

West Bengal State Council of Technical &
Vocational Education and Skill
Development
(Technical Education Division)



Reduced Draft Syllabus
of
Diploma in Survey Engineering

Part-II (3rd Semester)

Only for Academic Session 2021 - 2022

CURRICULAR STRUCTURE OF DIPLOMA IN SURVEY ENGINEERING

WEST BENGAL STATE COUNCIL OF TECHNICAL & VOCATIONAL EDUCATION AND SKILL DEVELOPMENT

TEACHING & EXAMINATION SCHEME FOR DIPLOMA IN ENGINEERING COURSES

BRANCH: SURVEY

SEMESTER: THIRD

SLNO	CODE	COURSE TITLE	CREDIT	CLASS/WK			EXAMINATION SCHEME						
				L	T	P	INTERNAL			ESE	PIA	PEA	TOTAL
							INT	AS/QZ	ATD				
1	SEPC201	Surveying -I	3	3	-	-	20	10	10	60	-	-	100
2	SEPC203	Surveying -II	3	3	-	-	20	10	10	60	-	-	100
3	SEPC205	Building Construction Practices	2	2	-	-	20	10	10	60	-	-	100
4	SEPC207	Cadastral Survey and Land Laws	2	2	-	-	20	10	10	60	-	-	100
5	SEPC209	Mechanics of Material	2	2	-	-	20	10	10	60	-	-	100
6	SEPC211	Concrete Technology	3	3	-	-	20	10	10	60	-	-	100
7	SEPC213	Field Survey Practices -I	3	-	-	6	-	-	-	-	60	40	100
8	SI201	Internship-I	1	-	-	-	-	-	-	-	100	-	100
TOTAL			19	15	-	6	-	-	-	-	-	-	800

STUDENT CONTACT HOURS PER WEEK: 21 Hrs. Theories and Practical Period of 60 Minutes each.

L –Lecture, T–Tutorial, P –Practical, INT- Internal Assessment, AS/QZ– Assignment /Quiz, ATD- Attendance, ESE – End Semester Exam, PIA- Practical Internal Assessment, PEA-Practical External Assessment.

Name of the Course: Diploma in Survey Engineering			
Course Title: Surveying-I	Course code: SEPC201		
Number of Credit: 3	Semester: THIRD		
Teaching Scheme	Examination Scheme		
Duration:	Maximum Marks: 100		
Theory: -3hrs/week	Continuous Internal Assessment	20 Marks	
Tutorial: -NIL	Attendance	10 Marks	
Practical: NIL	Assignment/Presentation/Quiz	10 Marks	
Total Contact Hours:	End Semester Examination	60 Marks	
Pre-Requisite: Students should have the knowledge of drawing and sketching.			
Aim: Developing the survey skill required for survey engineering			
Course Objective:			
1 To understand types of surveying works required.			
2 To know the types of method and equipment to be used for different surveys.			
3 To know the use and operational details of various surveying equipment.			
Course Content:			
	Content (Theory)	Hrs./Unit	Marks
Unit:1	1.0 Introduction 1.1 Definition and object of surveying. 1.2 Principle of Surveying. 1.3 Classification of surveying. 1.4 Difference between Plane and Geodetic Surveying.		5
Unit:2	2.0 Chain Surveying 2.1 INSTRUMENTS USED IN CHAIN SURVEY: Metric Chain, Tapes, Arrow, Ranging rod, Line ranger, Offset rod, Open cross staff, Optical square. 2.2 Chain survey Station, Base line, Check line, Tie line, Offset, Tie station. 2.3 Ranging: Direct and Indirect Ranging. 2.4 Methods of Chaining, obstacles in chaining. 2.5 ERRORS IN LENGTH: Instrumental error, personal error, error due to natural cause, random error. 2.6 Principles of triangulation. 2.7 Types of offsets: Perpendicular and Oblique. 2.8 Conventional Signs, Recording of measurements in a field book.		10
Unit:3	3.0 COMPASS SURVEYING 3.1 Bearing, designation of bearing, converting whole circle bearing to quadrant bearing & vice-versa. 3.2 Meridians, classification of bearing.		15

	<p>3.3 Azimuth, reduce bearing.</p> <p>3.4 Forebearing, back bearing.</p> <p>3.5 Computation of internal angles from bearing & vice-versa.</p> <p>3.6 Magnetic declination, isogonic lines, agonic lines.</p> <p>3.7 Computation of angles from bearings and bearing from angles and related problems.</p> <p>3.8 Local attraction, detection and elimination of local attraction.</p> <p>3.9 Prismatic Compass, surveyor's compass.</p> <p>3.10 Traversing by compass, closed traverse, open traverse.</p> <p>3.11 Numerical problems</p>		
--	--	--	--

Unit:4	<p>4.0 PLANETABLE SURVEYING</p> <p>4.1 Plane Table, its parts & accessories.</p> <p>4.2 Setting up & orienting the table by back sighting & by magnetic needle.</p> <p>4.3 Various methods of plane table survey by: —</p> <p style="padding-left: 20px;">4.3.1 Radiation method,</p> <p style="padding-left: 20px;">4.3.2 Intersection method or triangulation method,</p> <p style="padding-left: 20px;">4.3.3 Traversing method,</p> <p style="padding-left: 20px;">4.3.4 Resection method,</p> <p>4.4 Three point problems & their solution by tracing paper method.</p> <p>4.5 Advantages & disadvantages of plane table and sources of errors in plane tabling.</p> <p>4.6 Problems on above topics</p>		10
Unit:5	<p>5.0 LEVELLING</p> <p>5.1 Concept of levelling, uses of levelling, Definition of important terms used in levelling.</p> <p>5.2 Datum elevation, vertical angle, mean sea level and benchmark.</p> <p>5.3 Levelling staff.</p> <p>5.4 Tests and adjustments of dumpy level</p> <p>5.5 Details of differential levelling, profile levelling, cross-sectioning & reciprocal levelling.</p> <p>5.6 Methods of booking, calculation of reduced levels & plotting of level sections</p> <p>5.7 Recording and plotting of longitudinal section of an alignment.</p> <p>5.8 Sources of errors in levelling, precautions.</p> <p>5.9 Numerical Problems</p>		10
Unit:6	<p>6.0 TACHEOMETRY</p> <p>6.1 Introduction.</p> <p>6.2 Advantage of Tachometric Survey.</p> <p>6.3 Tachometer.</p> <p>6.4 Basic systems of Tachometric Measurements.</p> <p>6.5 Principle of Stadia Method.</p> <p>6.6 Determination of Tachometric Constants.</p>		10

	6.7 DISTANCE AND ELEVATION FORMULA: Line of sight horizontal — Line of sight inclined. 6.8 Use of Tachometry. 6.9 Sources of error, accuracy of measurement. 6.10 Numerical Problems		
Total			60

TextBooks:-			
Sl. No.	TitlesoftheBook	NameofAuthors	NameofthePublisher
1	SurveyingandLevelling	N Nbasak	TataMcGraw-Hill
2	Surveying and Levelling (Part I)	T.P.Kanetkar&S.V. Kulkarni	PUNEVIDHYARTHI GRIHAPrakashan
3	Surveying and Levelling (Vol.I&II)	Dr.B.C.Punmiya	LaxmiPublication
4	Textbookof Surveying	S.K.Husain,M.S.Nagaraj	S.Chand andcompany
5	SurveyingandLevelling	S. K.Duggal	TATAMCGRAW-HILL
6	PlaneSurveying	Dr.A.M.Chandra	NEWAGEINTERNATION AL
7	Surveying(Vol.I)	Dr.K.R.Arora	STANDARD BOOKHOUSE
8	Fundamentals ofSurveying	S.K.Roy	PHILearning Pvt.Ltd.
Referencebooks:-Nil			
SuggestedList of LaboratoryExperiments:-Nil			
SuggestedListofAssignments/Tutorial:- Nil			

Course outcomes: After completing this course, student will be able to:

1. Select the type of survey required for given situation.
2. Compute area of open field using chain, tape and cross staff.
3. Conducttraversing in the field using chain , compass and Plane Table.
4. Use levelling instruments to determine reduced level for preparation of contour maps
5. Find distances and elevations using Tachometer

Name of the Course: Diploma in Survey Engineering		
Course Title: SURVEYING-II	Course code: SEPC203	
Number of Credit: 3	Semester: THIRD	
Teaching Scheme	Examination Scheme	
Duration:	Maximum Marks: 100	
Theory: -3hrs/week	Continuous Internal Assessment	20 Marks
Tutorial: -NIL	Attendance	10 Marks
Practical: NIL	Assignment/Presentation/Quiz	10 Marks
Total Contact Hours:	End Semester Examination	60 Marks
Pre-Requisite: Students should have the knowledge of drawing and sketching.		
Aim: Developing the survey skill required for survey engineering		
Course Objective:		
1. To understand types of surveying works required.		
2. To know the types of method and equipment to be used for different surveys.		
3. To know the use and operational details of various surveying equipment.		
Course Content:		
Content (Theory)	Hrs./Unit	Marks
Unit:1 1.0 THEODOLITE SURVEY 1.1 Classification of Theodolite, description of Theodolite, function of its different parts. 1.2 Temporary adjustments of the Theodolite. 1.3 Measurement of Horizontal Angles: Repetition method &, Reiteration method 1.4 Measurement of vertical angles. 1.5 Calculation of bearings from angles. 1.6 Traversing with the Theodolite by bearing and included angles. 1.7 Sources of error in Theodolite work. 1.8 Traverse computation 1.9 ADJUSTMENT OF CLOSED TRAVERSE: 1.9.1 Distribution of angular errors; 1.9.2 Balancing the traverse by Bowditch's Rule and transit rule. 1.10 Computation of area of a closed traverse. 1.11 Computation of length and bearing from co-ordinates. 1.12 Missing data problems		15

Unit:2	<p>2.0 COMPUTATION OF AREA & VOLUME</p> <p>2.1 COMPUTATION OF AREA: Area by planimeter—Area computed by map measurement.</p> <p>2.2 COMPUTATION OF VOLUME: Measurement from cross-sections —Prismoidal formula — Trapezoidal formula — Volume from contour plans.</p>		10
Unit:3	<p>3.0 CONTOURING</p> <p>3.1 Basic concept, contour interval.</p> <p>3.2 Characteristics of contour.</p> <p>3.3 Methods of locating contours.</p> <p>3.4 Interpolation & extrapolation of contour.</p> <p>3.5 Contour gradient.</p> <p>3.6 Use of contour maps.</p> <p>3.7 Locating the proposed route for a road on a contour map.</p>		15

Unit-4	<p>4.0 CURVE</p> <p>4.1 Definition of curve.</p> <p>4.2 Classification of curve.</p> <p>4.3 Elements of curve.</p> <p>4.4 Degree of curve.</p> <p>4.5 Relation between radian and degree.</p> <p>4.6 Methods of curve ranging:-</p> <p style="padding-left: 20px;">4.6.1 Location of tangent points.</p> <p style="padding-left: 20px;">4.6.2 Setting out of curve by chain or tape.</p> <p style="padding-left: 20px;">4.6.3 Setting out of curve by ordinates or offsets from long chord.</p> <p style="padding-left: 20px;">4.6.4 Setting out of curve by offsets from tangent.</p> <p style="padding-left: 20px;">4.6.5 Setting out of curve by offsets from chords produced.</p> <p style="padding-left: 20px;">4.6.6 Setting out of curve by deflection angles(Rankine's method).</p> <p style="padding-left: 20px;">4.6.7 Setting out of curve by two theodolites method.</p> <p>4.7 Elements of compound curve.</p> <p>4.8 Problems on simple curve.</p> <p>4.9 Transition curve: - (i)Definition of transition curve,(ii)Super elevation,(iii) Characteristic of transition curves.</p> <p>.</p> <p>4.13 Vertical curves</p> <p>4.14 Characteristic of vertical curve.</p> <p>4.15 Length of vertical curve.</p> <p>4.16 Problem on vertical curve.</p>		20
Total			60

TextBooks:-			
Sl. No.	TitlesoftheBook	NameofAuthors	NameofthePublisher
1	SurveyingandLevelling	N. N. Basak	TataMcGraw-Hill
2	Surveying and Levelling (Part I)	T.P.Kanetkar&S. V. Kulkarni	PUNEVIDHYARTHI GRIHAPrakashan
3	Surveying and Levelling(Vol.I&II)	Dr.B.C.Punmiya	LaxmiPublication
4	Textbookof Surveying	S.K.Husain,M.S.Nagaraj	S.Chand andcompany
5	SurveyingandLevelling	S. K.Duggal	TATAMCGRAW-HILL
6	PlaneSurveying	Dr.A.M.Chandra	NEWAGEINTERNATIONAL
7	Surveying(Vol.I)	Dr.K.R.Arora	STANDARD BOOKHOUSE
8	Fundamentals ofSurveying	S.K.Roy	PHILearning Pvt.Ltd.
Referencebooks:-Nil			
SuggestedList of LaboratoryExperiments:-Nil			
SuggestedListofAssignments/Tutorial:- Nil			

Course outcomes: After completing this course, student will be able to:

1. Select the type of survey required for given situation.
2. Prepare plans using Theodolite surveys.
3. Prepare of contour maps.
4. Use digital planimeter to calculate the areas.

Name of the Course: Diploma in Survey Engineering			
Course Title: Building Construction Practices	Course code: SEPC205		
Number of Credit: 2	Semester: THIRD		
Teaching Scheme	Examination Scheme		
Duration:	Maximum Marks: 100		
Theory: -2hrs/week	Continuous Internal Assessment	20 Marks	
Tutorial: -NIL	Attendance	10 Marks	
Practical: NIL	Assignment/Presentation/Quiz	10 Marks	
Total Contact Hours:	End Semester Examination	60 Marks	
Pre-Requisite: 1. Students should know the basic properties of material being used in the construction of the building. 2. Students should be able to think over the construction problems and their remedies.			
Aim: Developing the conceptual knowledge in building material, construction, problems and its remedies.			
Course Objective:			
1. Identify various components of buildings and their functions.			
2. Check line, level and plumb of various construction activities.			
3. Identify & suggest rectification of the various defects in civil engineering works.			
Course Content:			
	Content (Theory)	Hrs./Unit	Marks
Unit: 1	<p>1.0 STONES</p> <p>1.1 Formation of rock, Igneous, Sedimentary, Metamorphic.</p> <p>1.2 Classification of stones, different varieties of stones available from different rocks.</p> <p>1.3 Qualities of good building stone.</p> <p>BRICK</p> <p>1.4 Definition</p> <p>1.5 Classification and size</p> <p>1.6 Traditional and Modular, I.S. characteristics of 1st/2nd/3rd class bricks</p> <p>1.7 Use in different purposes.</p> <p>LIME</p> <p>1.8 Classification of lime, manufacturing of lime, burning, air slaking, storage.</p> <p>1.9 Characteristics of good lime.</p> <p>CEMENT</p> <p>1.10 Type of cement – Portland cement, Rapid hardening cement & Slag cement.</p> <p>TIMBER</p> <p>1.11 Definition, characteristics of good timber.</p> <p>1.12 Seasoning, artificial and natural seasoning.</p>		30

	<p>1.13 Use for different purposes.</p> <p>METALS</p> <p>1.14 Ferrous and non – ferrous metals,</p> <p>1.15 Manufacture of pig iron by blast furnace.</p> <p>1.16 Cast iron, wrought iron and steel, its properties and uses in engineering works.</p>		
<p>Unit:2</p>	<p>2.0</p> <p>MORTAR</p> <p>2.1 General principles and precaution in brick masonry work–mortar used.</p> <p>CONCRETE</p> <p>2.2 Definition</p> <p>2.3 Types&properties</p> <p>2.4 Use</p> <p>2.5 Preparation of concrete</p> <p>2.6 Reinforced cement concrete-function</p> <p>CONCEPT OF SOIL & FOUNDATION</p> <p>2.7 Concept of soil, Definition of soil, Classification of soil as per BIS classification only,</p> <p>2.8 Concept of foundation, object of foundation, bearing capacity of soil, Determination of width and depth of foundation.</p> <p>2.9 Different types of foundation used at specific locations(no detail of construction).</p> <p>BRICK MASONRY</p> <p>2.10 Definition</p> <p>2.11 Bonding</p> <p>2.12 Function</p> <p>2.13 Types(only two types)</p> <p>2.14 Odd and even layer</p> <p>2.15 Plan of 1-brick & ½ brick thick in English bond.</p> <p>WALL FINISH</p> <p>2.16 Plastering–types and function</p> <p>2.17 Whitewashing– function and methods</p> <p>2.18 Colour washing–function, types and methods</p> <p>PAINTS</p> <p>2.19 Paints, object of painting, ingredients of paints.</p> <p>2.20 Characteristics of good paints</p> <p>PLASTERING, POINTING & JOINING</p> <p>2.21 Object of plastering, composition and application.</p> <p>2.22 Different types of pointing and joining.</p> <p>DAMP PROOF COURSE</p> <p>2.23 Causes of dampness, its harmful effect.</p> <p>2.24 Methods of damp proofing.</p> <p>FLOORING</p> <p>2.25 Definition, choice of floor construction.</p> <p>2.26 Construction details of different flooring.</p>		<p>30</p>

ROOF 2.27 Definition, choice of roof construction. 2.28 Construction details of different flat roofs		
DOORS&WINDOWSSHUTTERS 2.29 Different types of door & window shutters, 2.30 Its construction details.		
LINTEL&ARCHES 2.31 Lintels–advantages, classification of lintels. 2.32 Arches– object of providing it, parts of an arch, classification of arches (no details of construction).		
Total		60

Text Books:-			
Sl. No.	Titles of the Book	Name of Authors	Name of the Publisher
1	Building materials	S. K. Duggal	New Age International
2	Building Construction	Dr. B. C. Punmiya	Laxmi Publication
3	Building Construction	Sushil Kumar	Standard Publication
4	Construction Materials	D. N. Ghose	TATA MCGRAW-HILL
Reference books:- Nil			
Suggested List of Laboratory Experiments:- Nil			
Suggested List of Assignments/Tutorial:- Nil			

Course outcomes: After completing this course, student will be able to:

1. Identify components of building structures.
2. Propose suitable type of foundation for building structures.
3. Select suitable type of masonry for building structures.
4. Propose relevant means of communications for different types of buildings.
5. Select relevant material for finishing works

Name of the Course : Diploma in SURVEY ENGINEERING		
Course Title: Cadastral Survey and Land Laws	Coursecode:SEPC207	
Number of Credit:2	Semester: THIRD	
Teaching Scheme	Examination Scheme	
Duration:	MaximumMarks:100	
Theory:-2hrs/week	Continuous Internal Assessment	20Marks
Tutorial:-NIL	Attendance	10 Marks
Practical: NIL	Assignment/Presentation/Quiz	10 Marks
Total Contact Hours:	End Semester Examination	60Marks
Pre-Requisite: Basic knowledge of Surveying.		
Aim: To study, understand and apply the basic concepts of detailed map preparation and Land related rules and regulations.		
Course Objective:		
1. Understand the detailed concept of Cadastral Survey		
2. Understand detailed procedure of map preparation in field		
3. Understand the concept of present Land Laws.		
4. Understand the application of Land laws in the surveying field.		
Course Content:		
Content(Theory)	Hrs./Unit	Marks
Unit:1 1.0 CADASTRAL SURVEYING : 1.1 Definition & Purpose of Cadastral Survey, Unit of Cadastral Survey 1.2 Use of Cadastral Survey Instruments: PlaneTable, Optical Square, Sight vane, Offset Scale (Gunia), Diagonal Scale, Acre Comb & Compass, Testing of these instruments. 1.3 Different methods of finding missing Traverse Station. 1.4 Polygon closing by finding Traverse Station, Principle of distribution of errors 1.5 Arrangement of Quadrilaterals, Sikmi Lines, Selection of Sikmi Lines, Limit of Offsets. 1.6 Definition: Chanda, Goda, Dhai, Katan, Standard Line, Thoka Line, Tri-junction Pillar, Alamat and Scale and their classification, 1.7 Detailed Survey, Booking of Field Notes, Survey-in- Situ, Procedure of Chain Triangulation and Prolongation, Plotting of fields, Plotting of village 1.8 Inspection of cadastral survey – Running of Partal Line, 1.9 Boundary comparison, Plot Numbering, Bata and Chhut Plot Numbers, 1.10 Inking of Map, 1.11 Area extraction with the help of Acre-Comb, comparison of different Scales, conversion of area, 1.12 Khanapuri, Bujharat, Attestation 1.13 Post Draft publication &, Post Final publication 1.14 Maintenance of Cadastral Survey Maps and other records, 1.15 Definition of R.O.R., Parcha, Khatian, Share in Land, J.L.Number, C.S. Map, R.S. map, L.R. map.		40

Unit:2	2.0 LAND LAWS: 2.2 West Bengal Land Reforms Act, 1955 : 2.2.1 Sec-2 (Definition) – Land, Personal Cultivation, Raiyat, Bargadar, Encumbrance, Homestead, 2.2.2 Sec-4 – Salient Provisions. 2.2.3 Sec-14K(c) Family. 2.2.4 Sec-14K (f) Standard Hectare. 2.2.5 Sec-14M (1 & 2)-Ceiling Area. 2.2.6 Sec-14U – Restriction on transfer of land by a raiyat. 2.2.7 Sec-14Y -Limitation on farther acquisition of land. 2.2.8 Sec-22, Sec-23 & Sec-24 – Provisions as to Revenue. 2.2.9 Sec-50- Maintenance of R-O-R. 2.2.10 Sec-51- Revision & Preparation of R-O-R. 2.4 The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 : 2.4.1 Objectives and important features of the new act. (Sec-1, Sec-11 to Sec- 38, Sec- 81). 2.5 Bengal Survey Act, 1875: 2.5.1 Section – 2, 5, 6, 3, 7, 8, 9, 10, 11.		20
Total			60

Text Books:-			
Sl. No.	Titles of the Book	Name of Authors	Name of the Publisher
1	Surveying and Levelling	N. N. Basak	Tata McGraw-Hill Publisher
2	Cadastral Survey	A.C. Dutta	
3	A Simple Guide to Land Survey — Rules, Methods & Application	Arjun Kanungo	Eastern Law House publication
4	West Bengal Land & Land Reforms Manual	T N Shukla	Kamal Law House
5	Land Laws	S.S. Pal	Moon Law agency
6	Jami Jarip Paddhati	Subir Kumar Pal	Kamal Law House
7	Jami Jarip	Subir Kumar Pal	Kamal Law House
8	Technical Rules and Instruction from Director of Land Records and Survey WB		
9	West Bengal Gram Panchayat Administrative Rules , Department of Panchayats and Rural Development , Govt. of West Bengal		
Reference books:-Nil			
Suggested List of Laboratory Experiments:-Nil			
Suggested List of Assignments/Tutorial:- Nil			

Course outcomes: After completing this course, student will be able to:

1. Understand the basic concept and application of Cadastral Survey.
2. Understand the preparation of a Cadastral Survey Map.
3. Understand the importance and application of Land Laws in Surveying.
4. Know various important clauses of different law related to various field activities of Surveying

Name of the Course : Diploma in SURVEY ENGINEERING		
Course Title: Mechanics of Materials	Course code: SEPC209	
Number of Credit: 2	Semester: THIRD	
Teaching Scheme	Examination Scheme	
Duration:	Maximum Marks: 100	
Theory: -2hrs/week	Continuous Internal Assessment	20 Marks
Tutorial: -NIL	Attendance	10 Marks
Practical: -NIL	Assignment/Presentation/Quiz	10 Marks
Total Contact Hours:	End Semester Examination	60 Marks
Pre-Requisite: Student should be perfect in basic concepts of engineering mechanics and mathematical analysis.		
Aim: To study, understand and apply the basic concepts of mechanics of structural elements.		
Course Objective:		
Calculate bending and shear stresses in the simple beam element.		
Analyse the truss by using different methods.		
Draw shear force and bending moment diagrams.		
Calculate axial load capacity of axial loaded column using different approaches.		
Analyse the Elastic constants in uniaxial, biaxial and Tri axial stress condition.		
Course Content:		
	Content(Theory)	Marks
Unit:1	Elastic Constants & Principal Stresses Volumetric strain due to uni-axial force and change in volume, Biaxial and tri-axial stresses and volumetric strain & change in volume, Definition of bulk modulus, volumetric strain, Relation between modulus of elasticity, modulus of rigidity and bulk modulus, [simple numerical problem]	10
Unit:2	Shear Force And Bending Moment Shear force and bending moment diagrams for simply supported beams and cantilever subjected to uniformly varying load point of contra flexure (simple numerical problem)	15
Unit:3	Stresses In Beams Concept of pure bending, theory of simple bending, assumptions in theory of bending, neutral axis, neutral plane bending stresses and their nature, bending stress distribution diagram, moment of resistance. Shear stresses in beams	15

	Shear stress equation(no deduction), meaning of terms in equation, shear stress distribution for rectangular, hollow rectangular, circular and hollow circular sections.	
Unit:4	Analysis of Trusses Definition frames, classification of frames, perfect, imperfect, redundant and deficient frame, relation between members and joints, assumption in analysis. Using Method of joint only	8
Unit: 5	Columns Application of Rankin's and Euler theory, designing solid circular or hollow circular sections	7

Text books and References books	
Sl. No.	Books
1	Strength of Materials by Ramamrutham, Dhanpat Rai Publication
2	Elements of Strength of Materials by Timoshenko and Young, East-west press
3	Strength of Materials by S S Rattan, McGraw Hill Education
4	Strength of Materials by M. Chakraborty, Katson Publication
5	A text book of Strength of Materials by R.S. Khurmi and N. khurmi , S.Chand
6	A text book of Strength of Materials by R.K. Rajput, S. Chand Publishing
7	Strength of Materials by S S Bhavikatti, Vikash publishing house
8	Analysis of Structures- Vol I by Vazirani & Ratwani, Khanna Publishers

Name of the Course : Diploma in Survey Engineering			
Course Title: Concrete Technology	Course code : SEPC211		
Number of Credit : 3	Semester : THIRD		
Teaching Scheme	Examination Scheme		
Duration :	Maximum Marks : 100		
Theory : - 3 hrs./week	Continuous Internal Assessment	20 Marks	
Tutorial: - NIL	Attendance	10 Marks	
Practical : NIL	Assignment/Presentation/Quiz	10 Marks	
Total Contact Hours:	End Semester Examination	60 Marks	
Pre-Requisite: Student should take survey of different types of materials used in building construction.			
Aim: Study of cement and concrete.			
Course Objective :			
1. Determine the properties of concrete ingredients i.e. cement, sand, coarse aggregate by conducting different tests.			
2. Use different types of cement as per their properties for different fields applications.			
4. Supervise various concreting operations.			
5. Carry out field and laboratory tests on concrete in plastic and hardened stage.			
6. Use different types of admixtures to improve the properties of concrete for different field applications.			
7. Describe different types of concrete.			
8. Infer the test results as per relevant I.S. Provisions.			
Course Content :			
	Content (Theory)	Hrs./Unit	Marks
Unit:1	Cement: 1.1 Chemical composition, hydration of cement, heat of hydration, cement compounds.		5
Unit: 2	Types, Properties and Testing of cement: 2.1 Physical properties, specifications as per relevant IS codes & field application of the following types of cement: (i) Ordinary Portland cement (OPC), (ii) Rapid Hardening Portland cement(RHPC), (iii) Low Heat Cement, (iv) Portland Pozzolana Cement(PPC), (v) Blast furnace slag cement, (vi) Sulphate resisting cement, (vii) White cement, (viii) Quick setting Cement, (ix) Hydrophobic Cement 2.2 Testing of cement: (i) Fineness test(ii) Standard Consistency test (iii)Setting Time test(initial & final setting times) (iv) Compressive Strength test (v) Soundness test.		10

<p>Unit: 3</p>	<p>Properties of Aggregates and Testing: 3.1 Properties of fine aggregates: Classification, Concept of size, shape, surface texture, strength, specific gravity, bulk density , water absorption, surface moisture, soundness, bulking impurities, alkali-aggregate reaction, source. 3.2 Determination of fineness modulus & grading zone of sand by sieve analysis, 3.3 Bulking of sand, phenomenon of bulking 3.4 Determination of fineness modulus of coarse aggregate by sieve analysis, grading of Coarse Aggregates and its effect on concrete mix proportion. 3.6 Determination of crushing value, impact value & abrasion value of coarse aggregate, flakiness index & elongation index of coarse aggregate and their specification.</p>		<p>10</p>
<p>Unit: 4</p>	<p>Water, Admixtures and Construction Chemicals 4.1 Qualities of water and its use 4.2 General, Types of admixtures and its effect on properties of concrete.</p>		<p>5</p>
<p>Unit:5</p>	<p>Properties of Concrete: 5.1 Introduction to concrete: Definition of concrete, necessity of supervision for concreting operation, different grades of concrete (ordinary concrete, standard concrete & high strength concrete, minimum grade of concrete for different exposure conditions, minimum grade of concrete for R.C.C., water retaining structure & in sea water construction, durability of concrete. 5.2 Water cement ratio Definition of w/c ratio, significance of w/c ratio 5.3 Properties of fresh concrete Definition of workability, factors affecting workability of concrete. Determination of workability of concrete by slump cone test, compaction factor test, Range values of workability requirement for different types of concrete works, segregation, bleeding. 5.4 Properties of hardened concrete Definition of compressive strength, durability.</p>		<p>10</p>
<p>Unit:6</p>	<p>Quality Control of Concrete and Concrete Mix Design: 6.1 Selection of ingredients of concrete.. 6.2 Transportation, placing, compaction & finishing of concrete: methods of compaction, care to be taken during compaction, purpose of finishing, types of finishing & methods of application ,requirement of good finish. 6.3 Curing of concrete: Definition of curing, necessity of curing, 6.4Testing of concrete Significance of testing, determination of compressive strength of concrete cubes at different ages, interpretation & co-relation of test results 6.5 Non- destructive testing of concrete Importance of NDT, methods of NDT - rebound hammer test & ultrasonic pulse velocity test. 6.6 Importance & need of waterproofing, joining old & new concrete, methods of joining, materials used for filling joints. 6.7 Repair materials and rehabilitation of concrete</p>		<p>10</p>

	structures. 6.8 Definition, Objectives of mix design, list of different methods of mix design, procedure of mix design as per IS 10262.		
Total			60

Text Books:-			
Sl. No.	Titles of the Book	Name of Authors	Name of the Publisher
1	Concrete Technology	M S Shetty	S Chand Publication
2	Concrete Technology	M.L Gambhir	Tata McGraw-Hill Publisher
Reference books:-Nil			
Suggested List of Laboratory Experiments: -Nil			
Suggested List of Assignments/Tutorial: - Nil			

Course outcomes: After completing this course, student will be able to:

1. Use different types of cement and aggregates in concrete
2. Prepare concrete of desired compressive strength.
3. Prepare concrete of required specification.
4. Maintain quality of concrete under different conditions.
5. Apply relevant admixtures for concreting.

Name of the Course :Diplomain Survey Engineering		
CourseTitle:FieldSurveyPractice-I	Coursecode: SEPC213	
Number of Credit: 3	Semester:THIRD	
Teaching Scheme	ExaminationScheme	
Duration:	MaximumMarks:100	
Theory:-NIL	ContinuousInternalAssessment	60Marks
Tutorial:-NIL		
Practical:6hrs/week		
Total ContactHours:	EndSemesterExamination	40Marks
Pre-Requisite: Perfectionindrawing andsketching. Studentsshouldhavebasicknowledgeof Surveying.		
Aim: Developingthesurveyskillrequiredfortheareasrelatedto Survey Field		
Course Objective:		
1. Identifyanduse differentsurveyinstruments.		
2. Recordandobservenecessaryobservation withthesurveyinstruments.		
3. Computenecessarysurveydatafromfieldobservationfor preparationof drawing etc.		
4. Preparereportincludingdrawingusingsurveydatacollectedinthefield.		
Instructions:		
1. Group size for survey practical workshould be formed in such a way that each studentfrom a group can handle instruments independently to understand the functions of differentcomponents ofthe instrument.		
2. Drawing and plotting should be considered as part of practical work.		
3. Term work shall consist of record of all practical and projects in field book and drawing ofProjectworkonfull/halfimperialsizeddrawingsheets.		
Content:		
Sl.No.	Assignments/Practical	
Unit: 1	1. CHAIN SURVEY 1.1 Unfolding and folding the chain 1.2 DirectRanging:RangingbyEye–RangingbyLineRanger–ChainingonLevelGround 1.3 Indirect Ranging:Chaining on Sloping Ground 1.4 Layingofangle withchainandtape:30°,60°, 45°&90° 1.5 Obstacle in Chaining: (a) Chaining free but Vision obstructed (b)Chaining obstructed but vision free (c) Chaining and vision both obstructed 1.6 Cross Staff Survey 1.7 Surveying an area with Chain and Tape: Reconnaissance the area of survey Preparation of Key Plan and Reference Sketch – Selection of Base Line, Station Points and Marking of Stations – Booking Field Notes – Plotting of Field Data with conventional signs	
	2. COMPASS SURVEY 2.1 Traversing an area with prismatic compass (Clockwise and Anticlockwise Traverse).	

	<p>2.2 Traversing in presence of local attraction.</p> <p>2.2 Surveying an area with prismatic compass, noting the field book, calculate the correct bearings, plotting the traverse by bearing and distance. Graphical adjustment of closing error of the traverse.</p>
Unit: 3	<p>3. PLANE TABLE SURVEY</p> <p>3.1 Setting up and Orientation of plane table with Trough Compass and Back Ray Method</p> <p>3.2 Plane Tabling by Radiation Method</p> <p>3.3 Plane Tabling by Intersection Method</p> <p>3.4 Plane Tabling by Traversing Method</p> <p>3.5 Plane Tabling by Resection Method</p> <p>3.6 Fixing inaccessible objects in a plane table survey</p>
Unit: 4	<p>4. LEVELLING</p> <p>4.1 Temporary Adjustment of Levels.</p> <p>4.2 B.M. connection from G.T.S. B.M. or local B.M.</p> <p>4.3 Fly levelling, Check levelling and Profile Levelling with Auto Level and Dumpy Level and Recording of level book.</p> <p>4.4 Profile levelling, recording & plotting of longitudinal section in suitable scales from level book data.</p>
Unit: 5	<p>5. CADASTRAL SURVEY (Optional)</p> <p>5.1 Preparation and Reading of a Cadastral Survey Map following the procedure of Cadastral Survey (to be prepared only for learning purpose).</p>

Course outcomes:

After completing this course, student will be able to:

1. Select the type of survey required for given situation.
2. Compute area of open field using chain, tape and cross staff.
3. Conduct traversing in the field using chain and compass.
4. Use levelling instruments to determine reduced level to prepare contour maps.

Name of the Course :Diploma in Survey Engineering		
CourseTitle: Internship-I	Coursecode: SI201	
Number of Credit: 1	Semester:THIRD	
Teaching Scheme	ExaminationScheme	
Duration:15weeks	MaximumMarks:100	
Theory:-NIL	Continuous Internal Assessment	
Tutorial:-NIL		
Practical:		
Total ContactHours:	EndSemesterExamination	
Pre-Requisite: Students should have a good communication skill and a clear idea on his subject.		
Aim: Developingthetechnical and professional skillrequiredforindustrial needs.		
Course Objective:		
1. Manifest the potentiality of good communication and professional skill.		
2. Relate and understand the connection between academic and industrial working field.		
3. Understand the latest research and development in today's industrial world.		
4. Develop the power to represent own observation through arrangement of report &, seminar using the data collected and recorded from the training.		
Instructions:		
1. Students are required to be involved in, Inter/ Intra Institutional activities viz. Training and simulation program with different institutes like Workshop of ITI, other polytechnics and other Technical Institutions.		
2. Students are required to be involved in,Soft skill training organized by Training and Placement Cell of the respective institutions.		
3. Students are required to be involved in,Contribution at innovation/ entrepreneurship cell of the institute.		
4. Students are required to be involved in,Participation in workshops/ competitions etc.		
5. Students are required to be involved in,Learning at Departmental Lab/ Institutional workshop.		
Content:		
SI.No.	Assignments/Practical	
Unit: 1	After completion of each internship,the student should prepare a comprehensive report to indicate what he/ she has observed and learnt in the training period. The student may contact Industrial Supervisor/ Faculty Mentor/ TPO for assigning topics and problems and should prepare the final report on the assigned topics. The training report should be signed by the Industrial Supervisor/ Internship Faculty Mentor, TPO and HOD.	
Unit: 2	After completion of each internship, the student should prepare for seminars based on his/ her training report which is to be represented before an internal committee constituted by the concerned department of the institute.	

Course outcomes:

After completing this course, student will be able to:

1. Develop good communication and professional skill.
2. Understand the practical use of theoretical knowledge in industrial fields.
3. Learn how to cope with the demands in modern industry.
4. Learn how to record, take notes and represent own observations before others to understand them.