

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

**SYLLABUS  
(FOURTH SEMESTER)**

**WEST BENGAL STATE COUNCIL OF TECHNICAL EDUCATION**

PREPARED BY:

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# DESIGN OF STRUCTURES — I

Subject Code ARCH / 4 / T1 / DOS1	Course offered in Fourth 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 will: —

- (i) understand different types of load on structures;
- (ii) have an idea of the working stress and limit state methods of design;
- (iii) understand the specific use of steel in the field of structural construction, and, be able to solve simple design problems of steel beams, steel columns and steel column bases;
- (iv) understand the specific use of timber in the field of structural construction, and be, able to design simple timber beams and posts;
- (v) have an idea regarding different types of rivets and riveted joints and be able to design simple riveted connections;
- (vi) have an idea regarding different types of welds and their symbols and be able to design typical weld connections.

## MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A	1	GENERAL CONCEPTS OF LOADS ON STRUCTURES	10
B	2	STEEL DESIGN	18
C	3	RIVETED CONNECTIONS	9
	4	WELDED CONNECTIONS	8

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	FOR 5 MARKS	FOR TWENTY MARKS	COMBINATION OF QUESTIONS VARYING FROM 1 TO 2 MARKS	20	TWO	ANY FIVE, TAKING AT LEAST ONE FROM EACH GROUP	TEN	10 X 5= 50
B	2	FOR 12 MARKS				FOUR			
C	3, 4	FOR 8 MARKS				THREE			

## DETAIL COURSE CONTENT

### GROUP – A

10 PERIODS

#### 1.0 GENERAL CONCEPTS OF LOADS ON STRUCTURES

- 1.1 Introduction to IS : 875, 1987
- 1.2 Different TYPES OF LOADS: Dead, Super-Imposed, Live, Wind, Seismic and Moving
- 1.3 METHODS OF DESIGN: Working Stress and Limit State Methods with introduction to material behaviour

### GROUP – B

18 PERIODS

#### 2.0 STEEL DESIGN

- 2.1 Specific use of steel in the field of structural construction
- 2.2 PERMISSIBLE STRESS IN STEEL: Permissible stresses in flexure, shear, direct tension and compression
- 2.3 DESIGN OF STEEL BEAMS: Rolled Steel Beams in flexure and shear for a given span with the compression flange fully restrained against lateral buckling and without any restraining, checks — Reference to steel table in SP: 6 (1) — Simple problems
- 2.4 DESIGN OF STEEL COLUMNS: Slenderness ratio, effective length, permissible stress, design of axially loaded columns using I-section with or without cover plates — Design of column section for axial load and uniaxial bending with compression flange partially or fully restrained against lateral buckling — Steps using trial & error method for design — Simple problems
- 2.5 DESIGN OF STEEL COLUMN BASE: Design of axially loaded steel column base (slab base) subjected to axial load— Simple problems

### GROUP – C

17 PERIODS

#### 3.0 RIVETED CONNECTIONS

9

- 3.1 Types of rivets and riveted joints
- 3.2 Failure of rivets — Calculation of rivet value — Efficiency of joint

3.3 Design of simple riveted connections

3.4 Simple problems

#### 4.0 WELDED CONNECTIONS

8

4.1 Types of weld and their symbols

4.2 Throat thickness — Size of weld — Length of weld

4.3 Simple problems

#### REFERENCE BOOK

1. CODE OF PRACTICE FOR GENERAL CONSTRUCTION IN STEEL (SECOND REVISION) [IS : 800 – 1984] / Bureau of Indian Standards
2. IS 875: 1987/ Bureau of Indian Standards
3. DESIGN OF STEEL STRUCTURES, 2<sup>nd</sup> Edition, 2002 / L. S. Negi / Tata McGraw-Hill
4. DESIGN OF STEEL STRUCTURES / S. Ramamurtham & R. Narayan / Dhanpat Rai Pub. Co.
5. DESIGN OF STEEL STRUCTURES / V. N. Vazirani & M. M. Rathwani / Khanna Publishers, Delhi
6. DESIGN OF STEEL STRUCTURES / RAM CHANDRA / Standard Book House, New Delhi
7. Design of Steel Structures, 2<sup>nd</sup> Edition, 2002 / Duggal / Tata McGraw-Hill
8. Structural Design in Steel, 1<sup>st</sup> Edition, 1999 / Ramchandran / New Age International

## HISTORY OF ARCHITECTURE — II

Subject Code	Course offered in	Duration	4 lecture contact periods	Full Marks
ARCH / 4 / T2 / HOA2	Fourth Semester	17 weeks	per week	100

#### OBJECTIVE

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

- (i) Architecture of ancient Indus Valley Civilization and Vedic Culture;
- (ii) Stupa Architecture in India;
- (iii) Rock-cut architecture in India from the Pillars through the Early Rock-cut, the Hinayana, the Orissan Group (Jain), the Mahayana to the Final Brahminical phases;
- (iv) evolution of temple architecture of southern India (Dravidian style) pertaining to the Pallava, Chola, Pandya, Vijaynagar and Madura dynasties;
- (v) evolution of temple architecture of northern India (Indo-Aryan style) pertaining to the Orissa & Khajuraho groups, the provincial style of Bengal and, the Jain temples;
- (vi) Islamic architecture in India pertaining to the architecture of Delhi or Imperial style (through the Slave, Tughlaq and Sayyid & Lodi Dynasties); the architecture of Sher-Shah-Sur, provincial style of Bengal and that of the Mughal period (through the sandstone & marble phase

#### MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A	1	ARCHITECTURE OF THE INDUS VALLEY CIVILIZATION	2
	2	ARCHITECTURE OF THE VEDIC CULTURE	1
B	3	STUPA ARCHITECTURE	2
	4	ROCK-CUT ARCHITECTURE	10
C	5	EARLIEST TEMPLES	2
	6	TEMPLE ARCHITECTURE OF SOUTHERN INDIA (DRAVIDIAN STYLE)	6
	7	TEMPLE ARCHITECTURE OF NORTHERN INDIA (INDO-ARYAN STYLE)	15
D	8	BEGINNING OF ISLAMIC ARCHITECTURE IN INDIA : THE DELHI OR IMPERIAL STYLE	4
	9	THE BUILDINGS OF SHER SHAH SUR	2
	10	PROVINCIAL STYLE OF BENGAL	2
	11	MUGHAL PERIOD	14

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	3	ANY TWEWNTY	ONE	1 X 20 = 20	ONE	ANY FIVE, TAKING AT LEAST ONE FROM GROUPS – A & B TAKEN TOGETHER, AND, AT LEAST ONE EACH FROM THE GROUPS C & D	TEN	10 X 5 = 50
B	3, 4	4				TWO			
C	5, 6, 7	9				THREE			
D	8, 9, 10, 11	9				THREE			

## DETAIL COURSE CONTENT

### GROUP - A THE ANCIENT INDIA 3 PERIODS

#### Module 1 ARCHITECTURE OF THE INDUS VALLEY CIVILIZATION 2

Prominent features of town planning: straight streets at right angles, main thoroughfare & principal buildings oriented towards cardinal points, public services system — Burnt-brick laid in mud-mortar in 'English Bond' — No instance of true arch: openings spanned by wooden lintels — Study of the (a) CITY OF MOHEN-JO-DARO with reference to the GREAT BATH, MOHEN-JO-DARO; (b) GRANARY, HARAPPA

#### Module 2 ARCHITECTURE OF THE VEDIC CULTURE 1

Outcome of migration: unrelated to the Indus Valley Civilization — Elementary type of forest dwelling leading to TIMBER CONSTRUCTION — GRAMA (little collection of huts) protected by bamboo railing: THABA (post), SUCHI (needle), GAMADVARA (entrance), TORANA (gateway)

### GROUP - A STUPA & ROCK-CUT ARCHITECTURE 12 PERIODS

#### Module 3 STUPA ARCHITECTURE 2

Supreme sacred monument of Buddhism — Basic form: solid domical mound crowned by an *chhatra* (umbrella) — More monumental *stupas*: surrounded by *vedika* (railing) with *toranas* (gateways) at cardinal points — Detailed study of the GREAT STUPA (STUPA 1), SANCHI

#### Module 4 ROCK-CUT ARCHITECTURE 10

- 4.1 PILLARS: Plain unornamented circular shaft — campaniform capital — circular abacus with animal motif — Study of the LION CAPITAL, SARNATH, UTTAR PRADESH
- 4.2 EARLY ROCK-CUT ARCHITECTURE: Simple woodwork imitating forms — Study of the LOMASH RISHI CAVES, BARABAR HILLS, BIHAR
- 4.3 HINAYANA PHASE: Necessity of monasteries suitable for congregational worship, forbiddance of worship of Buddha's image - leading to - *Chaityagriha* & *Vihara* hewn out of rock, introduction of symbolic forms — translation of carpentry forms into stones, horseshoe-arch-gable — Study of the CHAITYA HALL, KARLI
- 4.4 ORISSAN GROUP (JAIN): Monastic retreat only without any *chaitya* or *stupa* — semicircular arches with simple brackets — Study of the RANI GUMPHA, UDAYAGIRI
- 4.5 MAHAYANA PHASE: Influence of Hinduism — introduction of image — change in disposition of inner most cells of *Vihara* serving as monastery as well as sanctuary — Study of the AJANTA CAVE NO. 9
- 4.6 FINAL PHASE (BRAHMINICAL): Gradual elaboration of interior from primitive singular cell to isolated cell with ambulatory — culmination in emulation of structural temple — Study of the KAILASA TEMPLES, ELLORA

### GROUP - B THE EVOLUTION OF TEMPLE ARCHITECTURE 23 PERIODS

#### Module 5 EARLIEST TEMPLES 2

Roof suggesting timber & thatch origin — later addition of tower & pillared porch — square shaft with 'cushion' capital — lack of proportion — Study of the LAD KHAN TEMPLE, AIHOLE — Evolution of structured temple — *Vimana* (shrine) with *Sikhara* (tower), *Garbhagriha* (sanctum), *Mandapa* (assembly hall), *Antarala* (vestibule), *Pradakshina Patha* (ambulatory) — Two main styles: Dravidian & Indo-Aryan

#### Module 6 TEMPLE ARCHITECTURE OF SOUTHERN INDIA (DRAVIDIAN STYLE) 6

- 6.1 PALLAVA: Origin from rock-cut architecture — *mandapa* or pillared hall with a cell — Study of the monolithic RATHAS, MAMMALLAPURAM
- 6.2 CHOLA: Simplicity in treatment — lofty *vimana* — pillared *mandapa* aligned axially within walled enclosure — 'kalasa' capital replacing Pallava Lion capital
- 6.3 PANDYA: Concentric walls enclosing *prakarana* (open courtyards) — introduction of *gopuram* (temple portal)
- 6.4 VIJAYNAGAR: Elaboration in ceremony — addition of *Amman* shrine & 'Kalyan' *mandapa*

- 6.5 MADURA: Two main temple formations: (a) inner flat-roofed courtyard with *vimana* thrusting above, and, (b) outer open courtyard – rectangular plan enclosed within high boundary wall with series of *gopuram* – interior pillars with foliated or gryphon brackets – Study of the SUNDARESWAR & MEENAKSHI TEMPLE, MADURA

**Module 7 TEMPLE ARCHITECTURE OF NORTHERN INDIA (INDO-ARYAN STYLE) 15**

- 7.1 ORISSA GROUP: Separate nomenclature (*Rekha Deul, Pida Deul, Jagamohan, Rahapaga, Pista etc.*) – Wall enclosing axially aligned structures without pillars – interiors devoid of ornamentations – exteriors decorated with figure sculptures – Study of the LINGARAJA TEMPLE, BHUBANESWARA
- 7.2 KHAJURAHU GROUP: Elegantly proportioned detached temples without enclosing wall in ‘Latin cross’ plans – separate domical roofs gradually increasing in height grouped centripetally – rich surface ornamentation – Study of the KANDARYA MAHADEVA TEMPLE
- 7.3 PROVINCIAL STYLES OF BENGAL: Origin in wooden houses & thatched bamboo huts – parabolic roofs and cornices or eaves suitable to drain rainwater – wide & short pillars with arched openings – square panelled terracotta relief – Study of the JOR-BANGLA TEMPLE, BISHNUPUR
- 7.4 JAIN TEMPLES: Exuberantly curved white marbles on vaulted ceilings surrounded by high enclosing walls of cells, enshrining statues of ‘Jina’ – open portico & vestibule leading to enclosed shrine with octagonal nave – obscured structural consideration – Study of the DILWARA TEMPLE, MOUNT ABU

**GROUP - C ISLAMIC ARCHITECTURE IN INDIA 22 PERIODS**

**Module 8 BEGINNING OF ISLAMIC ARCHITECTURE : THE DELHI OR IMPERIAL STYLE 4**

Dominated by Persian style — Typical characteristics: Jami Masjid – Tomb – Pointed Arch – Dome – Stalactite corbel – External surface in coloured patterned tile work – Arabesque – Stone grille & Pierced screen — SLAVE DYNASTY: Built from relics of Hindu temple – Study of the QUTB MINAR — TUGHLAQ DYNASTY: Compromise between trabeated & arcuated styles in the form of beam at base of arch – pointed domed ceiling supported on squint arch — SAYYID & LODI DYNASTIES: Two forms of tombs – (a) single storied octagonal tomb surrounded by arched veranda, and, (b) two / three storied square tomb without veranda; both mounted by domes, range of pillared kiosk over parapet.

**Module 9 THE BUILDINGS OF SHER SHAH SUR 2**

STUDY OF THE TOMB OF SHER SHAH: Grand fulfilment of the Lodi style – harmonious transition from square form of lower storeys to diminishing octagonal forms surmounted by circular base of crowning hemispherical dome with finial

**Module 10 PROVINCIAL STYLE OF BENGAL 2**

Brick structures necessitating arcuated style – short pillars supporting pointed ‘drop’ arches & vaults in brick – curvilinear form of roof originating from thatched bamboo hut facilitating water drainage – Study of the ADINA MASJID, PANDUA

**Module 11 THE MUGHAL PERIOD 14**

- 11.1 EARLIER SANDSTONE PHASE: BABAR & HUMAYUN: Beginning of garden tomb – Study of the HUMAYUN’S TOMB — AKBAR: Style executed in red sandstone with insertion of marble – trabeated construction system with frequent use of four-centred arch giving visual impression of arcuated style – hollow dome – many sided pillars with bracket capital – carving or bold inlay ornamentation with occasional painted design – Study of the FATEHPUR SIKRI with (a) BULAND DARWAJA, (b) JAMI MASJID, and, (c) TOMB OF SALIM CHISTI
- 11.2 LATER MARBLE PHASE: JAHANGIR: Marked transition from sandstone to marble resulting change in method of decoration – Study of the TOMB OF IT-MAD-ULLAH — SHAHJAHAN: Age of marble – fine & restrained moulding – inlaid pattern of decoration in coloured stone – dome assuming Persian bulbous form constricted at neck – system of true double doming – voluted bracket capital & foliated base of pillions – Study of the (a) RED FORT emphasising planning & design of DIWAN-I-AM; and, (b) TAJ MAHAL emphasising on both tomb and garden

**REFERENCE BOOKS**

1. Indian Architecture Vol. 1 (Buddhist & Hindu) / Percy Brown / D.B. Taraporevala Sons & Co. Pvt. Ltd.
2. Indian Architecture Vol. 2 (Islamic Period) / Percy Brown / D.B. Taraporevala Sons & Co. Pvt. Ltd.
3. Islamic Architecture in India / Satish Grover / Galgotia Publishing Company, New Delhi
4. Buddhist and Hindu Architecture in India / Satish Grover / CBS
5. A History of Architecture / Sir Banister Fletcher / Butterworth Heinemann (Hb), CBS (Pb)
6. The Great Ages of World Architecture / G. H. Hiraskar / Dhanpat Rai Co. Pvt. Ltd., Delhi

# MATERIALS & METHODS OF CONSTRUCTION – II

Subject Code ARCH / 4 / T3 / MMC2	Course offered in Fourth 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 will: —

- (i) understand the constituents, properties, defects & curing measures and applications of principal types of concrete, and, non-conventional concretes like pre-cast concrete, pre-stressed concrete, FRC and Ferrocement;
- (ii) understand the functions of different building types of building mortars;
- (iii) have clear concepts regarding the purpose of the foundation with special reference to different types of shallow foundation;
- (iv) have clear concepts regarding the purpose of the plinth and methods of its filling;
- (v) understand the causes of dampness to foundations & basements of buildings and methods of prevention from the same;
- (vi) understand different methods of spanning of openings using lintels and arches;
- (vii) have knowledge regarding different design considerations for a good stair with special reference to the RCC stairs;
- (viii) understand the different constructional methodology of water proofing treatment to flat roofs & terraces, parapet wall and window sill in detail.

## MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A (MATERIALS)	1	CEMENT CONCRETE	9
	2	NON-CONVENTIONAL CONCRETE	3
	3	BUILDING MORTARS	3
B (CONSTRUCTION)	4	FOUNDATION & PLINTH	6
	5	DAMP PROOFING TREATMENT	6
	6	SPANNING OF OPENINGS	6
	7	STAIRS	6
	8	WATER PROOFING TREATMENT	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	9	ANY TWENTY	ONE	1 X 20 = 20	THREE	ANY FIVE, TAKING AT LEAST ONE FROM EACH GROUP	TEN	10 X 5 = 50
B	4, 5, 6, 7, 8	16				FIVE			

## DETAIL COURSE CONTENT

### GROUP - A MATERIALS

**15 PERIODS**

#### 1.0 CEMENT CONCRETE

**9**

1.1 CONCRETE: Definition

1.2 CONCRETE MAKING MATERIALS: CEMENT – Portland Cement – Types of Portland Cement: Pozzolona Cement – White Cement – Blast furnace slag cement (properties and uses only) – Storage of cement — AGGREGATES – Grading of aggregates: Fine & Coarse aggregate (definition & function) — WATER – Properties of water to be mixed with cement – Functions of water

1.3 PROPERTIES OF CONCRETE: Strength – Durability – Water-cement ratio – Workability

1.4	DEFECTS OF CONCRETE and their CURING MEASURES	
1.5	PRINCIPAL TYPES OF CONCRETE: Plain Cement Concrete (PCC) & Reinforced Cement Concrete (RCC) — Their advantages & properties	
<b>2.0</b>	<b>NON- CONVENTIONAL CONCRETE</b>	<b>3</b>
	Pre-cast concrete – Pre-stressed concrete – FRC – Ferrocement (definitions and applications only)	
<b>3.0</b>	<b>BUILDING MORTARS</b>	<b>3</b>
	Classification of mortars on the basis of materials used and their functions: Cement mortar – Lime mortar – Mud mortar – Composite mortars (Lime-Cement mortar, <i>Surki</i> -Lime mortar) – Gypsum mortar	

**GROUP - B CONSTRUCTION** **30 PERIODS**

<b>4.0</b>	<b>FOUNDATION &amp; PLINTH</b>	<b>6</b>
4.1	FOUNDATION: Definition – Purpose	
4.2	CLASSIFICATION OF FOUNDATION: Shallow Foundation & Deep Foundation	
4.3	SPREAD FOOTINGS: Wall Footings – Reinforced Concrete Footings – Inverted Arch Footings – Isolated Column Footings — COMBINED FOOTING — MAT OR RAFT FOUNDATION (Concepts with sketches)	
4.4	TYPICAL DETAILS OF FOUNDATION: (i) Brick wall foundation & (ii) Isolated RCC column foundation	
4.5	PLINTH: Definition – Purpose	
4.6	FILLING OF PLINTH: Materials used – Methods of filling – Purpose of filling	
<b>5.0</b>	<b>DAMP PROOFING TREATMENT</b>	<b>6</b>
5.1	DAMPNESS — CAUSES of dampness — DEFECTS caused by dampness	
5.2	METHODS OF PREVENTION OF DAMPNES: Membrane Damp Proofing – Integral Damp Proofing – Surface Treatment – Guniting – Cavity Wall Construction	
5.3	DAMP PROOFING TREATMENT TO: (i) Foundation & plinth & (ii) Basement	
<b>6.0</b>	<b>SPANNING OF OPENINGS</b>	<b>6</b>
6.1	Post & Lintel openings — Limitations of material — Arched openings	
6.2	LINTEL AND ARCH: Definitions – Typical detail of a masonry window opening showing sill, lintel & <i>chajja</i> projection – Typical detail of an arched opening showing various parts	
6.3	TYPES OF LINTEL: Brick lintel — RCC lintel — Precast concrete lintel (with or without <i>chajja</i> )	
6.4	TYPES OF ARCHES: Semi-Circular Arches — Segmental Arches — Flat Arches	
6.5	RELIEVING ARCHES	
<b>7.0</b>	<b>STAIRS</b>	<b>6</b>
7.1	STAIRS: Definition – Technical terms used in stairs construction	
7.2	LOCATION of Stairs	
7.3	REQUIREMENT of a good stair	
7.4	RISER & TREAD RELATIONSHIP	
7.5	CLASSIFICATION of stairs on the basis of their forms	
7.6	RCC STAIRS: Advantages of RCC stairs – Design Principle of RCC stairs	
7.7	FIXING DETAILS: (i) Balusters (metal & wood) & (ii) Nosing to steps	
<b>8.0</b>	<b>WATER PROOFING TREATMENT</b>	<b>6</b>
8.1	Water proofing treatment to FLAT ROOFS & TERRACES: (a) Grading of Bitumen: Four course treatment – Six course treatment — (b) Grading of other materials: Grading of lime concrete – Grading of lime concrete with tiles – Grading of mud <i>pushka</i> with tiles (brief description with detail sketch)	
8.2	Water proofing treatment to PARAPET WALL: Detail of Coping, Drip course / Mould	
8.3	Water proofing treatment to WINDOW SILL & CHAJJA: Detail of Drip course / Mould	

**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

## **BUILDING SERVICES & EQUIPMENTS – II**

<b>Subject Code</b>	<b>Course offered in</b>	<b>Duration</b>	<b>3 lecture contact periods</b>	<b>Full Marks</b>
ARCH / 4 / T4 / BSE2	Fourth Semester	17 weeks	per week	100

### OBJECTIVE

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

- (i) establish the ideas of natural and mechanical ventilation with respect to the orientation of building in order to achieve desirable comfort conditions;
- (ii) understand the principles of lighting, daylighting and artificial lighting;
- (iii) understand the considerations for the design & planning of an electrical installation in a building with respect to the substation & distribution of supply;
- (iv) prepare typical distribution scheme (wiring diagram) in a residential building with separate circuits for lights, fans & power appliances with architectural symbols;
- (v) understand the principles of acoustics and establish the constructional measures for sound insulation of buildings;
- (vi) understand the design considerations for lift installation;
- (vii) understand the general requirements of fire protection with emphasis to the exit requirements.

### MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS	FACULTY
A	1	VENTILATION	9	ARCH
	2	LIGHTING	7	ARCH, EE
B	3	ELECTRICAL INSTALLATION	7	EE, ARCH
	4	ACOUSTICS, SOUND INSULATION AND NOISE CONTROL	7	ARCH
C	5	INSTALLATION OF LIFTS	7	ARCH
	6	FIRE PROTECTION	8	ARCH, ME

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	10	ANY TWENTY	ONE	1 X 20 = 20	FOUR	ANY FIVE, TAKING AT LEAST ONE FROM EACH GROUP	TEN	10 X 5 = 50
B	3, 4	7				THREE			
C	5, 6	8				TWO			

### DETAIL COURSE CONTENT

#### GROUP - A

16 PERIODS

#### Module 1 VENTILATION

##### 1.1 ORIENTATION OF BUILDING

1



CLIMATE & WEATHER — BASIC CLIMATIC ZONES: Hot & Arid, Hot / Warm & Humid, Cold — CLIMATIC FACTORS: Solar Radiation & Temperature, Clouds, Relative Humidity, Prevailing wind; measuring instruments and SI units— ASPECTS OF DAYLIGHTING — PLANTATION OF TREES.

- 1.2 COMFORT: THE DESIRABLE CONDITIONS** **1**  
REQUIREMENT OF VENTILATION — HEAT BALANCE OF BODY: Fanger's comfort equation — AIR CHANGE PER HOUR — RECOMMENDED VALUES OF AIR CHANGES for 'bed rooms/ living rooms', 'bath rooms/ toilets', 'cafes/ restaurants', 'cinemas/ theatres (non-smoking)', 'class rooms', 'garages', 'hospital wards', 'kitchens (common)', 'kitchens (domestic)', 'laboratories' and 'offices' [values only]— METHODS OF VENTILATION.
- 1.3 NATURAL VENTILATION** **2**  
WIND ACTION:  $Q = KAV$  — STACK EFFECT:  $Q = 7.0A \sqrt{h} (t_r - t_o)$  — CROSS-VENTILATION — POSITION OF OPENINGS — SIZE OF OPENINGS — CONTROL OF OPENINGS: sashes, canopies, louvers — WIND SHADOW — HUMIDITY CONTROL: wind scoop
- 1.4 MECHANICAL VENTILATION** **5**  
FAN: propeller & centrifugal — INSTALLATION OF FANS: local & central — SYSTEMS OF VENTILATION: exhaust, plenum (positive ventilation) & combined — MECHANICAL COOLING (HEAT- PUMP CIRCUIT): refrigerant, compressor, condenser, pressure release valve, evaporator — REFRIGERATOR & AIR COOLER — TON OF REFRIGERATION — SIMPLE AIR-CONDITIONER: propelling, filtering, washing, humidifying, cooling, dehumidifying, heating or re-heating

## **Module 2 LIGHTING**

- 2.1 PRINCIPLES OF LIGHTING** **3**  
AIMS OF GOOD LIGHTING and realization of the same — PLANNING THE BRIGHTNESS PATTERN considering the VISUAL TASK, the immediate background of the task (CENTRAL FIELD & VISUAL FIELD) and the general surroundings (PERIPHERAL FIELD) — GLARE: direct, reflected & veiling — RECOMMENDED VALUES OF ILLUMINATION LEVEL for 'homes', 'restaurants', 'cinemas', 'theatres', 'schools & colleges', 'hospitals', 'offices' [values only].
- 2.2 DAYLIGHTING** **2**  
SOURCES OF LIGHT OF A POINT INSIDE A BUILDING: skylight, externally reflected light, internally reflected light, direct sunlight — WORKING PLANE — DAYLIGHT FACTOR
- 2.3 ARTIFICIAL LIGHTING**  
NECESSITY OF ARTIFICIAL LIGHTING — SELECTION OF LIGHT SOURCES & LUMINAIRES depending on general lighting, direct lighting, localized or local lighting — TYPES OF LUMINAIRES: Incandescent & Fluorescent — ARRANGEMENT OF LUMINAIRES.

## **GROUP - B** **14 PERIODS**

### **Module 3 ELECTRICAL INSTALLATION**

- 3.1 CONSIDERATIONS FOR DESIGN & PLANNING OF AN ELECTRICAL INSTALLATION** **1**
- 3.2 SUBSTATION** **2**  
LOCATION — LAYOUT — ROOM / SPACES required for supply company's switchgear room, high voltage switchgear room (HT), transformer room, low voltage switchgear room (LT), standby generator room.
- 3.3 DISTRIBUTION OF SUPPLY** **3**  
IDEA REGARDING SOME ACCESSORIES: cables – cleat; circuit – circuit breaker; fuse – fuse-element – fuse-switch; distribution board; energy meters; switch – switchboard; socket-outlet – schedule of socket-outlets in a residential building — MARKING OF APPARATUS for three-wire three-phase wiring (AC & DC) — VOLTAGE & FREQUENCY OF SUPPLY (values only).
- 3.4 ARCHITECTURAL SYMBOLS FOR ELECTRICAL INSTALLATION IN BUILDINGS** **1**  
Wiring, Fuse Boards, Switches & Switch-outlets, Socket-outlets, Lamps & Lighting Apparatus, Electrical Appliances, Bells, Buzzers & Sirens, Fans, Telecommunication Apparatus, Fire Alarms, Earthing.

### **Module 4 ACOUSTICS, SOUND INSULATION AND NOISE CONTROL**

- 4.1 NOISE & TRANSMISSION OF SOUND** **3**  
AUDIBLE RANGE OF SOUND — EFFECTS OF NOISE — NOISE IN FREE FIELD: effect of wind velocity & temperature gradient, acoustic shadow & diffraction at respectively high & low frequencies — INCIDENCE

OF SOUND:  $a + t + r = 1$  — TRANSMISSION LOSS (TL) — NOISE IN ENCLOSED SPACE: direct & reverberant components — SOUND TRANSMISSION: air-borne & impact (structure-borne) sound.

**4.2 NOISE CONTROL** **2**

DISTANCING & SCREENING — SOUND ABSORBENTS: porous absorbents, membrane absorbents, resonant absorbers (Helmholz resonators), perforated panel absorbents — ACCEPTABLE INDOOR NOISE LEVELS for 'apartments, hotels & homes', 'restaurants', 'hospitals & cinema theatres', 'class rooms', 'conference rooms, small offices & libraries', 'large public offices, banks & stores' [values only].

**4.3 CONSTRUCTIONAL MEASURES FOR SOUND INSULATION OF BUILDINGS** **2**

HOLLOW & COMPOSITE WALL CONSTRUCTION — SOUND INSULATION OF FLOORS & CEILINGS: Using a resilient surface material on floors; Providing a floating floor construction – (a) Concrete floors, (b) Wooden Floors; Using a suspended ceiling with air-space — SOUND INSULATION OF SKIRTING — TREATMENT OF WINDOWS & VENTILATORS

**GROUP - C**

**15 PERIODS**

**Module 5** **INSTALLATION OF LIFTS**

**5.1 LIFT: ESSENTIAL PARTS** **2**

Lift – Lift Floor – Mezzanine – Mezzanine Floor – Lift Landing – Storey – Subsidiary Storey(s) – Basement Storey – Nomenclature of Floors and Storeys – Total Headroom – Lift Travel – Lift Landing Call Push – Lift Landing Door – Lift Car – Lift Door – Call Indicator – Lift Suspension Ropes – Lift Guides – Lift Well – Lift Pit – Lift Well Enclosure – Lift Rated Load – Lift Rated Speed – Lift Contract Speed – Lift Machine – Lift Overhead Beam [definitions only].

**5.2 CLASSIFICATION OF LIFT** **1**

Passenger Lift – Goods Lift – Hospital Lift – Service Lift (Dumb waiter) – Fireman's Lift

**5.3 DESIGN CONSIDERATIONS** **3**

NUMBER OF LIFTS & CAPACITY: Occupant load, Quantity of service, Quality of service, Car speed — POSITIONING OF LIFTS — SHAPE & SIZE OF LIFT CAR — ACCESS TO MACHINE ROOM & LIFT PITS — SAFETY MEASURES

**5.4 INFORMATION TO BE PROVIDED IN DRAWING (s)** **1**

**Module 6** **FIRE PROTECTION**

**6.1 GENERAL CLASSIFICATION OF BUILDINGS BASED ON OCCUPANCY** **1**

Criteria of Fire Resistance — Combustible Material — OCCUPANCY or Use Group — TYPES OF CONSTRUCTION

**6.2 GENERAL REQUIREMENTS OF FIRE PROTECTION** **4**

MAXIMUM HEIGHT — FAR — OPEN SPACES: additional provisions for high rise buildings, MIXED OCCUPANCY — FIRE WALL, FIRE STOP OR ENCLOSURE of all openings — AUTOMATIC FIRE DETECTION & ALARM SYSTEM — FIXED FIRE FIGHTING INSTALLATIONS/ REQUIREMENTS for A, B & C occupancy buildings: Wet riser, Wet riser-cum-downcomer, Automatic sprinkler installation, Static reservoir, Dry riser.

**6.3 EXIT REQUIREMENTS** **3**

TYPES OF FIRE EXITS — GENERAL EXIT REQUIREMENTS — OCCUPANT LOAD — CAPACITY OF EXITS — ARRANGEMENT OF EXITS: travel distance — DOORWAYS — CORRIDORS & PASSAGEWAYS — INTERNAL STAIRCASES — FIRE ESCAPES OR EXTERNAL STAIRS — ROOF EXIT — HORIZONTAL EXITS — FIRE TOWER — RAMPS

**REFERENCE BOOKS**

1. SP 7 (4) : 2005 NATIONAL BUILDING CODE OF INDIA GROUP 4 – PART VIII BUILDING SERVICES / Bureau Of Indian Standards
2. Manual of Tropical Housing and Building Part 1 Climatic Design / O. H. Koenigsberger, T. G. Ingersoll, A. Mayhew, S. V. Szokolay / Orient Longman

# SESSIONAL COURSES OFFERED IN 4TH SEMESTER, PART - II

## DEVELOPMENT OF LIFE SKILLS-II

<b>Subject Code</b> ARCH / 4 / S1 / DLS2	<b>Course offered in</b> Fourth Semester	<b>Course Duration</b> 17 weeks	<b>2 lecture contact periods</b> per week	<b>Full Marks</b> 50
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**NOTE : SYLLABUS CONTENTS SIMILAR TO OTHER DISCIPLINES.**

## AutoCAD LAB

<b>Subject Code</b> ARCH / 3 & 4 / S2 / ACAD	<b>Course offered in</b> Part – II	<b>Full Marks</b> 100
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### 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-B)

<b>Course offered in</b> Fourth Semester	<b>Course Duration</b> 17 weeks	<b>2 sessional contact periods</b> per week
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## MODULAR DIVISION OF THE SYLLABUS

MODULE	TOPIC	CONTACT PERIODS	
		Lecture	Sessional
1	VIEWPORTS & MODEL SETTING	3	6
2	DRAWING 3D SURFACES	4	6
3	3D VIEWS	4	6
4	SOLID MODELLING	4	6
5	SOLID EDITING	3	6
6	USER CO-ORDINATE SYSTEM	4	4
7	OBJECT LINKING AND EMBEDDING	4	4
8	RENDERING	4	7

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

INTERNAL ASSESSMENT: 10

TOTAL PERIODS: 85

## DETAIL COURSE CONTENT

### Module 1 VIEWPORTS & MODEL SETTING

**3 LECTURE & 6 SESSIONAL PERIODS**

Model Space Viewports – Displaying viewports as tiled areas: VPORTS command – Making a viewport current – Joining two adjacent viewports – Model space: MSPACE command – Paper space: PSPACE command – Editing the viewports: Controlling the display of the objects in the viewport, Locking the display in the viewports, Controlling the display of the hidden lines in the viewports, Clipping the existing viewports – PAGESETUP command – MVSETUP command

### Module 2 DRAWING 3D SURFACES

**4 LECTURE & 6 SESSIONAL PERIODS**

RULESURF command – TABSURF command – REVSURF command – EDGESURF command – 3DMESH command – 3DFACE command – 3DPOLY command – 3DARRAY command – MIRROR3D command – ROTATE3D command – ALIGN command – HIDE command

### Module 3 3D VIEWS

**4 LECTURE & 6 SESSIONAL PERIODS**

VPOINT command – Plan View – Top – Bottom – Left – Right – Front – Back – 3D Orbit

### Module 4 SOLID MODELLING

**4 LECTURE & 6 SESSIONAL PERIODS**

About solid modelling – Predefined solid primitives – Creating solid objects: BOX, CONE, CYLINDER, SPHERE, TORUS, WEDGE commands – Constructing a Region: Creating a 2D Region: REGION command – Subtracting Regions: SUBTRACT command – Creating an extruded solid: EXTRUDE command

### Module 5 SOLID EDITING

**3 LECTURE & 6 SESSIONAL PERIODS**

Constructing a composite solid: UNION, SUBTRACT, INTERSECT, REVOLVE, FILLET, CHAMFER commands – Slicing solids: SLICE, SECTION commands

### Module 6 USER CO-ORDINATE SYSTEM

**4 LECTURE & 4 SESSIONAL PERIODS**

World Co-ordinate System (WCS) – User Co-ordinate System (UCS) – UCSICON command – UCS command

### Module 7 OBJECT LINKING AND EMBEDDING

**4 LECTURE & 4 SESSIONAL PERIODS**

OLE feature – Clipboard – Object Embedding: COPYCLIP command – Linking objects: COPYLINK command

### Module 8 RENDERING

**4 LECTURE & 6 SESSIONAL PERIODS**

Rendering – Loading and unloading AutoCAD Render – Elementary Rendering – Selecting different properties for rendering: Rendering type, Rendering option, Rendering procedures, Destination, Sub sampling, Background, Fog / Depth cue – Inserting and modifying lights – Defining and rendering a scene – Attaching and detaching materials – Saving a Rendering

## REFERENCE BOOKS / CD

1. AutoCAD 14 for Windows – Bible (with Applications) / Sham Tickoo / Galgotia Publications pvt. Ltd.
2. Advanced AutoCAD / Robert M. Thomas / Sybex BPD
3. AutoCAD Part – 1 & 2: Banglaly Prokashito Tutorial / CD Media / Sonolite, 55, Elliot Rd, Kolkata – 16

# 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.

## 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

CONTACT PERIODS: 150

INTERNAL ASSESSMENT: 20 PERIODS

TOTAL PERIODS: 170

## 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.

**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**

**Module 8 Two-Point Perspective Projections of Combination of Solids 12**

Any two or three SOLIDS MENTIONED ABOVE IN COMBINATION, the solids being positioned concentrically and in isolation.

**Module 9 Two-Point Perspective Projections of Combination of Solids with Sciography 12**

Sciography on any two or three SOLIDS MENTIONED ABOVE IN COMBINATION, the solids being positioned concentrically and in isolation.

**GROUP – C PERSPECTIVE PROJECTIONS OF INTERIORS 16 PERIODS**

**Module 10 One-Point Perspective Projections of Interiors 8**

At least one projection of a simple interior space\* showing all furniture and fixtures

**Module 11 Two-Point Perspective Projections of Interiors 8**

At least one projection of a simple interior space\* showing all furniture and fixtures

\* N.B. The interior spaces (Modules – 10 & 11) may be living room, a bed room, a kitchen, a toilet etc. Two different interior spaces should be dealt with in the two different projections mentioned above. Necessary plans(s), elevation(s), section(s) etc. shall be provided by the teacher concerned.

**GROUP – D PERSPECTIVE VIEW 20 PERIODS**

**Module 12 Perspective View of Exteriors (For Architecture Only)**

- (a) A two-point perspective projection of the exterior of any one building designed by the student in the subject ARCHITECTURAL DESIGN & DRAWING – I in Part – II or may be supplied by the teacher concerned. 12
- (b) A perspective view of the above with sciography showing landscaping elements, cars and human figures in a different sheet (opaque/ transparency/ photocopy) in colour. 8

**OR**

**PERSPECTIVE VIEW OF INTERIORS (FOR INTERIOR DECORATION, HANDICRAFTS & FURNITURE DESIGN ONLY)**

- (a) A perspective projection of any one interior space designed by the student in the subject INTERIOR DESIGN & DRAWING – I in Part – II or may be supplied by the teacher concerned. 12
- (b) A perspective view of the above showing furniture, fixture & accessories, human figures, interior landscaping elements in a different sheet (opaque/ transparency/ photocopy) in colour. 8

## SCHEDULE OF PLATES

### ARCHITECTURAL GRAPHICS (GROUP – B) FOURTH SEMESTER

SHEET NO.	TITLE OF SHEET	SHEET SIZE
1.	TWO-POINT PERSPECTIVE PROJECTIONS OF COMBINATION OF SOLIDS based on Module VIII	HALF IMPERIAL
2.	TWO-POINT PERSPECTIVE PROJECTIONS OF COMBINATION OF SOLIDS WITH SCIOGRAPHY based on Module IX	HALF IMPERIAL
3.	ONE-POINT PERSPECTIVE PROJECTION OF AN INTERIOR based on Module X	HALF IMPERIAL
4.	TWO-POINT PERSPECTIVE PROJECTION OF AN INTERIOR based on Module XI	HALF IMPERIAL
5.	TWO-POINT PERSPECTIVE PROJECTION OF A BUILDING based on Module XII (A) (FOR ARCHITECTURE ONLY) <b>OR</b> PERSPECTIVE PROJECTION OF AN INTERIOR SPACE based on Module XII (A) (FOR INTERIOR DECORATION, HANDICRAFTS & FURNITURE DESIGN)	FULL IMPERIAL
6.	PERSPECTIVE VIEW OF A BUILDING WITH SCIOGRAPHY & LANDSCAPING ELEMENTS based on Module XII (B) (FOR ARCHITECTURE ONLY) <b>OR</b> PERSPECTIVE VIEW OF AN INTERIOR SPACE based on Module XIII (B) (FOR INTERIOR DECORATION, HANDICRAFTS & FURNITURE DESIGN)	FULL / 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 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. <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 – B)	Fourth Semester	

### WORKING DRAWING – I (GROUP – B)

**Course offered in**  
Fourth Semester

**Course Duration**  
17 weeks

**4 sessional & 1 Tutorial contact periods**  
per week

### OBJECTIVE

On satisfactory completion of Group – B of the course, the students will be in a position to prepare a set of working drawing of a simple double storied load bearing structure drawn manually.

## MODULAR DIVISION OF THE SYLLABUS

SHEET NO.	MODULE	CONTACT PERIODS
1	TRENCH PLAN	10
2	GROUND FLOOR PLAN	12
3	FIRST FLOOR PLAN	12
4	ROOF PLAN	6
5	ELEVATIONS	10
6	SECTIONAL ELEVATIONS	10
	TUTORIALS	15

CONTACT PERIODS: 75

INTERNAL ASSESSMENT: 10

TOTAL PERIODS: 85

## DETAIL COURSE CONTENTS

A set of working drawings in 1 : 50 scale drawn manually based on a simple double storied load bearing structure. Relevant drawings are to be supplied by teacher.

**SHEET No. 1 TRENCH PLAN 10**

Showing plot line, width of foundation trench, construction of wall, proper dimensions. Footing detail of steps (in 1 : 20 scale) from Ground Level to Plinth Level, staircase, toe beam, load bearing brick wall, schedule of windows – same as that of door with addition of sill height.

**SHEET No. 2 GROUND FLOOR PLAN 12**

Showing dimensions of all walls, door & windows, width of flight, tread, landing, number of treads, width of stairwell (if any), inner & outer plaster line, overall dimension.

**SHEET No. 3 FIRST FLOOR PLAN 12**

Same as above.

**SHEET No. 4 ROOF PLAN 6**

Showing *ghundi*, ridgeline, slope line, position & size of Rain Water Pipe, thickness of parapet wall, roof projection (if any), sectional plan of stair room with its roof projection (if any).

**SHEET No. 5 ELEVATIONS 10**

TOPIC A: ONE ROAD SIDE ELEVATION

TOPIC B: ONE LATERAL ELEVATION

Showing Ground Level, Plinth Level, First Floor level, Roof level, Mumpity Room Roof level, Sill & Lintel levels in one storey only, Height of parapet wall – specification of all other non-structural elevational feature.

**SHEET No. 6 SECTIONAL ELEVATIONS 10**

Two sectional elevations through staircase, kitchen, toilet & front window or veranda – showing Ground Level, Plinth Level, First Floor level, Roof level, Entrance to roof, Sills, Lintel, Floor slabs at all levels, Flat Brick Soling, Damp Proof Course, Parapet wall.

# ARCHITECTURAL DESIGN & DRAWING - I

Subject Code  
ARCH / 3 & 4 / S5 / SAD1

Course offered in  
Part – II

Full Marks  
250

## COURSE & EXAMINATION SCHEDULE

SUBJECT CODE	NAME OF THE COURSES	COURSES OFFERED IN	MARKS ALLOTTED
ARCH / 3 & 4 / S5 / SAD1	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



	Architectural Design & Drawing (S) – I (Group – B)	Fourth Semester	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..
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, 1983 are allowed during the examinations.

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

Course offered in  
Fourth Semester

Course Duration  
17 weeks

4 sessional & 1 Tutorial contact periods  
per week

### OBJECTIVE

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

- (i) understand the standards of individual units of housing schemes for the EWS, the LIG, MIG and HIG;
- (ii) understand the definitions of different parts of a residential apartment building;
- (iii) develop the architectural design of a ‘G + 4’ residential apartment building in sketch-wise phases;
- (iv) draw the developed architectural design.

### MODULAR DIVISION OF THE SYLLABUS

MODULE	TOPIC	CONTACT PERIOD
1	STUDY SHEETS OF HOUSING UNITS	8
2	UNDERSTANDING PARTS OF A RESIDENTIAL BUILDING	2
3	ARCHITECTURAL DESIGN	22
4	ARCHITECTURAL DRAWING	28
	TUTORIALS	15

CONTACT PERIODS: 75

INTERNAL ASSESSMENT: 10

TOTAL PERIODS: 85

### DETAIL COURSE CONTENT

#### Module 1 STUDY SHEETS OF HOUSING UNITS 8

Preparing study sheets of individual units of some standard housing designs for Economically Weaker Sections (EWS), Lower Income Groups (LIG), Middle Income Groups (MIG) and Higher Income Groups (HIG).

#### Module 2 UNDERSTANDING PARTS OF A RESIDENTIAL BUILDING 2

Definitions of the terms “apartment” and “means of access” as per the CMC bye-laws; definitions of the terms “BUILDING, HEIGHT OF”, “CARPET AREA”, “HABITABLE ROOM”, “LEDGE OR TAND”, “LIFT”, “LOFT” and “MEZZANINE FLOOR” as per the NBC.

#### Module 3 ARCHITECTURAL DESIGN 22

Architectural design of a ‘G + 4’ residential apartment building in sketch-wise phases keeping in mind the provisions of bye-laws regarding “Height Limitations”; and, minimum floor area, minimum width & minimum height of designed spaces.

#### Module 4 ARCHITECTURAL DRAWING 28

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 means of access, approach to the designed building, 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 transparent sheets.**