

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL  
UNIVERSITY, BHILAI**

Diploma Programme in Mining and Mine Surveying

***Semester -VI***

| S. No        | Board of Study   | Subject Code   | Subject  | Period/week in Hours |   |   | Scheme of Examination |     |    |           |     | Credit<br>L+(T+P)/2 |             |
|--------------|------------------|----------------|--|----------------------|---|---|-----------------------|-----|----|-----------|-----|---------------------|-------------|
|              |                  |                |  | L                    | T | P | Theory                |     |    | Practical |     |                     | Total Marks |
|              |                  |                |  |                      |   |   | ESE                   | CT  | TA | ESE       | TA  |                     |             |
| 1.           | Mining           | 239611<br>(39) | Mine economics and beneficiation               | 4                    | 1 | - | 100                   | 20  | 20 | -         | -   | 140                 | 5           |
| 2.           | Mining           | 239612<br>(39) | Open -cast mining and land reclamation         | 4                    | 2 | - | 100                   | 20  | 20 | -         | -   | 140                 | 5           |
| 3.           | Mining           | 239613<br>(39) | Mine management legislation and general safety | 4                    | 2 | - | 100                   | 20  | 20 | -         | -   | 140                 | 5           |
| 4.           | Mining           | 239614<br>(39) | Advance mine surveying                         | 5                    | 2 | - | 100                   | 20  | 20 | -         | -   | 140                 | 6           |
| 5.           | Mechanical engg. | 200615<br>(37) | Entrepreneurship Development                   | 4                    | 1 | - | 100                   | 20  | 10 | -         | -   | 130                 | 5           |
| 6.           | Mining           | 239621<br>(39) | Open cast mining and land reclamation (Lab)    | -                    | - | 2 | -                     | -   | -  | 50        | 20  | 70                  | 1           |
| 7.           | Mining           | 239622<br>(39) | Advance mine surveying (Lab)                   | -                    | - | 3 | -                     | -   | -  | 100       | 50  | 150                 | 2           |
| 8.           | Mining           | 239623<br>(39) | Industrial training                            | -                    | - | 1 | -                     | -   | -  | 50        | 40  | 90                  | 1           |
| <b>Total</b> |                  |                |  | 21                   | 8 | 6 | 500                   | 100 | 90 | 200       | 110 | 1000                | 30          |

L: Lecture Hours, T: Tutorial Hours, P: Practical Hours,  
ESE: End Sem Exam, CT: Class Test, TA: Teacher's Assessment

\* Industrial Training: Students will undergo on industrial practical training for 2 & 1/2 months during 6<sup>th</sup> semester.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL  
UNIVERSITY, BHILAI**

|                       |   |                                  |
|-----------------------|---|----------------------------------|
| A) SEMESTER           | : | VI                               |
| B) SUBJECT TITLE      | : | MINE ECONOMICS AND BENEFICIATION |
| C) CODE               | : | 239611 (39)                      |
| D) BRANCH /DISCIPLINE | : | MINING AND MINE SURVEYING        |
| E) RATIONAL           | : |                                  |

A good engineer should be a good economist also. The back bone of any industry is economics and such industrial economics is included as a subject in many branches of engineering.

In mining industry economics is not applied only to higher level ie planning level but also at the lowest level ie planning of faces in the district for production. It is necessary for a diploma pass out in mining to have the elementary knowledge of economics, its general terminology and definitions and their applications to mining operations.

In this paper basic topics of economics are included with mine economics and beneficiation, to make a diploma holder perfect on the supervisory cadre.

F) TEACHING AND EXAMINATION SCHEME :

| Sl. No | Course Code | Periods/week (In Hrs.) |   |   | Scheme of examination |    |    |           |    |             | Credit L+(T+P)/2 |
|--------|-------------|------------------------|---|---|-----------------------|----|----|-----------|----|-------------|------------------|
|        |             | L                      | T | P | Theory                |    |    | Practical |    | Total Marks |                  |
|        |             |                        |   |   | ESE                   | CT | TA | ESE       | TA |             |                  |
| 1.     | 239611 (39) | 4                      | 1 | - | 100                   | 20 | 20 | -         | -  | 140         | 5                |

L - Lecture hours ,                      T - Tutorial hours,                      P - Practical hours  
ESE -End of Semester Exam,      CT - Class Test,                      TA- Teacher's Assessment

G) DISTRIBUTION OF MARKS AND HOURS :

| S. No | Chapter No. | Chapter Name                           | Hours | Marks |
|-------|-------------|--|-------|-------|
| 1.    | 1           | General economics                      | 16    | 20    |
| 2.    | 2           | Mine economics                         | 16    | 20    |
| 3.    | 3           | Sampling                               | 16    | 20    |
| 4.    | 4           | Valuation                              | 16    | 20    |
| 5.    | 5           | Tender documents and their application | 16    | 20    |
| Total |             |  | 80    | 100   |

CHAPTER- 1 GENERAL ECONOMICS

- 1.1 Economics terms -
  - a) Wealth
  - b) Value:
    - (i) value in use and.
    - (ii) value in exchange.
  - c) Goods.
  - d) Price.
  - e) Income.
  - f) Investment.
  - g) Saving.
- 1.2 Consumption and its importance
  - a) consumption- satisfaction-needs.
  - b) Types of consumption.
  - c) importance of Consumption .
- 1.3 Wants- wants and economic activities, classification of wants-
  - a) Law of diminishing utility
  - b) Law of equi-marginal utility.
- 1.4 Utility- Meaning measurement, marginal and total utility.
- 1.5 Demand- definition, demand schedule and demand curve.
  - a) Law of Demand.
  - b) Extension and contraction in demand.
  - c) Increase and decrease in demand.
  - d) Elasticity of demand.
- 1.6 Supply.
  - a) Supply of price.
  - b) Supply schedule.
  - c) Supply curve
  - d) Supply function.
  - e) Law of supply.
  - f) Elasticity of supply.
- 1.7 Capital- Meaning, definition-
  - a) Characteristics of capital.
  - b) Wealth and Capital.
  - c) Capital and labour.
  - d) Capital and lands.
  - e) Importance and function of Capital.
- 1.8 Money:
  - a) Definition of money.
  - b) function of money.
  - c) Classification of money.

## CHAPTER -2 MINE ECONOMICS-

- 2.1 Mineral industry - its role in national economy.
  - a) Indian mineral resources and their statistics.
  - b) Mineral policies.
  - c) Conservation of minerals including coal company.

- 2.2 Constitution of companies under companies act.
- a) Types of companies.
  - b) Private and public sector , merits and demerits.
    - i) Govt. undertakings .
  - c) Nationalisation of coal industry formation of CIL and its subsidiaries.
  - d) Elementary introduction of the following companies.
    - i) HCL
    - ii) BGML
    - iii) BALCO
    - iv) MOIL
  - e) Labour
    - i) Efficiency of labour.
    - ii) Labour welfare.
    - iii) Social securities.
    - iv) Trade unions.

#### CHAPTER -3 SAMPLING-

- 3.1
  - a. Methods and importance of sampling.
  - b. Size of samples.
  - c. Class of samples.
  - d. Different methods of sampling.
  - e. Surface sampling.
  - f. Under ground sampling.
  - g. sampling of alluvial deposits.
  - h. Errors in Sampling.
- 3.2 Salting
  - a. Method of salting
  - b. safe guards against salting.
  - c. Sampling records .
  - d. Computation for tonnage –
    - Average assay value
    - Average sloping width
    - Clear width
    - Willing width
    - Length average
    - Average of block and total average
    - Prismoidal averaging

#### CHAPTER – 4 VALUATION

- 4.1
  - a) Methods of valuation
  - b) Cases requiring valuation risk in calculation of mines
  - c) Calculation of life of a mine
  - d) Valuation reports
  - e) Mine as a wasting assets
  - f) Redemption of capital depreciation

#### 4.2 Valuation of mineral property and preparation of report

##### **Reference Book**

| Sl.No. | Title                      | Author, Publisher, Edition and Year |
|--------|----------------------------|-------------------------------------|
| 1.     | Industrial economics       | V.C.Sinha and Pushpa Sinha          |
| 2.     | Mineral economics          | R.K.Sinha and N.L.Sharma            |
| 3.     | Mineral and mine economics | R.T.Deshmukh                        |
| 4.     |                            |                                     |

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**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL  
UNIVERSITY, BHILAI**

|                       |   |                                       |
|-----------------------|---|---------------------------------------|
| A) SEMESTER           | : | VI                                    |
| B) SUBJECT TITLE      | : | OPEN CAST MINING AND LAND RECLAMATION |
| C) CODE               | : | 239612 (39)                           |
| D) BRANCH /DISCIPLINE | : | MINING AND MINE SURVEYING             |
| E) RATIONAL           | : |                                       |

The techniques of extracting minerals from the earth are changing rapidly with recent developments in mining industry. Stress is being given for winning of deposits by removing overlying strata as compared to underground mining. as employment of heavy machineries. It is essential to study the technology applied in mining field for extraction of mineral completely by introducing heavy machines & comfortable natural conditions;

Open cast mining and problems of mined out area is one of the important field of mining/Industry. To enable the knowledge of student in this regard, an attentive attention is attracted through the various topics covered in this Subject, like :-

1. Open cast mining
2. Removal of strata.
3. Transportation of mineral.
4. Loading machines.
5. Land Reclamation.

A comprehensive knowledge on the aforesaid topics with certain case study of some important Indian open cast mines will enable a student to become a good mining engineer.

**F) TEACHING AND EXAMINATION SCHEME:**

| Sl. No. | Course code | Periods/week (In Hrs.) |   |   | Scheme of examination |    |    |           |    |             | Credit L+(T+P)/2 |
|---------|-------------|------------------------|---|---|-----------------------|----|----|-----------|----|-------------|------------------|
|         |             | L                      | T | P | Theory                |    |    | Practical |    | Total Marks |                  |
|         |             |                        |   |   | ESE                   | CT | TA | ESE       | TA |             |                  |
| 1.      | 239612 (39) | 4                      | 2 | - | 100                   | 20 | 20 | -         | -  | 140         | 5                |
| 2.      | 239621 (39) | -                      | - | 2 | -                     | -  | -  | 50        | 20 | 70          | 1                |

L - Lecture hours ,  
ESE -End of Semester Exam,  
Assessment

T - Tutorial hours,  
CT - Class Test,

P - Practical hours  
TA- Teacher's

G) DISTRIBUTION OF MARKS AND HOURS :

| S. No. | Chapter No. | Chapter Name             | Hours | Marks |
|--------|-------------|--------------------------|-------|-------|
| 1.     | 1           | Open cast mining         | 14    | 15    |
| 2.     | 2           | Opening of opencast mine | 14    | 15    |
| 3.     | 3           | Removal of strata        | 36    | 40    |
| 4.     | 4.          | Loading Machines         | 10    | 10    |
| 5.     | 5.          | Transportation           | 10    | 10    |
| 6.     | 6.          | Land Reclamation         | 12    | 10    |
| Total  |             |                          | 96    | 100   |

CHAPTER 1- OPEN CAST MINING

- 1.1 Classification of O.C. mine, manual, semi mechanized & mechanized.
- 1.2 Scope and limitation of O/C mines, Advantages and disadvantage of O/C mining.
- 1.3 Factors deciding the O/C mining.
- 1.4 Machineries used in O/C mines.

CHAPTER 2- OPENING OF O/C MINE

- 2.1 box cut and access trenches.
- 2.2 lay out and design – bench, dimensions, height and width, overall pit slope; stability, general layout of O/C mine.
- 2.3 Drainage in pit and slope.
- 2.4 Suitability & limitations of O/C Machineries.

CHAPTER 3- REMOVAL OF STRATA

- 3.1 By scrapers, Dozers, Graders, Draglines for soft strata. shovels and haul packs surface miners and bucket wheel excavators.
- 3.2 By drilling and blasting for hard strata; primary & secondary blasting.
- 3.3 Blast hole pattern; burden, spacing, diameter and depth of blast holes.
- 3.4 Drilling blast holes and drill machines.
- 3.5 Blast hole geometry , toe formation, sub grade drilling , creator theory.
- 3.6 Different types of explosive used in O/C mines liquid oxygen, ANFO, OCG, slurries, side mixed slurry (SMS) , Emulsion explosive
- 3.7 Deck charging, & column loading ; calculation of powder factor/ charge factor. calculation of charge /hole, control blasting technique- Special blasting technique.

- 3.8 detonators- blasting fuses, detonating fuses, Electric detonators, Nonel & Raydets detonators.
- 3.9 Secondary blasting – pop shooting and plaster shooting, snake holing,
- 3.10 Ground vibration measurement- its limitations.

**CHAPTER 4- LOADING MACHINARIES**

- 4.1 Different machines used for loading – shovels, dragline, Multi bucket excavators, front end loader, pay loader and cranes- their application, scope & capacity.
- 4.2 Time study and calculation of out-put with shovel, dumper& dragline.

**CHAPTER 5- TRANSPORTATION**

- 5.1 Rail transport; trackless transport, Dumpers, conveyors; spreaders, transport haul road gradient width and slope.

- 5.2 Dumps-site, slope and prevention of double handling.

**CHAPTER 6- LAND RECLAMATION**

- 6.1 Physical restoration of mined out areas.
- 6.2 Slope stabilization.
- 6.3 Various methods for land reclamation ; afforestation crop cultivation etc.

**Reference Book**

| Sl.No. | Title                                  | Author, Publisher, Edition and Year |
|--------|--|-------------------------------------|
| 1.     | Elements of mining technology Vol -I   | D.J. Deshmukh                       |
| 2.     | Surface mining technology              | Sameer Das                          |
| 3.     | Explosive & Blasting practice in mines | Sameer Das                          |

**Subject: Open cast mining and land reclamation Lab**

**Practical Code: 239621 (39)**

**Hours: 32**

**LIST OF PRACTICALS:**

- 1. To study and discuss the advantages and disadvantages of open cast mining.
- 2. To study and describe the factors deciding the open cast mining.
- 3. To list the machineries used in open cast mining.
- 4. To study and design different types of mine entries in open cast mines.



5. To study and design layout of open cast mines for
  - i. manual mines
  - ii. mechanized Mines for the given production.
6. To study and describe different combinations of loading and transpiration machines
7. To study and calculate the output with given numbers of shovel, dumpers and draglines.
8. To study and describe methods of land reclamation.

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UNIVERSITY, BHILAI**

|                       |   |   |
|-----------------------|---|---|
| A) SEMESTER           | : | VI  |
| B) SUBJECT TITLE      | : | MINE MANAGEMENT LEGISLATION<br>AND GENERAL SAFETY |
| C) CODE               | : | 239613 (39)                                       |
| D) BRANCH /DISCIPLINE | : | MINING AND MINE SURVEYING                         |
| E) RATIONAL           | : |   |

Mining is an operation in which the natural stability of the ground is disturbed. as such the strata becomes unstable which may cause serious accidents causing losses of life and property. Similarly the machines used on the surface and underground should be safe enough because mining is a work against nature. It is very essential that mining operation should be quite safe.

Under the provisions of mines act,1952 various rules and regulations are made for safe working. The diploma pass out in mining should be well aquented with the rules and regulations enforced, the violations of regulation and rules may cause criminal action against the authorities and closer of mines. Similarly provision of various act on prevention and control of pollution, environment protection act, Indian forest act etc, are also applicable to mining. The mines authorities are to file returns to the pollution control board. The student should also know these obligations, As such these topics are also included in this subject, which are not there previously. Regulation of land for mining is a very complicated procedure as such a diploma holder should be aquented the provisions of land requisition , this is also introduced.

The diploma pass outs are to appear in the legislation paper for second class mine managers certificate of competency as such the topic of the syllabus of second class exam. are also covered in this subject.

**F) TEACHING AND EXAMINATION SCHEME :**

| Sl. No. | Course code    | Periods/week<br>(In Hrs.) |   |   | Scheme of examination |    |    |           |    |                | Credit<br>L+(T+P)/2 |
|---------|----------------|---------------------------|---|---|-----------------------|----|----|-----------|----|----------------|---------------------|
|         |                | L                         | T | P | Theory                |    |    | Practical |    | Total<br>Marks |                     |
|         |                |                           |   |   | ESE                   | CT | TA | ESE       | TA |                |                     |
| 1.      | 239613<br>(39) | 4                         | 2 | - | 100                   | 20 | 20 | -         | -  | 140            | 5                   |

L - Lecture hours ,

T - Tutorial hours,

P - Practical hours

ESE -End of Semester Exam,  
Assessment

CT - Class Test,

TA- Teacher's

G) DISTRIBUTION OF MARKS AND HOURS :

| S. No. | Chapter No. | Chapter Name | Hours | Marks |
|--------|-------------|--------------|-------|-------|
| 1.     | 1           | Management   | 32    | 40    |
| 2.     | 2           | Safety       | 32    | 20    |
| 3.     | 3           | Legislation  | 32    | 40    |
| Total  |             |              | 96    | 100   |

CHAPTER- 1 MANAGEMENT

- 1.1 General principles of scientific management.
- 1.2 Managerial function of the following in brief-
  - a) Planning.
  - b) Organising
  - c) Staffing
  - d) Direction and control.
  - e) Motivation
- 1.3 Work study in brief-
  - a) Motion study
  - b) Time study

CHAPTER- 2 SAFETY

- 2.1 Accidents.
  - a) Classification
  - b) causes
  - c) Remedial measures and Provisions in regulation.
  - d) Cost of accident
  - e) Report writing.

CHAPTER- 3 LEGISLATION

- 3.1 Prevention and control of pollution Acts and rules ( Air and water) Environment ( Protection Act 1986 Provisions applicable to mining operation only.
- 3.2 Provisions of reclamation mined out land and aforrestation asper forest conservation Act 1980.
- 3.3 Authority of pollution control Board over mining Industry and returns to be filed to board.
- 3.4 Provisions of land requisition for mining operations. The land revenue Code of the state and procedure for the same.
- 3.5 Elementary Knowledge about the Provisions of mineral conecssion rule 1960 and mine and mineral ( Regulation & Development) Act 1957.

**MINE MANAGEMENT LEGISLATION AND GENERAL SAFETY**

BOOK RECOMMENDED –

1. Mines Act..
2. Coal mines Regulations.
3. Metalliferous Mine Regulations
4. Mine rules.
5. Indian dispute Act.
6. Environment ( Protection) Act 1986.
7. Environment ( Protection) Rules 1986.
8. Indian forest Act 1927.
9. The hazardous wastes Act 1988.
10. Forest conservation Act 1980.
11. Commentaries on water air pollution and Environment ( Protection) Laws.
12. Mineral concession rules 1960.
13. Mines and Mineral ( Regulation and development Act 1957.
14. Land revenue code.
15. Contract labour and abolition rule.
16. Rescue rules.
17. V.T. Rules.
18. Trade Union Act.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL  
UNIVERSITY, BHILAI**

|                       |   |                           |
|-----------------------|---|---------------------------|
| A) SEMESTER           | : | VI                        |
| B) SUBJECT TITLE      | : | ADVANCE MINE SURVEYING    |
| C) CODE               | : | 239614 (39)               |
| D) BRANCH /DISCIPLINE | : | MINING AND MINE SURVEYING |
| E) RATIONAL           | : |                           |

Statutory provisions of coal mines regulation 1957, and metalliferous mine regulation 1961, require employment of a mine surveyor, having certificate of competency to work in mines, as a surveyor, granted by board of mining examination under the chairmanship of “Director General of Mines Safety” of Govt. of India.

BME has granted an exemption to pass outs of three years Diploma in mining and mine surveying from appearing in the examination for certificate of competency this exemption is the special achievement and credit to this diploma, in the country ; and this honor and status is awarded only on the ground of adequate theoretical & Practical teaching of the following subjects in the final year :-

1. Rectangular coordinate system.
2. Tachometry
3. Curves
4. Triangulation survey .
5. Correlation survey
6. Stope surveying
7. Open cast mine surveying.
8. Drifts, Dip, Strike borehole problems
9. Faults problems..
10. Modern survey technique
11. Introduction to Arial photography

with the acquired skill of maintaining the standard of accuracy a student will become qualified mine surveyor as target to achieve designed by this course.

**F: TEACHING AND EXAMINATION SCHEME :**

| Sl.No. | Course Code    | Periods/week<br>(In Hrs.) |   |   | Scheme of examination |    |    |           |    |                | Credit<br>L+(T+P)/2 |
|--------|----------------|---------------------------|---|---|-----------------------|----|----|-----------|----|----------------|---------------------|
|        |                | L                         | T | P | Theory                |    |    | Practical |    | Total<br>Marks |                     |
|        |                |                           |   |   | ESE                   | CT | TA | ESE       | TA |                |                     |
| 1.     | 239614<br>(39) | 5                         | 2 | - | 100                   | 20 | 20 | -         | -  | 140            | 6                   |
| 2.     | 239622<br>(39) | -                         | - | 3 | -                     | -  | -  | 100       | 50 | 150            | 2                   |

L - Lecture hours ,

T - Tutorial hours,

P - Practical hours

G) DISTRIBUTION OF MARKS AND HOURS :

| S. No. | Chapter Name | Chapter Name                          | Hours | Marks |
|--------|--------------|---------------------------------------|-------|-------|
| 1.     | 1            | Rectangular coordinate system         | 8     | 10    |
| 2.     | 2            | Tacheometry                           | 10    | 10    |
| 3.     | 3            | Curves                                | 13    | 10    |
| 4.     | 4            | Triangulation survey .                | 12    | 10    |
| 5.     | 5            | Correlation survey                    | 15    | 10    |
| 6.     | 6.           | Stope surveying                       | 10    | 10    |
| 7.     | 7.           | Open cast mine surveying.             | 5     | 5     |
| 8.     | 8.           | Drifts, Dip, Strike borehole problems | 10    | 10    |
| 9.     | 9.           | Faults problems..                     | 10    | 10    |
| 10.    | 10.          | Modern survey technique               | 12    | 10    |
| 11.    | 11.          | Introduction to Arial photography     | 7     | 5     |
| Total  |              |                                       | 112   | 100   |

CHAPTER- 1 RECTANGULAR COORDINATE SYSTEM

- 1.1 Definitions; latitudes & departures.
- 1.2 Partial latitude and partial departures.
- 1.3 Calculation of Partial latitude and partial departures
- 1.4 Total latitude and total departures
- 1.5 Calculation of Total latitude and total departures
- 1.6 Calculation of length & bearing from total coordinates.
- 1.7 Calculation of Area by Partial coordinate
- 1.8 Calculation of Area by total coordinates Methods
- 1.9 National grid system.
- 1.10 To join colliery survey with N.G.

CHAPTER- 2 TACHEOMETRY

- 2.1 General
- 2.2 Stadia Diaphragm and its principle.
- 2.3 Theory of anallatic lens.
- 2.4 Determination of Multiplier and additive constant.
- 2.5 Tacheometric survey.

CHAPTER- 3 CURVE

- 3.1 Definition & properties of circle.
- 3.2 Types of Curves.
- 3.3 Nomenclature of a simple circular curve.

- 3.4 Elements of simple curve ( Circular )
- 3.5 Pet Interval , Degree of curve.
- 3.6 Classification of curve ranging method.
- 3.7 Methods of simple circular curve ranging .
  - a. Chain and tape
    - i. By successive bisection of arc.
    - ii. by taking perpendicular off sets from tangents.
    - iii. by taking perpendicular off sets from long chord
    - iv. Chord and off set method.
  - b. Instrumental methods.
    - i) Chord and angle method (tangential angle method)
    - ii) by taking angles from single station .( ranking method)
    - iii) by taking angles from Two stations.
- D. U/G curve ranging methods.
  - i) chord and off set methods
  - ii) Chord and angle methods
- 3.8 Super Elevation.
- 3.9 Numerical Problems on simple circular curve.

#### CHAPTER- 4 TRIANGULATION SURVEY

- 4.1 Definition & principle of Triangulation survey.
- 4.2 Classification of Triangulation survey
- 4.3 Fixing of Stations.
- 4.4 Selection of site for Base line.
- 4.5 Sequence of operation before base line measurement.
- 4.6 Equipments required for base line measurement.
- 4.7 measurement of base line
- 4.8 Correction required in base line measurement.
- 4.9 Prolongation of a base line .
- 4.10 Adjustment of horizontal angles.
- 4.11 Colliery Triangulation
- 4.12 Precautions in Measuring angles and base line.
- 4.13 Triangulation and Precise traversing.
- 4.14 True north determination (App. Method)
- 4.15 Methods of determining true north astronomical Method.
- 4.16 determination of True north in day time by observing sun.
- 4.17 Method of determining latitude and longitude of a survey station
- 4.18 Definition of astronomical survey and Important terms , determination of azimuth by astronomical observation.

## CHAPTER- 5 STOPE SURVEYING

- 5.1 Definition and Introduction, purpose of stope survey.
- 5.2 Methods of stope surveying for flat, moderate indianed of steeply indined ore deposits.

## CHAPTER- 6 OPEN CAST MINE SURVEYING

- 6.1 fixing of stations around boundary.
- 6.2 fixing of stations on benches.
- 6.3 taking techeometric observation to check the position of stations.
- 6.4 Levelling operation to determine the R.L. of Station points.
- 6.5 to conduct traverse survey to determine the exact position of stations.
- 6.6 To conduct off set survey to determine the position of bench.

## CHAPTER- 7 CORRELATION SURVEY

- 7.1 Purpose of correlation survey.
- 7.2 classification of methods of orientation.
- 7.3 Direct methods of traversing .
- 7.4 Assumed bearing method ( Two shaft method).
- 7.5 Exact alignment method.
- 7.6 Approximate alignment method.
- 7.7 Wiessqudrilateral method.
- 7.8 Special chain of tape method.
- 7.9 Precise magnetic method.
- 7.10 Gyrotheodolite method.
- 7.11 Correlation with national grid and local scale factor.

## CHAPTER- 8 DRIFT AND FAULT PROBLEM

- 8.1 Definition , fault, normal, reverse and trans current fault, fault plane hade of fault , throw, want heave, excess.
- 8.2 Numerical problems on drift and fault.

## CHAPTER- 9 INTRODUCTION TO MODERN SURVEY TECHNIQUES

- 9.1 Digital theodolite , electronic distance measuring equipment , Geodimeter; Tellurometer, Total station , Diatomite, software's related to mine surveying.

## CHAPTER- 10 INTRODUCTION TO AERIAL PHOTOGRAPHY

- 10.1 General Principle; Phototheodolite; Stero photographic surveying; aerial
- 10.2 surveying- field of application ; Vertical and oblique photographs; aerial photography; preparation of photographical maps by simple methods;



### **Reference Book**

| Sl.No. | Title                         | Author, Publisher, Edition and Year |
|--------|-------------------------------|-------------------------------------|
| 1.     | Mining Suveying Vol-I& II     | S.Ghatak                            |
| 2.     | Surveying and leveling Vol-II | Kanetkar and Kulkarni               |
| 3.     | Surveying Vol-II              | B.C. Punamia                        |
| 4.     | Advance Surveying             | Alam chand                          |
| 5.     | Advance mine Surveying        | D.C. Clark                          |
| 6.     | Surveying Vol-I& II & III     | Arora                               |

**Subject: ADVANCE MINE SURVEYING LAB**

**Practical Code: 239622 (39)**

**Hours: 48**

### **LIST OF PRACTICAL**

1. To traverse an area by included angle method.
2. To traverse an area by deflection angle method.
3. To traverse an area by Continuous azimuth method.
4. To determine the height of an electric pole / building tower by measuring vertical angle from a single station.
5. To determine the height of an electric pole/building tower by measuring vertical angle from a Two station.
6. To determine the constant of given a teacheometer.
7. To determine the distances from the Instrument stations to the given stations.
8. To traverse an area by measuring horizontal angles and staff intercept.
9. To range a curve by successive bisection of arc.
10. To range a curve by taking perpendicular off sets from tangents.
11. To range a curve by taking perpendicular off sets from long chord.
12. To range a curve by chord of off sets method.
13. To range a curve by chord and angle method.
14. To range a curve by measuring from single station.
15. To range a curve by measuring angles from two stratification.
16. To prolong a given base line up to a given length.
17. To Measure a given base line and apply necessary correction on it.
18. To Conduct a triangulation survey in an given area.
19. To Conduct correlation survey by exact alignment method.
20. To Conduct correlation survey by direct method of traversing.
21. To Conduct correlation survey by approximate alignment method.

- necessary
22. To Conduct correlation survey by quadrilateral method.
23. To calculate the coordinate of given station points by taking observation and plot the same by rectangular coordinate system.
- traverse by
24. To calculate the length and bearing of closing line of given taking necessary observations.
- coordinate method
25. To calculate the area of a given closed traverse by total by taking necessary observations.
- Total
26. Demonstration of modern survey equipments ,EDM, Tacheomate, station etc.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL  
UNIVERSITY, BHILAI**

- A) **SEMESTER** : **VI**  
 B) **COURSE TITLE** : **ENTREPRENEURSHIP DEVELOPMENT**  
 C) **CODE** : **200615 (37)**  
 D) **BRANCH/DISCIPLINE** : **Mining and Mine Surveying**  
 E) **RATIONALE**

It has been experienced in most parts of the world that entrepreneurship development is a means of rapid economic development vis-à-vis creation of gainful employment of masses. The myth that entrepreneurs are born and not made no longer holds good. Experiences of last few decades in India show that it is possible to develop entrepreneurs through planned efforts. These designed efforts are more essentially required in polytechnics where increasing unemployment has necessitated promoting self-employment/entrepreneurship as career option thereby creating more job providers than job seekers. This course focuses on inputs required for students to undertake entrepreneurial activities as career option.

F) **TEACHING AND EXMINATION SCHEME:**

| Course Code    | Periods/Week<br>(In Hours) |   |   | Scheme of Examination |    |    |           |    |             | Credit<br><br>L+(T+P)/2 |
|----------------|----------------------------|---|---|-----------------------|----|----|-----------|----|-------------|-------------------------|
|                | L                          | T | P | Theory                |    |    | Practical |    | Total Marks |                         |
|                |                            |   |   | ESE                   | CT | TA | ESE       | TA |             |                         |
| 200615<br>(39) | 4                          | 1 | - | 100                   | 20 | 10 | -         | -  | 130         | 5                       |

L: Lecture hours; T: Tutorial hours, P: Practical hours

ESE – End of Semester Exam.; CT – Class Test; TA- Teacher’s Assessment ;

G) **DISTRIBUTION OF MARKS AND HOURS:**

| Sl. No. | Chapter No. | Chapter Name                                 | Hours     | Marks      |
|---------|-------------|--|-----------|------------|
| 1.      | 1.          | Entrepreneurship Development                 | 10        | 12         |
| 2.      | 2.          | Forms of business organization               | 8         | 10         |
| 3.      | 3.          | Institutional support for SSI                | 8         | 10         |
| 4.      | 4.          | Planning a small scale industry              | 10        | 18         |
| 5.      | 5.          | Management of small business firms           | 8         | 12         |
| 6.      | 6.          | Project selection, formulation and appraisal | 12        | 10         |
| 7.      | 7.          | Problems of small industries                 | 12        | 12         |
| 8.      | 8.          | Entrepreneurial motivation training          | 12        | 10         |
|         |             | <b>Total</b>                                 | <b>80</b> | <b>100</b> |

## H) DETAILED COURSE CONTENTS:

### CHAPTER-1 Entrepreneurial Development

- Definition of entrepreneurship,
- Characteristics of entrepreneurs,
- Factors influencing entrepreneurship,
- Need for promotion of entrepreneurship and small business
- Entrepreneurial Environment
- Environmental analysis.
- Government policies for setting up new small enterprises
- Opportunities in service industries.

### CHAPTER – 2 Forms of Business Organization

- Forms of ownership
- Sole Proprietorship
- Partnership
- Cooperative society
- Joint – stock company
- Private Limited Companies
- Public Limited Companies

### CHAPTER – 3 Institutional support to SSI

- Institutional set up

- Industries centers,
- Industrial estates
- Institutional support at National level
- Institutional support at State level
- Commercial banks and financial institutions

#### **CHAPTER – 4 Planning a SSI**

- What is planning?
- Types of planning
- Importance of planning
- Steps in planning
- Steps in planning a SSI
- Technical dimensions for setting up an enterprise

#### CHAPTER-5 Management of Small Business Firm

- Functional areas of small business firm
- Fundamentals of Management
- Managerial effectiveness
- Essential data for effective control of small business
- Resource management
- Office management
- Employees Welfare & safety
- Factory rules and Labour Laws related to SSIs
- Sales Tax and Income Tax laws related to SSIs

#### CHAPTER-6 Project selection, Formulation & Appraisal

- Project selection & formulation
- Scope of project report
- Content & Format of Project report
- Need of Project Appraisal
- Steps of Project Appraisal

#### CHAPTER-7 Problems of Small industries

- Power shortages
- Project planning
- Finance
- Raw material
- Production constraints
- Marketing
- Personal constraints

- Regulations

CHAPTER-8 Entrepreneurial Motivation Training

- Achievement Motivation
- Creative thinking
- Risk taking abilities

**D) SUGGESTED INSTRUCTIONAL STRATEGIES:**

- **Lecture Method.**
- **Industrial visits.**
- **Simulation**
- **Role play**
- **Interaction with successful entrepreneurs**
- **Demonstration.**
- **Games**

**J) SUGGESTED LEARNING RESOURCES:**

**(a) Reference Books :**

| <b>Sl. No.</b> | <b>Title</b>  | <b>Author, Publisher, Edition &amp; Year</b>             |
|----------------|---|--|
| 1.             | Starting your own Business, A step-by-step Blue print for the First-time Entrepreneur         | Stephen C. Harper, Mc Craw-Hill                          |
| 2.             | Harward Business Review on Entrepreneurship   | Harvard Business School Press                            |
| 3.             | Entrepreneurship Development in small scale proceedings of National Seminar, DCSSI, New Delhi | Patel V.G.   |
| 4.             | Entrepreneurship : Strategies & Resources   | Abrams Grant Pass, Oregon: Oasis Press                   |
| 5.             | The Business Planning Guide   | David H. Bangs<br>Upstart Publishing Company, In Chicago |
| 6.             | Entrepreneurship development in India   | Dr. C.B. Gupta<br>Dr. N.P. Srinivasan                    |

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**LIST OF TEAM WORK**

Team Work will consist of collecting following information by the students:

1. Collect State industrial policy
2. Report of interaction with successful entrepreneurs/industrial visits
3. Prepare list of opportunities for business, service and industrial ventures
4. Whom to approach for What?
5. Facilities and incentives available from various support agencies

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL  
UNIVERSITY, BHILAI**

- A) SEMESTER : VI  
 B) SUBJECT TITLE : INDUSTRIAL TRAINING  
 C) CODE : 239623 (39)  
 D) BRANCH/DISCIPLINE : MINING AND MINE SURVEYING  
 E) RATIONALE:

Industrial Training is one of the most essential components for a diploma graduate in Mining and Mine Surveying. The sole purpose of industrial training is to expose the students to “real life” situations. Different aspect of mining such as geology, exploration, selection of method of working, selection of machines for mining, environmental controls and measures, safety in mines and various statutory provisions can only be understood when the students are exposed to different mine workings. Students will cover different coal and metal mines both underground and opencast in such a way that at the end of the completion of diploma programme, they are conversant with different mining conditions. Industrial training also opens avenues of new learning to the students and apply them during their project and industrial training presentations.

F) TEACHING AND EXMINATION SCHEME:

| Course Code    | Periods/Week<br>(In Hours) |   |   | Scheme of Examination |    |    |           |    |             | Credit<br><br>L+(T+P)/2 |
|----------------|----------------------------|---|---|-----------------------|----|----|-----------|----|-------------|-------------------------|
|                | L                          | T | P | Theory                |    |    | Practical |    | Total Marks |                         |
| 239623<br>(39) |                            |   |   | ESE                   | CT | TA | ESE       | TA |             |                         |
|                | -                          | - | 1 | -                     | -  | -  | 50        | 40 | 90          | 1                       |

**Note:** Student will undergo on industrial practical training for 2 months after/before end of semester examination

L : Lecture hours : T : Tutorial hours, P : Practical hours



ESE – End of Semester Exam.; CT – Class Test; TA- Teacher’s Assessment of the Training Report.

**G) DISTRIBUTION OF MARKS AND DURATION:**

| <b>Sl. No.</b> | <b>Items</b>                          | <b>Duration</b> | <b>Marks</b> |
|----------------|---------------------------------------|-----------------|--------------|
| 1              | <i>Preparation of report format</i>   | 2 Hrs           | 15           |
| 2              | Industrial Training                   | 08 Weeks        | 20           |
| 3              | Report Writing                        | 01 week         | 15           |
| 4              | Report Presentation                   | -               | -            |
| 5              | Seminar                               | -               | 20           |
| 6              | End of the semester exam<br>viva voce | -               | 20           |
| <b>TOTAL</b>   |                                       | <b>09 Weeks</b> | <b>90</b>    |

Before going for training, the students will prepare various formats for data collection based on the topic of training assigned to them. The students will be given specific assignments for the period of training. During the course of training students will complete weekly report, assignments and keep weekly attendance updated. On completion of training each student will submit a report of training and make a presentation before the group of students. Teacher assessment will be done during the training, on presentation of training and at the end of semester examination. A seminar will be organized on specific topics identified by the teacher and the students will present their experiences earned during the training on the specific tasks. End of the semester examination will be an external exam.