resection.
10. Resection by Two Point Problem.
11. Resection by Three-Point Problem- Mechanical, Graphical and Lehmann's.
12. Constructional detail of theodolite.
13. Relationship between axis and Temporary adjustment.
14. Measurement of horizontal angles- General, Repetition, and Reiterating.
15. Measurement of vertical angle.
16. Permanent adjustment of theodolite – Plate Level, Line of Sight, Horizontal Axis and Altitude Level.
17. Traversing by fast-needle Method – Direct method with Transiting, Direct method without transiting and Back bearing method.
18. Traversing by direct observation of angles.
19. Locating detail with transit & tape, Checks in closed traverse.

**Suggested learning resources:**


1. Punmia,B.C,;Jain,AshokKumar;Jain,ArunKumar,SurveyingI,LaxmiPublications,NewDelhi.
2. Basak,N.N., Surveying and Levelling, McGrawHill Education, NewDelhi.
3. Kanetkar,T.P.;Kulkarni,S.V., Surveying and Levelling volumeI, Pune Vidyarthi Gruh Prakashan.
4. Duggal,S.K., SurveyI, McGrawHill Education, NewDelhi.
5. Saikia,MD.;Das.B.M.;Das.M.M., Surveying, PHILearning, NewDelhi.
6. Subramanian,R., Fundamentals of Surveying and Levelling, Oxford University Press. NewDelhi.
7. Rao,P.VenugopalaAkella,Vijayalakshmi,Text book of Surveying, PHILearning NewDelhi.
8. Bhavikatti,S.S., Surveying and Levelling,Volume1,I.K.International,NewDelhi.
9. AroraKR, Surveying Vol.I, Standard Book House.
10. Mine Surveying and Levelling Vol. I & II-S..Ghatak

**Course outcomes:**

After completing this course, student will be able to:

- Measure the reduce level (R.L.) by trigonometric method.
- Sketch & draw the contour lines.
- Prepare the plan with plane table surveying.
- Familiar with theodolite constructional detail & its traversing method.

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**DIPLOMA WING**
**RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL**
DIPLOMA IN MINE SURVEYING (M11)

*SEMESTER IV*

| | | |
|---|---|---|
| COURSE TITLE | : | MINING TECHNOLOGY - II |
| PAPER CODE | : | 7578 |
| SUBJECT CODE | : | 402 |
| TREORY CREDITS | : | 03 |
| PRACTICAL CREDITS | : | 01 |

**Course Objectives:**

Following are the objectives of this course:

- To understand board & pillar method.
- To understand longwall mining method.
- To know the various terminology of Metal Mining.
- To list the applicability and limitations of mode of entries.
- To know the different raising method & various type of stoping methods.

**Course Content:**

**Unit-I Board and Pillar Method**

- Classification of method of working.
- Conditions for selection of method of working.
- Board and pillar-applicability advantages and disadvantages.
- Calculation of percentage of extraction.
- Design of panel.
- Different layout.
- SDL chain conveyor layout
- Continuous miners.
- LHD layout.
- Man powe calculation and OMS.
- Open & closed panel system.
- Preparatory arrangements before depillaring.
- Line of extraction and numbering of pillars
- Systematic support rules.
- Different types of pillar extraction methods
- Caving & Stowing.
- Thick seam working.
- Precautions while working near–restricted areas.
- Working near fire area.
- Working below waterlogged area.
- Working below depillared goaf.
- Contiguous working of seams.
- Layout and case study

**Unit-II Long wall Mining**

- Applicability
- Design of long wall panel
- Factors affecting length of long wall face, Barrier width, gate road length
- Long wall advancing
- Long wall retreating
- Cyclic long wall
- Non cyclic long wall
- Different machines used
- Lay out of DERD manpower calculation
- Thick seam working with long wall Top slicing and sublevel caving
- Long wall caving and stowing

**UNIT–III Introductions &Development in underground Metal Mine**

- Terminology used in Metal Mining.
- Classify modes of entries–Adits, inclines and shafts, applicability of entries.
- Compares coal and metal Mining.
- Block formation of Mineral deposit.
- Factors effecting choice of level interval.
- Describe raising methods in metal mines.
  ( i) Open raising method, (ii) Two compartment method, (iii) Jora raise lift, iv) Long hole drilling method, (v) Alimak raise climber, (vi) Raise borer

**UNIT–IV Classify stoping methods with application and affecting factors**

Stoping without support:

- Open stoping.
- Overhand stoping.
- Underhand stoping.

Stoping with support:

- Shrinkage stoping
- Cut & fill stoping.
- Square set stoping

Caving methods:

- Top slicing.
- Sublevel caving.
- Block caving.

**Unit-V Stowing and Room & Pillar method**

- Hand packing.
- Mechanicals and stowers.
- Hydraulics and stowing.

▪ Conditions, suitability.
▪ Quality and gathering of sand.
▪ Transportation of sand and storage.
▪ Mixing chamber and waters and ratio.
▪ Stowing practice.

- **Room & Pillar method**-Applicable condition ,suitability , imitation & working method

**Suggested learning resources:**

1. Elements of Mining Technology Vol.I: D.J.Deshmukh
2. Wining and working coal: .T.Deshmukh & D.J. Deshmukh,Vol.1
3. Long wall Mining: Samir Kumar Das
4. Modern coal Mining Technology : Samir Kuma rDas
5. Principle & Practices of Coal Mining: R.D.Singh
6. Coal Mining practice: Stathum
7. Surface Mining Technology : Samir Kumar Das.
8. Surface Mining: T.N.Singh
9. Under ground Mining Methods Handbook Society of Mining Engineering-Hustrulid,W.A.Ed.,AMIE,NewYork,1990

**Course out comes:**

After completing this course, student will be able to:

- Knowledge of pit top & pit bottom layout of mines.
- Understand board & pillar method.
- Understand longwall mining method.
- Explain the stowing.
- Concept of special mining method.

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# MINING TECHNOLOGY-II LAB

**Course Objectives:**

Following are the objectives of this course:

- To layout the pit top & pit bottom of mines.
- To show the different method of workings in mines.
- To calculate the percentage of extraction for depillaring work.

**List of Practicals to be performed**

1. Layout of Bord and pillar showing.
2. Development work and ventilation network.
3. Layout of Bord and pillar
4. Showing method depillaring and ventilation network.
5. Layout of longwall retreating method
6. Layout of Blasting Gallery panel.
7. Calculate the percentage of extraction for depillaring work,
8. Layout of CM district
9. Study and draw sketches of Breast stoping,
10. Study and draw sketches of underhand stoping,.
11. Study and draw sketches of Shrinkage stoping,
12. Study and draw sketches of Sublevel stoping,
13. Study and draw sketches of vertical craterre treating method.
14. Study and draw sketches of Cut &fill methods
15. Study and draw sketches various method of stowing.
16. Sketch & draw room & pillar method.

**Suggested learning resources:**


1. Elements of Mining Technology Vol.I: D.J.Deshmukh
2. Wining and working coal: R.T.Deshmukh & D.J. Deshmukh,Vol.1&
3. Longwall Mining: Samir Kumar Das
4. Modern coal Mining Technology: Samir Kumar Das
5. Principle & Practices of Coal Mining: R.D.Singh
6. Coal Mining practice: Stathum
7. Surface Mining Technology:S amir Kumar Das.
8. Surface Mining:T .N.Singh


**Course outcomes:**

After completing this course, student will be able to:

- Layout the pit top & pit bottom of mines.
- Show the different method of workings in mines.
- Calculate the percentage of extraction for depillaring work.

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**DIPLOMA WING**
**RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL**
DIPLOMA IN MINE SURVEYING (M11)

*SEMESTER IV*

| | | |
|---|---|---|
| COURSE TITLE | : | GEOLOGY - II |
| PAPER CODE | : | 7579 |
| SUBJECT CODE | : | 403 |
| TREORY CREDITS | : | 03 |
| PRACTICAL CREDITS | : | 01 |

**Course Objectives:**

Following are the objectives of this course

- To know Indian **s**tratigraphy
- To understand the various methods of prospecting of mineral deposits.
- To know the depositions of various modes of coal and other metal deposited which are to be considered for mining operations.
- To synthesize the classification of coal.
- To interpret the rock hydrology.

**Course Contents:**

**Unit-I INDIANSTRATIGRAPHY**

- Principles of stratigraphy, principles of correlation, geological time scale, stratigraphic classification of Indian rock formations.
- Physiographic divisions of Indian peninsular India, indogangetic plan and extra peninsular India.
- Archaean system-A brief account of the dharwar system, sausor group,Iron-Ore group, Archaean rocks of Rajasthan,Economic Minerals of Archeean rocks.
- Cuddapah system-cuddapah rocks of cuddapahvasin Andhra Pradesh, Delhi System economic minerals of cuddapah rocks.
- Vindhyan system- A brief account of the Vindhyan rocks of North India .Economic minerals of vindhyan rocks.
- Gondwanas system-A brief account of the Gondwana rocks of India .Economic minerals of the Gondwana rocks.
- Deccan Traps-A brief account of the Deccan traps of India. Econonic Importance of Deccan traps.

**Unit-II OREDEPOSITS**

- Concept of ore mineral, gangue and Tenorofores, Abrief out line of the Classification of ore deposits.
- Magmatic ore deposits early magmatic, late magmatic.
- Pegmatic deposits, sublimation deposits, contact metasomatic deposits.
- Hydrothermal deposits classification of hydrothermal deposits cavity filling deposits, Types of cavity filling deposits, replacement deposits, Types of replacement deposits.
- Sedimentation deposits, Evaporation deposits, residual deposits, Mechanical concentration deposits (placer deposits), Types of placer deposits.
- Oxidation and super gene enrichment deposits, metamorphic deposits.
- Controls of ore deposition structural controls, stratigraphic controls, physical control, physical and chemical controls.

**Unit-III COAL AND PETROLEUM**

- RANKS OFA COAL,CLASSIFICATION OF COAL- peat, Lignite, Bituminous coal, Anthracite and cannel coal.
- Bended constituents of coal, chemical properties of coal structural features of coal seam.
- Origin of coal in situ theory, drift theory, formation of coal preservation ,Biochemical change, Carbonization and metamorphism
- Occurrence of coal in India. A brief outline of the lower Gondwana coalfields.
- Petroleum, Origin of petroleum migration of petroleum. Oil traps, types of oil traps, petroleum deposits of India.
- ORES ANDMINERALDEPOSITS OF INDIA
  A brief account of the origin, occurrence, distribution in India and economic uses of the following ores and minerals gold, Iron-pre, manganese ore copper ore, Lead and zinc ores, Aluminum ores, chromate and mica.

**Unit-IV PROSPECTING METHODS**

- Ground prospecting methods A brief out-line of the various prospecting methods, surface prospecting methods geological mapping, Trenching, pitting, Augering and wash boring, and Drilling.
- Geophysical prospecting methods elementary study of gravity, magnetic,
- Electrical resistively and seismic methods of geophysical prospecting.

**Unit-V GROUND WATER &FOSSILS**

- GROUNDWATER: Elementary Idea of Ground water occurrence of ground water, zone of Aeration, saturation, water Table, hydrological properties of rocks porosity and permeability, Aquifer.
- FOSSILS: Definition mode of occurrence, uses of fossils.

**Suggested learning resources:**

- **Principles of Engineering Geology - K.M.Bangar**
- **A text book of Geology -P.K.Mukherjee**
- **Engineering and General Geology -Parbin Singh**
- **Mineral Economics -Sinha & Sharma**
- **Ground Water Hydrology -Todd.**

**Course outcomes:**

After completing this course, student will be able to:

- Describe the Indian stratigraphy situation.
- Classify the ore deposits.
- Explain the coal & petroleum formation.
- Discuss the prospecting method.
- Understand the ground water occurrence & fossils.

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# GEOLOGY-II LAB

**Course Objectives:**

Following are the objectives of this course:

- To sketch the Geomorphological and structural models.
- To construct the geological cross sections from geological maps.
- To study the common ore minerals in hand specimens.

**List of Practicals to be performed**

1. Sketching and describing the various Geomorphological and structural models.
2. Constructing the geological cross sections from geological maps.
   - Maps showing unconformity.
   - Maps showing folds.
   - Maps showing faults.
   - Maps showing igneous intrusions.
3. At least three exercises on maps of completion of outcrops.
4. Study of common ore minerals in hand specimens:
   Al,Fe,Cr,Mg,Mn,Zn,Pb.Sn,Sb,Sn,Sb,Cu,Arsenic.

**Suggested learning resources:**

- **Principles of Engineering Geology - K.M.Bangar**
- **A text book of Geology -P.K.Mukherjee**
- **Engineering and General Geology -ParbinSingh**
- **Mineral Economics -Sinha&Sharma**
- **Ground Water Hydrology -Todd.**

**Course outcomes:**

After completing this course, student will be able to:

- Sketch the Geomorphological and structural models.
- To construct the geological cross sections from geological maps.
- Understand the identification of Hand Specimen of various minerals.

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**DIPLOMA WING**
**RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL**
DIPLOMA IN MINE SURVEYING (M11)

*SEMESTER IV*

| | | |
|---|---|---|
| COURSE TITLE | : | MINE ENVIRONMENT - II |
| PAPER CODE | : | 7580 |
| SUBJECT CODE | : | 404 |
| TREORY CREDITS | : | 03 |
| PRACTICAL CREDITS | : | 00 |

**Course Objectives:**

Following are the objectives of this course:

- To ensure the responsible factors of mine fires.
- To know the characteristic of firedamp explosion.
- To know the coal dust explosion.
- To ensure the causes of inundation & water dam.
- To know the various type of due to mining.
- To take part in rescue operations.

**Course Contents:**

**Unit-I MINEFIRES**

- Factors responsible for mine fire.
- Causes of mine fire.
- Accidental fire, spontaneous heating; factors responsible for spontaneous heating.
- Incubation period, crossing point,ignition point.
- Precautions against spontaneous heating.
- Preventive measures against mine fires.
- Firestopping-purpose, constructional details
- Opening of a sealed off Area.
- Sampling from sealed off area.

**Unit-II FIREDAMPEXPLOSION**

- Introduction, Composition of firedamp Modes of emission of Firedamp, Degree of gassiness, methane layering.
- Mechanism of fire damp explosion, Flammability of firedamp, lower and upper limit of explosibility of firedamp, coward diagram factors governing limits of flammability, lagon ignition .Explosive limits of other flammable gases.
- Causes of fire damp explosion and its prevention. Characteristic of fire damp explosion.
- Study of some important gas explosions in Indian coalmines.

**Unit-III COALDUSTEXPLOSION**

- Mechanism of Coal Dust explosion, Flammability limits of coal dust, factors governing explosibility of coal dust, Characteristics of coal dust explosion.
- Causes of coal dust explosion.
- Prevention of coal dust explosion.
- Generalized stone dusting, Quantity of stone dust, Types and properties of stone dust ,stone dusting plan.

- 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.

**Unit-IV NUNDATION**

- Surface and underground uses fInundation and it sprevention.
- Water dams ,bulkhead doors.
- Precaution while approaching old waterlogged areas.
- Dewatering, burn side safety boring apparatus.
- Dams-purpose; site of dam; types of dams & their constructional details.
- Study of some important inundation causes in Indian mines.
- Additional precautions in rainy season in the mines located nearby the rivers.

**Unit-V POLLUTIONCONTROL**

- Various types of pollution due to mining operations.
- Sources and harmful effects of pollution (Air,water,noise,dust, deforestation,spoiling of surface land etc.)
- Preventive measures.
- Introduction to pollution control Board.

**Suggested learning resources:**

- Elements of Mining Technology VolII - D.J.Deshmukh
- Mine Environment &Ventilation - G.B.Mishra
- Mine Ventilation Vol-I&II -S.Ghatak
- Mine Disaster and Mine rescue–M.A.Ramlu

**Course outcomes:**

After completing this course, student will be able to:

- Take precautionary measures against occurrence of the fire damp and coal dust explosions.
- Take precautionary measures against occurrence of spontaneous heating, its detection and conduct sealing off operations.
- Detect presence of fire and supervise the firefighting operations.
- Ensure safe withdrawal of persons in case of any eventuality of explosion ,fire and inundation.
- Take part in sealing off and reopening operations.

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**DIPLOMA WING**
**RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL**
DIPLOMA IN MINE SURVEYING (M11)

*SEMESTER IV*

| | | |
|---|---|---|
| COURSE TITLE | : | MINE SAFETY AND LEGISLATION - II |
| PAPER CODE | : | 7581 |
| SUBJECT CODE | : | 405 |
| TREORY CREDITS | : | 03 |
| PRACTICAL CREDITS | : | 00 |

**Course Objectives:**
Following are the objectives of this course:

1. To know the general vocational & refresher training as per the MinesVocationalTrainingRules,1966.
2. To know the provision of prospecting, prospecting lease & Mining lease as per MINESANDMINERALSACT,1957.
3. To know the general provision of competency & responsibility of mining employee, mine working, mine lighting, etc as per MMR 1961.

**Course Contents:**

**UNIT-I Mines Vocational Training Rules,1966**

- **Chapter I.–Preliminary**
- CHAPTER II PERSONSTOBETRAINED
- CHAPTER III General Vocational Training
- CHAPTER IV REFRESHER TRAINING
- CHAPTER V TRAINING OF SPECIAL CATEGORIES OF EMPLOYEES
- CHAPTER VI TRAINING CENTRES AND ARRANGEMENTS FOR TRAINING.
- CHAPTER VII ALLOWANCE OFTRAINEES AND ISSUEOF CERTIFICATES.
- CHAPTER VIII MISCELLANEOUS (Rule 31 to 32)
- FIRST SCHEDULE to EIGHTH SCHEDULE
- FORM-A & FORM-B

**UNIT-II MINES AND MINERALS (DEVELOPMENT AND REGULATION) ACT,1957**

- CHAPTERI–Preliminary.
- CHAPTERII – GENERAL RESTRICTIONS ON UNDERTAKING PROSPECTING AND MINING OPERATIONS
- CHAPTERIII- PROCEDURE FOR OBTAINING, PROSPECTING LICENCES OR MINING LEASES IN RESPECT OF LAND IN WHICH THE MINERALS VEST IN THE GOVERNMENT
- CHAPTERIV – RULES FOR REGULATING THE GRANT OF PROSPECTING LICENCES AND MINING LEASES
- CHAPTERV - SPECIAL POWERS OF CENTRAL GOVERNMENT TO UNDERTAKE PROSPECTING OR MINING OPERATIONS IN CERTAIN CASES

- CHAPTERVI- DEVELOPMENT OF MINERALS
- CHAPTERVII -MISCELLANEOUS (Section 19-33)
- THE FIRS TSCHEDULE to THE FOURTH SCHEDULE

**UNIT-III MMR 1961**

- ChapterI.–Preliminary
- ChapterII–Returns ,Notices and Records
- CHAPTERIII–Examinations and Certificates of competency and of Fitness
- CHAPTER IV–Inspection and Mine Officials
- CHAPTER-V:Duties and Responsibilities of Workmen,Competent Persons and Officials,etc.
- CHAPTER-VI:Plans and Sections

**UNIT-IV MMR 1961**

- CHAPTER-VII:Means of Access and Egress
- CHAPTER-VIII:Ladders and Ladderways
- CHAPTER-IX:Transport of Men and Materials–Winding in shafts
- CHAPTER-X:Transport of Men and Materials–Haulage
- CHAPTER-XI: Mine Workings
- CHAPTERXII–Precautions against Dangers from Fire, Dust, Gas and Water
- CHAPTER–XIII–Ventilation

**UNIT-V MMR1961**

- CHAPTERXIV–Lighting and Safety Lamps
- CHAPTERXV–Explosives and Shot firing
- CHAPTERXVI-Machinery and Plant
- CHAPTERXVII–Miscellaneous (Regulation No.-177 to 195)
- FIRST to FOURTH SCHEDULE FORMI

**Suggested learning resources:**

| | | |
|---|---|---|
| Coal Mines Regulation1957– | - | L.C.Kaku |
| Mine Rule1955 | - | L.C.Kaku |
| Mines Act1952 | - | L.C.Kaku |
| DGMS Circular | - | L.C.Kaku |

**Course outcomes:**

After completing this course, student will be able to:

- Perform duties as provisions of mines regulations.
- Enforce compliance of provisions related to access and egress under regulations.
- Supervise and carryout blasting operations and enforce compliance by provisions related to explosives and blasting.
- Take precaution against Fire, Dust, Gas and Water.
- Take the lighting, machinery and plant as per regulation.

**DIPLOMA WING**
**RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL**
DIPLOMA IN MINE SURVEYING (M11)

*SEMESTER IV*

| | | |
|---|---|---|
| COURSE TITLE | : | BASIC CIVIL ENGINEERING |
| PAPER CODE | : | 7582 |
| SUBJECT CODE | : | 411 |
| TREORY CREDITS | : | 03 |
| PRACTICAL CREDITS | : | 00 |

**Course Objectives:**
Following are the objectives of this course:

- To know the feature & characteristic of bricks, stone aggregates, cement, steel & timber.
- To understand the primary level of constructional technology.
- To observe the road & rail alignment.
- To know the constructional detail of dam.
- To estimate the quantity measurement.

**Unit-I GENERAL MATERIAL TECHNOLGY:**

- BRICKS: Type of bricks, good quality of bricks , Laboratory tests for bricks.
- STONE AGGREGATES: Requirement of good quality of stones, test for stones, selection of stone for different civil works, coarse & fine agreements, Fitness modules
- CEMENT: Composition of cement, Type of cement, Laboratory test & Field test on cement.
- STEEL & STEEL PRODUCT; Composition of steel, change in properties due to alloying ,impurities in steel, steel alloy, defect in steel, steel section, test of M.S.Bar.
- TIMBER & TIMBER PRODUCT; Characteristics of good timber, defect in timber, preservatives, seasoning of timber.

**Unit-II CONSTRUTIONTECHNOLOGY:**

- FOUNDATION: Necessity of foundation, bearing capacity & safe bearing capacity, type of foundation, shallow foundation, deep foundation, selection of type of foundation, procedure to give layout, different terms, centre line plan, foundation plan, checking the accuracy of layout, utility of control point.
- MASONARY: Type of masonry, necessity bond of bricks masonry, type of stone masonry, dry stone masonry ,revetment.
- CONCRETE: Ingredients in cement concrete properties of ingredient, grade & strength of concrete, nominal mix controlled concretes, work ability of concretes, slum test, water cement ratio,test for compressive strength of concrete, factors which affect the quality of concrete, use of Reinforcement in concrete, R.C.C.&P.C.C.

**Unit-III ROAD& RAILALIGNMENT:**

- ROAD ALIFNMENT:
- Type of Roads
- General detail of Roads Construction;
- Topographical survey; Establishing Survey Control Points, Levelling, Detailed Topographical survey, Cross-Section Surveys.
- Design Criteria; Geometric Design, Pavement Design, Drainage.
- RAIL ALIGNMENT:
- Survey for track alignment.
- Traffic Survey.
- Reconnaissance survey-Instrument.
- Preliminary survey-Instrument.
- Detail survey or final location survey

**Unit-IV SIMPLE CONSTRUCTION DETAIL OF BRIDGES & DAMS:**

- BRIDGES: Components of Culverts– Causeways
- Type of Bridge. Slab Bridge, T-beam and slab Bridge, Suspension Bridge.
- DAMS:
- Purpose of dams
- Type of Dams. Earthen Dam & Gravity Dam.
- Detail survey or final location survey

**Unit-V QUANTITY MEASUREMENT**

- Procedure of Estimating Quantities: Introduction – Main items of work – calculation of quantities of earth work, stone masonry, brick masonry, plastering, cement concrete, R.C.C., Doors, Windows, Flooring, White Washing, colour washing, Distempering and their units.
- Rate Analysis: Factors affecting rates–importance–Materials for different items of work – Rates of materials and labour – analysis of Rates for cement concrete, R.C.C., brick masonry, Stone masonry, Hollow block masonry, Plastering, Painting, Flooring, Road works, Sanitary Works, Water supply works and Electrical works.

**Suggested learning resources:**


1. Arunachalam N.,'Basic Civil Engineering', PratheebaPublishers,Coimbatore,2000
2. Ramesh BabuV.,'Basic Civil Engineering', AnuradhaAgencies,Kumbakonam,2001
3. B.N.Dutta 'Estimating and Costing' S.Dutta and Company, Luuknow


Course out comes:

After completing this course, student will be able to:

- Observe the material technology that is used in general civil work.
- Provide appropriate surveying alignment for road and rail setup.
- Affiliate them with work of general construction detail of Dam.
- Calculate the quantities of earth work, stone masonry, brick masonry, plastering, cement concrete, etc.
- Analysis the rate of materials.

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DIPLOMA IN MINE SURVEYING (M11)

*SEMESTER IV*

| | | |
|---|---|---|
| COURSE TITLE | : | CONSTRUCTION MANAGEMENT |
| PAPER CODE | : | 7379 |
| SUBJECT CODE | : | 412 |
| TREORY CREDITS | : | 03 |
| PRACTICAL CREDITS | : | 00 |

**Course Objectives:**

Following are the objectives of this course:

- To understand the contract management and associated labour laws.
- To prepare and understand the principles involved in site layout.
- To know the procedure for scheduling of various activates in construction project.
- To understand the Labour laws, procedure for arbitration, settlements.
- To know different safety measures in construction projects.

**Course Content**

**Unit – I Construction industry and management**

- Organization-objectives, principles of organization, types of organization: government/public and private construction industry, Role of various personnel in construction organization
- Agencies associated with construction work- owner, promoter, builder, designer, architects.
- Role of consultant for various activities: Preparation of Detailed Project Report (DPR), monitoring of progress and quality, settlement of disputes.

**Unit – II Site Layout**

- Principles governing site layout.
- Factors affecting site layout.
- Preparation of site layout.
- Land acquisition procedures and providing compensation.

**Unit- III Planning and scheduling**

- Identifying broad activities in construction work & allotting time to it, Methods of Scheduling, Development of bar charts, Merits & limitations of bar chart.
- Elements of Network: Event, activity, dummy activities, Precautions in drawing Network, Numbering the events.
- CPM networks, activity time estimate, Event Times by forward & backward pass calculation, start and finish time of activity, project duration. Floats: Types of Floats-Free, independent and total floats, critical activities and critical path,
- Purpose of crashing a network, Normal Time and Cost, Crash Time and Cost, Cost slope, Optimization of cost and duration.
- Material Management- Ordering cost, inventory carrying cost, Economic Order Quantity .
- Store management, various records related to store management, inventory control by ABC technique, Introduction to material procurement through portals (e.g. www.inampro.nic.in)

**Unit IV Construction Contracts and Specifications**

- Types of Construction contracts
  - Contract documents, specifications, general special conditions
  - Contract Management, procedures involved in arbitration and settlement (Introduction only)

**Unit– V Safety in Construction**

- Safety in Construction Industry—Causes of Accidents, Remedial and Preventive Measures.
  - Labour Laws and Acts pertaining to Civil construction activities (Introduction only)

**Suggested learning resources**


1. Sharma S C and Deodhar S V, Construction Engineering and Management, Khanna Book Publishing, New Delhi
2. Gahlot,P.S. and Dhir, B.M Construction planning and management New Age International (P) Ltd. Publishers, New Delhi.
3. Shrivastava, U.K., Construction planning and management, Galgotia Publication Pvt Ltd. New Delhi
4. Mantri, S., The A To Z of Practical Building Construction and its Management, Satya Prakashan New Delhi
5. Khanna, O.P. , Industrial Engineering and management, Dhanpat Rai New Delhi
6. Punmia, B.C. and Khandelwal, K.K., Project Planning and Controlling with PERT And CPM, Laxmi Publications (P)Ltd.
7. Sengupta, B., Guha H., Construction Management and Planning, Tata-McGraw Hill.
8. Harpal, Singh, Construction Management and accounts, Mc-Graw Hill.
9. Sharma, S.C., Industrial Engineering and Management, Khanna Publications, New Delhi


**Course outcomes:**

After competing this course, student will be able to:

- Understand the contract management and associated labour laws.
- Prepare and understand the nuances of executing the site layout.
- Prepare networks and bar charts for the given construction project.
- Understand the intricacies of disputes, related arbitration and settlement laws.
- Apply safety measures at construction projects.

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**DIPLOMA WING**

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DIPLOMA IN MINE SURVEYING (M11)

SEMESTER - IV

| | | |
|---|---|---|
| COURSE TITLE | : | MINOR PROJECT |
| PAPER CODE | : | -- |
| SUBJECT CODE | : | -- |
| TREORY CREDITS | : | 00 |
| PRACTICAL CREDITS | : | 02 |

MINOR PROJECT - Evaluation is based on work done, quality of report performance in viva-voce, presentation etc.

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**DIPLOMA WING**

**RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL**

DIPLOMA IN MINE SURVEYING (M11)

SEMESTER - IV

| | | |
|---|---|---|
| COURSE TITLE | : | ESSENCE OF INDIAN KNOWLEDGE AND TRADITION |
| PAPER CODE | : | -- |
| COURSE CODE | : | -- |
| TREORY CREDITS | : | 00 |
| PRACTICAL CREDITS | : | 00 |

- **Course Content:**
- Basic Structure of Indian Knowledge System:

  (i)वेद

  (ii)उन्नवेद (आयवेद, धनुवेद गन्धवेद स्थान्त्यआदद)

  (iii)वेदांग (शिक्षा कल्नानन रूत व्याकरण ज्योनतषछांद),

  (iv)उन्नाइग (धर्मर्ीरांसा, न्नुराण,तकमिस्त्र)
- Modern Science and Indian Knowledge System
- Yoga and Holistic Healthcare
- Case Studies.

**SUGGESTEDTEXT/REFERENCEBOOKS:**

| S. No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1. | Cultural Heritage of India-Course Material | V. Sivarama krishna | Bharatiya Vidya Bhavan, Mumbai,5thEdition, 2014 |
| 2. | Modern Physics and Vedant | Swami Jitatmanand | Bharatiya Vidya Bhavan |
| 3. | The wave of Life | Fritzof Capra | |
| 4. | Tao of Physics | Fritzof Capra | |
| 5. | Tarka sangraha of Annam Bhatta, Inernational | V N Jha | Chinmay Foundation, Velliarnad, Amaku,am |
| 6. | Science of Consciousness Psychotherapy and Yoga Practices | R N Jha | Vidyanidhi Prakasham, Delhi,2016 |

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