

| JHARSUGUDA ENGINEERING SCHOOL, JHARSUGUDA | | | |
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| DEPARTMENT OF CIVIL ENGINEERING | | | |
| LESSON PLAN | | | |
| Semester: 4th | | Subject: Land Survey-I | |
| Session: 2021-2022 (Summer-2022) | | Theory | |
| Branch: Civil Engineering | | Name of the Faculty: Mr. Niranjan Jena | |
| Period | Chapter | Topic to be Covered | Remarks |
| 1 | 1 | Surveying: Definition, Aims and objectives | |
| 2 | | Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying | |
| 3 | | Precision and accuracy of measurements, | |
| 4 | | Instruments used for measurement of distance, Types of tapes and chains | |
| 5 | | Errors and mistakes in linear measurement – classification, Sources of errors and remedies | |
| 6 | | Corrections to measured lengths due to-incorrect length, temperature variation | |
| 7 | | Pull, sag, numerical problem applying corrections | |
| 8 | 2 | Equipment and accessories for chaining, Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging | |
| 9 | | Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction | |
| 10 | | Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles | |
| 11 | | Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines | |
| 12 | | Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square | |
| 13 | | Errors in chain surveying – compensating and accumulative errors causes & remedies | |
| 14 | | Precautions to be taken during chain surveying | |
| 15 | | Measurement of angles with chain, tape & compass | |
| 16 | | Compass – Types, features, parts, merits & demerits, testing & adjustment of compass | |
| 17 | | Designation of angles- concept of meridians – Magnetic, True, arbitrary; Concept of bearings – Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application | |
| 18 | | Numerical problems on conversion of bearings | |
| 19 | | Use of compasses – setting in field-centering, leveling, taking readings, concepts of Fore bearing, Back Bearing | |
| 20 | | Numerical problems on computation of interior & exterior angles from bearings | |
| 21 | | Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination | |

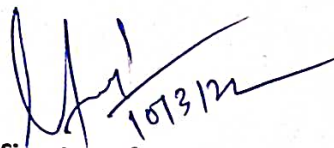
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| 22 | | Errors in angle measurement with compass – sources & remedies | |
| 23 | | Principles of traversing – open & closed traverse, Methods of traversing | |
| 24 | | Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction | |
| 25 | | Errors in compass surveying – sources & remedies | |
| 26 | 3 | Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table | |
| 27 | | Study of direction, Scale, Grid Reference and Grid Square | |
| 28 | | Study of Signs and Symbols | |
| 29 | | Cadastral Map Preparation Methodology | |
| 30 | | Unique identification number of parcel | |
| 31 | | Positions of existing Control Points and its types | |
| 32 | | Adjacent Boundaries and Features | |
| 33 | 4 | Topology Creation and verification | |
| 34 | | Objectives, principles and use of plane table surveying | |
| 35 | | Instruments & accessories used in plane table surveying | |
| 36 | | Methods of plane table surveying – (1) Radiation, (2) Intersection | |
| 37 | | (3) Traversing, (4) Resection | |
| 38 | | Statements of TWO POINT and THREE POINT PROBLEM | |
| 39 | | Errors in plane table surveying and their corrections | |
| 40 | 5 | Precautions in plane table surveying | |
| 41 | | Purpose and definition of theodolite surveying | |
| 42 | | Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite | |
| 43 | | concept of vernier, reading a vernier, Temporary adjustment of theodolite | |
| 44 | | Concept of transiting –Measurement of horizontal and vertical angles | |
| 45 | | Measurement of magnetic bearings, deflection angle, direct angle, setting out angles | |
| 46 | | Prolonging a straight line with theodolite, Errors in Theodolite observations | |
| 47 | | Methods of theodolite traversing with – inclined angle method, deflection angle method, bearing method | |
| 48 | | Plotting the traverse by coordinate method, Checks for open and closed traverse | |
| 49 | | Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table | |
| 50 | | Numerical problems on omitted measurement of lengths & bearings | |
| 51 | | Closing error – adjustment of angular errors | |
| 52 | | Adjustment of bearings, numerical problems 6.8 Balancing of traverse – Bowditch's met | |
| 53 | | Balancing of traverse – Bowditch's method, transit method | |
| 54 | | Graphical method, axis method | |
| 55 | 6 | Calculation of area of closed traverse | |

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| 56 | | Definition and Purpose and types of leveling– concepts of level surface, Horizontal surface, vertical surface, datum, R. L., B.M | |
| 57 | | Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis | |
| 58 | | Levelling staff – Temporary adjustments of level, taking reading with level, concept of bench mark, BS, IS, FS, CP, HI | |
| 59 | | Field data entry – level Book – height of collimation method and Rise & Fall method, comparison | |
| 60 | | Numerical problems on reduction of levels applying both methods, Arithmetic checks | |
| 61 | | Effects of curvature and refraction, numerical problems on application of correction | |
| 62 | | Reciprocal leveling – principles, methods, numerical problems, precise leveling | |
| 63 | | Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels | |
| 64 | | Definitions, concepts and characteristics of contours | |
| 65 | | Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets | |
| 66 | | Use of contour maps on civil engineering projects – drawing crosssections from contour maps, locating proposal routes of roads / railway / canal on a contour map | |
| 67 | | computation of volume of earthwork from contour map for simple structure | |
| 68 | | Map Interpretation: Interpret Human and Economic Activities (i.e.: Settlement, Communication, Land use etc.) | |
| 69 | | Interpret Physical landform (i.e.: Relief, Drainage Pattern etc.) | |
| 70 | 7 | Problem Solving and Decision Making | |
| 71 | | Determination of areas, computation of areas from plans | |
| 72 | | Calculation of area by using ordinate rule | |
| 73 | | Trapezoidal rule, Simpson's rule | |
| 74 | | Calculation of volumes by prismoidal formula and trapezoidal formula | |
| 75 | 8 | Prismoidal corrections, curvature correction for volumes | |



Signature of Faculty Member

Date: 10/03/2022



Counter Signature of H.O.D.