Shri Rawatpura Sarkar University, Raipur

Examination Scheme & Syllabus

for

Diploma In Civil Engineering

Semester-III

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the Session: 2022-23)

Shri Rawatpura Sarkar University, Raipur, Chhattisgarh
Faculty of Engineering

Three Years Diploma Programme

Scheme of Teaching and Examination

Diploma Third Semester Civil Engineering

Outcome Based Education (OBE) and Choice Based Credit System (CBCS)

(Effective from the Academic Year 2022-2023)

S.No.	Course Code	Course Title	Hours / Week			Credits	Maximum Marks			Sem End Exam Duration (Hrs)
			L	**T**	**P**		Continuous Evaluation	Sem End Exam	Total	
1	DENCE301T	Surveying-I	3	1	-	4	30	70	100	3
2	DENCE301P	Surveying-I	-	-	2	1	15	35	50	-
3	DENCE302T	Material Technology	3	1	-	4	30	70	100	3
4	DENCE302P	Material Technology	-	-	2	1	15	35	50	-
5	DENCE303T	Hydraulics	3	1	-	4	30	70	100	3
6	DENCE303P	Hydraulics	-	-	2	1	15	35	50	-
7	DENCE304T	Civil Engineering Drawing	3	1	-	4	30	70	100	4
8	DENCE305T	Building Construction	3	1	-	4	30	70	100	3
9	DENCE305P	Building Construction	-	-	2	1	15	35	50	-
	Total Contact hr Per Week: 28		**Total Credit: 24**				**Grand Total Marks:**		**700**	-

L-lecture **P-Period** **T-Tutorial**

Diploma In Civil Engineering
Semester-III
2022-23

<table>
<tr><td>Course Title</td><td colspan="5">Surveying – I</td></tr>
<tr><td>Course Code</td><td colspan="5">DENCE301T</td></tr>
<tr><td rowspan="2">Course Credits</td><td>L</td><td>T</td><td>P</td><td>TC</td><td></td></tr>
<tr><td>3</td><td>1</td><td>-</td><td>4</td><td></td></tr>
<tr><td>Prerequisites</td><td colspan="5">Knowledge about various surveys needed for any type of construction</td></tr>
<tr><td>Course Objectives</td><td colspan="5">This course will enable students to:
Understand the importance of surveying in the field of civil engineering
Study the basics of linear/angular measurement methods like chain surveying, compass surveying
Know the basics of levelling and theodolite survey in elevation and angular measurements
Study the significance of plane table surveying in plan making</td></tr>
<tr><td>Course Contents</td><td colspan="5">UNIT-I

Introduction
Purpose of engineering surveys, Principles of surveying, Various instruments used for length and angular measurements, Plane and geodetic surveying.

UNIT-II

Chain Surveying
Types of chain and tapes Study of 20m and 30 m chain ,Accessories in chain surveying, Ranging methods- direct ranging indirect/reciprocal ranging ,Use of line range, Chaining on plane and sloping ground ,Obstacles in chaining, offsets, Types of offsets ,Use of offsets Instruments used to take offsets Recording field book, chain traversing, base line, tie line, check line, and chain triangulation, Errors in chaining, tape and their correction ,Symbols and signs to indicate ground features.

UNIT-III

Compass Surveying
Types of compass prismatic and surveyors compass ,Bearing of lines fore bearing and back bearing ,Whole circle bearing and reduced bearing systems ,Local attraction and its detection ,Magnetic declination and dip Calculation of - exterior and interior angle ,Closed and open traverse, closing errors, Graphical adjustment of closing error.

UNIT-IV

Plane Table Surveying</td></tr>
</table>

	Principles of plane table surveying ,Plane table and its accessories, setting of plane table ,Methods of plane table surveying ,Suitability of each method ,Plane table survey by radiation ,Intersection and traversing ,Advantages and disadvantages of plane table surveying . **UNIT – V** **Levelling & Contouring** Meaning of various terms used in levelling Types of levels and their uses, Dumpy level, tilting level, quick set level, Auto-set level and digital level, Description of dumpy level, Temporary adjustment of level, Fundamental lines of levels and their relationships. , Computation of reduced level by H.I. method and rise and fall method, Methods of levelling: Simple levelling, fly levelling, differential levelling, reciprocal levelling, Longitudinal and cross sectioning, Computation of missing readings, Errors in levelling. **Contouring** - Definition of contours, Contour interval, horizontal equivalent, Methods of contouring, direct and indirect method of contouring, Interpolation of contours, plotting of contour, use of toposheet.
Course Outcomes	**After the completion of course:** • Learn the basic principles of Surveying • Know different instruments and techniques to determine the positions on the surface of the earth • Prepare maps/plans from the collected field data • Familiar with the basic surveying techniques to be used for a specific civil engineering project • Plot and Interpret contours.
Text Books	1. Surveying Vol. I, Punmia, B.C., Laxmi Publications (P) Ltd, New Delhi, 13th edition 2004. 2. Surveying Vol. II, Punmia, B.C., Laxmi Publications (P) Ltd, New Delhi, 15th edition 2004. 3. Surveying (Vol. II & III) – Agor, R (Khanna publications, Delhi, 1995) 4. Surveying (Vol. I & II) – S.K. Duggal (Tata McGraw Hill) 5. Surveying (Vol. I & II) – Kanetkar T.P. (Pune Vidyarthi Griha Prakashan, Pune) 6. Surveying (Vol. I & II) – C Venkataramaih (Universities Press Hyderabad)
Reference Books	1. Surveying, Bannister, A., and Raymond, S. ELBS, Sixth Edition, 1992. 2. Surveying Vol. I and II, Arora,K. R., Standard Book House, New Delhi,1991.

Diploma In Civil Engineering
Semester-III
2022-23

<table>
<tr><td>Course Title</td><td colspan="5">Surveying-I</td></tr>
<tr><td>Course Code</td><td colspan="5">DENCE301P</td></tr>
<tr><td rowspan="2">Course Credits</td><td>L</td><td>T</td><td>P</td><td>TC</td><td></td></tr>
<tr><td>-</td><td>-</td><td>2</td><td>1</td><td></td></tr>
<tr><td>Prerequisites</td><td colspan="5">Knowledge about various surveys needed for any type of construction</td></tr>
<tr><td>Course Objectives</td><td colspan="5">This course will enable students to:
The Lab sessions would include extensive experiments on
• Chain Surveying
• Chain Traverse
• Compass Surveying
• Compass Surveying Traversing
• Plane Table Surveying—Radiation, Intersection, Traverse, Resection Levelling
• Dumpy Level/Auto Level Surveying</td></tr>
<tr><td>Course Contents</td><td colspan="5">List of Experiments
1. To fixed station point and to measure length of a line by directs ranging with the help of chain and tape and plot it.
2. To perform a chain survey of closed traverse fixing the angle between two chain lines by time lines and to plot them and adjusting the closing error by graphical method.
3. Study the parts of prismatic compass and surveyor’s compass and to measure the bearings of lines joining different station point
4. To take the fore bearing and back bearing of sides of a regular polygon and to calculate included angle and check them.
5. To perform a chain and compass survey of an area by open traverse and prepare a map.
6. To learn temporary adjustment of levelling instrument and to find the R.L. of the given point.
7. To find the difference of R.L. of two given point by shifting of instrument on change points and applying arithmetical checks.
8. To take the longitudinal and cross-section levels of an existing road.
9. To study the accessories of plane table surveying and to plot the objects by radial method.
10. To perform the plan table survey of small area by intersection method.
11. To take the block levelling of undulated site and to draw the contours using method of interpolation.</td></tr>
</table>

	12. Preparing a contour map of a small area by direct method of contouring. 13. To draw contour map of a small panel and to calculate its capacity. 14. To study a Toposheet of certain area and to mark on it watershed line and find out catchments area of a stream at a place.
Course Outcomes	**After the completion of course:** • Use the theodolite along with chain/tape, compass on the field • Apply geometric and trigonometric principles of basic surveying calculations • Plan a survey, taking accurate measurements, field booking, plotting and adjustment of errors • Apply field procedures in basic types of surveys, as part of a surveying team • Employ drawing techniques in the development of a topographic map
Text Books	1. Surveying and Levelling by Vol. I and Vol. II – T.P. Kanetkar and S.V.Kulkarni 2. Surveying and Levelling by Subramanian, Oxford University Press. 3. Surveying, Vol. I & II by Dr. B.C.Punmia, Ashok K. Jain, Arun K.Jain 4. Surveying: Vol. II. And III by Dr. B. C. Punmia :Laxmi Publication - New Delhi. 5. Surveying and Levelling by N. N. Basak 6. Surveying Vol. I & II by Dr.K. R. Arora 7. Surveying, Vol. I & II by S. K. Duggal
Reference Books	1. Surveying, Bannister, A., and Raymond, S., ELBS, Sixth Edition, 1992. 2. Surveying Vol. I and II, Arora, K. R., Standard Book House, New Delhi, 1991.

Diploma In Civil Engineering
Semester-III
2022-23

Course Title	**Material Technology**				
Course Code	**DENCE302T**				
Course Credits	**L**	**T**	**P**	**TC**	
	3	**1**	**-**	**4**	
Prerequisites	**Chemistry**				
Course Objectives	**This course will enable students to:** • Introduce students to various materials commonly used in civil engineering construction and their properties. • Develop the conceptual knowledge in building material • Select appropriate material in given field situation • Develop awareness about latest building materials				
Course Contents	**UNIT-I** **Introduction** Importance of material technology for civil engineer Clay products -. bricks, roofing tiles, flooring tiles ,Method of preparation of bricks ,Table moulded and ground moulded bricks ,Burning of bricks , Hoffaman's continuous kiln ,Properties of good building bricks ,Testing of bricks. **UNIT-II** **Stone & Aggregate** Classification of rocks –geological(igneous, sedimentary and metamorphic) Properties of good building stones ,Methods of quarrying ,Stone as aggregate for road construction with their various grades as per I.S. ,Use of aggregate for building work at various stages ,sources and properties of aggregate and sand **UNIT-III** **Binding Materials** Lime - Lime as binding material, Types of lime: - fat lime, hydraulic lime, quicklime, Properties of lime. ,Cement -Different ingredients used for manufacturing cement with their percentage ,Methods of preparation of cement by (i)wet process (ii) dry process ,Physical & Chemical Properties of Cement ,Testing of cement such as:- Ordinary port land cement. , Low heat cement, Slag cement, Rapid hardening of cement, Sulphate resistant cement, White & color cement .Quick setting cement. Portland Pozzolana cement .,Water repellent cement **UNIT-IV** **Flooring Materials & Roofing Materials**				

	Difference between wood and timber ,Timber to be used as an engineering material ,Growth of timber:- exogenous, endogenous ,Defects in timber-knot, twisted fibers, rind gall ,Seasoning of timber ,Preservation of timber ,Plywood, veneers laminated plywood. **Flooring Materials:** Different types of floors used in building, Flag stone floor, Cement concrete floor, Mosaic flooring, Tile floors, Ceramic tile floor, Glazed tiling, Wooden floor, Glass floor. **Roofing Materials:** Roof covering materials - bamboo mats, galvanized iron sheets, corrugated types, asbestos cement sheet , Plain and Trafford type tiles-Allahabad tiles, Manglore tiles, half round tiles, local country tiles **UNIT-V** **Steel And Aluminium Products** Steel as engineering materials in different shapes -T section, Angle section, Channel section, I-section, Steel sheets used in manufacturing of doors. , Aluminium as construction material, Different uses of steel and aluminium in building. **Miscellaneous** Use of material like glass, rubber, tar, emulsion, bitumen, glass wool. Plastics, P.V.C. pipes used as a materials in pipe laying for water supply purposes, irrigation etc. ,Water tanks ,P.V.C. sheets doors and windows
Course Outcomes	**After the completion of course:** • Classify and characterize bricks and its properties. • Explain the properties of stone, aggregate and bricks and its selection criteria as per requirement and specification in civil engineering works/projects. • Explain the types and properties of binding materials and it's as per requirement in civil engineering works. • Select appropriate flooring, roofing false ceiling and cladding materials as per construction requirements and prevailing condition. • Recognize uses of miscellaneous building material.
Text Books	1. Building Materials, Varghese. P.C, PHI Learning Pvt. Ltd, New Delhi, 2015. 2. Engineering Materials, Rajput. R.K., S. Chand and Company Ltd., 2008. 3. Concrete Technology, Gambhir. M.L., 3rd Edition, Tata McGraw Hill Education, 2004 4. Building Materials, Duggal. S.K. 4th Edition, New Age International, 2008.
Reference Books	1. Alternative Building Materials Technology, Jagadish. K.S, New Age International, 2007. 2. Building Materials, products, properties and systems, Gambhir. M.L., &Neha Jamwal., Tata McGraw Hill Educations Pvt. Ltd, New Delhi, 2012.

	3. IS456 - 2000: Indian Standard specification for plain and reinforced concrete, 2011 4. IS4926 - 2003: Indian Standard specification for ready–mixed concrete, 2012 5. IS383 - 1970: Indian Standard specification for coarse and fine aggregate from natural Sources for concrete, 2011 6. IS1542-1992: Indian standard specification for sand for plaster, 2009 **7.** IS 10262-2009: Indian Standard Concrete Mix Proportioning –Guidelines, 2009

Diploma In Civil Engineering
Semester-III
2022-23

<table>
<tr><td>Course Title</td><td colspan="5">Material Technology</td></tr>
<tr><td>Course Code</td><td colspan="5">DENCE302P</td></tr>
<tr><td rowspan="2">Course Credits</td><td>L</td><td>T</td><td>P</td><td>TC</td><td></td></tr>
<tr><td>-</td><td>-</td><td>2</td><td>1</td><td></td></tr>
<tr><td>Prerequisites</td><td colspan="5">Chemistry& Subject Knowledge</td></tr>
<tr><td>Course Objectives</td><td colspan="5">This course will enable students to:
Facilitate the understanding of the behavior of construction materials
Help for selecting and verifying materials and to evaluate material quality, performance, troubleshooting, research and many other applications</td></tr>
<tr><td>Course Contents</td><td colspan="5">List Of Experiments
Grading of Aggregate<ol type="a">
Fineness modulus of fine aggregate.
Fineness modulus of coarse aggregate
Bulking of sand.
Test on Bricks<ol type="a">
Water absorption test.
Compressive strength of bricks.
Test for Cement<ol type="a">
Fineness test of cement.
Normal consistency of cement.
Setting time test initial and final.
Tensile strength.
Testing for Steel<ol type="a">
Tensile strength of M.S. bar.
Shear strength on M.S. bar.</td></tr>
<tr><td>Course Outcomes</td><td colspan="5">After the completion of course:
Classify and characterize stones
Comprehend the manufacturing process of bricks, lime and cement
Recognize the preservation methods of timber and metals
Understand the use of non-conventional Civil Engineering materials</td></tr>
<tr><td>Text Books</td><td colspan="5">1. Civil Engineering Materials—Neil Jackson &Ravindra K. Dhir-- Palgrave</td></tr>
</table>

	Macmillan 2. Building Materials---S.K. Duggal—New Age International Publishers 3. Civil Engineering Materials --- TTTI Chandigrah, Tata McGraw Hill Publications. 4. Materials of construction --- Ghosh, Tata McGraw Hill. 5. Building Construction -- S.C. Rangwala. 6. National Building Code. (Latest edition) 7. Doors Windows and Stairs by R. Barry. 8. Building Materials Technology by Branyly, Tata McGraw Hill. 9. Properties of Concrete by A. M. Neville.

Diploma In Civil Engineering
Semester-III
2022-23

<table>
<tr><td>Course Title</td><td colspan="5">Hydraulics</td></tr>
<tr><td>Course Code</td><td colspan="5">DENCE303T</td></tr>
<tr><td rowspan="2">Course Credits</td><td>L</td><td>T</td><td>P</td><td>TC</td><td></td></tr>
<tr><td>3</td><td>1</td><td>-</td><td>4</td><td></td></tr>
<tr><td>Prerequisites</td><td colspan="5">Physics</td></tr>
<tr><td>Course Objectives</td><td colspan="5">This course will enable students to:
Understand the behaviour of fluid flow in different conditions in pipes, channels, canals, notches, weirs etc. is necessary for civil, environmental and transportation engineers.
Acquire basic knowledge about hydraulics will be useful in subjects like Irrigation, Water Resources Management and Public Health Engineering.
In this course, basics of hydraulics and its application oriented content has been kept with a focus that students should be able to solve practical problems.
Develop Competencies by this course would therefore be useful for students while performing his/her job in the field of Water resources / Irrigation/ PHE and Environment Engineering.</td></tr>
<tr><td>Course Contents</td><td colspan="5">UNIT-I

Introduction
Definition of liquid, Ideal liquid and Real liquid ,Mass density ,Specific weight ,Compressibility , Viscosity ,Surface tension, ,Branches of hydraulics- Hydro statics, hydro kinematics and hydrodynamics.

Pressure and its Measurements: Pressure, Pressure intensity, Variation of pressure with depth of liquid, Pressure head, Effect of shape and size of container on pressure, .PASCAL’s law, Types of pressure - atmospheric pressure, gauge pressure, absolute pressure, Manometer, and differential monometer. , Bourdons pressure gauge.

UNIT-II

Hydro Statics
Total pressure on plane horizontal surface , vertical surface and inclined surface , Centre of pressure and pressure distribution diagram

Hydro Kinematics-Law of conservation of mass, Equation of continuity, Steady and unsteady flow, Uniform and non-uniform flow, Laminar and turbulent flow, Lines of flow, Path line, and Stream line.</td></tr>
</table>

	UNIT-III **Hydro Dynamics** Various forms of energies present in liquid flow - potential energy, kinetic ,energy, pressure energy, total energy Bernoulli's theorem ,Limitations of Bernoulli's theorem **UNIT-IV** **Water Discharge Measurement** Principles of discharge measurement through pipes , Venturimeter, Equation of discharge through venture meter ,Orifice meter ,Velocity measuring instruments ,Pitot tube ,Current meter ,Description method ,Orifice and flow through orifice Hydraulic co-efficient, ,Jet trajectory, Vena contracta ,Small and large orifice ,Expression for discharge for free flow Submerged flow ,Time required for emptying tank. , Notch sharp crested, rectangular, triangular and trapezoidal, Expression for discharge of flow through notches, Weirs - definition, description and types of weirs and Discharge calculation. **UNIT-V** **Flow Through Pipes** Characteristics of Pipe Flow, Law of liquid friction for laminar flow and turbulent flow, Expression for head loss in pipes due to friction, Darcy's weishbach / equation. , Major losses. , Expressions for loss due to sudden enlargement, bends, minor losses, Flow through long pipe.
Course Outcomes	**After the completion of course:** • Measure pressure of fluid using equipments such as manometer, mechanical gauge • Interpret the problems related to fluid/liquid and apply for solving fluid mechanics problem. • Apply Bernoulli's theorem in different situations. • Measure discharge by different methods. • Analyze pipe flow.
Text Books	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
Reference Books	1. Hydraulics and Fluid Mechanics including Fluid Machines Standard Book House Modi, P.N., & Seth, S.M., , New Delhi, 2000. 2. Fluid Mechanics and Machinery Rama Durgaiah, D. New Age International

	Publishers, New Delhi, 1st Edition, Reprint, 2006. 3. Open Channel Hydraulics, Chow, V.T., Blackburn Press, 2nd Edition, Reprint, 2009.

Diploma In Civil Engineering
Semester-III
2022-23

<table>
<tr><td>Course Title</td><td colspan="5">Hydraulics</td></tr>
<tr><td>Course Code</td><td colspan="5">DENCE303P</td></tr>
<tr><td rowspan="2">Course Credits</td><td>L</td><td>T</td><td>P</td><td>TC</td><td></td></tr>
<tr><td>-</td><td>-</td><td>2</td><td>1</td><td></td></tr>
<tr><td>Prerequisites</td><td colspan="5">Physics & Subject Knowledge</td></tr>
<tr><td>Course Objectives</td><td colspan="5">This course will enable students to:
Give fundamental knowledge of fluid, its properties and behavior under various conditions of internal and external flows.
Develop an appreciation for the properties of Newtonian fluids,
Study analytical solutions to variety of simplified problems,
Understand the dynamics of fluid flows and the governing non-dimensional parameters, apply concepts of mass, momentum and energy conservation to flows</td></tr>
<tr><td>Course Contents</td><td colspan="5">List of Experiments
Pressure measurement at a point. To measure difference of pressure between two given points by U tube manometer and differential manometer.
Determination of Hydraulic coefficients Cc , Cv and Cd
Determine discharge through venturimeter.
Determine discharge through orifice meter.
Plotting hydraulic gradient line and total energy line.
Verification of Bernoulli’s theorem.
Determine time of emptying tank
Determine friction loses through pipes
Determine losses in pipe due to sudden enlargement and sudden contraction
Determine discharge through open channel
Study the working of<ol type="a">
Reciprocating pump
Centrifugal pump
Submersible pump</td></tr>
<tr><td>Course Outcomes</td><td colspan="5">After the completion of course:
Understand hazards of hydraulic and pneumatic circuits and be able to work safely.</td></tr>
</table>

	• Understand the concepts of fluid statics and dynamics as applied to commercial and industrial control. • Recognize standard schematic symbols for common fluid power components. • Understand and troubleshoot basic fluid power, electro-hydraulic, and electro-pneumatic circuits using schematic diagrams. • Understand the operation, application, and maintenance of common fluid power components such as pumps, compressors, valves, cylinders, motors, rotary actuators, accumulators, pipe, hose, and fittings
Text Books	1. Engineering Chemistry by O. P. Agrawal. 2. Engineering Chemistry by Jain and Jain. 3. Physical Chemistry by Glosstone. 4. Organic Chemistry by Sarkar and Rakshit. 5. Engineering Chemistry by M. M. Uppal Revised by S. C. Bhatia. 6. Modern Text Book of Applied Chemistry by P.C. Jain, Dr. G. C. Saxena and Dr.A. K. Goswami.
Reference Books	1. Hydraulics and Fluid Mechanics including Fluid Machines Standard Book House Modi, P.N., & Seth, S.M., , New Delhi, 2000. 2. Fluid Mechanics and Machinery Rama Durgaiah, D. New Age International Publishers, New Delhi, 1st Edition, Reprint, 2006. 3. Open Channel Hydraulics, Chow, V.T., Blackburn Press, 2nd Edition, Reprint, 2009.

Diploma In Civil Engineering
Semester-III
2022-23

<table>
<tr><td>Course Title</td><td colspan="5">Civil Engineering Drawing</td></tr>
<tr><td>Course Code</td><td colspan="5">DENCE304T</td></tr>
<tr><td rowspan="2">Course Credits</td><td>L</td><td>T</td><td>P</td><td>TC</td><td></td></tr>
<tr><td>3</td><td>1</td><td>-</td><td>4</td><td></td></tr>
<tr><td>Prerequisites</td><td colspan="5">Engineering Drawing</td></tr>
<tr><td>Course Objectives</td><td colspan="5">This course will enable students to:
Understand the principles of planning and bylaws
Draw plan, elevation and section of load bearing and framed structures
Draw plan, elevation and section of public and industrial structures
Prepare detailed working drawing for doors, windows, etc.</td></tr>
<tr><td>Course Contents</td><td colspan="5">UNIT-I

Introduction
Various types of drawings, Importance and situations where above drawings are required. ,Types Of Projections;- First angle and Third angle projection, Symbols, conversions, and abbreviations commonly used in building drawing ,Scales used for various types of drawings ,Titles, margins, as per I. S. , sizes of various standard drawing sheets.

UNIT-II

Building Bye-Laws
Building bye-laws for residential buildings, Industrial and commercial buildings.

Principles of Planning: Principles of planning of residential building for Room dimensions , Area , Heights , Privacy , Ventilation ,Access, Circulation , Economy Drainage aspect , Prospect ,Orientation , Grouping etc. Principles of planning for school, hospital, post office, shopping centre, office ,building, industrial unit

Details of Building Drawing :Site plan ,Line plan ,Detailed plan ,Elevations ,Sections ,Foundation plan , Layout plan , Showing drainage septic tank water supplies and electricity

UNIT-III

Doors And Windows
Types of doors and windows according to materials, Types of doors and window according to the nature of their construction, Detailed drawing of panelled door and window, Sketches of all types of doors and windows.

Stair Cases: Importance of staircase in building , Location of stair case ,Types of stair case used in building i.e. straight flight, dog legged, open well stair case</td></tr>
</table>

	UNIT-IV **Pitched Roof Including Roof Trusses** Types of pitched roofs Timber truss, King post & queen post truss, Various members used in pitched roof like tie beam, principal rafter, ridge, eves, board, common rafter, purlins, batten, Roof covering materials tiles, A. C. sheets, and G.I. sheets. **UNIT-V** **Box & Pipe Culvert** • Box & pipe culvert • Component parts • Detailed working drawing plan, elevation section
Course Outcomes	**After the completion of course:** • Interpret conventional sign, symbols and working drawings of various civil engineering structures • Apply the basic principles and bye laws for preparation of engineering drawings of building • Prepare detailed working drawings of Building components including doors, windows and typical staircase. • Prepare a detailed drawing of pitched roofs, trusses & Components of roofs. • Prepare a detailed drawing Box type culvert & pipe culvert.
Text Books	1. Building Drawing, Shah M.G. Kalec. M. &Patki SY Tata Mcgraw Hill, New Delhi, 2000 2. Drawing & House Planning, Verma, B.P., Civil Engg. Khanna publishers, New Delhi, 2000. 3. Building drawing & detailing, Balagopal & Prabhu, T.S., Spades Publishers, Calicut, 2000
Reference Books	1. A Course in Civil Engineering Drawing, Sikka, V.B., 4th Edition, S.K. Kataria & Sons, New Delhi – 1998. 2. Building Drawing with an integrated Approach to Built Environment, Shah, M.G. Kale, C.M. & Patki, S.T., 4th edition, Tata McGraw Hill Publishing Co. Ltd., New Delhi – 2002.

Diploma In Civil Engineering
Semester-III
2022-23

<table>
<tr><td>Course Title</td><td colspan="5">Building Construction</td></tr>
<tr><td>Course Code</td><td colspan="5">DENCE305T</td></tr>
<tr><td rowspan="2">Course Credits</td><td>L</td><td>T</td><td>P</td><td>TC</td><td></td></tr>
<tr><td>3</td><td>1</td><td>-</td><td>4</td><td></td></tr>
<tr><td>Prerequisites</td><td colspan="5">Chemistry</td></tr>
<tr><td>Course Objectives</td><td colspan="5">This course will enable students to:
• Develop knowledge of material science and behaviour of various building materials used in construction.
• Identify the construction materials required for the assigned work.
• Provide procedural knowledge of the simple testing methods of cement, lime and concrete etc.
• List the requirements and different types of stairs</td></tr>
<tr><td>Course Contents</td><td colspan="5">UNIT-I

Introduction
Components of a structure, Sub/super structure, Types of structure, Framed & load bearing structure and comparison between the two Site selections, Construction tool.
Foundation: Importance of foundation ,Necessity of foundation ,Types of foundation ,Trenches/pile type foundation Empirical formula for design of foundations ,Selection of foundation ,Bearing capacity ,Construction procedure Timbering, dewatering of trenches ,Type of piles ,Shoring in soft soil ,Lay out of building ,Under-reamed piles ,Timber pile ,Precast pile ,Concrete pile.

UNIT-II

Masonry
Types of masonry - Stone, bricks, hollow concrete block ,Comparison between different types of masonry ,Uses of different types of masonry ,Technical terms involved in masonry ,Bond in bricks and stone masonry- Types and their merits.

Plastering : Plastering and pointing ,Difference between plastering and pointing ,Types of plastering and pointing Different materials used for finishing and their selection

Doors and Windows: Types and details of doors and windows ,Materials used for doors and windows and their suitability ,Sizes of doors and windows as per I.S. code ,Selection criteria for doors and windows

UNIT-III

Concrete
Types of concrete, Grades as per I.S. code, Workability, Water cement ratio and its</td></tr>
</table>

	effect on workability and strength, Testing of concrete for strength and workability. Centering, False work, Mixing, laying and curing of concrete. **Precast Construction:** Advantages of precast construction, Materials of construction, Components of precast construction such as flooring, beams, columns, lintels, sunshades, manhole cover, window-door frame, railings, septic tank etc., and Stages of pre-casting concrete products**.** **UNIT-IV** **Floors** Types of floors ,Different materials used in flooring ,Their merits and demerits Selection & suitability of different floors Procedure for construction of floors **Roof :** Types of roofs- flat and pitched roof ,Comparison & uses of roofs ,Terms related to pitched roof Components of pitched roofs , Types of steel trusses-their uses and suitability for different types of roof **UNIT-V** **Scaffolding & Site Clearance** Purpose of scaffolding, types of scaffolding, Importance of scaffolding, Situation where scaffolding is used, Merits and demerits of different types of scaffolding, Necessity and procedure of site clearance. **Stairs:** Various terms used in stairs ,Types of stairs and their suitability ,Material used in construction of stairs ,Relations between rise and tread , Empirical formula and I.S. code for rise and tread
Course Outcomes	**After the completion of course:** • Supervise foundation work as per working drawing and specifications and BOQ/SOR • Supervise masonry work as per working drawing and construction of walls and describe doors and windows and also monitor different type of plastering. • Supervise precast construction of lintels & flooring, beams, columns. Requirements of the concrete in construction. • Demonstrate the types and construction methods of different floors & roofs. • Demonstrate the types and purpose of scaffolding & identify different types of stair and its components.

Text Books	1. Building Materials, S. K. Duggal, New Age International Publishers. 2. Building Materials and construction, Sushil Kumar Standard Publishers, 20th edition, reprint, 2015. 3. Building Construction, Dr. B. C. Punmia, Ashok kumar Jain, Arun Kumar Jain, Laxmi Publications (P) ltd., New Delhi. 4. Engineering Materials, Rangawala S. C. Charter Publishing House, Anand, India.
Reference Books	1. Building Construction PC Verghese, PHI. 2. Construction Technology, R. Chuddy, Vol 1 & 2, Longman UK. 3. Basic Civil Engineering, Subhash Chander, Jain Brothers.

Diploma In Civil Engineering
Semester-III
2022-23

<table>
<tr><td>Course Title</td><td colspan="5">Building Construction</td></tr>
<tr><td>Course Code</td><td colspan="5">DENCE305P</td></tr>
<tr><td rowspan="2">Course Credits</td><td>L</td><td>T</td><td>P</td><td>TC</td><td></td></tr>
<tr><td>-</td><td>-</td><td>2</td><td>1</td><td></td></tr>
<tr><td>Prerequisites</td><td colspan="5">Chemistry& Subject Knowledge</td></tr>
<tr><td>Course 0bjectives</td><td colspan="5">This course will enable students to:
Test the basic properties ingredients of concrete, fresh and hardened concrete properties.
Provide procedural knowledge of the simple testing methods of cement, lime and concrete etc.</td></tr>
<tr><td>Course Contents</td><td colspan="5">List of Experiments
Testing of concrete for workability
Testing of concrete for compressive strength
Layout of a room with verandah.
Layout of a residential building.
Layout of a framed structure.
Planning and layout of a staircase
Sketches To Be Prepared:
Various types of foundations.
Various types of brick bonds and masonry finishing.
Various types of doors and window.
Various types of stairs
Various types of scaffoldings.
Sketches knots and scaffolding.</td></tr>
<tr><td>Course Outcomes</td><td colspan="5">After the completion of course:
Explain various types of cements and their applications in construction.
Analyze the importance of mineral and chemical admixtures, requirements of the concrete in construction.
Explain different types of lintel, arches and the materials which are commonly used for construction.
Explain the suitability of floors in buildings like mosaic flooring, terrazzo flooring, rubber flooring, asphalt flooring.
Understand the different types of trusses, RCC roofs, and madras terrace/shell</td></tr>
</table>

	roofs. • Explain the foundations and uses of different types of foundations.
Text Books	1. Workshop Technology (Vol-1) Hazra & choudhary. 2. Workshop Technology – (Vol-1 & 2) Chapnan 3. Manufacturing process (Vol-1 Delela 4. Materials and Manufacturing Lindberg processes.
Reference Books	1. Building Construction PC Verghese, PHI. 2. Construction Technology, R. Chuddy, Vol 1&2, Longman UK. 3. Basic Civil Engineering, Subhash Chander, Jain Brothers.