

ANNEXURE - I

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

1010 : DIPLOMA IN CIVIL ENGINEERING SYLLABUS

N- SCHEME

(To be implemented for the students from the year 2020-21 onwards)

CURRICULUM OUTLINE

THIRD SEMESTER (FULL TIME)

Subject Code	Subject Name	Hours Per Week			
		Theory	Drawing	Practical	Total
4010310	Mechanics of Solids	6	-	-	6
4010320	Construction Materials and Construction Practice	5	-	-	5
4010330	Surveying	6	-	-	6
4010340	Building Planning and Drawing	-	4	-	4
4010350	Civil Engineering Drawing and CAD Practical – I	-	-	4	4
4010360	Material Testing Laboratory– I	-	-	3	3
4010370	Surveying Practice –I	-	-	4	4
Co-curricular activities	Physical Education	-	-	-	2
	Library	-	-	-	1
	TOTAL	17	4	11	35

ANNEXURE – II

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

1010 : DIPLOMA IN CIVIL ENGINEERING SYLLABUS

N-SCHEME

(To be implemented for the students from the year 2020-21 onwards)

SCHEME OF EXAMINATION

THIRD SEMESTER (FULL TIME)

Subject Code	Subject Name	Examination Marks			Minimum for pass	Duration of Exam Hours
		Internal assessment Marks	Board Examination Marks (Converted to 75)	Total Marks		
4010310	Mechanics of Solids	25	100	100	40	3
4010320	Construction Materials and Construction Practice	25	100	100	40	3
4010330	Surveying	25	100	100	40	3
4010340	Building Planning and Drawing	25	100	100	40	3
4010350	Civil Engineering Drawing and CAD Practical – I	25	100	100	50	3
4010360	Material Testing Laboratory– I	25	100	100	50	3
4010370	Surveying Practice –I	25	100	100	50	3
TOTAL			700	700		

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN CIVIL ENGINEERING SYLLABUS
N-SCHEME

(To be implemented for the students admitted from the year 2020-2021 onwards)

Course Name : 1010: DIPLOMA IN CIVIL ENGINEERING
Subject Code : 4010310
Semester : III Semester
Subject Title : **MECHANICS OF SOLIDS**

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
MECHANICS OF SOLIDS	6 Hrs	96 Hrs	25	100*	100	3 Hrs

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks

Topics and Allocation of Hours

Unit	Topics	Hours
I	Simple Stresses and Strains	20
II	Shear Force and Bending Moment	17
III	Geometrical Properties of Sections	18
IV	Stresses in Beams and Shafts	17
V	Pin Jointed Frames	17
	Test & Model Exam	7
TOTAL		96

RATIONALE:

Being the basic engineering subject, this imparts basic knowledge and skill regarding properties of materials, concept of stresses and strains, bending moment and shear force diagrams, second moment of area, bending and shear stresses, slope and deflection and analysis of trusses. The above knowledge will be useful for designing simple structural components. This subject is very important to develop basic concepts and principles related to structural mechanics. This subject is much essential for the students to continue their further education.

OBJECTIVES:

On completion of the course, the student will be able to:

- Analyse the mechanical properties of engineering materials, elastic constants, relationship between elastic constants, different types of stresses and strains, the deformation of elastic bodies under simple stresses, the use and principles of composite sections;
- Analyse the structural behaviour of materials under various loading conditions.
- Interpret shear force and bending moment diagrams for various types of beams and loading Conditions, application of stress and strain in engineering field. Articulate practical applications of moment of inertia of symmetrical and unsymmetrical structural sections.
- Determine the different types of stresses induced in beams and shafts due to bending and twisting moments respectively
- Analyse perfect frames for vertical loads by analytical as well as graphical methods.

Unit	Name of the Topics	Hours
II	<p>SHEAR FORCE AND BENDING MOMENT</p> <p>2.1 TYPES OF LOADS AND BEAMS</p> <p>Definitions of: Axial load, Transverse load, Concentrated (or) Point load, Uniformly Distributed load (UDL), Varying load – Types of Supports and Reactions: Simple support, Roller support, Hinged support, Fixed support; Vertical reaction, Horizontal reaction, Moment reaction- Types of Beams based on support conditions- Diagrammatic representation of beams, loads and supports– Static equilibrium equations – Determinate and indeterminate beams.</p> <p>2.2 SHEAR FORCE AND BENDING MOMENT IN BEAMS</p> <p>Definitions of Shear Force and Bending Moment – Conventional signs used for S.F. and B.M – S.F and B.M of general cases of determinate beams – S.F and B.M diagrams for Cantilevers, Simply supported beams– Position of maximum BM - Derivation of Relation between intensity of load , S.F and B.M. – Numerical problems on S.F and B.M. (Determinate beams with concentrated loads-udl and couple).</p>	<p>8</p> <p>9</p>
III	<p>GEOMETRICAL PROPERTIES OF SECTIONS</p> <p>3.1 CENTROID</p> <p>Geometrical properties – Definitions and examples of Symmetrical, Anti Symmetrical, Asymmetrical shapes - Definitions of centre of gravity and centroid - Centroid of Symmetrical shapes (solid / hollow square, rectangular, circular, I Sections) - Centroid of Asymmetrical shapes (triangular, semi circular, quadrant, trapezoidal, parabolic sections) - Centroid of Anti Symmetric shapes (S, Z sections) – Built up structural sections – Problems.</p>	8

Unit	Name of the Topics	Hours
III	<p>3.2 MOMENT OF INERTIA</p> <p>Definitions of: Inertia, Moment of Inertia, Polar moment of inertia, Radius of gyration, Section Modulus, Polar modulus - Parallel and perpendicular axes theorems - Derivation of expressions for M.I / Polar M I, Section modulus and Radius of gyration of regular geometrical plane sections (rectangle and circle only) – M.I about centroidal axis / base, Section modulus, Radius of gyration of symmetric, asymmetric, anti symmetric and built up symmetrical sections – Numerical problems.</p>	10
IV	<p>STRESSES IN BEAMS AND SHAFTS</p> <p>4.1 STRESSES IN BEAMS DUE TO BENDING</p> <p>Types of Bending stresses – Neutral axis – Theory of simple bending – Assumptions – Moment of resistance – Derivation of flexure/bending equation $M / I = E / R = \sigma / y$ – Bending stress distribution – Curvature of beam – Position of N.A and centroidal axis – Stiffness equation – Flexural rigidity – Strength equation – Significance of Section modulus – Numerical problems.</p> <p>4.2 STRESS IN SHAFTS DUE TO TORSION</p> <p>Definitions of: Shaft, Couple, Torque (or) Twisting moment - Types of Shafts (one end fixed and the other rotating, both ends rotating at different speeds) - Theory of Pure Torsion – Assumptions -Derivation of Torsion equation, $T / I_p = \sigma_{max} / R = G\theta / l$ - Shear stress distribution in circular section due to torsion - Strength and Stiffness of shafts – Torsional rigidity - Torsional modulus - Power transmitted by a shaft - Numerical problems.</p>	<p>8</p> <p>9</p>

Unit	Name of the Topics	Hours
V	<p>PIN JOINTED FRAMES</p> <p>5.1 ANALYSIS BY ANALYTICAL METHOD (METHOD OF JOINTS) Definitions of: Frame / Truss, Pin Joint, Nodes, Rafters, Ties, Struts, Slings - Determinate and indeterminate frames - Classification of frames - Perfect and imperfect frames – Deficient / Instable and redundant frames - Formulation of a perfect frame - Common types of trusses - Support conditions - Resolution of a force - Designation of a force - Nature of forces in the frame members - Analysis of Symmetrical Frames – Assumptions - Methods of analysis - Analytical methods - Method of Joints and Method of Sections - Problems on Analysis of cantilever and simply supported perfect frames (with not more than ten members) with vertical nodal loads by method of joints only. Identification of members with nil force in a determinate truss.</p> <p>5.2 ANALYSIS BY GRAPHICAL METHOD Graphic statics - Advantages - Space diagram - Bow's notation- Resultant force (or) Equivalent force -Equilibrant force - Vector diagram - Determination of magnitude and nature of forces in the members of a cantilever / simply supported determinate trusses (with not more than eight members) with vertical nodal loads only.</p>	<p>10</p> <p>7</p>
	Test & Model Exam	7 Hrs.

Reference Books

1. R.S.Khurmi “Strength of Materials”, S.Chand & Company Ltd, New Delhi
2. S.Ramamirtham, “Strength of Materials”, Dhanpat Rai (2003)
3. Vazirani & Ratwani, “Analysis of Structures-Vol 1”, Khanna Publishers(2003)
4. S.B.Junnarkar, “Mechanics of Structures- Vol 1”, Charotar Publishing House
5. Sanchayan Mukherjee, “Elements of Engineering Mechanics”, PHI Learning Pvt. Ltd.
6. R K Bansal, “Engineering Mechanics”, Laxmi Publications Pvt.Ltd.



DIPLOMA IN CIVIL ENGINEERING

II YEAR

N - SCHEME

III SEMESTER
CONSTRUCTION MATERIALS AND
CONSTRUCTION PRACTICE

IMPLEMENTED FROM 2020- 2021

CURRICULUM DEVELOPMENT CENTRE

DIRECTORATE OF TECHNICAL EDUCATION
CHENNAI-600 025, TAMIL NADU

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN CIVIL ENGINEERING SYLLABUS
N-SCHEME

(To be implemented for the students admitted from the year 2020-2021 onwards)

Course Name : 1010 : DIPLOMA CIVIL ENGINEERING
Subject Code : 4010320
Semester : III Semester
Subject Title : **CONSTRUCTION MATERIALS AND CONSTRUCTION PRACTICE**

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
CONSTRUCTION MATERIALS AND CONSTRUCTION PRACTICE	5 Hrs.	80 Hrs.	Internal Assessment	Board Examination	Total	
			25	100*	100	

*Examinations will be conducted for 100 marks and it will be reduced to 75 marks

Topics and Allocation of Hours

Unit	Topics	Hours
I	Building Materials	15
II	Building Materials (Contd.)	15
III	Foundations And Masonries	15
IV	Doors, Floors, Roofs, etc.,	14
V	Pointing, Plastering, Painting, Form Work, etc.,	14
	Test & Model Exam	7
	TOTAL	80

RATIONALE:

Civil Engineering diploma holders have to supervise construction of various types of civil works involving, the 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. The students should have requisite knowledge regarding the characteristics, uses and availability of various building materials and skills in conducting tests to determine the suitability of materials for various construction purposes. In addition, specifications of various materials should also be known (PWD/BIS) for effective quality control.

To perform the above tasks, it is essential that students should have knowledge of various sub components of buildings like foundations, walls, roofs, stair cases, floors etc., and their constructional details. Therefore, the subject of Construction Materials and Construction Practice is very important for Civil Engineering diploma holders.

OBJECTIVES:

On completion of the course, the students will be able to:

- State different construction materials and their properties.
- Explain the different types of cement, grades of cements and tests on cement.
- State and explain the different types of modern building materials such as ceramic products, glass, metals and plastics.
- Explain the method of preparation of mortar, cement concrete and state the different types of structures.
- Describe the different types of foundations.
- Describe the classification of stone masonry & brick masonry. State the different types of doors, windows, lintels & stairs.
- Describe the types of floors and roofs.
- Describe the different methods of pointing, plastering and termite proofing.
- Explain the methods of scaffolding, shoring & underpinning and form work.
- Describe procedure of colour washing, white washing, painting and varnishing.

DETAILED SYLLABUS

4010320-CONSTRUCTION MATERIALS AND CONSTRUCTION PRACTICE

Contents: Theory

Unit	Name of the Topics	Hours
I	<p>1.1 INTRODUCTION</p> <p>Physical properties of materials - Density, Bulk density, Specific gravity, porosity, water absorption, permeability, chemical resistance, fire resistance, weathering resistance, thermal conductivity, Durability. (Definitions only).</p>	2
	<p>1.2 ROCKS AND STONES</p> <p>Rocks - Classification of Rocks - Geological, Physical and Chemical classification - Uses of stones - Requirements of a good building stone - Natural and Artificial stones for flooring - Examples (Detailed description not required).</p>	2
	<p>1.3 BRICKS</p> <p>Definition - Brick earth - Composition of good brick earth - Manufacturing process - classification of bricks - properties of bricks - special types of bricks and their uses - compressive strength of bricks - Tests on bricks (Names only) - grades and corresponding requirements of bricks as per BIS.</p>	2
	<p>1.4 LIME AND POZZOLANAS</p> <p>Sources of lime - classification of lime - Fat, Hydraulic and Poor lime - uses of lime - Pozzolanic materials - Surki, Flyash, Ground blast furnace slag, Rice husk ash - Advantages of adding pozzolanas to cement.</p>	2

www.binils.com

Unit	Name of the Topics	Hours
II	<p>2.4 METALS AND PLASTICS</p> <p>Types of metals used in construction - Cast Iron, Steel, Aluminium, GI, Stainless steel - Market forms of steel Steel for reinforced concrete - steel for pre stressed concrete - Plastics Characteristics and Uses of plastics -Types - Thermoplastics and Thermosetting plastics - Various plastic products: pipes, taps, tubs, basins, doors, windows, water tanks, partitions sizes, capacity and uses - Advantages and disadvantages of plastic products- Asbestos - uses of asbestos.</p>	3
	<p>2.5 TIMBER AND TIMBER PRODUCTS</p> <p>Types of Timber -Teak, Sal, Rosewood, Mango, and Jack - Defects in timber seasoning of timber- objectives - Timber Products - Veneers, Ply woods, Particle Board, Fibre board, Hard board, Block board, Laminated board Uses.</p>	2
	<p>2.6 ROOF COVERINGS</p> <p>Definition - objectives and uses - AC Sheets - FRP Sheets - G.I. sheets- Steel sheets- Polycarbonate sheets- Shell roof - R C C roof Advantages - Types.</p>	2
	<p>2.7 DAMP PROOFING MATERIALS</p> <p>Materials used for damp proofing - Properties and functions of various types of water proofing materials - commonly available chemicals used for grouting / Coating porous concrete surfaces - Admixtures for cement mortar and cement concrete - Functions of Admixtures, Accelerators, Retarders, Air repelling chemicals.</p>	2

Unit	Name of the Topics	Hours
III	<p>3.1 INTRODUCTION TO STRUCTURES</p> <p>Permanent and temporary structures - Life of structures - Sub structure - super structure - load bearing structure - framed structure - concept of framed structure - advantages of framed structure.</p>	2
	<p>3.2 FOUNDATION</p> <p>Definition - objectives of foundation - Bearing capacity of soil – Definition - maximum/ultimate and safe bearing capacity - Bearing capacity of different types of soils - Requirements of a good foundation - Types of foundations - Shallow foundation: Spread foundation, Isolated column footing, combined footing, continuous footing, Raft foundation - Deep foundation: Pile, Stone columns Types of piles : Bearing pile, Friction pile, under reamed pile - Causes of failure of foundation - Remedial measures.</p>	3
	<p>3.3 STONE MASONRY</p> <p>Definition - Common terms used : Natural bed, sill, corbel, course, cornice, coping, weathering, throat, spalls, quoins, string course, lacing course, through stone, plinth, jambs Classification of stone masonry - Rubble masonry : Coursed, un coursed & Random rubble masonry - Ashlar masonry - points to be considered in the construction of stone masonry - Tools used(Names only).</p>	2
	<p>3.4 BRICK MASONRY</p> <p>Definition - Common terms used - Header, stretcher, bed joint, lap, perpend, closer, king, queen & bevelled, bat permissible loads in brick masonry - Bond - Types Header, stretcher, English bond & Flemish bond one brick thick and one and a half brick thick - 'T' junction in English bond - Points to be considered in the construction of brick masonry - Cavity bond masonry - Defects in brick masonry - Maintenance of brick masonry - Reinforced brick masonry - purpose - Its Advantage with respect to strength and Earthquake resistance.</p>	3

Unit	Name of the Topics	Hours
III	<p>3.5 PARTITION</p> <p>Definition - Requirements of good partition wall - Types Brick, Concrete, glass, Aluminium frame with Glass sheet, timber, straw board, wood wool, Asbestos Cement board and plastic board partitions.</p>	2
	<p>3.6 WATER PROOFING AND DAMP PROOFING</p> <p>Dampness - Causes of dampness - Effects of dampness - Damp proofing - Damp proof courses (DPC) - Method of mixing - Bad effects of excessive Admixtures in RCC - Water proofing coats for sump / overhead tank wall - Methods of grouting.</p>	3
IV	<p>4.1 DOORS, WINDOWS AND VENTILATORS</p> <p>Standard sizes of doors and windows - Location of doors and windows - Different materials used - Doors Component parts Types - Framed and panelled, glazed, flush, louvered, collapsible, rolling shutter and sliding doors - Windows Types - Casement, Glazed, Bay, Corner, Pivoted, Circular and Dormer windows - Ventilators - Definition, purpose, Types - Ventilator combined with windows / doors.</p>	3
	<p>4.2 HOLLOW BLOCK CONSTRUCTIONS</p> <p>Hollow blocks - Advantages of hollow blocks - load bearing and non load bearing hollow blocks - Open cavity blocks - face shells, web, gross area, nominal dimensions of blocks, minimum thickness of face shells and web, grades of hollow concrete blocks - Materials used, admixtures added - mixing, moulding, placing and compacting, curing, drying.</p>	2
	<p>4.3 STAIRS</p> <p>Definition - Terms used - Location of stair types - Straight, Dog legged, Open well, bifurcated and spiral stairs - Moving stairs (Escalators) - Lift components uses and advantage of lifts over stairs.</p>	2

	<p>4.4 FLOORS AND FLOORING</p> <p>Floors - Definition - Types - Timber, Composite, RCC floors Flooring - Definition- Materials used - Selection of flooring types - Construction Methods (As per C.P.W.D/P.W.D Specifications) - Mosaic, Granolithic, Tiled, Granite, Marble, Pre cast concrete flooring, Plastic & PVC tile flooring- Carpet tile & Rubber flooring.</p> <p>4.5 ROOFS</p> <p>Definition - Types of roof - Flat roof - RCC roof - Pitched roof - Tile roof - Shell roof - Technical terms - Steel roof truss Types: King post, Raised chord, Howe truss, Fan, fink, north light and Modified north light trusses.</p> <p>4.6 WEATHERING COURSE</p> <p>Weathering course – Purpose - Materials Required - Brick Jelly Concrete preparation - Laying procedure- Preparation of mortar with Damp Proof materials for laying pressed clay tiles- Pointing and finishing of clay tiles - Use of Thermal Resistant - Weathering Tiles.</p>	<p>3</p> <p>2</p> <p>2</p>
V	<p>5.1 POINTING</p> <p>Objectives - Mortar for pointing - Methods of pointing (As per C.P.W.D. / P.W.D Specifications) - Types of pointing - Flush, recessed, weathered, keyed or grooved pointing.</p> <p>5.2 PLASTERING</p> <p>Definitions - Objectives - Cement mortars for Plastering - Requirements of a good plaster - Methods of Plastering - Defects in plastering - Stucco plastering - Acoustic plastering - Granites silicon – plastering – Sand faced Pebble dash - Wall paper finishing - Wall tiling.</p>	<p>2</p> <p>3</p>

V	<p>5.3 WHITE WASHING, COLOUR WASHING , DISTEMPERING, PAINTING & VARNISHING</p> <p>White washing - preparation of surface - Application of white wash - Colour washing - Distempering - Preparation of surfaces - Application of distemper- Painting & Varnishing - Preparation of Surface - Application of Painting & Varnishing.</p> <p>5.4 ANTI-TERMITE TREATMENT</p> <p>Definition - objectives and uses - Methods of termite treatment.</p> <p>5.5 SCAFFOLDING, SHORING AND UNDER PINNING</p> <p>Scaffolding – Definition - Component parts - Types Single, double & Steel scaffolding, Shoring – Definition - Types Raking, flying and dead shores - Underpinning definition - Purpose - Types - Pit Methods - Pile Method.</p> <p>5.6 FORM WORK</p> <p>Definition - Materials used - Requirements of a good form work - Form work for column, RC beams and RC slab.</p>	<p>3</p> <p>1</p> <p>3</p> <p>2</p>
	Test & Model Exam	7 Hrs.



DIPLOMA IN CIVIL ENGINEERING

II YEAR

N-SCHEME

www.binils.com

III SEMESTER

SURVEYING

IMPLEMENTED FROM 2020 -2021

CURRICULUM DEVELOPMENT CENTRE

DIRECTORATE OF TECHNICAL EDUCATION

CHENNAI-600 025, TAMIL NADU

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN CIVIL ENGINEERING SYLLABUS
N-SCHEME

(To be implemented to the student admitted from the year 2020-2021 onwards)

Course Name : 1010 : DIPLOMA IN CIVIL ENGINEERING
Subject Code : 4010330
Semester : III Semester
Subject Title : **SURVEYING**

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
SURVEYING	6 Hrs.	96 Hrs.	Internal Assessment	Board Examination	Total	3 Hrs.
			25	100*	100	

*Examinations will be conducted for 100 marks and it will be reduced to 75 marks

Unit	Topics	Hours
I	Introduction to Surveying and Chain Surveying and compass surveying	22
II	Levelling	17
III	Theodolite Surveying	17
IV	Tacheometric Surveying & Contour Surveying	17
V	Total Station and Global Positioning system	16
	Test & Model Exam	7
	TOTAL	96

RATIONALE:

The important functions of a diploma civil engineer include the jobs of detailed surveying, plotting of survey data, preparation of survey maps and setting out works. While framing the curriculum for the subject of surveying, stress has been given to the development of the skill in each type of survey like chain surveying, compass surveying and levelling that the Civil Engineering diploma holder will normally be called upon to perform. Each type of Survey like Chain surveying, Compass surveying, Levelling, Theodolite surveying, Tacheometric surveying, Contour surveying, Total station surveying and GPS introduced in this course.

OBJECTIVES:

On completion of the course, the students will possess knowledge about:

- Chain surveying
- Compass surveying
- Theodolite surveying
- Tacheometric Surveying
- Preparation of Contour layouts
- Total Station Surveying
- Global Positioning System

www.binils.com

DETAILED SYLLABUS

4010330 - SURVEYING

Contents: Theory

Unit	Name of the Topics	Hours
I	<p>INTRODUCTION TO SURVEYING AND CHAIN SURVEYING AND COMPASS SURVEYING</p> <p>1.1 SURVEYING Definition - Objectives and uses of surveying -Classification of Surveying - Principles of surveying.</p> <p>1.2 CHAIN SURVEYING Introduction - Instruments used for chaining- Chains and Tapes – Types - Definitions of terms commonly used in chain surveying: Survey stations, base line, check line and tie line - Ranging: Direct and Indirect ranging Offsets: Definition, types, Instruments used - Errors in Chaining, Tape corrections and its necessity.</p> <p>1.3 COMPASS SURVEYING Angular measurements-Necessity Instruments used Prismatic compass - Construction details, functions and Temporary adjustment - Types of meridians - Types of bearings - Whole circle and Reduced bearings, Fore and Back bearings- Computation of included angles from bearings - Computation of bearings from included angles - Problems.</p>	<p>2</p> <p>10</p> <p>10</p>
II	<p>2.1 LEVELLING Levelling - Definition - Level Parts, Functions, Accessories- Types of levels : Dumpy level, Quick setting level, Automatic and Laser level Levelling staff - Types Component parts of Levelling instrument - Definitions of terms used : Level surface, Horizontal and Vertical surfaces, Datum, Bench marks, Reduced level, Rise, Fall, Line of collimation, Axis of telescope, Axis of bubble tube, Station, Back sight, Fore sight,</p>	17

V	TOTAL STATION AND GLOBAL POSITIONING SYSTEM	
	5.1 Total Station Introduction - Application of total station - Component parts of a Total Station - Accessories used - Summary of total station characteristics - Features of total station - Electronic display and data reading - Field procedure for co-ordinate measurement - Instrument preparation, Setting and Measurement (Distance, Angle, Bearing, Curve etc.).	8
	5.2 GLOBAL POSITIONING SYSTEM (GPS) Introduction - Maps - Types of Maps - Various Satellites used by GPS - Differential GPS - Fundamentals of GPS - Application of GPS - GPS Receivers - Hand held GPS Receiver - Function Field procedure - Observation and processing applications in Civil Engineering.	8
	Test & Model Exam	7 Hrs.

www.binils.com



DIPLOMA IN CIVIL ENGINEERING

II YEAR

N-SCHEME

www.binils.com
III SEMESTER

BUILDING PLANNING AND DRAWING

IMPLEMENTED FROM 2020 -2021

CURRICULUM DEVELOPMENT CENTRE

DIRECTORATE OF TECHNICAL EDUCATION

CHENNAI-600 025, TAMIL NADU

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN CIVIL ENGINEERING SYLLABUS
N-SCHEME

(To be implemented to the students admitted from the year 2020-2021 onwards)

Course Name : 1010 : DIPLOMA IN CIVIL ENGINEERING
Subject Code : 4010340
Semester : III Semester
Subject Title : **BUILDING PLANNING AND DRAWING**

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
BUILDING PLANNING AND DRAWING	4 Hrs.	64 Hrs.	Internal Assessment	Board Examination	Total	3 Hrs.
			25	100*	100	

*Examinations will be conducted for 100 marks and it will be reduced to 75 marks

Topics and Allocation of Hours

Unit	Topics	Hours
I	Introduction	5
II	Planning of Building	5
III	Basic Drawings	9
IV	Building Drawings	38
	Test & Model Exam	7
	TOTAL	64

RATIONALE:

Drawing is the language of engineers. Engineering is absolutely incomplete without a thorough knowledge of drawing. A Civil Engineering diploma holder must be capable of sketching detailed constructional drawing of various components of building for the purpose of communication with the craftsman. Planning of small buildings, developing a line plan, dimensioning, key plan, and drainage plan should be a part of curriculum. The diploma engineer must be conversant with reading and interpretation of drawing for execution of work.

OBJECTIVES:

On completion of the course, the students will be able to:

- Study Conventions and Abbreviations;
- Prepare layout of buildings;
- Gain thorough knowledge of the rules, regulations and standards of buildings;
- Read the line sketch and prepare plan, elevations of buildings and gain thorough knowledge of planning various types of buildings.

www.binils.com

DETAILED SYLLABUS

4010340-BUILDING PLANNING AND DRAWING

Contents: Theory

Unit	Name of the Topics	Hours
I	INTRODUCTION 1.1 CONVENTIONS, SYMBOLS : General – Conventions- Title block- Scales- Line work- Lettering - Symbols - Abbreviations 1.2 BUILDING BYE-LAWS AND SUBMISSION OF DRAWINGS Objects of bye-laws- Importance of bye-laws- Function of local authority- Set backs- Plot Coverage- Number of floors- Height of building- Built up Area- Floor space index (FSI) - Views and details necessary for the preparation of a civil engineering drawing- Site Plan – Necessity for Approval of plans from local body- Layout plan and key plan- Requirements for submission of drawing for approval- Rules and bye-laws of sanctioning authorities for construction work.	5
II	PLANNING OF BUILDINGS 2.1 PLANNING OF RESIDENTIAL BUILDINGS Types of residential buildings- Usual requirements-Types of Rooms – Minimum Size requirement for each type of rooms - Furniture arrangement in each room- Position of stairs / lifts- Position of Doors/ Windows House drainage and Sanitary fittings – Sump/Water tanks- Plumbing Pipes -Preparation of line drawing for given requirements with dimensions, not to scale. 2.2 PLANNING OF INDUSTRIAL STRUCTURES Planning aspects - Requirements of industrial units - Sheets for pitched roof coverings – Rolling Shutters - Ramps- Stores- Public Toilets/ Bath rooms- Dining / Resting halls- Ventilation and Lighting - Preparation of line drawing for given requirement with measurements (not to scale).	5

	<p>2.3 PLANNING OF PUBLIC BUILDINGS</p> <p>Types of public buildings - Miscellaneous public buildings - General requirements of Public Buildings -Landscape architecture - Preparation of line plan with dimensions for the given requirements (not to scale).</p>	
III	<p>BASIC DRAWINGS</p> <p>Standard symbols used in Civil Engineering Drawing.</p> <p>Draw the elevation of :</p> <ol style="list-style-type: none"> 1. Fully panelled double leaf door. 2. Fully Panelled single leaf door 3. Flush door 4. Fully Panelled window with grill 5. Partly glazed and partly panelled window 6. Lean- to – roof 7. King post roof truss 8. Steel roof truss 9. Rain water Harvesting– Recharging into the ground <ol style="list-style-type: none"> a. Shallow well system b. Percolation pit system. 	9
IV	<p>BUILDING DRAWINGS</p> <p>Preparation of plan, section and elevation of buildings with specifications for the given line drawing to suitable Scale:</p> <ol style="list-style-type: none"> 1. A Reading room with R.C.C flat roof 2. A House with single bed room and attached bathroom with R.C.C. flat roof. 3. A residential building with two bed rooms with R.C.C. flat roof 4. A Two roomed house with RCC slope roof with gable ends 5. A Small workshop with north light steel roof truss (6 to 10m Span) over R.C.C. Columns. 6. A Primary health center for rural area with R.C.C roof. 7. A Village Library building with R.C.C flat roof 8. A small Restaurant building with R.C.C flat roof 9. A Single storied School building with R.C.C flat roof 10. A Bank building with R.C.C flat roof. 	38
	Test & Model Exam	7 Hrs.

Reference Books

1. National Building code of India 2016
2. Tamil Nadu District Municipal building rules and by-laws
3. Civil Engineering Drawing and house planning – by B.P.Verma
4. Elements building drawings and design – by R.S.Deshpande and N.K.Karandikar
5. Design of Houses – by J.S.Yadav
6. A Guide to Civil Engg. Drawing – by V.R.Thothathri Dr
7. Building Planning and Drawing by N. Kumaraswamy and A. Kameswara Rao.
8. Civil Engineering Drawing by S.C.Rangwala
9. Building Planning and Construction Companion”, G. Vaidhyanathan,
I. Kulasekaran, G. Sathish Kumar”

Scheme of Examination

PART A From unit I and II (2 x 4, Unit III – 1 x 12)	20 marks
PART B From IV	80 marks
TOTAL	100 Marks *

Note: *Board Examinations will be conducted for 100 Marks and converted to 75 Marks.



DIPLOMA IN CIVIL ENGINEERING

II YEAR

N - SCHEME

III SEMESTER

CIVIL ENGINEERING DRAWING AND

CAD PRACTICAL - I

IMPLEMENTED FROM 2020 -2021

CURRICULUM DEVELOPMENT CENTRE

DIRECTORATE OF TECHNICAL EDUCATION

CHENNAI - 600 025, TAMILNADU

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN CIVIL ENGINEERING SYLLABUS
N-SCHEME

(To be implemented to the students admitted from the year 2020-2021 onwards)

Course Name : 1010 : DIPLOMA IN CIVIL ENGINEERING
Subject Code : 4010350
Semester : III Semester
Subject Title : **CIVIL ENGINEERING DRAWING AND CAD PRACTICAL - I**

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
CIVIL ENGINEERING DRAWING AND CAD PRACTICAL - I	4 Hrs.	64 Hrs.	Internal Assessment	Board Examination	Total	3 Hrs.
			25	100*	100	

*Examinations will be conducted for 100 marks and it will be reduced to 75 marks

RATIONALE:

Computers play a very vital role in present day life, more so, in all the professional life of engineering. In order to enable the students, use the computers effectively in drafting, this course offers Computer Aided Drafting of various drawings in civil engineering.

OBJECTIVES:

On completion of the course, the students will be able to:

- Know about CAD commands
- Understand building components
- Draw building drawing using CAD software
- Prepare approval drawing for submission to authority

DETAILED SYLLABUS

4010350 - Civil Engineering Drawing and CAD Practical - I

Contents:Practical

Total: 64 Hours

LIST OF EXPERIMENTS

Preparation of drawing using CAD Software

Introduction of CAD software for Preparation of Drawings

6 Hours

1. Definition of various commands used in CAD software.
2. Simple Exercises for familiarizing the drawing commands in CAD software.

PART A

14 Hours

Draw the given drawings in Computer and take print out of all drawings in A4 sheet using Inkjet / laser printer or plotter and produced in file forms as record.

3. Section of semicircular Arch
4. Elevation of door, partly panelled and partly glazed
5. Preparation of Plan showing arrangement of furniture / fixtures and other features with standard sizes for the followings (Each room to be drawn separately - features and furniture may be pasted from the Blocks available in the packages)
(i) Living (ii) Bed Room (iii) Kitchen (iv) Toilet
6. Steel Structures: Cross section of I, Channel, T, Angle and Tubular section, Compound Beams.
7. Section of Load bearing wall from parapet to foundation showing all the details across the section. (Single storey)

PART B

44 Hours

Draw the building drawing using available CAD software

8. Plan, Section and Elevation of a single bed roomed building (R.C.C. Roof)
9. Plan, Section and Elevation of a Double bed roomed building (R.C.C. Roof)
10. Plan, Section and Elevation of a Primary School Building
11. Plan, Section and Elevation of a Hospital Building
12. Plan, Section and Elevation of a Workshop with steel columns, Steel roof truss and Metal sheet Roofing of about 300 m² area.

13. Preparation of approval drawing to be submitted to Corporation or Municipality showing required details in one sheet such as
- a) Site Plan (Land boundary, Building boundary, Car Parking, Passage, sanitary layout, septic tank location etc.
 - b) G.F. Plan, F.F. Plan, Section and Elevation (line diagram is enough)
 - c) Key Plan
 - d) Septic tank Plan and section (line diagram)
 - e) Rain water harvesting pit (with all detail)
 - f) Typical foundation details (Column foundation or spread footing)
 - g) Title block showing – joinery details, Specification, Area statement, colour Index, Title of the property, space for owners Signature and Licensed Surveyor's Signature with address.

IN BOARD EXAMINATION, QUESTIONS WILL BE CHOSEN AS FOLLOWS

PART – A	45 marks
PART – B	50 marks
Viva – voce	5 marks
TOTAL	100 marks

LIST OF EQUIPMENTS (for a batch of 30 students):

S.No.	List of the equipments	Quantity Required
1.	Computers	30 Nos.
2.	Laser printer	3 Nos.
3.	CAD software	30 Users



DIPLOMA IN CIVIL ENGINEERING

II YEAR

N - SCHEME

III SEMESTER

MATERIAL TESTING LABORATORY-I

www.binils.com

IMPLEMENTED FROM 2020 -2021

CURRICULUM DEVELOPMENT CENTRE

DIRECTORATE OF TECHNICAL EDUCATION

CHENNAI - 600 025, TAMILNADU

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN CIVIL ENGINEERING SYLLABUS
N-SCHEME

(To be implemented for the students admitted from the year 2020-2021 onwards)

Course Name : 1010: DIPLOMA IN CIVIL ENGINEERING
Subject Code : 4010360
Semester : III Semester
Subject Title : **MATERIAL TESTING LABORATORY-I**

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Subject	Instructions		Examination			Duration
	Hours/ Week	Hours/ Semester	Marks			
MATERIAL TESTING LABORATORY-I	3 Hrs.	48 Hrs.	Internal Assessment	Board Examination	Total	3 Hrs.
			25	100*	100	

*Examinations will be conducted for 100 marks and it will be reduced to 75 marks

RATIONALE:

The understanding of the structural, physical and mechanical properties and behaviour of engineering materials is at the very core of engineering design. A command of this knowledge is essential for all civil engineers. This laboratory provides a hands-on experience with the testing and evaluation of civil engineering materials, including steel, wood, Cements, Aluminium, Brass and Brick.

OBJECTIVES:

On completion of the course, the students will be able to:

- Study of UTM, Torsion testing machine, Hardness tester, Compression testing machine.
- Determine the Material Properties- test conducted on steel, wood, cement, Aluminium, Brass and Brick.

DETAILED SYLLABUS

4010360 - MATERIAL TESTING LABORATORY - I

Contents: Practical

Total: 48 Hrs.

Unit	Name of the Topics	Hours
PART A	1. Tension test on mild steel / deformed steel bars. 2. Deflection test on Simply Supported Beams of a. wood and b. steel to find Young's modulus 3. Torsion test on mild steel bar to determine the Modulus of Rigidity. 4. Double shear test on M.S. bar. 5. Impact Test on mild steel by performing Izod / Charpy tests. 6. Find Brinell's hardness numbers of the following materials. a. Mild steel b. Brass c. Aluminium. 7. Find Rockwell's hardness numbers of the following materials. a. Mild steel b. Brass c. Aluminium.	25 Hrs.
PART B	8. Compression Test on Wooden cube. 9. Compression test on Bricks. 10. Compression test on Solid Blocks 11. Water absorption test on Bricks /pressed tiles. 12. Flexure test on Tiles. 13. Casting of Cement Mortar cubes after determining the normal consistency of cement.. 14. Determining the compressive strength of Cement Mortar cubes.	23 Hrs.

www.binils.com

4010360 - MATERIAL TESTING LABORATORY - I

DETAILED ALLOCATION OF MARKS

S.No	Description	Part - A Max. Marks (50)	Part - B Max. Marks (45)
1.	Procedure	5	5
2.	Tabulation and Observation	20	20
3.	Calculations	15	10
4.	Sketch / Graph	5	5
5.	Accuracy of result	5	5
6.	Viva	5	

LIST OF EQUIPMENTS (for a batch of 30 students):

S.No.	List of the Equipments	Quantity
1.	UTM	1 no.
2.	Rock well-cum-Brinell Hardness testing machine	1 no.
3.	Torsion testing machine	1 no.
4.	Impact testing machine for Izod and Charpy test	1 no.
5.	Deflection test verification of Maxwell theorem with magnetic stand, deflection gauge, weights and sets of beam (floor type)	1 no.
6.	Weighing balance-digital 10 kg capacity one gram accuracy with battery backup 8 hours/direct electrical connection	1 no.
7.	Compression testing machine 100 tons capacity (electrical operated)	1 no.
8.	Flexural Testing Machine for Tiles	1 no.
9.	Spring testing Apparatus	1 no.
10.	Double shear test apparatus	1 no.
11.	Vicat's Apparatus	1 no.



DIPLOMA IN CIVIL ENGINEERING

II YEAR

N - SCHEME

III SEMESTER

SURVEYING PRACTICE-I

www.binils.com

IMPLEMENTED FROM 2020 -2021

CURRICULUM DEVELOPMENT CENTRE

DIRECTORATE OF TECHNICAL EDUCATION

CHENNAI - 600 025, TAMILNADU

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN CIVIL ENGINEERING SYLLABUS
N-SCHEME

(To be implemented to the students admitted from the year 2020-2021 onwards)

Course Name : 1010: DIPLOMA IN CIVIL ENGINEERING
Subject Code : 4010370
Semester : III Semester
Subject Title : **SURVEYING PRACTICE - I**

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
SURVEYING PRACTICE-I	4 Hrs.	64 Hrs.	Internal Assessment	Board Examination	Total	3 Hrs.
			25	100*	100	

*Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

The important functions of a diploma civil engineer include the jobs of detailed surveying, plotting of survey data, preparation of survey maps and setting out works. Field work should be a selected one so that the student can check his work and have an idea of the results and the extent of error in the work done by him. As far as possible, the surveys done should be got plotted, as this will also reveal errors in the work and develop skill in plotting

OBJECTIVES:

On completion of the course, the students will be able to:

- Handle surveying equipments
- Do practical exercises in Chain surveying, Compass surveying, Levelling and GPS.

DETAILED SYLLABUS

4010370 - SURVEYING PRACTICE-I

Contents : Practical

Total:64 Hrs.

Unit	Name of the Topics	Hours
PART A	<p>1. CHAIN AND COMPASS SURVEYING</p> <p>Study of chain, tape and accessories used for chain survey. Study of Prismatic compass, setting up over a station and observe bearings of lines.</p> <p>Running closed traverse and finding the included angles Use Chain / Tape and Compass. Minimum 5 points. Determination of distance between two points when their base is accessible. Use Chain / Tape and Compass. Determination of distance between two points when their base is inaccessible. Use Chain / Tape and Compass.</p>	8
	<p>2. GLOBAL POSITIONING SYSTEM (GPS)</p> <p>Reading of various Maps like Taluk map, District Map and Topo sheets. Study of Hand held GPS. Measurement of Latitude, Longitude and Altitude using hand held GPS. Selection and marking of routings (Way points) using hand held GPS.</p>	8
PART B	<p>3. LEVELLING</p> <p>Study of a Level - Temporary adjustment, taking readings and booking in a field book. Fly leveling Reduction by Height of Collimation method - Minimum 6 points with two change points (Minimum Two exercises)</p> <p>Fly leveling Reduction by Rise and Fall method - Minimum 6 points with two change points (Minimum Two exercises). Fly levelling covering minimum 6 points with 2 inverted readings (Minimum Two exercises).</p> <p>Check levelling and reduction of levels (Minimum Two exercises)</p>	48

4010370 - SURVEYING PRACTICE-I

In Board Examination, questions will be chosen as follows:

PART A	By Lot	i. Compass Survey	- 35 Marks
		ii. GPS	- 15 Marks
PART B		Levelling (Compulsory)	- 45 Marks
		Viva-Voce	- 5 Marks
TOTAL			- 100 Marks

DETAILED ALLOCATION OF MARKS

S.No	Description	Part - A		Part - B
		Max.Marks (35)	Max.Marks (15)	Max. Marks (45)
1.	Procedure, Handling Instruments / Tools	5	3	5
2.	Field works, Observation and Tabulation	15	10	20
3.	Calculations and Check / drawings.	10	0	15
4.	Accuracy of result	5	2	5
5.	Viva-Voce	5		

LIST OF EQUIPMENTS (for a batch of 30 students):

S.No.	List of the Equipments	Quantity Required
1.	Chain with (arrows)	6 nos.
2.	Prismatic compass	6 nos.
3.	Dumpy level	10 nos.
4.	Levelling staff	10 nos.
5.	Cross staff	6 nos.
6.	Ranging rod	2 nos.
7.	Hand held GPS	6 nos.