

**PROPOSED CURRICULUM AND SYLLABUS FOR  
DIPLOMA COURSE IN  
ARCHITECTURE**

**SYLLABUS  
(THIRD SEMESTER)**

**WEST BENGAL STATE COUNCIL OF TECHNICAL EDUCATION**

PREPARED BY:

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# THEORY OF STRUCTURES

Subject Code  
ARCH / 3 / T1 / TOS

Course offered in  
Third Semester

Course Duration  
17 weeks

3 lecture contact periods  
per week

Full Marks  
100

## OBJECTIVE

On satisfactory completion of the course, the students should be in a position to: —

- (i) analyse simple pin-jointed frame & truss structures;
- (ii) tackle simple problems of retaining walls regarding stress intensity at the base and its stability;
- (iii) understand the load carrying criteria of columns with respect to length and shape;
- (iv) draw Shear Force and Bending Moment diagrams of two-span continuous beams using Clapeyron's Theorem of Three Moments and Slope deflection method;
- (v) solve the problems of cantilever as well as simply supported beams in simple loading conditions.

## MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A	1	PIN JOINTED STRUCTURES	14
	2	COLUMNS & STRUTS	10
B	3	TWO SPAN CONTINUOUS BEAMS	9
	4	FIXED BEAMS	6
	5	PROPPED CANTILEVER	6

CONTACT PERIODS: 45

INTERNAL ASSESSMENT: 6

TOTAL PERIODS: 51

## EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2	15	ANY TWENTY	ONE	1 x 20 = 20	SIX	ANY FIVE, TAKING AT LEAST ONE FROM EACH GROUP	TEN	10 X 5 = 50
B	3, 4, 5	10				THREE			

## DETAIL COURSE CONTENT

### GROUP – A

**24 PERIODS**

#### 1.0 PIN JOINTED STRUCTURES 14

- 1.1 Concept of a Frame: Perfect, Redundant & Deficient — Plane frames & Space frames — Different types of end supports of frames — Concept of statically determinate & indeterminate structures
- 1.2 Assumptions made in finding the forces in the members of a perfect frame
- 1.3 Different methods of finding the forces in the members of perfect frames (cantilever and simply supported) subjected to loadings by: – (a) graphical method, (b) method of joints
- 1.4 Numerical problems

#### 2.0 COLUMNS & STRUTS 10

- 2.1 Problems for finding critical load by Euler's formula for various kinds of end conditions for columns of: rectangular, circular, symmetrical and asymmetrical sections
- 2.2 Rankine–Gordon formula for critical load for various end conditions (no proof) – Related problems
- 2.3 BIS Code formula (statement only)
  - (a) in addition to above it carries an uniformly distributed super imposed load on top of back fill.
- 3.1 Problems for finding minimum base width

### GROUP – B

**21 PERIODS**

#### 3.0 TWO SPAN CONTINUOUS BEAMS 9

- 3.1 To draw Shear Force and Bending Moment diagrams for two equal spans carrying – (a) uniformly distributed load over whole span, and, (b) equal point load at centre of each span; using Clapeyron's Theorem of Three Moments (no proof) .

3.2 Simple problems.

**4.0 FIXED BEAMS** **6**

To draw Shear Force and Bending Moment diagrams for – (a) uniformly distributed load over whole span, and, (b) point load at any intermediate point within the span

**5.0 PROPPED CANTILEVER** **6**

To find out prop reaction for rigid and elastic prop by – moment area method — To draw Shear Force and Bending Moment diagrams for – (a) uniformly distributed load (partly and fully throughout the span), and, (b) point load at any intermediate position in the span.

**REFERENCE BOOKS**

1. STRENGTH OF MATERIALS / S. Ramamurtham & R. Narayanan / Dhanpat Rai & Sons, Delhi
2. STRENGTH OF MATERIALS / M. Chakraborty / S. K. Kataria & Sons, Gurunanak Market, Delhi
3. THEORY OF STRUCTURES / R. S. Khurmi
4. TREATISE OF STRUCTURAL MECHANICS / SOME MUKHERJEE
5. ANALYSIS OF STRUCTURES VOL. I / V. N. Vazirani & M. M. Rathwani / Khanna Publishers, Delhi
6. Basic Structural Analysis / Reddy / Tata McGraw-Hill

## **HISTORY OF ARCHITECTURE — I**

<b>Subject Code</b>	<b>Course offered in</b>	<b>Course Duration</b>	<b>4 lecture contact periods</b>	<b>Full Marks</b>
ARCH / 3 / T2 / HOA1	Third Semester	17 weeks	per week	100

**OBJECTIVE**

On satisfactory completion of the course, the students will understand the typical features of the:—

- (i) architecture of ancient Egypt and that of West Asia;
- (ii) Classical European architecture of Greece & Rome and be able to compare the same;
- (iii) evolution of Church Architecture through the Medieval European times to the Renaissance period covering the change of features during the Early Christian, the Byzantine, the Romanesque and the Gothic periods with special reference to the evolution of plan and corresponding evolution of construction technique of the systems of spanning.

**MODULAR DIVISION OF THE SYLLABUS**

GROUP	MODULE	TOPIC	CONTACT PERIODS
A	1	ARCHITECTURE OF THE ANCIENT EGYPT	6
	2	ARCHITECTURE OF THE ANCIENT WEST ASIA	6
B	3	ARCHITECTURE OF THE CLASSICAL GREECE	10
	4	ARCHITECTURE OF THE CLASSICAL ROME	10
C	5	EARLY CHRISTIAN ARCHITECTURE	3
	6	BYZANTINE ARCHITECTURE	4
	7	ROMANESQUE ARCHITECTURE	7
	8	GOTHIC ARCHITECTURE	7
	9	RENAISSANCE ARCHITECTURE	7

CONTACT PERIODS: 60

INTERNAL ASSESSMENT:8

TOTAL PERIODS: 68

**EXAMINATION SCHEME**

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS

A	1, 2	5	TWENTY	1	1 X 20 = 20	TWO	ANY FIVE, TAKING AT LEAST ONE FROM EACH GROUP	TEN	10 X 5 = 70
B	3, 4	8				THREE			
C	5, 6, 7, 8, 9	12				FIVE			

## DETAIL COURSE CONTENT

### GROUP - A THE ANCIENT WEST

**12 PERIODS**

#### Module 1 ARCHITECTURE OF THE ANCIENT EGYPT

**6**

Belief in after-life, powerful priesthood, abundant labour – leading to – TOMB ARCHITECTURE, MONUMENTAL SCALE — Detail study of the (i) GREAT PYRAMID OF CHEOPS, GIZEH: section showing ENTRANCE, SUBTERRANEAN CHAMBER, QUEEN'S CHAMBER, GRAND GALLERY – KING'S CHAMBER, AIR-SHAFT; (ii) GREAT TEMPLE OF AMUN, KARNAK, THEBES — Brief idea about the MASTABAS, ROCK-HEWN TOMBS, PYLONS, OBELISKS AND SPHINX

#### Module 2 ARCHITECTURE OF THE ANCIENT WEST ASIA

**6**

Plentiful supply of soil in the alluvial plains of Tigris & Euphrates, knowledge of kiln-fire, scarcity of stone & timber, availability of bitumen from natural springs – leading to – ubiquity of MUD BRICK (SUN-DRIED & KILN-FIRED) LAID IN BITUMEN — Constraints imposed by the structural demands of brick vaulting, knowledge of true arch – leading to – ARCUATED ARCHITECTURE — Detail study of the (i) ZIGGURAT OF URNAMMU AT UR: core of mud brick covered with a skin of convex burnt brickwork, weeper holes

### GROUP - B THE CLASSICAL EUROPEAN ARCHITECTURE

**20 PERIODS**

#### Module 3 ARCHITECTURE OF THE CLASSICAL GREECE

**10**

Abundance of high quality limestone & marble, scarcity of hardwood, restriction on building spanning; expression of direct democracy; Mediterranean climate – leading to – COLUMNAR & TRABEATED ARCHITECTURE, HUMAN SCALE, EXTROVERT SPACE — ORDERS: DORIC, IONIC, CORINTHIAN — Elements of urban architecture: ACROPOLIS AT ATHENS with brief idea about AGORA, STOA, BOULEUTORION, THEATRE, ODEION, STADIUM, HIPPODROME AND GYMNASIA (definitions with names of two examples each) — Detail study of the PARTHENON, THE TEMPLE TO ATHENA with emphasis to its (a) Elevation: facade treatment, proportion (Golden section, optical correction); (b) Plan: PRONAOS, NAOS & STATUE AND OPISTHODOMOS OR EPINAOS.

#### Module 4 ARCHITECTURE OF THE CLASSICAL ROME

**10**

Introduction of FIRED BRICK, use of IMPROVED MORTAR analogous to modern concrete, judicious use of different quality of stone, STUCCO & MARBLE VENEERING; knowledge of TRUE ARCH, BARREL & CROSS VAULTS, CUPOLA AND COFFER CEILING; expression of majesty of the Imperial Empire; financial resources from conquests – leading to – ARCUATED ARCHITECTURE, MONUMENTAL SCALE, GRANDEUR, INTROVERT SPACE — ORDERS added: TUSCAN and COMPOSITE or ROMAN — Comparative proportions of the Classical Orders — Brief idea about the TEMPLES, FORUM, BASILICAS, THERMAE & BALNEAE, THEATRE, AMPHITHEATRE, CIRCUSES, TRIUMPHAL ARCHES & COLUMNS, AQUEDUCTS & BRIDGES (definition with names of two examples each) — Detail study of the PANTHEON, ROME with emphasis to section through its great dome.

### GROUP - C THE EVOLUTION OF CHURCH ARCHITECTURE

**28 PERIODS**

#### Module 5 EARLY CHRISTIAN ARCHITECTURE

**3**

Acceptance of Christianity by Constantine, need for enclosed religious congregational space; lack of resources & skilled craftsmen, adaptation of existing building elements – leading to – BASILICAN CHURCHES — Detail study of the BASILICA OF ST. PETER, ROME with emphasis to its Plan: SINGLE AXIS from ENTRANCE to the APSE through NAVE & AISLE

#### Module 6 BYZANTINE ARCHITECTURE

**4**

Knowledge of placing a DOME over a regular polygonal plan with PENDENTIVES, TWO AXES – leading to – Orthodox Churches with square plan, enclosing nave & aisle in the shape of GREEK CROSS, use of large opening creating radiant interior — Detail study of the HAGIA SOPHIA, CONSTANTINOPLE

#### Module 7 ROMANESQUE ARCHITECTURE

**7**

Consolidation of Papal hierarchy; desire to articulate, to stress or underline every structural division in order to produce unified compositions; continuing development of STONE VAULTING into GROINED SYSTEMS – leading to – development of church plan as a LATIN CROSS with addition of TRANSEPTS, extension of aisles carried

round APSIDAL SANCTUARY to form AMBULATORY, FIGURATIVE & NON-FIGURATIVE SCULPTURES designed and integrated with structure & construction — Detail study of the PISA CATHEDRAL & CAMPANILE

**Module 8    GOTHIC ARCHITECTURE** **7**

Medieval age, supremacy of religion, desire to create lofty towered cathedrals, mystic interiors; knowledge to cut & shape stone, entire structure conceived as framework of organised coherent system of POINTED ARCHES & VAULTS – leading to – rectangular church plans with high PINNACLES, dramatic external massing of light & shadow, TRACERY admitting defused light, reduction of structural function of wall to a minimum — Detail study of the NOTRE DAME, PARIS with emphasis to its (a) Plan showing NAVE & CHOIR and, (b) transverse section showing POINTED ARCH, FLYING BUTTRESS, NAVE ARCADE & TRIFORIUM.

**Module 9    RENAISSANCE ARCHITECTURE** **7**

Reformation movement in Christianity, decline of temporal power of the Church; revival of classical learning resulting in symbolism, plain forms of church with uncluttered interiors – STUCCO widely used for decorative interiors – Increasing refinement and systematisation of architectural drawing – Detail study of the CATHEDRAL OF ST. PETER, ROME in plan & section — BAROQUE: movement, spatial invention, drama and freedom of detail – Detail study of PIAZZA OF ST. PETER, ROME in plan.

**REFERENCE BOOKS**

1. A History of Architecture (Century Edition) / Sir Banister Fletcher / Butterworth Heinemann (Hb), CBS Publishers & Distributors (Pb)
2. The Story of Architecture FROM ANTIQUITY TO THE PRESENT / Jan Gympel / KÖNEMANN (Pb)
3. CRASH COURSE IN ARCHITECTURE / Eva Howarth / Caxton Editions
4. The Great Ages of World Architecture / G. H. Hiraskar / Dhanpat

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**MATERIALS & METHODS OF CONSTRUCTION – I**

Subject Code	Course offered in	Duration	3 lecture contact periods	Full Marks
ARCH / 3 / T3 / MMC1	Third Semester	17 weeks	per week	100

**OBJECTIVE**

On satisfactory completion of the course, the students will: —

- (i) understand the characteristics of good building stone & brick, and, the general principles to be followed in stone & brick masonry construction;
- (ii) have idea regarding the common clay products like burnt clay hollow brick, clay tiles, terracotta, porcelain, stoneware and earthenware glazing;
- (iii) have idea regarding the characteristics of good timber and understand the properties & uses of common wood products like veneer, plywood, fibreboard, particle board, block board, batten board and laminated board;
- (iv) understand the properties and use of common available varieties of iron & steel, and, that of non-ferrous metals aluminium and brass, as building materials;
- (v) understand the properties, merits, demerits and use of different types of plastics and commercially available forms of glass as building material;
- (vi) have knowledge regarding different types of doors & windows, and, different building hardware for fixing & fastening them.

## MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A (MATERIALS)	1	STONE MASONRY	3
	2	CLAY PRODUCTS: BRICK MASONRY	6
	3	OTHER CLAY PRODUCTS	4
	4	WOOD & WOOD PRODUCTS	4
	5	FERROUS METALS	3
	6	NON FERROUS METALS: ALUMINIUM & BRASS	3
	7	PLASTICS	3
	8	GLASS	4
B (CONSTRUCTION)	9	BUILDING HARDWARE	3
	10	DOORS	6
	11	WINDOWS	6

CONTACT PERIODS: 45

INTERNAL ASSESSMENT: 6

TOTAL PERIODS: 51

## EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2, 3, 4, 5, 6, 7, 8	15	ANY TWENTY	ONE	1 x 20 = 20	SIX	ANY FIVE, TAKING AT LEAST TWO FROM EACH GROUP	TEN	10X 5 = 70
B	9, 10	10				THREE			

## DETAIL COURSE CONTENT

### GROUP - A MATERIALS

**30 PERIODS**

- |            |  |          |
|------------|--|----------|
| <b>1.0</b> | <b>STONE MASONRY</b>   | <b>3</b> |
| 1.1        | Classification of Rocks: Igneous, Sedimentary, Metamorphic (Definitions with examples)   |          |
| 1.2        | Characteristics of good building stone   |          |
| 1.3        | Technical terms associated with stone masonry  |          |
| 1.4        | General principles to be followed in stone masonry   |          |
| 1.5        | Types of stone masonry: (i) Rubble work, (ii) Ashlars (Concepts only)  |          |
| <b>2.0</b> | <b>CLAY PRODUCTS – BRICK MASONRY</b>   | <b>6</b> |
| 2.1        | Technical terms associated with brickwork — Sizes of bricks  |          |
| 2.2        | Classification of bricks   |          |
| 2.3        | General principles to be followed in brickwork   |          |
| 2.4        | Bonds in brickwork: English, Flemish and CBRI  |          |
| <b>3.0</b> | <b>OTHER CLAY PRODUCTS</b>   | <b>4</b> |
| 3.1        | Burnt-clay hollow brick (definitions and uses)   |          |
| 3.2        | Clay tiles: Flat & curved pan tiles – Half-round country tiles – Mangalore tiles (definitions and uses)  |          |
| 3.3        | Terracotta – Porcelain – Stoneware – Earthenware – Glazing (definitions and uses)  |          |
| <b>4.0</b> | <b>WOOD AND WOOD PRODUCTS</b>  | <b>4</b> |
| 4.1        | Classification of trees: Exogenous & Endogenous — Structure of timber  |          |
| 4.2        | Characteristics of good timber — names of commonly used good quality timber  |          |
| 4.3        | Defects in timber  |          |
| 4.4        | Wood products: Veneer – Plywood – Laminated board – Block board – Batten board – Composite boards – Fibreboard – Particleboard (definitions and uses). |          |
| <b>5.0</b> | <b>FERROUS METALS – IRON &amp; STEEL</b>   | <b>3</b> |
| 5.1        | General characteristics of metals: Ductility – Elasticity – Malleability – Toughness - Weldability   |          |

5.2 Definitions, comparison of average chemical composition with specific reference to carbon content and properties of pig iron, cast iron, wrought iron, mild steel (plain carbon steel), alloy steel (hard steel), HYSD and high tensile steel

**6.0 NON-FERROUS METALS – ALUMINIUM & BRASS 3**

6.1 Properties and mention of different uses of Aluminium

6.2 Properties and mention of different uses of Brass

**7.0 PLASTICS 3**

7.1 Properties, merits & demerits of plastics

7.2 Various types of plastics – PVC, Epoxy, Polyvinyl acetate, Polystyrene phenolic, Polypropylene — their applications as building materials.

**8.0 GLASS 4**

8.1 Definition of glass

8.2 Principal constituents of glass: silica, sodium or potassium carbonate (or sulphate), lime, lead, manganese dioxide, pigments, cullet

8.3 Classification of glass based on composition: Soda lime glass – Potash lime glass – Potash lead glass – Boro-silicate glass (properties & uses)

8.4 Classification of glass according to commercial forms: Sheet glass – Plate glass – Obscured glass – Wired glass – Structural glass – Laminated glass – Glass wool – Foam glass (properties & uses)

**GROUP - B CONSTRUCTION 15 PERIODS**

**9.0 BUILDING HARDWARE 3**

Fixing and fastening for doors and windows: Nails – Screws – Hinges – Bolts – Rivets – Handles

**10.0 DOORS 6**

9.1 Types of doors based on operation (concepts only): Swing door – Revolving door – Sliding door – Sliding-folding door – Collapsible door – Rolling shutter door – Fire door

9.2 Doors of timber (in detail): Panelled & glazed door – Flush door: solid & hollow-core

9.3 Doors of steel (in detail): Rolling shutter door

9.4 Doors of aluminium (in detail): Swing door – Sliding door

**11.0 WINDOWS 6**

10.1 Types of windows based on operation (concepts only): Fixed window – Casement window – Sliding window – Pivoted window – Louvered (or Venetian) window – Bay window – Clerestory window – Corner window – Dormer window

10.2 Windows of timber (in detail): Panelled & glazed timber casement window

10.3 Windows of steel (in detail): Glazed fixed & casement steel window

10.4 Windows of aluminium (in detail): Sliding aluminium window

**REFERENCE BOOKS**

1. Building Construction Volume I, II, III & IV (Metric Ed.) / J. K. McKay & W. B. McKay / Orient Longman
2. The Construction of Buildings Volume 1, 2, 3, 4 & 5 / R. Barry / English Language Book Society
3. A Text Book of Materials and Construction / TTTI
4. A Text Book of Building Construction / S. P. Aurora & S. P. Bindra
5. Building Construction / Sushil Kumar / Standards Publishers Distributors, Delhi
6. Building Materials / P.C. Varghese / PHI Learning Private Ltd., New Delhi
7. Building Material / Satish Agarwal / Dhanpat Rai & Co., New Delhi

# BUILDING SERVICES & EQUIPMENTS — I

Subject Code ARCH / 3 / T4 / BSE1	Course offered in Third Semester	Duration 17 weeks	3 lecture contact periods per week	Full Marks 100
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## OBJECTIVE

On satisfactory completion of the course, the students should be in a position to understand the basic principles of the water supply system, sanitation & drainage system, and, the materials, fittings & appliances of the water supply and drainage systems.

## MODULAR DIVISION OF THE SYLLABUS

MODULE	TOPIC	CONTACT PERIODS	FACULTY
1	WATER SUPPLY	12	ARCH, CE
2	SANITATION & DRAINAGE	27	ARCH, CE
3	MATERIALS, FITTINGS & APPLIANCES	6	ARCH, CE

CONTACT PERIODS: 45

INTERNAL ASSESSMENT: 6

TOTAL PERIODS: 51

## EXAMINATION SCHEME

MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
1	6	ANY TWENTY	ONE	1 X 20 = 20	THREE	ANY FIVE, TAKING AT LEAST ONE FROM EACH MODULE	TEN	10 X 5 = 50
2	15				FIVE			
3	4				TWO			

## DETAIL COURSE CONTENT

### MODULE - 1 WATER SUPPLY

**12 PERIODS**

- |            |  |          |
|------------|--|----------|
| <b>1.1</b> | <b>WATER SUPPLY: SOURCES &amp; REQUIREMENTS</b>  | <b>3</b> |
|            | GROUND WATER — SPRINGS: Gravity Springs, Artesian Springs – WELLS: Open Wells, Artesian Wells, Tube Wells (Shallow / Deep) – INFILTRATION WELLS & GALLERIES — SURFACE WATER — WATER SUPPLY REQUIREMENTS for — ‘residences’, ‘restaurants’, ‘cinemas & theatres’, ‘day schools’, ‘boarding schools’, ‘hostels’, ‘hospitals (including laundry)’, ‘offices’ [per capita per day consumption value only] — POTABLE WATER (Brief idea) |          |
| <b>1.2</b> | <b>WATER TREATMENT</b>   | <b>1</b> |
|            | Screening – Plain Sedimentation – Coagulation & Sedimentation – Filtration – Disinfection – Softening – Aeration [Definitions & Sequence only]   |          |
| <b>1.3</b> | <b>SYSTEM &amp; PERIOD OF WATER SUPPLY</b>   | <b>1</b> |
|            | DIRECT & INDIRECT SYSTEM — CONSTANT OR CONTINUOUS & INTERMITTENT SUPPLY  |          |
| <b>1.4</b> | <b>DESIGN OF WATER DISTRIBUTION SYSTEMS</b>  | <b>4</b> |
|            | GENERAL REQUIREMENTS OF WATER DISTRIBUTION SYSTEM — ESTIMATE OF DEMAND LOAD: Occupant Load, Fire Protection — BASIC PRINCIPLES OF WATER DISTRIBUTION WITHIN THE PREMISES — WATER MAIN — SERVICE PIPE: Ferrule, Goose-neck, Stop-cock box, Water-meter box – Communication Pipe – Consumer’s Pipe   |          |
| <b>1.5</b> | <b>STORAGE OF WATER &amp; DOWNTAKE DISTRIBUTION PIPES</b>  | <b>3</b> |
|            | REQUIREMENT for storage — QUANTITY to be stored — MATERIALS used — UNDERGROUND & OVERHEAD RESERVOIRS — DOWNTAKE TAPS (COLD WATER DROPS)  |          |

### MODULE - 2 SANITATION & DRAINAGE

**27 PERIODS**

- |            |   |          |
|------------|---|----------|
| <b>2.1</b> | <b>SANITATION REQUIREMENTS</b>  | <b>7</b> |
|            | WASH BASINS (flat-back) — CLEANER’S SINK — DRINKING WATER FOUNTAIN — WATER CLOSETS (WC): Squatting type (Indian style) & Sitting type (European style) — URINAL – MALE: Bowl type (flat back or |          |



angle back), Slab type, Stall type – FEMALE: Squatting plate type — FLUSHING CISTERNS — BATHS — SHOWERS — NUMBER OF SANITATION REQUIREMENTS for ‘residences’, ‘office buildings’, ‘cinemas & theatres’, ‘hotels’, ‘restaurants’, ‘hostels’ — LAYOUT DRAWINGS: students should be able to read orthographic & isometric projections of toilets-kitchens-WCs etc (supplied by the teachers) fitted with the above mentioned sanitations

<b>2.2</b>	<b>HOUSE DRAINAGE PIPES</b>	<b>3</b>
	SOIL PIPE (SP): Main Soil Pipe (MSP), Branch Soil Pipe (BSP) — WASTE PIPE (WP): Main Waste Pipe (MWP), Branch Waste Pipe (BWP), Rain Water Pipe (RWP) — MAIN SOIL WASTE PIPE (MSWP), BRANCH SOIL WASTE PIPE (BSWP) — VENTILATING PIPE (VP): Main Ventilating Pipe (MVP), Branch Ventilating Pipe (BVP), Drain Ventilating Pipe (DVP), Anti Siphonage Pipe (ASP) — VENT PIPE — JUNCTION PIPE [Definitions only]	
<b>2.3</b>	<b>PLUMBING SYSTEM</b>	<b>2</b>
	TWO-PIPE SYSTEM — ONE-PIPE SYSTEM — SINGLE STACK SYSTEM — PARTIALLY VENTILATED SINGLE STACK SYSTEM — CHOICE OF PLUMBING SYSTEM	
<b>2.4</b>	<b>TRAPS</b>	<b>3</b>
	TRAP: Water seal, Essentials of a good trap, Causes of loss or breaking of water seal — CLASSIFICATION OF TRAPS: Based on shape (P, Q, S); Based on use/ location (Floor trap, Gully trap, Intercepting trap, Grease trap, Silt trap)	
<b>2.5</b>	<b>CHAMBERS</b>	<b>3</b>
	INVERT — COLLECTION CHAMBER — GULLY CHAMBER — INSPECTION CHAMBER — MANHOLE — DROP MANHOLE — INCEPTOR MANHOLE OR INTERCEPTOR MANHOLE — MANHOLE CHAMBER [Definitions & sketches only]	
<b>2.6</b>	<b>DESIGN CONSIDERATIONS FOR DRAINAGE SYSTEM</b>	<b>4</b>
	SEWAGE: soil waste, waste water (sullage), storm water (rain water) — SOLID REFUSE — CHANNEL — DRAIN — DRAINAGE — SEWER — SEWERAGE — AIMS OF DESIGNING A DRAINAGE SYSTEM & REALIZATION OF THE SAME — SYSTEMS OF SEWAGE DISPOSAL: Dry or conservancy system (earth closets, trench latrines, bore-hole latrines, sanitary latrines); Water carriage or drainage system — SIZING OF RAIN-WATER PIPES FOR ROOF DRAINAGE — QUANTITY OF SEWAGE: DWF — SYSTEMS OF DRAINAGE: Separate system, Combined system, Partially separate system — CIRCULAR & EGG-SHAPED SEWERS	
<b>2.7</b>	<b>DISPOSAL OF SEWAGE FROM ISOLATED BUILDINGS</b>	<b>3</b>
	SEPTIC TANK: sludge & scum — DESIGN CONSIDERATIONS: capacity (detention period, sludge removal, consumption of water) – shape & dimensions; inlet & outlet; baffle wall; cover & manholes; ventilation; lining — DISPOSAL OF SEPTIC TANK EFFLUENT: CHLORINATION CHAMBER – SOAK PIT (LINED & UNLINED); DISPERSION CHAMBER – DISPERSION TRENCH	
<b>2.8</b>	<b>INFORMATION TO BE PROVIDED IN SUBMISSION PLANS</b>	<b>2</b>
<b>MODULE - 3 MATERIALS, FITTINGS &amp; APPLIANCES</b>		<b>6 PERIODS</b>
<b>3.1</b>	<b>PIPE MATERIALS</b>	<b>1</b>
	SUPPLY PIPES: Cast Iron, Steel, Reinforced concrete, Prestressed concrete, Galvanized Mild Steel tubes, Copper, Brass, Wrought Iron, Asbestos Cement, Lead, Polythene, Unplasticized PVC — DRAINAGE PIPES: Salt Glazed Stoneware, Cast Iron, Asbestos Cement, Lead, Unplasticized PVC	
<b>3.2</b>	<b>JOINTING OF PIPES</b>	<b>1</b>
	Names of different type of joints for different pipe materials with detail reference to SPIGOT & SOCKET JOINTS, FLANGED JOINTS AND CEMENT MORTAR JOINTS — LAGGING OF PIPES	
<b>3.3</b>	<b>VALVES, COCKS, TAPS, FIRE HYDRANTS &amp; OTHER FITTINGS</b>	<b>4</b>
	VALVES: Air valves or air relief valves, Reflux valves or check valves or non-return valves or flap valves or foot valves, Safety valves or pressure relief valves, Sluice valves or gate valves or stop valves, Scour valves or wash-out valves or blow-off valves, Mixing valves — STOP COCKS — TAPS: Bib taps, Self-closing taps — FIRE HYDRANTS — FITTINGS: Bends or elbows, Tees, Crosses, Wyes, Reducers, Increases, Flanges, Caps, Plugs, Back Nuts [Definitions, sketches & applications]	

## REFERENCE BOOKS

1. SP 7 (5) : 2005 NATIONAL BUILDING CODE OF INDIA GROUP 5 – PART IX PLUMBING SERVICES / Bureau of Indian Standards
2. A Text Book of Water Supply and Waste Engineering / TTTI

3. Text Book of WATER SUPPLY AND SANITARY ENGINEERING / S.K. Hussain / Oxford & IBH Publishing Co. Pvt. Ltd.
4. Solid Waste Management / Sasikumar & Gopi Krishna / PHI Learning Pvt. Ltd., New Delhi
5. Hand Book of Water Supply & Drainage Engineering / S. K. Sharma / Dhanpat Rai & Co., New Delhi

## **SESSIONAL COURSES OFFERED IN 3RD SEMESTER, PART - II**

### **PROFESSIONAL PRACTICE-I**

Subject Code ARCH / 3 / S1 / PP1	Course offered in Third Semester	Course Duration 17 weeks	1 lecture contact period per week	Full Marks 50
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#### **COURSE & EXAMINATION SCHEDULE**

NAME OF THE COURSES	COURSES OFFERED IN	MARKS ALLOTTED
PROFESSIONAL PRACTICE – I	THIRD SEMESTER	<b>Continuous internal assessment of 25 marks</b> is to be carried out by the teachers throughout the semester where marks allotted for assessment of sessional work undertaken <b>is 25. Distribution of marks:</b> Report – 15, viva-voce – 10. <b>External assessment of 25 marks</b> shall be held at the end of the Part – II First semester on the entire syllabi of Professional Practice – I <b>Distribution of marks:</b> Report – 15, Viva-voce – 10.

#### **OBJECTIVE**

On satisfactory completion of the course, the students will be in a position to prepare individual photo-documentation report of a traditional or contemporary building belonging to a particular period, style or influence after an educational tour.

CONTACT PERIODS: 15

INTERNAL ASSESSMENT: 2

TOTAL PERIODS: 17

### **AutoCAD LAB**

Subject Code  
ARCH / 3 & 4 / S2 / ACAD

Course offered in  
Part – II

Full Marks  
100

#### **OBJECTIVE**

AutoCAD, developed by the AutoDesk Inc., is the most popular PC-CAD system available in the market. Over one million people in 80 countries around the world use AutoCAD to generate various kinds of drawings. In 1997 the market share of AutoCAD grew to 78%, making it the worldwide standard for generating drawings. Also, AutoCAD's open architecture has allowed third-party developers to write application software that has significantly added to its popularity. This course is compatible to the latest version of AutoCAD.

On satisfactory completion of the course AutoCAD Lab (Group – A), the students should be in a position to solve two dimensional drafting and design problems by being able to use AutoCAD commands to make a

drawing, create text, dimension a drawing, hatch patterns and make & insert symbols. They will also be able to plot drawings.

On satisfactory completion of the course AutoCAD Lab (Group – B), the students should be in a position to draw isometric drawings, create three-dimensional objects & solid models and render the same, view the solids thus created from changing positions, and, will be able to establish link with other application software to embed objects into it.

### COURSE & EXAMINATION SCHEDULE

NAME OF THE COURSES	COURSES OFFERED IN	MARKS ALLOTTMENT
AutoCAD LAB (GROUP – A)	THIRD SEMESTER	<b>Continuous Internal Assessment of 50 Marks</b> is to be carried out by the teachers throughout the two semesters where marks allotted for assessment of sessional work undertaken in each semester is 50. <b>DISTRIBUTION OF MARKS: FIRST SEM. – LAB. NOTEBOOK -25 SECOND SEM. – LAB. NOTEBOOK 25</b>
AutoCAD LAB (GROUP – B)	FOURTH SEMESTER	<b>External Assessment of 50 Marks</b> shall be held at the end of the second semester on the entire syllabus of AutoCAD lab (Parts – A & B). One assignment per student from any one of the assignments done is to be performed. Assignments are to be set by lottery system. <b>DISTRIBUTION OF MARKS: LAB. NOTEBOOK-20; ON SPOT JOB -20; VIVA-VOCE -10.</b>

### AutoCAD LAB (GROUP-A)(FOR THIRD SEMESTER)

Course offered in  
Part – II First Semester

Course Duration  
17 weeks

2 lecture and 3 sessional contact periods  
per week

### MODULAR DIVISION OF THE SYLLABUS

MODULE	TOPIC	CONTACT PERIODS	
		LECTURE	SESSIONAL
1	GETTING STARTED – I	3	2
2	GETTING STARTED – II	3	2
3	DRAW COMMANDS	3	5
4	EDITING COMMANDS	2	5
5	DRAWING AIDS	3	2
6	CREATING TEXT	2	2
7	BASIC DIMENSIONING	3	2
8	INQUIRY COMMANDS	3	2
9	EDITING DIMENSIONS	2	2
10	HATCHING	2	2
11	BLOCKS	2	2
12	PLOTTING DRAWINGS	2	2
13	PRACTICE WITH COMPLETE DRAWING	-	15

CONTACT PERIODS: L-30 & S-45 = 75

INTERNAL ASSESSMENT: 10

TOTAL PERIODS: 85

### DETAIL COURSE CONTENT

#### Module 1 GETTING STARTED – I

3 LECTURE & 2 SESSIONAL PERIODS

Starting AutoCAD – AutoCAD screen components – Starting a drawing: Open drawings, Create drawings (Start from scratch, Use a template & Use a wizard) – Invoking commands in AutoCAD –Drawing lines in AutoCAD – Co-ordinate systems: Absolute co-ordinate system, Relative co-ordinate system – Direct distance method – Saving a drawing: Save & Save As – Closing a drawing – Quitting AutoCAD

#### Module 2 GETTING STARTED – II

3 LECTURE & 2 SESSIONAL PERIODS

Opening an existing file – Concept of Object – Object selection methods: Pick by box, Window selection, Crossing Selection, All, Fence, Last, Previous, Add, Remove – Erasing objects: OOPS command, UNDO / REDO commands – ZOOM command – PAN command, Panning in real time – Setting units – Object snap, running object snap mode – Drawing circles

**Module 3 DRAW COMMANDS**

**3 LECTURE & 5 SESSIONAL PERIODS**

ARC command – RECTANG command – ELLIPSE command, elliptical arc – POLYGON command (regular polygon) – PLINE command – DONUT command – POINT command – Construction Line: XLINE command, RAY command – MULTILINE command

**Module 4 EDITING COMMANDS**

**2 LECTURE & 5 SESSIONAL PERIODS**

MOVE command – COPY command – OFFSET command – ROTATE command – SCALE command – STRETCH command – LENGTHEN command – TRIM command – EXTEND command – BREAK command – CHAMFER command – FILLET command – ARRAY command – MIRROR command – MEASURE command – DIVIDE command – EXPLODE command – MATCHPROP command – Editing with grips: PEDIT

**Module 5 DRAWING AIDS**

**3 LECTURE & 2 SESSIONAL PERIODS**

Layers – Layer Properties Manager dialog box – Object Properties: Object property toolbar, Properties Window – LTSCALE Factor – Auto Tracking – REDRAW command, REGEN command

**Module 6 CREATING TEXT**

**2 LECTURE & 2 SESSIONAL PERIODS**

Creating single line text – Drawing special characters – Creating multiline text – Editing text – Text style

**Module 7 BASIC DIMENSIONING**

**3 LECTURE & 2 SESSIONAL PERIODS**

Fundamental dimensioning terms: Dimension lines, dimension text, arrowheads, extension lines, leaders, centre marks and centrelines, alternate units – Associative dimensions – Dimensioning methods – Drawing leader

**Module 8 INQUIRY COMMANDS**

**3 LECTURE & 2 SESSIONAL PERIODS**

AREA – DIST – ID – LIST – DBLIST – STATUS – DWGPROPS

**Module 9 EDITING DIMENSIONS**

**2 LECTURE & 2 SESSIONAL PERIODS**

Editing dimensions by stretching – Editing dimensions by trimming & extending – Editing dimensions: DIMEDIT command – Editing dimension text: DIMTEDIT command – Updating dimensions – Editing dimensions using the properties window – Creating and restoring Dimension styles: DIMSTYLE

**Module 10 HATCHING**

**2 LECTURE & 2 SESSIONAL PERIODS**

BHATCH, HATCH commands – Boundary Hatch Options: Quick tab, Advance tab – Hatching around Text, Traces, Attributes, Shapes and Solids – Editing Hatch Boundary – BOUNDARY command

**Module 11 BLOCKS**

**2 LECTURE & 2 SESSIONAL PERIODS**

The concept of Blocks – Converting objects into a Block: BLOCK, \_BLOCK commands – Nesting of Blocks – Inserting Blocks: INSERT, MINSERT commands – Creating drawing files: WBLOCK command – Defining Block Attributes – Inserting Blocks with Attributes – Editing Attributes

**Module 12 PLOTTING DRAWINGS IN AUTOCAD**

**2 LECTURE & 2 SESSIONAL PERIODS**

PLOT command – Plot Configuration – Pen Assignments – Paper Size & Orientation Area – Plot Rotation & Origin – Plotting Area – Scale

**Module 13 PRACTICE WITH COMPLETE DRAWING**

**15 PERIODS**

Each student is required to prepare a set of orthographic projections of a building designed by himself / herself in the Part - I Second Semester in the subject "BASIC DESIGN" or of any other design approved by the teacher-in-charge.

# ARCHITECTURAL GRAPHICS

Subject Code  
ARCH / 3 & 4 / S3 / SAGR

Course offered in  
Part – II

Course Duration  
34 weeks

4 sessional & 1 tutorial contact  
periods  
per week

Full Marks  
250

## OBJECTIVE

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

- (i) understand the Basic Principles of Sciography;
- (ii) draw sciography on the orthographic projections of three dimensional objects like right regular solids, buildings etc.;
- (iii) understand the Basic Principles of Perspective Projection;
- (iv) draw one & two point perspective projections of simple interior spaces like a living room, an office interior, a kitchen, a toilet etc with sciography showing all furniture & fixtures;
- (v) draw two point perspective projections of exteriors of buildings showing landscaping elements, cars and human figures.

## COURSE & EXAMINATION SCHEDULE

SUBJECT CODE	NAME OF THE COURSES	COURSES OFFERED IN	MARKS ALLOTTED
ARCH / 3 & 4 / S3 / SAGR	Architectural Graphics (S) (Group – A)	THIRD SEMESTER	<b>Continuous internal assessment of 75 marks</b> is to be carried out by the teachers throughout the two semesters where marks allotted for assessment of sessional work undertaken in <b>3<sup>rd</sup> semester is 35 &amp; 4<sup>th</sup> semester is 40.</b> <b>External assessment of 75 marks</b> shall be held at the end of the Part – II Second Semester on the entire syllabus of Architectural Graphics (Parts – A & B). <b>DISTRIBUTION OF MARKS: DRAWING SHEETS – 50, VIVA-VOCE – 25.</b>
	Architectural Graphics (S) (Group – B)	FOURTH SEMESTER	
ARCH / 4 / T5 / AGR	Architectural Graphics	FOURTH SEMESTER	<b>A four-hour examination of 100 marks</b> will be held during the Part – II Second Semester examinations on the entire syllabus.

## MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
<b>ARCHITECTURAL GRAPHICS (S) (GROUP – A) THIRD SEMESTER</b>			<b>60</b>
<b>A</b>	1	BASIC PRINCIPLES OF SCIOGRAPHY	1
	2	ORTHOGRAPHIC PROJECTIONS OF POINTS AND STRAIGHT LINES WITH SCIOGRAPHY	3
	3	ORTHOGRAPHIC PROJECTIONS OF LAMINA WITH SCIOGRAPHY	4
	4	ORTHOGRAPHIC PROJECTIONS OF RIGHT REGULAR SOLIDS WITH SCIOGRAPHY	24
	5	ORTHOGRAPHIC PROJECTIONS OF BUILDINGS WITH SCIOGRAPHY	15
<b>B</b>	6	BASIC PRINCIPLES OF PERSPECTIVE PROJECTION	1
	7	TWO-POINT PERSPECTIVE PROJECTIONS OF SIMPLE RIGHT REGULAR SOLIDS	12
<b>ARCHITECTURAL GRAPHICS (S) (GROUP – B) FOURTH SEMESTER</b>			<b>60</b>
<b>C</b>	8	TWO-POINT PERSPECTIVE PROJECTIONS OF COMBINATION OF SOLIDS	12
	9	TWO-POINT PERSPECTIVE PROJECTIONS OF COMBINATION OF SOLIDS WITH SCIOGRAPHY	12
<b>D</b>	10	ONE-POINT PERSPECTIVE PROJECTION OF INTERIORS	8
	11	TWO-POINT PERSPECTIVE PROJECTIONS OF INTERIORS	8
<b>E</b>	12	PERSPECTIVE VIEW OF EXTERIORS (for Architecture only) <b>OR</b> PERSPECTIVE VIEW OF INTERIORS (for Interior Decoration, Handicrafts & Furniture Design only)	20
	<b>F</b>	13	TUTORIAL FOR 3 <sup>RD</sup> SEMESTER
		TUTORIAL FOR 4 <sup>TH</sup> SEMESTER	15

CONTACT PERIODS: 150

INTERNAL ASSESSMENT: 20 PERIODS

TOTAL PERIODS: 170

## SCHEME FOR THE FOUR HOUR FOURTH SEMESTER EXAMINATION

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2, 3, 4, 5,	FOR 9 MARKS	FOR 20 MARKS	COMBINATION OF QUESTIONS VARYING FROM 1 OR 2 MARKS	20	TWO	ANY ONE	50	50
B&C	6, 7, 8, 9,	FOR 8 MARKS				—			
D	10, 11, 12	FOR 4 MARKS				—			
E	13	FOR 4 MARKS				—			

## DETAIL COURSE CONTENTS (FOR THIRD SEMESTER)

### GROUP – A      BASICS OF SCIOGRAPHY      47 PERIODS

#### Module 1      BASIC PRINCIPLES OF SCIOGRAPHY      1

TERMINOLOGIES: Altitude – Azimuth – Sun Path – Angle of Incidence of Solar Ray — METHODS OF SCIOGRAPHY

#### Module 2      ORTHOGRAPHIC PROJECTIONS OF POINTS AND STRAIGHT LINES WITH SCIOGRAPHY      3

POINTS in different quadrants- LINES: Parallel to both the planes – Perpendicular to one plane & parallel to the other – Inclined to one or both the planes

#### Module 3      ORTHOGRAPHIC PROJECTIONS OF LAMINA WITH SCIOGRAPHY      4

LAMINA: Triangular – Rectangular – Square – Pentagonal – Hexagonal – Circular in perpendicular & oblique positions

#### Module 4      ORTHOGRAPHIC PROJECTIONS OF RIGHT REGULAR SOLIDS WITH SCIOGRAPHY      24

(a) Regular Polyhedra – Prisms – Pyramids – Solids of Revolution (Cylinder & Cone) IN SIMPLE POSITIONS  
(b) Any two of the above mentioned SOLIDS IN SUCH COMBINATION THAT ONE CASTS SHADOW ON THE OTHER, being positioned concentrically and in isolation

#### Module 5      ORTHOGRAPHIC PROJECTIONS OF BUILDINGS WITH SCIOGRAPHY      15

SITE PLAN and ROAD SIDE ELEVATION of a Building with Sciography in a suitable scale; the plan & elevation of the building may be supplied by the teacher concerned or may be the one designed by the student in the subject BASIC DESIGN in Part –I Second Semester

### GROUP – B      BASICS OF PERSPECTIVE PROJECTION      37 PERIODS

#### Module 6      BASIC PRINCIPLES OF PERSPECTIVE PROJECTION      1

RECOLLECTION OF THE TERMINOLOGIES: Ground Plane (GP) – Picture Plane (PP) – Station Point (S) – Horizon Plane (HP) – Central Plane (CP) – Ground Line (GL) – Horizon Line (HL) – Axis of Vision (A<sub>v</sub>) – Centre of Vision (C<sub>v</sub>) – Vanishing Point (VP) — METHODS OF PERSPECTIVE PROJECTION: One-point, Two-point and Three-point

#### Module 7      TWO-POINT PERSPECTIVE PROJECTIONS OF SIMPLE RIGHT REGULAR SOLIDS      12

Regular Polyhedra – Prisms – Pyramids – Solids of Revolution (Cylinder & Cone) IN SIMPLE POSITIONS — DRAWN AT THREE POSITIONS OF THE SOLID WITH RESPECT TO THE PP: (i) touching, (ii) in front, and, (iii) behind

## SCHEDULE OF PLATES

### ARCHITECTURAL GRAPHICS (GROUP – A) THIRD SEMESTER

SHEET NO.	TITLE OF SHEET	SHEET SIZE
1.	ORTHOGRAPHIC PROJECTIONS OF POINTS, @ STRAIGHT LINES & LAMINA WITH SCIOGRAPHY based on Modules II	HALF IMPERIAL
2.	ORTHOGRAPHIC PROJECTIONS OF LAMINA WITH SCIOGRAPHY based on Modules III	HALF IMPERIAL
3.	ORTHOGRAPHIC PROJECTIONS OF RIGHT REGULAR SOLIDS WITH SCIOGRAPHY based on Module IV (A)	HALF IMPERIAL

4.	ORTHOGRAPHIC PROJECTIONS OF RIGHT REGULAR SOLIDS WITH SCIOGRAPHY based on Module IV (B)	HALF IMPERIAL
5.	ORTHOGRAPHIC PROJECTIONS OF A BUILDING WITH SCIOGRAPHY based on Module V	HALF IMPERIAL
6.	TWO-POINT PERSPECTIVE PROJECTIONS OF SIMPLE RIGHT REGULAR SOLIDS based on Module VII	HALF IMPERIAL

### REFERENCE BOOKS

1. Geometrical Drawing for Students / L. H. Morris
2. Manual of Rendering with Pen and Ink / Robert W. Gill / Thames and Hudson
3. Art of Perspective Drawing / Simon Graco

## WORKING DRAWING - I

Subject Code  
ARCH / 3 & 4 / S4 / SWKD1

Course offered in  
Part - II

Full Marks  
150

### COURSE & EXAMINATION SCHEDULE

NAME OF THE COURSES	COURSES OFFERED IN	MARKS ALLOTTED
WORKING DRAWING - I (GROUP - A)	THIRD SEMESTER	<b>Continuous internal assessment of 75 marks</b> is to be carried out by the teachers throughout the two semesters where marks allotted for assessment of sessional work undertaken in 3 <sup>rd</sup> semester is 35 & 4 <sup>th</sup> semester is 40.
WORKING DRAWING - I (GROUP - B)	FOURTH SEMESTER	<b>External assessment of 75 marks</b> shall be held at the end of the Part - II Second semester on the entire syllabi of Working Drawing - I (Groups - A & B). <b>Distribution of marks:</b> Drawing sheets - 50, Viva-voce - 25.

### WORKING DRAWING - I (GROUP - A) (FOR THIRD SEMESTER)

Course offered in  
Third Semester

Course Duration  
17 weeks

4 sessional & 1 tutorial contact periods  
per week

### OBJECTIVE

On satisfactory completion of Group - A of the course, the students will be in a position to prepare working drawings of the following types of doors & windows, drawn manually: —

- (i) single and double shutter timber panel doors with schedule;
- (ii) hollow and solid core timber flush doors with schedule;
- (iii) aluminium glazed doors with schedule;
- (iv) timber glazed & panelled casement window;
- (v) mild steel fixed & openable glazed casement window;
- (vi) aluminium sliding window.

### MODULAR DIVISION OF THE SYLLABUS

SHEET NO.	TITLE	CONTACT PERIODS
1	SINGLE & DOUBLE SHUTTER TIMBER PANEL DOORS WITH & WITHOUT BEADING	12
2	HOLLOW & SOLID CORE TIMBER FLUSH DOORS	12
3	ALUMINIUM GLAZED DOOR	12
4	DOUBLE SHUTTER TIMBER GLAZED & PANELLED CASEMENT WINDOWS	12
5	METAL CASEMENT WINDOWS	12
	TUTORIALS	15

CONTACT PERIODS: 75

INTERNAL ASSESSMENT: 10

TOTAL PERIODS: 85

### DETAIL COURSE CONTENTS

**SHEET No. 1 SINGLE & DOUBLE SHUTTER TIMBER PANEL DOORS WITH & WITHOUT BEADING 12**

TOPIC A: DOUBLE SHUTTER TIMBER PANEL DOOR WITH BEADING WITH SCHEDULE\*

TOPIC B: SINGLE SHUTTER TIMBER PANEL DOOR WITHOUT BEADING WITH SCHEDULE\*

Following drawings of each of the above: —

- (i) SECTIONAL PLAN showing width of masonry & clear opening, inside outside, sizes of frames stile & panel thickness (in 1 : 50 scale);
- (ii) FRONT ELEVATION showing height of masonry & clean opening, door clearance, width of top, bottom & lock rails, position of lock & hinge handles, fastened bolt (in 1 : 50 scale);
- (iii) SECTIONAL ELEVATION showing above (in 1 : 50 scale);
- (iv) (a) Typical detail showing fixing of frame to wall, stile, panel with beading; (b) same as above without beading; (c) overlapping of shutters (in 1 : 2 scale).

**SHEET No. 2 HOLLOW & SOLID CORE TIMBER FLUSH DOORS**

**12**

TOPIC A: SINGLE SHUTTER TIMBER HOLLOW CORE FLUSH DOOR WITH SCHEDULE\*

TOPIC B: SINGLE SHUTTER TIMBER SOLID CORE WITH SCHEDULE\*

Following drawings of each of the above: —

- (i) SECTIONAL PLAN – same as panel door except panel showing core (in 1 : 50 scale);
- (ii) FRONT ELEVATION – same as panel door (in 1 : 50 scale);
- (iii) SECTIONAL ELEVATION – same as panel door (in 1 : 50 scale);
- (iv) (a) Typical detail – showing same as panel door (except panel) with hollow cover; (b) Same as above with solid core (both removing a part of Venetian).

**SHEET No. 3 ALUMINIUM GLAZED DOOR (WITH SCHEDULE\*)**

**12**

Following drawings of each of the above: —

- (i) SECTIONAL PLAN – same as panel door, except panels (in 1:50 scale)
- (ii) FRONT ELEVATION – same as panel door, except panels (in 1:50 scale)
- (iii) SECTIONAL ELEVATION - same as panel door, except panels (in 1:50 scale)
- (iv) (a) Typical details sectional plan – same as panel door; (b) Vertical sectional detail of fixing glass with aluminium frame (in 1:2 scale)

*\* Schedule of the above doors (Sheet nos. 1, 2 & 3) will include masonry opening, frame size, shutter details viz. size of stile, top, bottom & lock rail, panel thickness, remarks specifying no. of shutter, material, specification handle, bolt, hinge, lock.*

**SHEET No. 4 DOUBLE SHUTTER TIMBER GLAZED & PANELLED CASEMENT WINDOWS**

**12**

Following drawings of each of the above: —

- (i) SECTIONAL PLAN showing width of masonry & clear opening, inside outside, size of frame, stile, thickness of glass (in 1 : 50 scale);
- (ii) FRONT ELEVATION – Showing height of masonry & clean opening, width of sash bar, handle fastener, bolt, hinge (1 : 50 scale);
- (iii) SECTIONAL ELEVATION – Showing same as above (in 1 : 50 scale);
- (iv) (a) Typical detail showing fixing of frame with wall, stile with glass panel; (b) Vertical section of joining glass with sash bar (in 1:2 scale).

**SHEET No. 5 METAL CASEMENT WINDOWS**

**12**

TOPIC A: FIXED & OPENABLE GLAZED MILD STEEL CASEMENT WINDOW

Following drawings of each of the above: —

- (i) Sectional plan;
- (ii) Front elevation;
- (iii) Sheet elevation (1:10);
- (iv) Detail showing: (a) overlapping of shutter with mullion; (b) joining of frame to wall; (c) fixing of glass to sash bar;
- (v) Determination of Z, T & I section (1:1).

TOPIC B: SLIDING ALUMINIUM WINDOW

Following drawings of each of the above: —

- (i) Section plan;
- (ii) Front elevation;
- (iii) Sectional elevation showing all the menu;

Detail – Same as above and section of channel.



# ARCHITECTURAL DESIGN & DRAWING – I

Subject Code  
ARCH / 3 & 4 / S5 / SADI

Course offered in  
Part – II

Full Marks  
250

SUBJECT CODE	NAME OF THE COURSES	COURSES OFFERED IN	MARKS ALLOTTED
ARCH / 3 & 4 / S5 / SADI	ARCHITECTURAL DESIGN & DRAWING (S) – I (GROUP – A)	THIRD SEMESTER	<b>Continuous internal assessment of 75 marks</b> is to be carried out by the teachers throughout the two semesters where marks allotted for assessment of sessional work undertaken <b>3<sup>RD</sup> semester is 35 &amp; in 4<sup>TH</sup> semester is 40.</b> Distribution of marks for Design problem is 50 & Time Sketch is 25. <b>External assessment of 75 marks</b> shall be held at the end of the Part – II Second Semester on the entire syllabi of Architectural Design & Drawing(S) – I (Groups – A & B). <b>Distribution of marks:</b> Drawing Sheets – 50, Viva-voce – 25.
	ARCHITECTURAL DESIGN & DRAWING (S) – I (GROUP – B)	FOURTH SEMESTER	
ARCH / 4 / T6 / ADD1	ARCHITECTURAL DESIGN & DRAWING – I	FOURTH SEMESTER	<b>A six-hour examination of 100 marks</b> is to be held during the Part – II Second Semester examinations on the syllabus of “Architectural Design & Drawing (s) – I (Group – A)”. Out of 2 questions set; any 1 is to be answered. The 2 internal assessments of 3 hours duration each are to be taken on the same syllabus. The Municipal Building Rules and the National Building Code of India, are allowed during the examinations.

## COURSE & EXAMINATION SCHEDULE

### ARCHITECTURAL DESIGN & DRAWING (S) – I (GROUP – A)

Course offered in  
Third Semester

Course Duration  
17 weeks

4 sessional & 1 Tutorial contact periods  
per week

#### OBJECTIVE

On satisfactory completion of Group – A of the course, the students should be in a position to:—

- (i) understand the definitions of basic terminologies related with architectural design;
- (ii) develop the architectural design of a small single or two-storied structure in sketch-wise phases;
- (iii) draw the developed architectural design.

#### MODULAR DIVISION OF THE SYLLABUS

MODULE	TOPIC	CONTACT PERIOD
1	DEFINITIONS OF BASIC TERMINOLOGIES	2
2	ARCHITECTURAL DESIGN	28
3	ARCHITECTURAL DRAWING	30
	TUTORIALS	15

CONTACT PERIODS: 75

INTERNAL ASSESSMENT: 10

TOTAL PERIODS: 85

#### DETAIL COURSE CONTENT

##### MODULE 1 DEFINITIONS OF BASIC TERMINOLOGIES 2

Definitions of the terms “BALCONY”, “BUILDING”, “CHAJJA”, “CHOWK OR COURTYARD”, “CHOWK, INNER”, “CHOWK, OUTER”, “COVERED AREA”, “GARAGE, PRIVATE”, “GARAGE, PUBLIC”, “OPEN SPACE”, “OPEN SPACE, FRONT”, “OPEN SPACE, REAR”, “OPEN SPACE, SIDE”, “PARAPET”, “PARKING SPACE”, PARTITION”, “PLINTH”, “PLINTH AREA”, “STOREY”, “STOREY, TOPMOST”, “VERANDAH”, “WATER-CLOSET”, “WINDOW” as per the NBC.

##### MODULE 2 ARCHITECTURAL DESIGN 28

Architectural design of any one of the following topics in sketch-wise phases keeping in mind the provisions of the CMC bye-laws regarding “Open Spaces” and “Parking Space”: —

Cafeteria, a primary health centre with about 16 beds, primary school, restaurant, small bank, small post office or any other topic of equivalent weightage.

While evolving the design, ideas should be given regarding the following:

- (a) Site analysis which basically deals with 'location', 'orientation', 'access' and 'parking';
- (b) Influence of materials on form of architecture

**MODULE 3      ARCHITECTURAL DRAWING**

**30**

The design should be presented through a set of architectural drawings in a suitable scale consisting of at least the following sheets:—

- (a) site layout showing approach roads to the site, internal road approaching the designed space(s), open parking spaces (if any), planting and landscaping;
- (b) plans showing furniture layout, parking spaces (if any), planting and landscaping (wherever applicable);
- (c) elevation(s);
- (d) minimum two sectional elevations cutting at least the toilet(s), stairs and any other service area (if any).

The drawings should be suitably rendered in pen and ink or colour or any other suitable medium **on opaque sheets.**

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