



# SARDAR PATEL UNIVERSITY, BALAGHAT (MP)

## School of Engineering and Technology

### Syllabus

Course: Diploma

Branch: Civil Engineering

Semester: III<sup>rd</sup>

Academic Session: 2024-25

w.e.f - Date-02-09-2024

### DCE031 SURVEYING

#### Course Content

#### Course Objectives:

1. To provide basic knowledge about principles of surveying for location, design and construction of engineering projects.
2. Students develop skills using surveying instruments including measuring tapes, automatic levels, theodolites, and electronic distance measurement equipment.
3. The ability to identify error sources and the procedures to minimize errors.
4. Use standard survey tools.
5. Understand and apply measurement error, accuracy, precision and techniques to improve accuracy of surveys

#### UNIT-I

**Types Of Survey:** Definition Objects of Surveying, Principles of Surveying, Uses of Surveying, Classification of Surveying. Primary – Plain, Geodetic, Secondary – Based on Instruments, method, object, Nature of field.

**Chain & Cross Staff Survey:** Principle of Chain Survey. Study and use of Instruments for linear measurements – chain, Tape, Ranging Rod, arrows, pegs, cross Staff, optical Square, line Ranger. Ranging: Direct and Indirect Ranging Chaining. plain and sloping grounds. Chain Triangulation – Survey Station and their Selections, factors affecting selection of survey station. Survey lines, Check lines, Tie lines, base line. Taking offsets. long and short offset, degree of offset. Obstacles in chaining. Chain & cross staff Survey for finding area of a field (Numerical problems) Errors in chain Surveying & applying Corrections for chain & Tape (Numerical problems). Conventional signs related to survey.

#### UNIT-II

**Compass Survey:** Principle of Compass Survey. Bearing of lines – Meridian – True, Magnetic, and Arbitrary. Bearing – fore bearing, Back bearing, Whole circle bearing, Quadrantal bearing system and Reduced bearing, Conversion of bearings, finding included angles from bearings. Prismatic Compass– Component, construction and use. Local attraction, Causes, precautions to be taken to avoid and correction of bearings affected due to local attraction, calculation of included angles. Traversing – traversing by chain and compass. open traverse, closed traverse, check on open and closed traverse. Graphical adjustment for closing error.

Numerical problems on calculation of bearings, Angles and local attraction.

#### UNIT-III

**Leveling:** Definitions, meaning of various terms used in leveling – Level surface, Level line, horizontal line, Vertical line, Datum surface, Reduced level, Bench mark and its types. Dumpy level – Components, Construction, Line of sight, Line of Collimation, Bubble tube axis, leveling Staff – Telescopic and folding type

. Foresight, back sight, Intermediate sight, Change point, Height of collimation

. Fundamental axes and their relationship Recording in level book. Temporary adjustments of dumpy level. Method of Reduction of levels – Height of instrument

method and Rise and fall method. Arithmetical checks, Numerical problems, Computation

of missing readings. Classifications of leveling -simple, differential, profile, cross sectional, fly and check leveling. Study and use of tilting level & Auto level. Sources and errors in leveling, precautions and difficulties faced in leveling.

#### **UNIT-IV**

**Contouring:** Definitions – Contour, contour interval, Horizontal equivalent. Characteristics of contours. Method of locating contours. Interpolation of contours. Establishing grade contours. Uses of Contour Maps. Calculation of reservoir capacity by contour map by trapezoidal and prismoidal formula. Interpretation of Typical Contour Sheets.

#### **UNIT V**

**Area And Volume Measurements:** Construction and use of polar planimeter for measurement of area and simple numerical problems. Study and use of Digital Planimeter. Concept of computation of Volume by Trapezoidal and Prismoidal formulae. (No numerical problems).

#### **Course Outcome:**

CO1. Set out horizontal curves.

CO2. Carry out a geodetic survey, taking accurate measurements using instruments and apply mathematical adjustment of errors involved in surveying measurements.

CO3. Plan a survey for applications such as road alignment and height of the building.

CO4. Invoke advanced surveying techniques over conventional methods in the field of civil engineering.

CO5. Provide a basic understanding on geospatial acquisition and its process.

#### **Reference Book:-**

<b>S.no</b>	<b>Title</b>	<b>Author</b>	<b>Publisher</b>
1	Surveying and Leveling	N.N. Basak	Tata McGraw-Hill
2	Surveying and Leveling Part- I and Part-II	T.P Kanetkar & S.V. Kulkarni	Pune Vidhyarthi Griha Prakashan.
3	Surveying and Leveling Part- I and Part-II	Dr.B.C.Punmiya	Laxmi Publication.
4	Text book of Surveying	S. K. Hussain & M. K. Nagarai	S Chand & Company



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### DCE032 MATERIAL TECHNOLOGY

#### Course Content

##### Course Objectives:

1. Civil Engineering diploma holders have to supervise construction of various types of civil works involving use of various materials like stones, bricks and tiles, cement and cement based products, lime, timber and wood based products, paints and varnishes, metals and other miscellaneous materials.
2. The students should have requisite knowledge regarding characteristics, uses and availability of various building materials and skills in conducting tests
3. To determine suitability of materials for various construction purposes.

#### UNIT-I

**Introduction:** Importance of material Technology for Civil Engineer. name of common Engineering materials used in construction.

**Masonry Materials:** a) Building stones- classification of rocks, requirement of good building stone, dressing of stones, quarrying of stones, artificial or cast stones. b) Bricks – properties of good building bricks, conventional bricks, standard bricks, composition of clay brick, method of preparation of bricks, strength of bricks, proportions of burnt clay bricks, testing of bricks, special bricks, hollow blocks, fly ash bricks.

**Timber:** Difference between wood and timber. Timber based material: use of timber, characteristics of good timber, defects in timber, plywood, particle board, veneer, sun mica, fore mica, wood, artificial timber, rubber wood.

#### UNIT-II

**Binding Materials:** Murrum, Properties of Murrum for Road work. Lime - Types and properties of lime: Fat lime, Hydraulic Lime, Quick lime. Cement - Different ingredients used for manufacturing cement with their percentage. Physical properties of ordinary Portland cement (OPC), hydration of cement. Physical properties of cement – fineness, standard consistency, initial and final setting time, compressive strength and soundness, different grades of OPC, 33, 43, 53 and their specification of physical properties as per relevant IS codes, field test of cement, storing cement at site, effect of storage of cement on properties of cement, Types of cement and their functional uses.

#### UNIT-III

**Aggregates:** Properties of fine aggregates - Concept of size, shape, surface texture, strength, specific gravity, bulk density, water absorption, surface moisture, soundness, bulking impurities. Determination of fineness modulus & grading zone of sand by sieve analysis, determination of silt content in sand & their specification as per IS 383, Bulking of sand, phenomenon of bulking, its effect on concrete mix proportion. Properties of coarse aggregates - Concept of size, shape, surface texture, water absorption, soundness, specific gravity & bulk density, Determination of fineness modulus of coarse aggregate by sieve analysis, grading of Coarse Aggregates. Determination of crushing value, impact value & abrasion value of coarse aggregate, flakiness index & elongation index of coarse aggregate and their specification.

**Mortars:** Classifications, lime mortar, cement mortar, special mortars. Functions of mortar, proportions, properties of mortar and tests for mortar.

#### UNIT-IV

**Concrete:** Introduction to concrete - Definition of concrete, necessity of supervision For concreting operation, different grades of concrete (as per provisions of IS 456- 2000), 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. Water cement(w/c) ratio, Definition of w/c ratio, significance of w/c ratio, maximum w/c ratio for different grades of concrete for different exposure conditions. Properties of fresh concrete Definition of workability, factors affecting workability of concrete. Determination of workability of concrete by slump cone test compaction factor test vee bee consistometer. Range values of workability requirement for different types of concrete works, cohesiveness, segregation, bleeding, creep of concrete. Curing of concrete. Testing of concrete for strength and workability. Properties of hardened concrete.

#### UNIT-V

**Paints, Varnishes & Colours:** Different in gradients used in manufacturing/ preparation of paints, Primers, their different types for steel and timber. Use of paint as protecting surface device for steel surface type of paint used and for wood surface types of paint used. VARNISH: Method of preparation of varnish, component materials used in varnish.

COLOURS: For decorative purpose and finished purpose use of colour as water base, colour as oil base, Distempers and cement paints.

**Steel And Aluminum Products:** Steel used as Engineering Material in different shapes. Like T- section Angle section, Channel Section, I-Section steel sheets used in manufacturing of Doors. Aluminum: Used as construction materials.

**Miscellaneous:** Give the concepts about the other materials which can be used as Engineering Materials like Glass, Rubber, Tar, Emulsion, Bitumen, Glass wool, Use of J bolts, U hooks, Stoneware pipes, Galvanized iron pipes. Miscellaneous materials: glass, plastic- P.V.C. pipes used as materials in pipe laying for water supply purposes, Irrigation etc. Water tanks. fibers, aluminum, steel, galvanized iron, asphalt bitumen etc. micro silica, PVC, CPVC, PPF. Waterproofing and termite proofing materials, admixtures in concrete, bonding agents, epoxy resins, Polishing materials etc. readymade concrete cover. Readymade ornamental material (wall papers, carpets, radium prints, blocks etc.)

#### Course Outcome:

CO1. Students are expected to understand materials of construction.

CO2. Students are expected to know about Special concrete.

CO3. Students are expected to read about timber, plywood, paints and glass materials

#### References Book:-

Title	Author
1. Engineering Materials	By Rangwala
2. Engineering Materials	By Deshpande
3. Engineering Materials	By Ojha
4. Engineering Materials	By Surendra Singh
5. Civil Engineering Materials	By T.T.T.I., Madras.
6. Building Materials	By S.K. Duggal
7. Construction Materials	By D.N.Ghose



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### DCE033 BUILDING CONSTRUCTION

#### Course Content

##### Course Objectives:

1. In recognizing the good materials to be used for the construction work.
2. In investigation of soil condition, Deciding and design of suitable foundation for different structures.
3. In supervision of different types of masonry.
4. In selection of materials, design and supervision of suitable type of floor and roof.
5. To gain knowledge about doors, windows, plastering, painting, damp proofing, scaffolding, shoring, underpinning and to take suitable engineering measures.

#### UNIT-I

**Building Components And Materials:** Building components and types of structure - building components & their function. Substructure – foundation, plinth. Superstructure – walls, sill, lintel, doors & windows, floor, roof, parapet, beams, columns. Types of structures – load bearing structures, Framed structures, composite structures.

#### UNIT-II

**Construction Of Sub-Structure:** Job layout – necessity and procedures, site clearance, preparing job layout, layout for load bearing structure and framed structure by center line And face line method, precautions while marking layout on ground. Earthwork - excavation for foundation, timbering and strutting, earthwork for embankment, material for plinth filling. Tools and plants used for excavation and earthwork. Foundation - importance and necessity, types of foundation, open foundations, shallow Foundation, stepped foundation, isolated and combined column footing, raft foundation, deep foundation and pile foundation. Selection of foundation. Pumping method of dewatering, coffer dams. Bearing capacity of foundation soil, under reamed pile Foundation.

#### UNIT-III

**Construction Of Superstructure:** stone masonry -terms used in stone masonry – facing, backing, hearting, through stone, corner stone. Uncoursed rubble masonry, coursed rubble masonry, point to be observed in construction of stone masonry, mortars for stone masonry, tools and plants used for Stone masonry, col-grout masonry. Brick masonry : common terms used in brick masonry, requirements of good brickwork, bonds in brick masonry, English, Flemish, stretcher and header bonds only. Brick laying ,line level and plumb of brickwork, striking and raking of joints, lead and lift, precautions in brick masonry, tools and plants used in brick masonry. Comparison between brick and stone masonry. Hollow concrete block masonry, composite masonry, cavity wall- purpose and construction. Doors and windows: doors -components and construction of paneled doors, battened doors, flush doors, collapsible doors, rolling shutters, revolving doors, Aluminum doors, glazed doors. Sizes of door – as per IS specification. Windows - component and construction of fully paneled, partly paneled and glazed, glazed wooden, steel, aluminum windows, sliding windows, louvered window, ventilators, cement grills. Protective treatment for doors and windows, fixtures and fastenings for doors and window. Selection of doors and windows. Sill, lintel and weather shed - functions, types and construction, Vertical communication means of vertical communication – stair case, elevators, escalators etc. terms used in stair case, characteristics of good staircase, types of staircase - fabricated stair.

Relation between rise and tread, IS standards, design of staircase for the given situation, Scaffolding and shoring: purpose, types of scaffolding,. Merits and demerits of different types of scaffolding, Purpose and types of Shoring.

#### UNIT-IV

**Building Finishes:** floors and roofs - floor finishes, brick flooring, flag stone, Shahabad , Kota, marble, granite, Kadappa, ceramic tiles, vitrified, mosaic tiles, Chequerred tiles, glazed tiles, pavement blocks, concrete floors, Tremix floor, skirting and dado. Process of laying-process of laying and construction, finishing and polishing of floors. Roofing materials – AC sheets ,GI sheets, plastic sheets, fiber sheets, Mangalore tiles etc. Steel trusses. R.C.C. slab, lean to roof, King post and Queen post trusses (Line Diagram). Wall finishes: plastering – necessity of plastering, single coat plaster, double coat plaster, Neeru finishing and pop, special plasters - stucco plaster, plaster board and Wall claddings. Precaution to be taken while plastering. Defects in plaster. Pointing – necessity and procedure of pointing, Difference between plastering and pointing. Painting – necessity, surface preparation.

#### UNIT-V

**Building Maintenance:** Cracks - causes and types of cracks, identification and repair of cracks. Guniting and grouting, use of epoxy and crack fills. Settlement - causes and remedial measures plinth protection – necessity and materials used. Demolition - necessity, method of demolition, hand demolition, Machine demolition, controlled blasting demolition, precautions during demolition. Re-baring techniques - necessity and equipment for re-baring techniques.

**Safety And Environmental Aspects :** Safety precautions to be observed during the construction viz. trenching, digging pits for foundation using machineries, masonry works, erection, scaffolding, centering etc. Environmental consideration to be observed during construction of a building e.g. laying out of drainage line and water supply line, soak pit, septic tank, precautions to be taken during site clearance considering environmental effect. Avoiding unnecessary cutting of bushes and tress etc.

#### Course Outcome:

- CO1. Students are expected to understand various parts of building.
- CO2. Students are expected to understand various types of bonds.
- CO3. Students are expected to read construction drawing of form work.
- CO4. Students are expected to understand importance of safety in construction.

#### Reference Book:-

Title	Author	Publisher
Building Construction,	S.P.AroraandBindra,	Dhanpat Rai Publication
Building Construction,	S.C.Rangawala	Charotar Publication
Building Construction,	SushilKumar,	Standard Publication
Building Construction,	B.C. Punmia	Laxmi Publication
Building Construction,	S.K.Sharma,	TataMcGraw-Hill
Building Construction,	Dr.JanardanZha,	Khanna Publication



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### DCE034 HYDRULICS

#### Course Content

##### Course Objectives:

1. Be familiar with different fluids.
2. Be familiar with different fluids flow condition.
3. Learning different flow & losses in pipes.
4. Be familiar with flow in open channel & different sections.

#### UNIT I

**Properties Of Fluid:** Definition of fluid, Difference in behavior of fluid with respect to solids. Introduction to fluid behavior of fluid with respect to solids. Introduction to fluid mechanics and hydraulics, Branches of hydraulics- Hydrostatics and hydrodynamics, Importance of Hydraulics with respect to Irrigation hydrodynamics, Importance of Hydraulics with respect to Irrigation and Environmental engineering. Physical properties of fluid Mass density, Weight density, Specific volume, Specific gravity, Surface tension and capillarity, Compressibility, Viscosity, Newton's law of viscosity – Dynamic and kinematics viscosity. Ideal and Real liquids.

#### UNIT II

**Hydrostatic Pressure:** Free liquid surface, Definition of pressure and its SI unit, Hydrostatic pressure at point, Pascal law Variation of pressure in horizontal and vertical direction in static liquid, Pressure diagram. Total hydrostatic pressure and center of pressure, Determination of total pressure & center of pressure on vertical & inclined faces of dams, sluice gates, sides and bottom of water tanks. Numerical Problems.

#### UNIT III

**Measurement Of Liquid Pressure In Pipes:** Concept of pressure head and its unit, Intensity of pressure, Variation of pressure with depth of liquid, Types of pressure-atmospheric gauge and absolute pressure. Conversion of pressure head of one liquid in to other, devices for pressure measurements in pipes – Piezometer, U-tube manometer, Bourdon's pressure gauge. Principle of working and limitations. Measurement of pressure difference using differential manometer –U- tube differential manometer and inverted U-tube differential manometer. Simple Numerical Problems.

#### UNIT IV

**Fundamentals Of Fluid Flow:** Concept of flow, Gravity flow and pressure flow. Types of flow – steady and Unsteady, uniform and non-uniform , Laminar and turbulent. Various combinations of flow with practical examples, Reynolds number and its application, Stream line and equi-potential line. Flow net and its uses. Discharge and its units, Continuity equation for fluid flow. Various forms of energies present in fluid flow- potential, kinetic, & pressure energy. Datum head, pressure head, velocity head and total head, Bernoulli's theorem, its assumptions and limitations. Loss of head and modified Bernoulli's theorem.

**Flow Of Liquid Through Pipes:** Loss of head due to friction, Darcy-Weisbach Equation Friction factor, relative roughness. Common range of friction factor for different types of pipe material. Minor loss of head in pipe flow-loss of head due to sudden Contraction, sudden expansion, gradual contraction & expansion, at entrance and exit of pipes and in various pipe fittings. Pipes in series and parallel, Equivalent pipe– Dupaite's equation. Hydraulic gradient line and Energy gradient line, Siphon pipe. Water hammer in pipes– cause effects and remedial measures, Use of Nomograms for design of water distribution

system. Simple Numerical on head loss.

## UNIT V

**Flow through open channel:** Types of channels-artificial& natural, purposes of artificial channel, Different shapes of artificial channels. Geometrical properties of channel section – wetted area, wetted Perimeter, hydraulics radius. Prismatic channel sections, steady- uniform flow through prismatic channel section. Chezy's equation and Manning's equation for calculation of discharge through an open channel, common range of values of Chezy's constants and Manning's constant of different types of channel surfaces. Most economical channel section, conditions for most economic all channel sections. Froud's number and its significance. Critical, subcritical and supercritical flow in channel, Hydraulic jump its occurrence infield, uses of hydraulic jump.

### Course Outcome:

CO1. Students are expected to find turbulence flow in pipe .

CO2. Students are expected to analyse flow of fluids in pipe network.

CO3. Students are expected to understand & evaluate flow in open channel.

CO4. Students are expected to understand & analyse transmission of pressure waves.

CO5. Students are expected to learn hydraulic properties of Turbine & Pumps.

### References Book:-

S. No.	Title	Author	Publisher
1	Hydraulics & Fluids Mechanics,	Dr. P.N.Modi & Dr.S.M.Seth,	Standard BookHouse,D ehli.
2.	Hydraulics & Fluids Mechanics,	S.Ramamrutham,	Dhanpat Rai & Sons,Delhi.
3	A Text Book of Hydraulics,	R.S.Khurmi.	
4	Fluids Mechanics & Hydraulics Machines,		S.Chand& CompanyLtd.New, Delhi.
5	A Text Book of Fluids Mechanics Hydr	R.K.Rajput,	S.Chand& CompanyLtd.NewD elhi.
6	Fluids Mechanics & Hydraulics,	Dr.JagdishLal,	Metropolitan Book Co.PrivateLtd.NewDelhi.
7.	Hydraulics Laboratory Manual	S.K. Likhi,	T.T.T.I.Chandhigrah.
8	Fluids Mechanics & Hydraulics Machines	R.K. Bansal.	



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### DCE035 BUILDING PLANNING & DRAWING

#### Course Content

##### Course Objectives:

1. To understand the fundamental principles and concepts of planning and architecture for buildings.
2. To study about different views of layout.
3. To learn the development controls covered by building bye laws and national building code for buildings.

##### UNIT-I

**Introduction & Conventions:** Conventions as per IS:962-1967 and other practices Types of Lines – Visible line, Centerline, Hidden line, Section line, Dimension line, Extension line, Pointers, Arrow heads or dots. Dimensioning systems. Symbols – Materials used in construction, building components. Reading of available ammonia prints of residential buildings.

##### UNIT-II

**Planning Of Building:** Principles of planning of Residential and Public building. Space requirements and norms for various units of Residential and Public building. Rules and byelaws of local governing authorities for construction. Drawing of line plans for Residential and Public building. Development of line plan – ground floor plan and roof plan with provision for drainage layout. Elevation (front elevation) Sectional elevation (section must pass through stair-case, bath WC, kitchen and front verandah) Site plan (to be developed from a Mouza map for conception of location plan) Foundation details (trench plan, section of main wall and a partition wall/ isolated footing with tie beam if provided).

##### UNIT-III

**Building Drawing:** Development of plan from line plan of a residential building, Elevation, Section, Site plan, Location Plan, Foundation plan, Area statement and other details. Submission Drawing and Working Drawing.

Drawing of Single storey load bearing residential building (2BHK) with staircase. Working Drawing – developed plan, elevation, section passing through staircase or w.c and bath. Foundation plan of Load bearing structure.

**Introduction To Truss** – wooden (king post and queen post), steel (with angles and tubular truss) along with demonstration of model 5.2 Details of a fink truss with welded/riveted joints and details of column connection.

##### UNIT-IV

**Detailed Drawing:** Drawing of staircase, drawing of steel truss & lean to roof, drawing of layout plan of water supply line with accessories. Layout plan of sanitary line- position of inspection chamber, septic tank, sanitary fittings. Position of wash basin, sink etc.

Working Drawing of Framed Structure- developed plan, elevation, section passing through staircase or w.c. and bath.

Foundation plan of Framed Structure. Details of RCC footing, column, beam, Chajjas Lintel, Staircase and slab.

## UNIT-V

**Perspective Drawing:** Definition, Necessity, Principles used in Perspective Drawing, Terms used in perspective drawing, Two point perspective view of a small object like pedestal, step block, small single storied building with flat roof, Monuments etc.

### Course Outcomes:

CO1. Students are expected to understand various methods of general principles of planning .

CO2. Students are expected to understand drawing plan of single, double story residential buildings

CO3. Students are expected to understand drawing of elevation of single & double story buildings.

### References Book:-

S. No	Title	Author	Publisher
1	Text Book of Building Drawing,	Shah, Kale & Patki	Mc Graw Hill publishing
2.	Elements of Building Drawing,	D. M. Mahajan	Computech Publication Ltd
3	Planning and Design of Building	Y. S. Sane	Allied Publisher New Delhi
4	Civil Engineering Drawing	Malik & Meo,	New Asian Publishers New Delhi .
5	Building Drawing,.	V.B.Sikka	Charotar Publication



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### DCE031P SURVEYING

#### Course Content

#### List of Experiments

1. Measurement of distances with chain & tape on ground with direct or indirect ranging.
2. Construction and use of optical square and open cross staff for setting out perpendicular and running a survey line for locating details.
3. Measurement of Area by Chain and cross staff survey.
4. Use of prismatic compass and observing fore bearing and back bearing.
5. Measuring Fore bearing and Back bearing of 5-6 side closed polygon. Identifying stations affected by local attraction and calculation of corrected F.B. & B.B.
6. Measuring fore bearing and back bearing for an open traverse (5 to 6 sided). Calculate direct angles between successive lines.
7. Use of Dumpy level, temporary adjustments and taking reading on leveling staff.
8. Recording readings in field book.
9. Differential leveling practice, reduction of level by H.I. method.
10. Differential leveling practice, reduction of level by rise & fall method.

#### Reference Book:-

	Title	Author, Publisher, Edition & year
1	Surveying and leveling	T.P.Kanetkar Vol.1
2	Surveying and leveling	Dr. B.C. Punnia
3	Surveying and leveling	Hussain & Nagraj
4	Surveying	A Arora



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## DCE032P MATERIAL TECHNOLOGY

### Course Content

#### List of Experiments

1. Identification of Materials by Visual Inspection
2. To determine Normal Consistency, Initial & Final setting time,
3. Specific Gravity, fineness & compressive strength of Cement (IS: 269-1967)
4. To Study the Utilization of Fly Ash
5. To Study the Procedure for Testing of Stone
6. To Study the Fiber Reinforced Concrete
7. To Study the Properties and Use Of Different Glasses
8. To Study the Different Aluminum and Steel Sections
9. To Study the Manufacture and Use of Concrete Hollow Blocks
10. To determine the Water Absorption and Tolerance Limit of Bricks

#### Reference Book:-

Sl. No.	Title	Author, Publisher, Edition & Year
1	Engineering materials	S.C. Rangwala
2	Engineering materials	Deshpande
3	Engineering materials	Ojha
4	Engineering materials	Surendra singh
5	Engineering materials	Gurcham singh



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## DCE033P BUILDING CONSTRUCTION

### Course Content

#### List of Experiments

1. Preparing foundation plan and marking on ground layout of load bearing structure by face line method from the given plan of the building.
2. Preparing foundations plan and marking on ground layout of framed structure by face line method from the given plan of the building.
3. Checking and transferring line and level of plinth, sill, lintel, flooring, slab level of a building and writing report of the process.
4. Checking verticality (plumb line) of formwork for column, beam and wall at construction site and writing report of the process.
5. Observing and writing report of the process of plastering.
6. Observing and writing report of the process of water proofing of terrace or basement.
7. Observing the models, specimen of building materials kept in the model room for few building items and writing a report for any five models/materials.
8. Visit to a building where slab casting is in progress.
9. Use of water level, plum bob, spirit level, Thread, gunia, etc.
10. Study and use of various tools used in building construction.

#### Reference Book:-

Sl. No.	Title	Author, Publisher, Edition & Year
1	Building construction	S.K.Sharma
2	Building construction	Sushil kumar
3	Building construction	S.C. Rangwala



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### DCE034P HYDRAULICS

#### Course Content

#### List of Experiments

1. Measurements of pressure and pressure head by Piezometer, U-tube manometer.
2. Verification of Bernoulli's theorem.
3. Reynolds experiment to study types of flow.
4. Determination of Darcy's friction factor for a given pipe.
5. Demonstration of Hydraulic jump.
6. Determination of coefficient of discharge for given rectangular or triangular notch.
7. Determination of coefficient of discharge for a given Venturimeter
8. Determination of hydraulic coefficients for sharp edge orifice.
9. Study & use of water meter.
10. Study of a model of centrifugal and reciprocating pump.

#### Reference Book:-

Sl. No.	Title	Author, Publisher, Edition & Year
1	Hydraulics and Hydraulics machines	Shri K.D.Saxena
2	Hydraulics and Hydraulic machines	Dr. J.Lal
3	Hydraulics	R.S.Khurmi
4	Fluid Mechanics and machinery	Dr. A.K.Jain
5	Hydraulic	K.K.Jain



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### DCE035P SOFTWARE LAB [AUTO CAD 2D]

#### Course Content

#### List of Experiments

1. CAD SOFTWARE : Meaning, various CAD software available in the market AutoCAD, Felix Cad, Auto Civil, 2D Max ; etc.) Starting up of CAD, CAD Window, Tool bar, Drop down menu, Command window, Saving the drawing. Introduction of Graphic screen.
2. CAD COMMANDS : WCS icon, UCS icon, co-ordinates, drawing limits, grid, snap, ortho features. Drawing commands, line, circle, polyline, multiline, ellipse, polygon etc. Editing commands – Copy, move, offset, fillet, chamfer, trim, lengthen, mirror, rotate, array etc. Working with hatches, fills, dimensioning, text etc.
3. SUBMISSION / WORKING DRAWING : Generation of line plan, Detailed Plan, elevation, section, site plan, Area statement, Generation of 2D view and print commands, Introduction to Auto Civil.
4. BUILDING DRAWING : Following exercises shall be completed with CAD software and Print of all the drawings should be prepared on A3 / A4 size paper :
  - a) Preparation of line plan of a residential building.
  - b) Preparation of line plan of a Public building.
  - c) Preparation of detailed plan of a small residential building
  - d) Preparation of submission drawing of residential building – showing Plan, Elevation, Section, Schedule of openings, Site Plan and Area Statement.
5. CIVIL ENGINEERING DRAWING : Preparation of Drawings with CAD software for the following exercises (Any Three) and Print of all the drawings should be prepared on A3 /A4 size paper.
  - a) Plan, Cross Section and Longitudinal section of a Culvert (Pipe culvert/Box Culvert).
  - b) Section of an Earthen Dam.
  - c) Plan and Section of K. T. Weir.
  - d) Cross Section of Retaining wall.
  - e) Bonds in brickwork – Plan and Elevation for English bond and Flemish bond for one brick thick wall.
  - f) Cross Section of ESR (Over Head Tank).
  - g) Cross Section of Clarri - flocculator

**Equipment/Machines/Instruments/Tools/Software Required:**

1. PC system.
2. AutoCAD Software.

**Reference Books:**

1. AutoCAD 2000 Complete – et. al. (BPB Publications)
2. An introduction to AutoCAD 2000 – A. Yarwood (Pearson Educations)