

IIPM SCHOOL OF ENGINEERING AND TECHNOLOGY

*LESSON PLAN: 2023-24*

**Sub : MINING SURVEY-1 (Th-2)**

**Faculty name : Deeptikant Sharma**

**Branch : Mining Engineering**

**Semester : 3rd SEM**

**Duration : 60 hours**

**SYLLABUS: -**

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| **UNIT – 1** | **Chain Survey**  o Give survey conventional signs, abbreviation used.  o Give standards of lining, inking and coloring.  o Describe selection of scales used.  o Explain principle of chain surveying.  o Describe instruments used and checking their correctness.  o Explain ranging and chaining of a line.  o Calculate errors in chaining.  o Explain obstruction while chaining.  o Describe chaining along a sloping ground.  o Describe use of optical square and line range and checking optical square for correctness.  o Describe offsets and their measurements.  o Give reference sketches of stations.  o Give procedure of chain surveying.  o Explain field booking and plotting of chain survey. |
| **UNIT - 2** | **Compass Survey**  o Describe prismatic compass, its adjustments and use.  o Explain true meridians, magnetic meridian, grid line meridian and arbitrary meridian.  o Explain W.C.B. and Q.B. and conversion from one to other  Find out fore and back bearing and their conversion.  Compute angles from bearing and bearing angles  o Define local alteration  Determine local alteration and necessary correction to the bearing.  o Explain closed and open compass surveying and its plotting.  o Give procedure of field booking in compass and chain traverses.  o Explain adjustment of closing error in compass traversing.  o Describe surveyor compass(miner’s dial),its adjustment and use  o Compare prismatic compass with surveyor compass. |
| **UNIT – 3** | **Plane Table Survey.**  o Fundamentals of Plane Table Survey.  o Explain two point problems.  o Explain three point problems and its solution by tracing paper method.  o Describe advantages and disadvantages of plane table. |
| **UNIT – 4** | **Computation of areas**  o Explain methods of determining areas.  o Find out areas from offset to a base line using  Mid ordinate rule  Average ordinate rule  Trapezoidal rule  Simpson’s rule  o Compute area by Planimeter and from graph paper. |
| **UNIT – 5** | **Leveling**  o Define benchmark M.S.L. Dumpy level.  o Adjust dumpy level, modern levels (Auto Level & etc.), and precise staff.  o Describe methods of leveling- Rise & fall method, height of instrument.  o Errors in ordinary leveling.  o Explain reciprocal leveling, subsidence leveling, setting out gradient, trigonometric leveling, geometrical leveling, and physical leveling. |
| **UNIT – 6** | **Calculation of Ore Reserves**  o Classify reserves.  o Evaluate reserves by exploratory .  o Calculate primary ore reserve by material balance method & decline curve method. |
| **UNIT – 7** | **Theodolite**  o Describe temporary and permanent adjustment of Theodolite.   Describe the principles of operation & describe different parts.  o Measure Horizontal & Vertical angles.  o Describe setting of the instrument.  o Explain Traversing with Theodolite. |

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| **SI NO** | **AUTHOR** | **TITEL OF BOOK** |
| **1** | B.C. PUNMIA VOL I & II | Textbook of Surveying |
| **2** | T.P KANETKAR | Textbook of Surveying |
| **3** | NN BASAK | Textbook of Surveying |

**OBJECTIVE: -**

The primary objective of surveying is to prepare a map to show the respective positions of the points of objects located on the surface of the earth which is then used for the preparation of plans of different construction works such as buildings, roads, railways, canals, etc.. The map is prepared on a suitable scale

**Learning Outcome:**

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| **Sl.No** | **Chapter** | **Proposed Week for Teaching** | **Lecture No.** | **Sub. Topic** | **Important Teaching Points** | **Content Source** |
| 1 | I | 1 | 1 | Chain Survey | Introduction  Definition of surveying Aim and objectives of surveying  Classification of surveying | NN BASAK PG NO-1 |
| 2 | 2 | Chain Survey | Primary classification Secondary calcination Plane surveying  Geodetic surveying | NN BASAK PG NO-2 |
| 3 | 3 | Chain Survey | Secondary classification  Based on instrument Based on method Based on objects Based on nature of  field | NN BASAK PG NO-2,3 |
| 4 | 4 | Chain Survey | Principle of surveying According to the first principal  According to second principal  Methods of linear  measurement | NN BASAK PG NO-3,4 |
| 5 |  |  | 1 | Chain Survey | Accessories for linear measurement | NN BASAK PG NO-7,8,9 |

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|  | I | 2 |  |  | Ranging rod Types of chain Steel band Engineers chain Gunter chain  Revenue chain |  |
| 6 | 2 | Chain Survey | unfolding of chain folding of chain testing of a chain *adjustment of chain*  Chaining on Level Ground:  Chaining on Sloping Ground:  Direct Method indirect method | NN BASAK PG NO- 12,13,14,15  16 |
| 7 | 3 | Chain Survey | Applying hypotenuse allowance  Chaining obstructed but vision free: Chaining and vision both obstructed: | NN BASAK PG NO- 18,19,20,21 |
| 8 | 4 | Chain Survey | Definition: Principle of Chain Surveying  Well-Conditioned Triangle: Conditioned Triangle  ERRORS IN LINEAR MEASUREMENTS CHAINING | NN BASAK PG NO-  NN BASAK PG NO- 54,55,56,57 |
| 9 | I  & II | 3 | 1 | Chain Survey | Chain and tape correction Problems on chain | NN BASAK PG NO- 22,23,24,25,  26,27 |
| 10 | 2 | Chain Survey | Procedure of piloting  Single-Line Field Book  Double-Line Field Book | NN BASAK PG NO-60 to 72 |
| 11 | 3 | Compass Survey | Introduction true meridian:  magnetic meridian  arbitrary meridian: grid meridian: | NN BASAK PG NO-80,81 |
| 12 | 4 | Compass Survey | designation of bearings  whole circle bearing (w.c.b)  quadrantal bearing (qcb) | NN BASAK PG NO-81, 82, |

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| 13 | II | 4 | 1 | Compass Survey | Convert the following WCBs to RBs Convert the following RBs to WCBs.  fore and back bearings | NN BASAK PG NO-93 |
|  | 2 | Compass Survey | Back Bearings: Back Bearing=Fore Bearing  Calculation of Included Angles from Bearings Calculation of Bearings from Included Angles the main parts of a  prismatic compass | NN BASAK PG NO- 83,84,91,92 |
| 14 | 3 | Compass Survey | Principle of compass surveying  Traverse Closed traverse Open traverse  Methods of traversing | NN BASAK PG NO- 86,87,88,89 |
| 15 | 4 | Compass Survey | Problems on above | NN BASAK PG NO- 94,97,98,99, |
| 16 | II  & III | 5 | 1 | Compass Survey | Problems on above | NN BASAK PG NO-  100’101,102,103 |
| 17 |  | Compass Survey | Problems on above | Previous year question |
| 18 | 2 | Plane Table Survey | Definition Objectives of plain table surveying  Principle of plain table surveying | NN BASAK PG NO-126,&  notes |
| 19 | 3 | Plane Table Survey | Accessories of plane table | NN BASAK PG NO 126,127, |
| 20 | 4 | Plane Table Survey | Accessories of plane table | NN BASAK PG NO-128,129 |
| 21 | III | 6 | 1 | Plane Table Survey | Procedure of setting up plane table over a station | NN BASAK PG NO- 131, |
| 22 | 2 | Plane Table Survey | Methods Of Plane Table | NN BASAK PG NO- 132,133 |
| 23 | 3 | Plane Table Survey | Methods Of Plane Table | NN BASAK PG NO-  134,135,136,137  138,139 |

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| 24 |  |  | 4 | Plane Table Survey | Errors and Precautions | NN BASAK PG NO-  140 |
| 25 | III III |  | 1 | Plane Table Survey | Solve question | NN BASAK PG NO- 143,144 |
| 26 | 2 | COMPUTATION OF AREA | Introduction: Methods for computation of area | NN BASAK PG NO- |
| 27 | 3 | COMPUTATION OF AREA | Calculation of area from Graphical method | NN BASAK PG NO- |
| 28 | 4 | COMPUTATION OF AREA | average ordinate rule mid ordinate rule trapezoidal rule | NN BASAK PG NO- |
| 29 | III  & IV | 7 | 1 | COMPUTATION OF AREA | average ordinate rule problem on average | NN BASAK PG NO- |
| 30 | 2 | COMPUTATION OF AREA | mid ordinate rule problem on mid ordinate | NN BASAK PG NO- |
| 31 | 3 | COMPUTATION OF AREA | trapezoidal rule problem on trapezoidal | NN BASAK PG NO- |
| 32 | 4 | COMPUTATION OF AREA | Solve model Question | NN BASAK PG NO- |
| 33 | IV | 8 | 1 | COMPUTATION OF AREA | Solve model Question | NN BASAK PG NO- |
| 34 | 2 | Leveling | Purpose of leveling Level Surface: Horizontal Plane/surface Vertical Plane/surface | NN BASAK PG NO- 146,147 |
| 35 | 3 | Leveling | Datum Surface or Line Reduced Level (R.L): Bench Mark | NN BASAK PG NO- 147, 148,149 |
| 36 | 4 | Leveling | Explain bs,fs,is,cp,hi, | NN BASAK PG NO- 149,150 |
| 37 |  |  | 1 | Leveling | Different types of level | NN BASAK PG NO- 150,151 |

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| 38 | IV  & V | 9 | 2 | Leveling | Description of dumpy level | NN BASAK PG NO- 151,152,153 |
| 39 | 3 | Leveling | Description of dumpy level | NN BASAK PG NO-  154,155 |
| 40 | 4 | Leveling | Temporary adjustment of level | NN BASAK PG NO- 156,157 |
| 41 | V | 10 | 1 | Leveling | Types of levelling operation | NN BASAK PG NO- 157,158,159 |
| 42 | 2 | Leveling | Types of Correction | NN BASAK PG NO-  161 |
| 43 | 3 | Leveling | Problem on  Ri & hi method | NN BASAK PG NO-  181,182,183,184 |
| 44 | 4 | **Calculation of Ore Reserves** | introduction | Internet & personal note |
| 45 | V | 11 | 1 | **Calculation of Ore Reserves** | Classify reserves. | Internet & personal note |
| 46 | 2 | **Calculation of Ore Reserves** | Polygonal method Triangular method Cross section method  Inverse Distance method | Internet & personal note |
| 47 | 3 | **Calculation of Ore Reserves** | Inverse Distance Method | Internet & personal note |
| 48 | 4 | **Calculation of Ore Reserves** | Evaluate reserves by exploratory. | Internet & personal note |
| 49 |  |  | 1 | **Calculation of Ore Reserves** | Calculate primary ore reserve by material balance method & decline curve method. | Internet & personal note |

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| 50 | VI | 12 | 2 | **Calculation of Ore Reserves** | Calculation | Internet & personal note |
| 51 | 3 | **Calculation of Ore Reserves** | Calculation | Internet & personal note |
| 52 | 4 | **Theodolite** | Introduction  Theodolite | NN BASAK 53PG NO-  54 |
| 53 | VI | 13 | 1 | **Theodolite** | Describe temporary adjustment of Theodolite. | NN BASAK PG NO |
| 54 | 2 | **Theodolite** | permanent adjustment of Theodolite. | NN BASAK PG NO |
| 55 | 3 | **Theodolite** | Describe the principles of operation | NN BASAK PG NO |
| 56 | 4 | **Theodolite** | describe different parts. | NN BASAK PG NO |
| 57 | VI | 14 | 1 | **Theodolite** | Measure Horizontal & Vertical angles. | NN BASAK PG NO |
| 58 | 2 | **Theodolite** | Describe setting of the instrument. | NN BASAK PG NO |
| 59 | 3 | **Theodolite** | Explain Traversing with Theodolite. | NN BASAK PG NO |
| 60 | 4 | **Theodolite** | Calculation | NN BASAK PG NO |

**Text book suggested : N N BASAK & PERSONAL NOTES**

Signature of

Faculty Member HOD Principal/ Director