ENGINEERING, CUTTACK

DEPARTMENT OF CIVIL ENGINEERING



LESSON PLAN

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| SUBJECT: LAND SURVEYING I (TH 3) | ACCADEMIC SESSION: 2021-22 |
| FACULTY: SRI ABINASH PANDA | SEMESTER: 4TH |
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| H O D (Civil Engg.) |

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| **Descipline**  Civil engineering | **Semester- 4th** | | |  |  | | --- | --- | | NAME OF THE TEACHING FACULTY | **ABINASH PANDA** | |
| Subject  LAND SURVEY-1 | **No of Days / per week class allotted :05 period per week**  Monday-1p,Thurs -2p, Friday-2p | | **Semester starts from date -10/03/2022 to date 10/06/2022**  **No of weeks : 14 weeks** |
| **Week** | **Class date** | **No of period available** | **Topics to be covered** |
| 1st | 10/03/2022 | 2 | **INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS: 1.1.**Surveying: Definition, Aims andobjectives  1.2.Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying. |
| 11/03/2022 | 2 | **1.3.** Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes andchains. |
| 2nd | 14/03/2022 | 1 | 1.4.Errors and mistakes in linear measurement – classification, Sources of errors andremedies. |
| 17/03/2022 | 2 | 1.5.Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applyingcorrections |
| 3rd | 21/03/2022 | 1 | 2.0.CHAININGAND CHAIN SURVEYING: 2.1.Equipment and accessories forchaining |
| 24/03/2022 | 2 | 2.2.Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrectranging. |
| 25/03/2022 | 2 | 2.3.Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slopecorrection.  2.4.Setting perpendicular with chain & tape, Chaining across different typesof obstacles –Numerical problems on chaining acrossobstacles |
| 4th | 28/03/2022 | 1 | **Class test 1** |
| 31/03/2022 | 2 | 2.5.Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Checklines.  2.6.Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square |
| 5th | 04/04/2022 | 1 | 2.7.Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chainsurveying **3.0.ANGULAR MEASUREMENT AND COMPAS SURVEYING 3.1.**Measurement of angles with chain, tape &compass |
| 07/04/2022 | 2 | **3.0.ANGULAR MEASUREMENT AND COMPAS SURVEYING 3.1.**Measurement of angles with chain, tape &compass 3.2.Compass – Types, features, parts, merits & demerits, testing & adjustment ofcompass |
| 08/04/2022 | 2 | 3.3. Designation of angles- concept of meridians – Magnetic, True, arbitrary; Concept of bearings – Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application |
| 6th | 11/04/2022 | 1 | 3.3.numerical problems on conversion of bearings |
| 7TH | 18/04/2022 | 1 | 3.4.Use of compasses – setting in field-centering, leveling, taking readings, concepts of Fore bearing, Back Bearing, Numerical problems on computation of interior & exterior angles frombearings.  3.5.Effects of earth’s magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction fordeclination |
| 21/04/2022 | 2 | 3.6.Errors in angle measurement with compass – sources &remedies.  3.7.Principles of traversing – open & closed traverse, Methods oftraversing.  3.8.Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to localattraction. |
| 22/04/2022 | 2 | 3.9Errors in compass surveying – sources &remedies.  Plotting of traverse – check of closing error in closed & open traverse, Bowditch’s correction, Gales table |
| 8TH | 25/05/2022 | 1 | CLASS TEST2 |
| 28/04/2022 | 2 | 4.0.MAP READING CADASTRAL MAPS & NOMENCLATURE:4.1.Study of direction, Scale, Grid Reference and Grid Square Study of Signs andSymbols 4.2.Cadastral Map PreparationMethodology  4.3.Unique identification number ofparcel |
| 29/04/2022 | 2 | 4.4.Positions of existing Control Points and itstypes  4.5.Adjacent Boundaries and Features, Topology Creation andverification |
| 9TH | 02/05/2022 | 1 | 5.0.PLANE TABLE SURVEYING: 5.1.Objectives, principles and use of plane tablesurveying.  Instruments & accessories used in plane tablesurveying |
| 05/05/2022 | 2 | **5.2.** Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4)Resection  5.3.Statements of TWO POINT and THREE POINTPROBLEM.  Errors in plane table surveying and their corrections, precautions in plane table surveying |
| 06/05/2021 | 2 | 6.0.THEODOLITE SURVEYING ANDTRAVERSING: 6.1.Purpose and definition of theodolitesurveying  6.2. Transit theodolite- Description of features, component parts |
| 10TH | 09/05/2022 | 1 | **INTERNAL TEST** |
| 12/05/2022 | 2 | 6.2. , Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment oftheodolite 6.3.Concept of transiting –Measurement of horizontal and verticalangles. |
| 13/05/2022 | 2 | 6.4.Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations |
| 11TH | 19/05/2022 | 2 | 6.5.Methods of theodolite traversing with – inclined angle method, deflection angle method, bearing method, Plotting the traverse by coordinate method, Checks for open and closedtraverse6.6Traverse computation – consecutive coordinates, latitude and departure, Gale’s traverse table, Numerical problems on omitted measurement of lengths & bearings. |
| 20/05/2022 | 2 | 6.7.Closing error – adjustment of angular errors, adjustment of bearings, numericalproblems6.8.Balancing of traverse – Bowditch’s method, transit method, |
| 12TH | 23/05/2022 | 1 | CLASS TEST 3 |
| 26/05/2022 | 2 | 6.8.graphical method, axis method, calculation of area of closed traverse |
| 27/05/2022 | 2 | 7.0. LEVELLING AND CONTOURING: 7.1.Definition and Purpose and types of leveling– concepts of level surface, Horizontal surface, vertical surface, datum, R. L.,B.M. 7.2. Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Verticalaxis. |
| 13TH | 02/06/2022 | 2 | 7.3.Levelling staff – Temporary adjustments of level, taking reading withlevel, concept of bench mark, BS, IS, FS, CP,HI.  7.4.Field data entry – level Book – height of collimation method and Rise & Fall method, comparison, Numerical problems on reduction of levels applying both methods, Arithmeticchecks |
| 03/06/2022 | 2 | 7.5.Effects of curvature and refraction, numerical problems on application of correction. 7.6.Reciprocal leveling – principles, methods, numerical problems, precise leveling .  7.7.Errors in leveling and precautions, Permanent and temporary adjustmentsof different types oflevels  7.8.Definitions, concepts and characteristics of contours |
| 14TH | 06/06/2022 | 1 | 7.9.Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets.  7.10.Use of contour maps on civil engineering projects – drawing cross- sections from contour maps, locating proposal routes of roads / railway / canal on a contour map, computation of volume of earthwork from contour map for simplestructure.  7.11.Map Interpretation: Interpret Human and Economic Activities (i.e.: Settlement, Communication, Land use etc.), Interpret Physical landform (i.e.: Relief, Drainage Pattern etc.), Problem Solving and DecisionMaking |
| 09/06/2022 | 2 | 8.0**. COMPUTATION OF AREA &VOLUME:**8.1.Determination of areas, computation of areas fromplans.8.2.Calculation of area by using ordinate rule, trapezoidal rule, Simpson’srule 8.3.Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction forvolumes |
| 10/06/2022 | 2 | Revision and previous year question |