BHUBANANANDA ODISHA SCHOOL OF ENGINEERING ,CUTTACK

DEPARTMENT OF CIVIL ENGINEERING

LESSON PLAN

SUBJECT : Survey-1

TOTAL NO OF WEEK: 15

SEMESTER: 4th

CLASS ALLOTTED PER WEEK :05

TOTAL PERIOD: 69

NAME OF TEACHING FACULTY: **PITABAS MISHRA**

SESSION- **2020-21(SUMMER)**

Weeks	Date /No of periods available		Topic to be covered	Topic actually covered	Shortfall if any	Reason of shortfall	How to make up	Remarks
1st	20/04/2021	2	**1.INTRODUCTION** 1.1 Surveying: Definition, Aims and objective 1.2 Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying 1.3 Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains.	**1.INTRODUCTION** 1.1 Surveying: Definition, Aims and objective 1.2 Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying 1.3 Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains.				
	23/04/2021	2	1.4 Errors and mistakes in linear measurement – classification, Sources of errors and remedies 1.5 Corrections to measured lengths due to-incorrect length, temperature variation.	1.4 Errors and mistakes in linear measurement – classification, Sources of errors and remedies 1.5 Corrections to measured lengths due to-incorrect length, temperature variation.				
2nd	27/04/2021	2	pull, sag, numerical problem applying corrections. **2-CHAINING AND CHAIN SURVEYING** 2.1 Equipment and accessories for chaining	pull, sag, numerical problem applying corrections.	**2-CHAINING AND CHAIN SURVEYING** 2.1 Equipment and accessories for chaining			

	28/04/2021	1	2.2 Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging. 2.3 Methods of chaining –Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction.	**2-CHAINING AND CHAIN SURVEYING** 2.1 Equipment and accessories for chaining 2.2 Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging.	2.3 Methods of chaining – Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction.			
	30/04/2021	2	2.4 Setting perpendicular with chain & tape, Chaining across different types of obstacles –Numerical problems on chaining across obstacles. 2.5 Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines.	2.3 Methods of chaining – Chaining on flat ground, Chaining on sloping ground – stepping method, Clinometer-features and use, slope correction. 2.4 Setting perpendicular with chain & tape, Chaining across different types of obstacles – Numerical problems on chaining across obstacles.	2.5 Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines.			
3rd	04/05/2021	2	2.7 Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square. 2.8 Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying. **3 ANGULAR MEASUREMENT AND COMPAS SURVEYING :** 3.1 Measurement of angles with chain, tape & compass 3.2 Compass – Types, features, parts, merits & demerits, testing & adjustment of compass	2.5 Purpose of chain surveying, Its Principles, concept of field book. Selection of survey stations, base line, tie lines, Check lines. 2.7 Offsets – Necessity, Perpendicular and Oblique offsets, Instruments for setting offset – Cross Staff, Optical Square. .	. 2.8 Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying **3 ANGULAR MEASUREMENT AND COMPAS SURVEYING :** 3.1 Measurement of angles with chain, tape & compass 3.2 Compass – Types, features, parts, merits & demerits, testing & adjustment of compass			

	05/05/2021	1	3.3 Designation of angles- concept of meridians – Magnetic, True, arbitrary; Concept of bearings – Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application, numerical problems on conversion of bearings	. 2.8 Errors in chain surveying – compensating and accumulative errors causes & remedies, Precautions to be taken during chain surveying	**3 ANGULAR MEASUREMENT AND COMPAS SURVEYING :** 3.1 Measurement of angles with chain, tape & compass 3.2 Compass – Types, features, parts, merits & demerits, testing & adjustment of compass 3.3 Designation of angles- concept of meridians – Magnetic, True, arbitrary; Concept of bearings – Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application, numerical problems on conversion of bearings			
	07/05/2021	2	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 from bearing 3.5 Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination.	**3 ANGULAR MEASUREMENT AND COMPAS SURVEYING :** 3.1 Measurement of angles with chain, tape & compass 3.2 Compass – Types, features, parts, merits & demerits, testing & adjustment of compass 3.3 Designation of angles- concept of meridians – Magnetic, True, arbitrary; Concept of bearings – Whole circle bearing, Quadrantal bearing, Reduced bearing, suitability of application, numerical problems on conversion of bearings	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 from bearing . 3.5 Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination.			
4th	11/05/2021	2	3.6 Errors in angle measurement with compass – sources & remedies. 3.7 Principles of traversing – open & closed traverse, Methods of traversing	3.4 Use of compasses – setting in field-centering, leveling, taking readings, concepts of Fore bearing, Back Bearing, Numerical	3.6 Errors in angle measurement with compass – sources & remedies. 3.7 Principles of traversing – open & closed traverse, Methods of			

			3.7 Principles of traversing – open & closed traverse, Methods of traversing. 3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction.	problems on computation of interior & exterior angles from bearing 3.5 Effects of earth's magnetism – dip of needle, magnetic declination, variation in declination, numerical problems on application of correction for declination.	traversing 3.7 Principles of traversing – open & closed traverse, Methods of traversing. 3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction.			
	12/05/2021	1	3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction	3.6 Errors in angle measurement with compass – sources & remedies. 3.7 Principles of traversing – open & closed traverse, Methods of traversing	3.7 Principles of traversing – open & closed traverse, Methods of traversing. 3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction 3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction			
5th	18/05/2021	2	3.9 Errors in compass surveying – sources & remedies. Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table. **4 MAP READING CADASTRAL MAPS & NOMENCLATURE:** 4.1 Study of direction, Scale, Grid Reference and Grid Square Study of Signs and Symbols	3.7 Principles of traversing – open & closed traverse, Methods of traversing. 3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction 3.8 Local attraction – causes, detection, errors, corrections, Numerical problems of application of correction due to local attraction	3.9 Errors in compass surveying – sources & remedies. Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table. **4 MAP READING CADASTRAL MAPS & NOMENCLATURE:** 4.1 Study of direction, Scale, Grid Reference and Grid Square Study of Signs and Symbols			

	19/05/2021	1	4.2 Cadastral Map Preparation Methodology	3.9 Errors in compass surveying – sources & remedies. Plotting of traverse – check of closing error in closed & open traverse, Bowditch's correction, Gales table.	**4 MAP READING CADASTRAL MAPS & NOMENCLATURE:** 4.1 Study of direction, Scale, Grid Reference and Grid Square Study of Signs and Symbols 4.2 Cadastral Map Preparation Methodology			
	21/05/2021	2	4.3 Unique identification number of parcel 4.4 Positions of existing Control Points and its types	**4 MAP READING CADASTRAL MAPS & NOMENCLATURE:** 4.1 Study of direction, Scale, Grid Reference and Grid Square Study of Signs and Symbols 4.2 Cadastral Map Preparation Methodology	4.3 Unique identification number of parcel 4.4 Positions of existing Control Points and its types			
6th	25/05/2021	2	4.5 Adjacent Boundaries and Features, Topology Creation and verification. **5 PLANE TABLE SURVEYING :** 5.1 Objectives, principles and use of plane table surveying.	4.3 Unique identification number of parcel 4.4 Positions of existing Control Points and its types	4.5 Adjacent Boundaries and Features, Topology Creation and verification. **5 PLANE TABLE SURVEYING :** 5.1 Objectives, principles and use of plane table surveying.			
	26/05/2021	1	5.2 Instruments & accessories used in plane table surveying	4.5 Adjacent Boundaries and Features, Topology Creation and verification.	**5 PLANE TABLE SURVEYING :** 5.1 Objectives, principles and use of plane table surveying. 5.2 Instruments & accessories used in plane table surveying			

	28/05/2021	2	5.3 Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection.	**5 PLANE TABLE SURVEYING :** 5.1 Objectives, principles and use of plane table surveying. 5.2 Instruments & accessories used in plane table surveying	5.3 Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection.			
7th	01/06/2021	2	5.4 Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying. 6 THEODOLITE SURVEYING AND TRAVERSING: 6.1 Purpose and definition of theodolite surveying	5.3 Methods of plane table surveying – (1) Radiation, (2) Intersection, (3) Traversing, (4) Resection.	5.4 Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying. 6 THEODOLITE SURVEYING AND TRAVERSING: 6.1 Purpose and definition of theodolite surveying			
	02/06/2021	1	6.2 Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite	5.4 Statements of TWO POINT and THREE POINT PROBLEM. Errors in plane table surveying and their corrections, precautions in plane table surveying.	6 THEODOLITE SURVEYING AND TRAVERSING: 6.1 Purpose and definition of theodolite surveying 6.2 Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite			
	04/06/2021	2	6.3 Concept of transiting – Measurement of horizontal and vertical angles. 6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations.	6 THEODOLITE SURVEYING AND TRAVERSING: 6.1 Purpose and definition of theodolite surveying 6.2 Transit theodolite- Description of features, component parts, Fundamental axes of a theodolite, concept of vernier, reading a vernier, Temporary adjustment of theodolite	6.3 Concept of transiting – Measurement of horizontal and vertical angles. 6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations.			

8th	08/06/2021	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 closed traverse.	6.3 Concept of transiting – Measurement of horizontal and vertical angles. 6.4 Measurement of magnetic bearings, deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite, Errors in Theodolite observations.	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 closed traverse.			
	09/06/2021	1	6.6 Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings	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 closed traverse.	6.6 Traverse computation – consecutive coordinates, latitude and departure, Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings			
	11/06/2021	2	6.7 Closing error – adjustment of angular errors, adjustment of bearings, numerical problems	6.6 Traverse computation – consecutive coordinates, latitude and departure,	Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings 6.7 Closing error – adjustment of angular errors, adjustment of bearings, numerical problems			
9th	16/06/2021	1	6.8 Balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation of area of closed traverse	Gale's traverse table, Numerical problems on omitted measurement of lengths & bearings	6.7 Closing error – adjustment of angular errors, adjustment of bearings, numerical problems 6.8 Balancing of traverse – Bowditch's method, transit method, graphical method, axis method, calculation of area of closed traverse			
	18/06/2021	2	7 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,	6.7 Closing error – adjustment of angular errors, adjustment of bearings, numerical problems 6.8 Balancing of traverse – Bowditch's method, transit method, graphical method, axis	7 LEVELLING AND CONTOURING : 7.1 Definition and Purpose and types of leveling– concepts of level surface, Horizontal surface, vertical surface, datum, R. L.,			

			concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis 7.3 Levelling staff – Temporary adjustments of level, taking reading with level, 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, Arithmetic checks	method, calculation of area of closed traverse	B.M. 7.2 Instruments used for leveling, concepts of line of collimation, axis of bubble tube, axis of telescope, Vertical axis 7.3 Levelling staff – Temporary adjustments of level, taking reading with level, 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, Arithmetic checks			
10th	22/06/2021	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 adjustments of different types of levels. 7.6 Reciprocal leveling – principles, methods, numerical problems, precise leveling. 7.7 Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels. 7.8 Definitions, concepts and characteristics of contours. 7.9 Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets. 7.10 Use	7 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, Vertical axis	7.3 Levelling staff – Temporary adjustments of level, taking reading with level, 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, Arithmetic checks 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			

			of contour maps on civil engineering projects – drawing crosssections from contour maps, locating proposal routes of roads / railway / canal on a contour map, computation of volume of earthwork from contour map for simple structure. 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 Decision Making		temporary adjustments of different types of levels. 7.6 Reciprocal leveling – principles, methods, numerical problems, precise leveling. 7.7 Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels. 7.8 Definitions, concepts and characteristics of contours. 7.9 Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets. 7.10 Use of contour maps on civil engineering projects – drawing crosssections from contour maps, locating proposal routes of roads / railway / canal on a contour map, computation of volume of earthwork from contour map for simple structure. 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 Decision Making			
	23/06/2021	1	8 COMPUTATION OF AREA & VOLUME: 8.1 Determination of areas, computation of areas from plans. 8.2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule.	7.3 Levelling staff – Temporary adjustments of level, taking reading with level, 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	7.6 Reciprocal leveling – principles, methods, numerical problems, precise leveling. 7.7 Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels. 7.8 Definitions, concepts and characteristics of contours. 7.9			

				both methods, Arithmetic checks 7.5 Effects of curvature and refraction, numerical problems on application of correction.	Methods of contouring, plotting contour maps, Interpretation of contour maps, toposheets. 7.10 Use of contour maps on civil engineering projects – drawing crosssections from contour maps, locating proposal routes of roads / railway / canal on a contour map, computation of volume of earthwork from contour map for simple structure. 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 Decision Making 8 COMPUTATION OF AREA & VOLUME: 8.1 Determination of areas, computation of areas from plans. 8.2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule. 8.3 Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes.			
	25/06/2021	2	8.3 Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes.	7.6 Reciprocal leveling – principles, methods, numerical problems, precise leveling.	7.7 Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels. 7.8 Definitions, concepts and characteristics of contours 7.9 Methods of contouring, plotting contour maps,			

					Interpretation of contour maps, toposheets. 7.10 Use of contour maps on civil engineering projects – drawing crosssections from contour maps, locating proposal routes of roads / railway / canal on a contour map, computation of volume of earthwork from contour map for simple structure. 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 Decision Making 8 COMPUTATION OF AREA & VOLUME: 8.1 Determination of areas, computation of areas from plans. 8.2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule. 8.3 Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes.			
11th	29/06/2021	2	REVISSION	7.7 Errors in leveling and precautions, Permanent and temporary adjustments of different types of levels	7.8 Definitions, concepts and characteristics of contours 7.9 Methods of contouring, plotting contour maps, 7.10 Use of contour maps on civil engineering projects – drawing crosssections from contour maps, locating			

					proposal routes of roads / railway / canal on a contour map, computation of volume of earthwork from contour map for simple structure. 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 Decision Making 8 COMPUTATION OF AREA & VOLUME: 8.1 Determination of areas, computation of areas from plans. 8.2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule. 8.3 Calculation of volumes by prismoidal formula and trapezoidal formula, Prismoidal corrections, curvature correction for volumes.			
	30/06/2021	1	CLASS TEST	7.8 Definitions, concepts and characteristics of contours 7.9 Methods of contouring, plotting contour maps,	NIL			
12th	02/07/2021	2	7.10 Use of contour maps on civil engineering projects – drawing crosssections from contour maps, locating proposal routes of roads / railway / canal on a contour map, computation of volume of earthwork from contour map for simple structure.	7.10 Use of contour maps on civil engineering projects – drawing crosssections from contour maps, locating proposal routes of roads / railway / canal on a contour map, computation of volume of earthwork from contour map for simple structure. .	NIL			

13th	06/07/2021	2	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 Decision Making	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 Decision Making	NIL			
	07/07/2021	1	8 COMPUTATION OF AREA & VOLUME: 8.1 Determination of areas,	8 COMPUTATION OF AREA & VOLUME: 8.1 Determination of areas,	NIL			
	09/07/2021	2	computation of areas from plans. 8.2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule.	computation of areas from plans. 8.2 Calculation of area by using ordinate rule, trapezoidal rule, Simpson's rule.	NIL			
14th	13/07/2021	2	8.3 Calculation of volumes by prismoidal formula	8.3 Calculation of volumes by prismoidal formula	NIL			
	14/07/2021	1	and trapezoidal formula, Prismoidal corrections, curvature correction for volumes	and trapezoidal formula, Prismoidal corrections, curvature correction for volumes	NIL			
	16/07/2021	2	Revision of chapter 1 & 2	Revision of chapter 1 & 2	NIL			
	20/07/2021	2	Revision of chapter 3 & 4	Revision of chapter 3 & 4	NIL			

15th	23/07/2021	2	Revision of chapter 5 & 6	Revision of chapter 5 & 6	NIL			
16th	27/07/2021	2	Revision of chapter 7	Revision of chapter 7	NIL			
	28/07/2021	1	Revision of chapter 8	Revision of chapter 8	NIL			
	30/07/2021	2	CLASS TEST	CLASS TEST	NIL			