

CURRICULUM
for
DIPLOMA PROGRAMME
in
ARCHITECTURAL ASSISTANTSHIP

2nd Year (3rd & 4th Semester)

FOR THE STATE OF HIMACHAL PRADESH



Prepared by
National Institute of Technical Teachers Training & Research,
Sector-26, Chandigarh-160019, India.

June, 2018

**STUDY AND EVALUATION SCHEME
THIRD SEMESTER ARCHITECTURAL ASSISTANTSHIP**

S. NO.	SUBJECTS	STUDY SCHEME Hrs/Week		MARKS IN EVALUATION SCHEME								TOTAL MARKS
				INTERNAL ASSESMENT			EXTERNAL ASSESMENT					
				Th	Pr	Th/Drg.	Pr	Total	Th/Drg.	Hrs	Pr	
3.1	Building Services	3	-	50	-	50	100	3	-	-	100	150
3.2	Build. Construction-II	1	6	100	-	100	100	4	#50	3	150	250
3.3	History of Architecture-I	3	-	50	-	50	100	3	-	-	100	150
3.4	Architectural Design-II	2	6	100	-	100	100	4	#50	3	150	250
3.5	Working Drawing-I	-	6	100	-	100	100	4	-	-	100	200
3.6	Surveying	1	2	25	25	50	100	3	50	3	150	200
3.7	Computer Graphics-I	-	4	-	50	50	-	-	50	3	50	100
3.8	*Basics of Information Technology	-	3	-	50	50	-	-	50	3	50	100
3.9	S.C.A.	-	3	-	25	25	-	-	-	-	-	25
TOTAL		10	30	425	150	575	600		250		850	1425

Viva Only

*common - All branches

**STUDY AND EVALUATION SCHEME
FOURTH SEMESTER ARCHITECTURAL ASSISTANTSHIP**

S. NO.	SUBJECTS	STUDY SCHEME Hrs/Week		MARKS IN EVALUATION SCHEME								TOTAL MARKS
				INTERNAL ASSESMENT			EXTERNAL ASSESMENT					
				Th	Pr	Th/Drg.	Pr	Total	Th/D	Hrs	Pr	
4.1	Estimating & Specification Writing	4	-	50	-	50	100	4	-	-	100	150
4.2	Building Construction-III	2	6	100	-	100	100	4	#50	3	150	250
4.3	History of Architecture-II	3	-	50	-	50	100	3	-	-	100	150
4.4	Architectural Design-III	2	6	100	-	100	100	4	#50	3	150	250
4.5	Building Bye Laws & Working Drawing	1	4	50	-	50	100	4	-	-	100	150
4.6	Structural Design - I	4	-	50	-	50	100	3	-	-	100	150
4.7	Computer Graphics-II	-	4	-	50	50	-	-	50	3	50	100
4.8	S.C.A.	-	4	-	-	25	-	-	-	-	-	25
TOTAL		16	24	400	50	475	600		150		750	1225

Viva Only

NOTE: students are required to undergo professional training after the end of the fourth semester examinations. The Duration of the training would be 4 weeks.

Industrial Training - After examination of 4th Semester, the students shall go for training in a relevant industry/field organisation for a minimum period of 6 weeks and shall prepare a diary. The students shall also prepare a report at the end of training and shall present it in a seminar, which will be evaluated during 5th semester.

3.1 BUILDING SERVICES

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RATIONALE

Building services are as important as any other part of the building. The teachers, besides classroom teaching should supplement the instruction by arranging field visits. Students may be encouraged to collect information, pamphlets and catalogues from different market/ manufacturing sources and prepare a scrapbook of the latest machines/fittings available for building services. Teachers may also encourage the students to go through relevant BIS codes for each topic. The subject knowledge should be used in preparing services drawings in the subject of Architectural design.

DETAILED CONTENTS

1. **Water Supply** (10 hrs)
 - 1.1 Water as a natural resource, public health significance of water quality, demand of water for domestic, commercial, industrial and public utility purposes as per BIS standards. Per capita demand, leakage and wastage of water and its preventive measures
 - 1.2 System of water supply – continuous, intermittent, their advantages and disadvantages
 - 1.3 Storage and Distribution of Water: Different methods of water distribution boosting water, gravity and pressure distribution by storage tanks of individual buildings
 - 1.4 Hot water supply for buildings including solar water heating.
 - 1.5 Service connections, types and sizes of pipes, water supply fixture and installations
 - 1.6 Concept of Rain water harvesting

2. **Drainage** (12 hrs)
 - 2.1 Principles of drainage, surface drainage; combined and separate system of drainage, shape and sizes of drains and sewers, storm water over flow chambers, methods of laying and construction of sewers
 - 2.2 House drainage: traps – shapes, sizes, types, materials and function
 - 2.3 Inspection chambers – sizes, and construction
 - 2.4 Ventilation of house drainage – anti siphon age and vent pipes, single stack and double stack system
 - 2.5 Functions and working of sinks, wash basins,, water closets, flushing cisterns, urinals, – sizes and types
 - 2.6 Septic tanks, seepage and soak pits

3. **Sound Insulation** (04 hrs)
 - 3.1 Behavior of sound propagation,
 - 3.2 Acoustics in building, acoustical defects such as echo, reverberation, sound foci, methods of correction, special requirements in Buildings like auditorium, conference halls, studios etc
 - 3.3 Acoustical materials and their uses in various buildings

4. **Lighting and Electrical Fittings** (4 hrs)
 - 4.1 Electrical distribution-conduits for wiring, types of wiring, types of switches, various terms used in lighting-illumination, Lux, lumen etc. distribution panels, MCB'S, ELCBS

- 4.2 Methods of lighting, quality of light of mercury lamps, incandescent types of lamps, fluorescent tubes, LED and other lamps, thumb rules for calculation of illuminating level, various systems of wiring and their sustainability
- 4.3 Symbolic representation of electrical fittings for different work areas in residential building (e.g. bed room, living room, kitchen, study and toilet)
- 4.4 Precautions to avoid electrical accidents
5. **Heat, Ventilation and Air Conditioning (HVAC)** (10 hrs)
- 5.1 Behavior of heat propagation, thermal insulating materials and their co-efficient of thermal conductivity.
- 5.2 General methods of thermal insulation. Thermal insulation of roofs, exposed walls
- 5.3 Ventilation: Definition and necessity
- 5.4 System of ventilation (Mechanical)
- 5.5 Types of Air Conditioning Systems and their applications, Criteria for Selection of Air Conditioning systems for different buildings
- 5.6 Installation of various types of Air Conditioners and ducting system
6. **Vertical Transportation Systems** (04 hrs)
Classification and types of lifts, lift sizes, provision and installation, escalators, sizes, safety norms to be adopted
7. **Fire Fighting Services** (04 hrs)
Causes of fire in Buildings, classification of building materials according to fire rating; fire alarm systems introduction to fire fighting system, precaution and controlling devices (fire panels, door and windows automation, fire hydrants and sprinklers) fire escape elements (staircases, ramps,), provisions in building from fire safety angle as per BIS; heat detectors, and fire detection system.

Note: Students shall prepare a scrapbook for all the above 8 numbers of topics.

Samples of various latest materials related to water supply, sanitary, electrical fitting and HUAC should be displayed in the building museum to make the students more familiar with latest materials.

SUGGESTED DISTRIBUTION OF MARKS		
Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	10	20
2	12	20
3	4	10
4	4	10
5	10	20
6	4	10
7	4	10
Total	48	100

3.2 BUILDING CONSTRUCTION –II

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RATIONALE

Students of architectural Assistantship at diploma level are supposed to prepare structural drawings, working drawings and detailed drawings of various components of buildings. Also students are expected to design small residential buildings. For this purpose, it is essential that students are taught various components of building construction comprising of: foundations, super structure, openings, roofs, staircases, flooring and finishing and other allied building components.

Therefore, the subject of building construction is very important for students undergoing diploma course in Architectural Assistantship.

Teachers while imparting instructions are expected to show various components of buildings under construction, make use of models or other audio-visual media to clarify the concepts. While preparing drawings, teachers should lay considerable stress on proportioning, dimensioning, specification writing and printing and composition of drawing work. Teachers should also emphasis on environmental aspects like lighting, ventilation and orientation of buildings. Students should be asked to maintain a sketch book for recording the observations from site visits. While conducting viva, teachers should point out specific mistakes done by students in the preparation of drawings.

DETAILED CONTENTS

Theory Practical

1. Doors and Windows (Wood)

- 1.1 Definitions, functions, sizes, location and classification of wooden doors
- 1.2 Windows:- Types, location, functions, Sizes (Bay, Dormer, Sky Light, Fan Light, Ventilators Etc.
- 1.3 Joints in Timber

42 Hrs.

2. Flooring

- 2.1 Introduction to the nature and characteristics of wood floors at ground & Upper floor levels.
- 2.2 Floor finishes for timber floors & its advantages & Limitations.

- 2.3 Floor finishes (Marble, Granite, Tiles Etc.)

20 Hrs.

3. Staircases and Ramps:

- 3.1 Introduction to various types of wooden staircases and their details with sketches.
- 3.2 Relation between different components of wooden staircase
- 3.3 Definitions, purpose, slopes, types of ramps
- 3.4 Calculation of steps required for stairs and slope for ramps for different height.

25 Hrs.

***4. Roof and Roof Coverings**

- 4.1 Introduction to the nature and characteristics of wood construction-roofs, its advantages and Limitations.
- 4.2 Various Terms related to roofs.
- 4.3 Trusses for various span (With sketches /line diagrams) 25 Hrs.

PRACTICALS

- 1. Detailed drawings and construction details of Battened-Ledged-Braced doors, Battened- Braced-Framed doors, Flush doors etc. (4 Drawings)
 - 2. Detailed drawings and construction details of Casement windows, corner window and Bay windows etc. (2 Drawings)
 - 3. Single, Double & Triple timber floor. (1 Drawing)
 - 4. Drawing showing details of floor finishing's. (2 Drawings)
 - 5. Drawing showing details of wooden staircase in various buildings (1 Drawing)
 - 6. Drawing details of fixing and layout of AC, GI sheets, slates, tiles and locally available materials. (1 Drawing)
 - 7. Drawing of king post and queen post trusses along with their constructional details (2 Drawings)
- Note: The latest building material should be displayed in the building museum.*

SUGGESTED DISTRIBUTION OF MARKS		
Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	42	40
2	25	20
3	25	20
4	20	20
Total	112	100

3.3 HISTORY OF ARCHITETURE

RATIONALE

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Students of architectural Assistantship at diploma level must be well conversant with the skills of preparing working drawings and vocabulary in architecture. The students, therefore, must have broad exposure to communicate and understand the vocabulary and terminology in the field of architecture. The course on History of Architecture develops appreciation regarding past and current trends in the field of architecture. The knowledge of this course will help the students to understand how the new technology and new materials influence the general trend in architecture and also the effect of society on architecture. The course covers broad topics like: important civilization (Indian, Egyptian, Greek and Roman), temple architecture in India, Buddhist Architecture, Islamic Architecture, Renaissance and modern Architecture in Europe and India. The teacher should try to create interest among the students for this course by organizing site visits to the local old monuments. Use of audio-visual aids can also be made to explain various architectural developments. While imparting instructions, teachers should emphasis on materials, construction methods, structural system and design concepts involved. The teacher should motivate the students to take general references from the history while designing their project.

DETAILED CONTENTS

1. Evolution of Civilization with special reference to:

- 1.1 Man and his needs with reference to shelter
- 1.2 Man and culture
- 1.3 Society and culture
- 1.4 Effects of changing environments - Geographical, Biological
- 1.5 Social groups, societies and civilizations
- 1.6 Culture and its development in the following fields - religion, societies, economic, political, intellectual, military
- 1.7 Study of Indus valley :- Planning development of Indus valley civilization
- 1.8 Causes of rise and fall of civilizations

2. Buddhist Architecture in India:

- 2.1 Historical, economical, social and geographical background
- 2.2 Emphasis on Siting, concept plans, elevations and sections, materials and construction methods
- 2.3 Building types - Chaitya-hall, Stupa, Stambh, Torans and Vihars
- 2.4 Large scale drawings / details of various features used in Buddhist Architecture

3. Temple Architecture in India:

- 3.1 Introduction to Temple Architecture before evolution in India: Development of Temple Architecture at Aihole, Badami Pattadakal. Evolution period & planning concept of Temple Architecture in India
- 3.2 **Dravidian Style**
 - 3.2.1 Emphasis on evolution period of temple Architecture siting concept plans, elevations, sections, materials and construction method.
 - 3.2.2 Area of studies -

- (1) Pallava (AD-600to 900)
- (2) Chola (900 - 1150) A D.
- (3) Pandya (1100 - 1350) A D.
- (4) Vijaynagar (1350 - 1565)
- (5) Madurai (1600) A D.

3.3 Indo Aryan Style or North Indian Style

3.3.1 Emphasis on evolution, siting layout concepts of plans, elevations and sections, materials and construction methods.

3.3.2 Areas of study: Khajuraho, Orissa

- 4. Architecture character in respect of orders development of church plan (Basilican)
Construction method and general architecture (St. Peter)
- 5. Roman & Greek orders.

PRACTICAL

- 1. Sketch drawings of local old monument building, showing elevation, sections and various related details.
- 2. Preparation of sketch drawings of the various important details, used in the temples of different periods. Such as details of columns, cornics, balusters, chajjas etc.

Recommended Books:-

- 1. *Urban Pattern*
- 2. *Great Ages of world Architecture By G.K Hiraskar*

SUGGESTED DISTRIBUTION OF MARKS		
Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	10	20
2	12	30
3	12	30
4	08	10
5	06	10
Total	48	100

3.4 ARCHITECTURAL DESIGN-II

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RATIONALE

Large percentage of diploma holders in Architectural Assistantship find employment with private architects and also majority of them go for self-employment. Therefore, diploma holders are required to design small residential and public buildings. This course aims at providing practical exercises in designing so as to develop appropriate knowledge and skills in building design. Teachers are expected to show various types of designs of small to medium residential buildings to develop an appreciation of different designs. Teachers should also motivate students to maintain their sketch book in which they draw line sketches of different architectural styles.

DETAILED CONTENTS

1. **Study of spaces and layout of furniture of various activities in small structure comprising public utilities like**
 - 1.1 Library
 - 1.2 Architect's Office
 - 1.3 Post Office
 - 1.4 Clinic

32 Hrs.

2. **Design of three bed room house (with access to terrace).**
 - 2.1 Study Report
 - 2.1.1 Case study of existing building types
 - 2.1.2 Study of site
 - 2.1.3 Analysis of requirement and respective areas
 - 2.1.4 Circulation analysis
 - 2.2 Presentation Drawings
 - 2.2.1 Plans
 - 2.2.2 Elevations
 - 2.2.3 Sections
 - 2.2.4 Perspective View
 - 2.3 Study Tour and its report

72 Hrs.

3. **Time Problem: Furniture Layout and section of mono functional space such as café, nursery class room. Etc.**

24 Hrs.

SUGGESTED DISTRIBUTION OF MARK

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	32	20
2	72	80
3	24	-
Total	112	100

3.5 WORKING DRAWING-I

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RATIONALE

Preparation of working drawings and detailing forms the most important activities of diploma holders in Architectural Assistantship. Students are expected to develop mastery of skills in preparing working drawings of different building components and their detailing. Therefore, the courses in working drawing and detailing is very important.

Teachers while imparting instructions are expected to show various components of building under construction by organizing field visits or use models and other audio-visual media to clarify the concepts involved in preparing working drawings.

Teachers are expected to lay considerable stress on proportioning, dimensioning, specification writing, lettering and composition of drawing work whilst supervising students. Teachers should also take into consideration environmental aspects while teaching preparation of working drawings.

Preparation of working drawings for a simple single story residential building:

1. Showing working dimensions system
 - 1.1 Centre Line 1 Sheet
 - 1.2 Three line
 - 1.3 Four line
2. Site plan 1 Sheet
3. Foundation plan with sectional details 1 Sheet
4. Ground floor plan 1 Sheet
5. Terrace floor plan 1 Sheet
6. Sections-cross and longitudinal (Complete vertical section through external wall from foundation to terrace /parapet level.) 1 Sheet
7. Elevations - front and rear. 1 Sheet
8. Electrical lay out Plan. 1 Sheet
9. Water Supply & Sanitary lay out plan. 1 Sheet

SUGGESTED DISTRIBUTION OF MARKS		
Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1,2	10	05
3	08	10
4,5	30	35
6,7	30	25
8,9	18	25
Total	96	100

3.6 SURVEYING

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Students of Architectural Assistantship at diploma level are expected to manage the site which involves taking measurements, surveying and inspection. Also the students are expected to align the columns and give levels and slope for flooring. Therefore, basic knowledge and skills of surveying including chain surveying, compass surveying, plane tabling, leveling, contouring is very essential. Hence this course. Teachers while imparting instructions are expected to explain various concepts and principles by showing various equipment and demonstration thereof. Considerable stress should be given on the use of survey equipment.

DETAILED CONTENTS

1. Surveying:

1.1 Definition, objects and its types 2 Hrs.

2. Chain surveying: (4 Hrs.)

2.1 Introduction Principle, and operations involved in chaining, advantages and disadvantages. Instruments used for setting right angles, different types of chains.

2.2 Direct and indirect ranging, off sets and recording off field notes, Conventional signs used in chain surveying.

3. Plane Tabling:

3.1 Equipment and accessories

3.2 Setting of a plane table at a station point

3.3 Methods of plane-tabling - traversing, intersections, radiation and resections and situations where each is used

3.4 Finding the station point by two-point method

3.5 Three point problem and its solutions by:

i) Triangle of Error method

ii) Tracing Paper

iii) Graphical method

3.6 Advantages and disadvantages of plane tabling 6 Hrs.

4. Leveling:

4.1 Definition of leveling and terms used in leveling

4.2 Types of leveling

4.3 Parts of a dumpy level

4.4 Temporary adjustment of a dumpy level and setting up a level

4.5 Types of leveling staff

4.6 Reducing levels by rise and fall method

4.7 Reducing levels by height of collimation method 6 Hrs.

5. Contouring:

5.1 Explanation of terms in contouring

5.2 Characteristics of contours

5.3 Uses of contours

5.4 Methods of contouring and their plotting

5.5 Interpolation of contours

- 5.6. Introduction to theodolite and its uses.
- 5.7 Introduction to total station & its uses

10 Hrs.

PRACTICAL EXERCISE

1. Chain Surveying

- a) Ranging a line
- b) Chaining a line and recording in the field book
- c) Taking offsets- perpendicular and oblique (with a tape only)
- d) Setting out right angle with a tape
- ii) Chaining of a line involving reciprocal ranging iii) Chaining a line involving obstacles to ranging iv) Chain Survey of a small area.

2. Plane Tabling

- 2.1 To study plane table survey equipment
- 2.2 To set a plane table on a station point
- 2.3 Plotting a few points by radiation method .
- 2.4 To orient the plane-table by:
 - a. Through Compass
 - b. Back-sighting
- 2.5 Plotting a few points by intersection method

12Hrs

3. Leveling

- 3.1 Study of dumpy Level and leveling staff
- 3.2 Temporary adjustment of a dumpy level
- 3.3 Taking staff readings on different stations from the single setting and finding difference of level between them. .
- 3.4 Find the difference level between two distant points 30 Hrs.

4. Contouring

- 4.1 Preparing contour plan by radial line method by the use of Dumpy level/Auto Level.
- 4.2 Preparing a contour plan by method of squares.
- 4.3 Using a planimeter

18 Hrs.

SUGGESTED DISTRIBUTION OF MARKS			
Topic No.	Time Allotted (Hrs)		Marks Allotted (%)
	Theory	Practical	
1	02	10	10
2	04	08	25
3	03	08	20
4	03	06	20
5	04	0	25
Total	16	32	100

3.7 COMPUTER GRAPHICS - I

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RATIONAE

In the present times an architectural assistant should be capable of drafting drawings on the computer as most of the architects lay greater stress on computerized drawings for their ease of drafting, editing, managing and presentation. At the end of the course the students should be able to make 2-D architectural drawings for presentation and construction purposes. The student should get familiar with the latest CAD software.

DETAILED CONTENTS

Note: Relevant theory may be taught along with practical exercises in each topic.

- | | |
|--|---------------|
| 1. Introduction to 2-D CAD | 06 Hrs |
| 1.1 Graphics | |
| 1.2 Starting AutoCAD | |
| 1.3 Inside the drawing editor | |
| 1.4 Commands in the menus (Tool bars) | |
| 1.5 Accessing Commands | |
| 1.6 Entity selection | |
| 1.7 Entering coordinates | |
| 1.8 Folders for organizing drawings and files | |
| Exercise: Creating folders and sub folders | |
|
 | |
| 2. Creating and Saving a new Drawing | 06 Hrs |
| 2.1 Commands and options to create new drawings | |
| 2.2 Units | |
| 2.3 Limits | |
| 2.4 Snap | |
| 2.5 Grid | |
| 2.6 Ortho | |
| 2.7 Layer | |
| 2.8 Application of layers | |
| 2.9 Open a new, existing drawing | |
| 2.10 Save, save as, quit, close, exit | |
| Exercise: Setting up a new drawing with units, limits etc | |
|
 | |
| 3. Drawing Commands | 10 Hrs |
| 3.1 Commands and options to create new drawings | |
| 3.2 Units | |
| 3.3 Limits | |
| 3.4 Snap | |
| 3.5 Grid | |
| 3.6 Ortho | |
| 3.7 Layer | |

- 3.8 Application of layers
- 3.9 Open a new, existing drawing
- 3.10 Save, save as, quit, close, exit
- Exercise:** Setting up a new drawing with units, limits etc

4. Viewing an Existing Drawing **12 Hrs**

- 4.1 Zoom
- 4.2 Pan
- 4.3 Redraw and Regen all
- 4.4 Regen Auto
- 4.5 View

Exercise: Viewing, zooming of existing drawing made in section 3.

5. Modifying an Existing Drawing **20 Hrs**

- 5.1 Undo Redo/Oops
- 5.2 Trim
- 5.3 .Move
- 5.4 Offset
- 5.5 Rotate
- 5.6 Array
- 5.7 Stretch
- 5.8 Divide
- 5.9 Chamfer
- 5.10 Erase
- 5.11 Break
- 5.12 Copy, multiple copy
- 5.13 Mirror (Mirror test)
- 5.14 Change (change properties)
- 5.15 Extend
- 5.16 Explode
- 5.17 Blip mode
- 5.18 Scale
- 5.19 Fillet

Exercise: a) Modifying composition made in section 3 b) Making plan, elevation and section of simple building

6. Making & Inserting Blocks **10 Hrs**

- 6.1 Blocks
- 6.2 Insert block
- 6.3 Base
- 6.4 Using library for blocks
- 6.5 W-block
- 6.6 X-ref
- 6.7 Explode

Exercise:- Inserting furniture, fixtures, trees etc. in the plans, sections and elevations made in section 5.

3.8 BASICS OF INFORMATION TECHNOLOGY

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RATIONALE

Information technology has great influence on all aspects of life. Primary purpose of using computer is to make the life easier. Almost all work places and living environment are being computerized. The subject introduces the fundamentals of computer system for using various hardware and software components. In order to prepare diploma holders to work in these environments, it is essential that they are exposed to various aspects of information technology such as understanding the concept of information technology and its scope; operating a computer; use of various tools using MS Office/Open Office/Libre Office using internet etc., form the broad competency profile of diploma holders. This exposure will enable the students to enter their professions with confidence, live in a harmonious way and contribute to the productivity.

Note:

1. Explanation of Introductory part should be demonstrated with practical work. Following topics may be explained in the laboratory along with the practical exercises. There will not be any theory examination.
2. Theory paper will cover the following content including content given in practical exercises

TOPICS TO BE EXPLAINED THROUGH DEMONSTRATION

1. Basic Concepts of IT and Its Application

Information Technology concept and scope, applications of IT. in office, Air and Railway Ticket reservation, Banks financial transactions, E-Commerce and E- Governance applications etc., Ethics of IT, concept of online frauds, threats of IT crimes.

2. Computer Hardware

Block diagram of a computer, components of computer system, CPU, Memory, Input devices; keyboard, Scanner, mouse etc; Output devices; VDU, LCD, Printers etc. Primary and Secondary Memory: RAM, ROM, magnetic disks – tracks and sectors, optical disk (CD , DVD & Blue Ray Disk.), USB/Flash Drive.

3. Software Concepts

System software, Application software, Virtualization software and Utility software, Introduction of Operating System, Installation of Window / linux, Features of OPEN OFFICE/MS_OFFICE(MS word, Excel, PowerPoint) .

4. Internet Concepts

Basics of Networking – LAN, WAN, Wi-Fi technologies and sharing of printers and other resources, Concept of IP addresses, DNS, introduction of internet, applications of internet like: e-mail and browsing, concept of search engine and safe searching. Various browsers like Internet explorer/Microsoft Edge, Mozilla Firefox, use of cookies and history, WWW (World Wide Web), hyperlinks, introduction to Anti-virus.

LIST OF PRACTICAL EXERCISES

1. Given a PC, name its various components and peripherals. List their functions
2. Installing various components of computer system and installing system software and application software
2. Installation of I/O devices, printers and installation of operating system viz. Windows/BOSS/ LINUX
4. Features of Windows as an operating system
 - Start
 - Shut down and restore
 - Creating and operating on the icons
 - Opening, closing and sizing the windows and working with windows interfacing elements (option buttons, checkbox, scroll etc.)

- Using elementary job commands like – creating, saving, modifying, renaming, finding and deleting a file and folders
- Changing settings like, date, time, colour (back ground and fore ground etc.)
- Using short cuts
- Using on line help

5. Word Processing (MS Office/Open Office)

- a) File Management:
 - Opening, creating and saving a document, locating files, copying contents in some different file(s), protecting files, giving password protection for a file
- b) Page set up:
 - Setting margins, tab setting, ruler, indenting
- c) Editing a document:
 - Entering text, cut, copy, paste using tool- bars
- d) Formatting a document:
 - Using different fonts, changing font size and colour, changing the appearance through bold/italic/underlined, highlighting a text, changing case, using subscript and superscript, using different underline methods
 - Aligning of text in a document, justification of document, inserting bullets and numbering
 - Formatting paragraph, inserting page breaks and column breaks, line spacing
 - Use of headers, footers: Inserting footnote, end note, use of comments, autotext
 - Inserting date, time, special symbols, importing graphic images, drawing tools
- e) Tables and Borders:
 - Creating a table, formatting cells, use of different border styles, shading in tables, merging of cells, partition of cells, inserting and deleting a row in a table
 - Print preview, zoom, page set up, printing options
 - Using find, replace options
- f) Using Tools like:
 - Spell checker, help, use of macros, mail merge, thesaurus word content and statistics, printing envelopes and labels
 - Using shapes and drawing toolbar,
 - Working with more than one window.

6. Spread Sheet Processing (MS Office/Open Office)

- a) Starting excel, open worksheet, enter, edit, data, formulae to calculate values, format data, save worksheet, switching between different spread sheets
- b) Menu commands:

Create, format charts, organise, manage data, solving problem by analyzing data. Programming with Excel Work Sheet, getting information while working
- c) Work books:

Managing workbooks (create, open, close, save), working in work books, selecting the cells, choosing commands, data entry techniques, formula creation and links, controlling calculations

Editing a worksheet, copying, moving cells, pasting, inserting, deletion cells, rows, columns, find and replace text, numbers of cells, formatting worksheet, conditional formatting

d) Creating a chart:

Working with chart types, changing data in chart, formatting a chart, use chart to analyze data
Using a list to organize data, sorting and filtering data in list

e) Retrieve data with query:

Create a pivot table, customizing a pivot table. Statistical analysis of data

f) Exchange data with other application:

Embedding objects, linking to other applications, import, export document.

7. PowerPoint Presentation (MS Office/Open Office)

a) Introduction to PowerPoint

- How to start PowerPoint
- Working environment: concept of toolbars, slide layout & templates.
- Opening a new/existing presentation
- Different views for viewing slides in a presentation: normal, slide sorter.

b) Addition, deletion and saving of slides

c) Insertion of multimedia elements

- Adding text boxes
- Adding/importing pictures
- Adding movies and sound
- Adding tables and charts etc.
- Adding organizational chart
- Editing objects
- Working with Clip Art

d) Formatting slides

- Using slide master
- Text formatting
- Changing slide layout
- Changing slide colour scheme
- Changing background
- Applying design template

e) How to view the slide show?

- Viewing the presentation using slide navigator
- Slide transition
- Animation effects, timing, order etc.

f) Use of Pack and Go Options.

8. Internet and its Applications

a) Establishing an internet connection.

b) Browsing and down loading of information from internet.

c) Sending and receiving e-mail

- Creating a message
- Creating an address book
- Attaching a file with e-mail message
- Receiving a message
- Deleting a message

- d) Assigning IP Addresses to computers and use of domain names.
9. Functioning of Antivirus
- a) Installation and updation of an antivirus.
 - b) How to scan and remove the virus.

RECOMMENDED BOOKS

1. Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
2. Information Technology for Management by Henery Lucas, Tata McGraw Hills, New Delhi
3. Computers Fundamentals Architecture and Organisation by B Ram, revised Edition, New Age International Publishers, New Delhi
4. Computers Today by SK Basandara, Galgotia publication Pvt Ltd. Daryaganj, New Delhi.
5. Internet for Every One by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
6. A First Course in Computer by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
7. Computer Fundamentals by PK Sinha; BPB Publication, New Delhi
8. Fundamentals of Information Technology by Leon and Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
9. On Your Marks - Net...Set...Go... Surviving in an e-world by Anushka Wirasinha, Prentice Hall of India Pvt. Ltd., New Delhi
10. Fundamentals of Information Technology by Vipin Arora, Eagle Parkashan, Jalandhar

SUGGESTED DISTRIBUTION OF MARKS	
Topic No.	Marks Allotted (%)
1	15
2 (Practical No. 1, 2 and 3)	20
3 (Practical No. 4, 5, 6 and 7)	40
4 (Practical No. 8 and 9)	25
Total	100

4.1 ESTIMATING AND SPECIFICATION WRITING

L T P

4 - -

RATIONALE

Diploma holders in Architectural Assistantship find employment with private architects and also some percentage of them start their own enterprises. Therefore, the profession demands the development of basic knowledge and skills of estimating and specification writing. This course covers different methods of taking out quantities, units of measurement, calculation of quantities of materials and preparation of cost estimates and elements of specification writing. Teachers are expected to lay considerable emphasis on estimating and costing exercises from given drawings. Practice of writing broad specifications should also be dealt with.

DETAILED CONTENTS

1. **General:-**

Introduction to Estimating – Definition and Types of Estimates, Various methods of Estimating, Various formulas used in estimates - measurement form, abstract of cost and material statement form.

Units of measurement and units of payment of different items of work including building services.

Calculation of quantities of main items of construction.

2. **Calculation of Quantities and Statement**

Calculation of quantities of main items of construction, Material statements. Thumb rule methods of calculating steel in RCC.

3. **Analysis of Rates**

Calculation of rates of the main item of construction including the calculation of carriage of materials, schedule of rates

4. **Specifications**

Principles of specifications writing; writing broad specifications of items of construction with special reference to two storied building.

5. **Accounts**

Accounts: Explanation of ordinary terms used in book keeping, cash book, work order, measurement book, petty cash and imprest, , receipts.

Note:- Exercises involving Preparation of a detailed estimates complete with detailed reports, specifications, abstract of cost and material & statement for a small residential building with a flat roof.

LIST OF BOOKS

1. *Estimating, Costing and Accounts by DD Kohli and RC Kohli(S Chand and Co)*
2. *Estimating and Costing by BN Dutta*

SUGGESTED DISTRIBUTION OF MARKS		
Topic	Time Allotted (Hrs)	Marks Allotted (%)
1	14	20
2	20	30
3	14	20
4	12	20
5	4	10
Total	64	100

4.2 BUILDING CONSTRUCTION-III

L T P
2 - 6

RATIONALE

Students of Architectural Assistantship at diploma level are supposed to prepare structural drawings, working drawings and detailed drawings of various components of buildings. Also students are expected to design small residential buildings. For this purpose, it is essential that students are taught various components of building construction comprising of: foundations, super structure, openings, roofs, staircases, flooring and finishing and other allied building components.

Therefore, the subject of building construction is very important for students undergoing diploma course in architectural Assistantship.

Teachers while imparting instructions are expected to show various components of buildings under construction, make use of models or other audio-visual media to clarify the concepts. While preparing drawings, teachers should lay considerable stress on proportioning, dimensioning, specification writing and printing and composition of drawing work. Teachers should also emphasis on environmental aspects like lighting, ventilation and orientation of buildings. Students should be asked to maintain a sketch book for recording the observations from site visits. While conducting viva, Teachers should point out specific mistakes done by students in the preparation of drawings.

DETAILED

CONTENTS Theory

1. Steel Doors and Windows

4 Drawings

- 1.1 Using standard rolled Sections in frames & shutters.
- 1.2 Using rolled sections in frames and wooden shutters.
- 1.3 Rolling and collapsible shutter
- 1.4 Fly proof shutters
- 1.5 Window and doors using pre stressed sheets

2. Steel roofs

3 Drawings

- 2.1 Line diagram of steel roofs for various spans.
- 2.2 Constructional details of steel roofs(North Light Truss with relevant details Etc.)
- 2.3 Roof covering: AC, GI sheets
- 2.4 Construction details of- Ridge cover, fixing of purlins/rafter/valleys /eaves board with gutter and RCC gutter etc.

3. Finishing

1 Drawing

- 3.1 Plastering and pointing
- 3.2 Stone cladding and tile lining
- 3.3 Gravel finish
- 3.4 Paneling and fibrous board finishes

4. Scaffolding & Form Work

(3 Sheets)

4.1 Types of Scaffolds, Definitions of form work, shuttering and centering.

4.2 Form work for different structural members.

SUGGESTED DISTRIBUTION OF MARKS		
Topic	Time Allotted (Hrs)	Marks Allotted (%)
1	40	30
2	38	30
3	12	10
4	38	30
Total	128	100

4.3 HISTORY OF ARCHITECTURE-II

L T P

3 - -

RATIONALE

Students of Architectural Assistantship at diploma level must be well conversant with the skills of preparing working drawings and vocabulary in architecture. The students, therefore, must have broad exposure to communicate and understand the vocabulary and terminology in the field of architecture.

The course on History of Architecture develops appreciation regarding past and current trends in the field of Architecture. The knowledge of this course will help the students to understand how the new technology and new materials influence the general trend in architecture and also the effect of society on Architecture. The course covers broad topics like: important civilization (Indian, Egyptian, Greek and Roman), temple architecture in India, Buddhist Architecture, Islamic architecture, Renaissance and modern Architecture in Europe and India.

The teacher should try to create interest among the students for this course by organizing site visits to the local old monuments. Use of audio-visual aids can also be made to explain various architectural developments in history.

While imparting instructions, teachers should emphasis on materials, construction methods, structural system and design concepts involved. The teacher should motivate the students to take general references from the history while designing their project.

DETAILED CONTENTS

1. Islamic Architecture in India:

- 1.1 Imperial Style
- 1.2 Slave Dynasty
- 1.3 Khilji Dynasty
- 1.4 Tuglak Dynasty
- 1.5 Building Types to be studied

Historical, economical, social, political and geographical background, effect of local elements on invading forces with special reference to building activity.

NOTE: Students may be taken to different nearby monuments.

2. Provincial Architecture: Areas of study - Gujrat, Bijapur, Malwa, Mandu.

3.1 Mughal Architecture: Rule of Humayun, Akbar, Jahangir, Shahjahan.

3.2 Building types: Important tombs, mosques, palaces, gardens.

4. Effects of Industrialization on social economical and Architectural Development.

5.1 Various modern movements in architecture caused by the works of Master Architects like Le Corbusier (Planning & Designing concepts of Chandigarh City), F.L. Wright, Mies Vande Rohe, Walter Gropius.

5.2 Modern Architecture in India covering the works of following Architects: Charles Correa, B.V. Doshi, Raj-Rewal, Hafeez Contractor.

Note:- *Students are required to present a seminar on topic 5 along with report.*

PRACTICAL

1. Sketch drawings of the details used in the various architectural styles.
2. Sketch Drawing of old monument building, showing elevation, sections and various related details.

SUGGESTED DISTRIBUTION OF MARKS		
Topic	Time Allotted (Hrs)	Marks Allotted (%)
1	12	20
2	9	20
3	06	20
4	06	10
5	15	30
Total	48	100

4.4 ARCHITECTURAL DESIGN-III

L T P
2 – 6

RATIONALE

Large percentage of diploma holders in Architectural Assistantship find employment with private Architects and also majority of them go for self-employment. Therefore, diploma holders are required to design small residential and public buildings. This course aims at providing practical exercises in designing so as to develop appropriate knowledge and skills in building design.

Teachers are expected to show various types of designs of small to medium residential buildings to develop an appreciation of different designs. Teachers should also motivate students to maintain their sketch book in which they draw line sketches of different architectural styles.

DETAILED CONTENTS

1. Study report on Vernacular/Regional Architecture:

- 1.1 Local case study
 - 1.1.1 Social background
 - 1.1.2 Living pattern
 - 1.1.3 Planning and design study
 - 1.1.4 Building materials
 - 1.1.5 Construction methods
 - 1.1.6 Relevance to present time
 - 1.1.7 Report along with seminar

Study Report along with sketches are to be prepared.

2. Design of building involving two or more floors, split levels etc. The buildings can be like Nursing Home/School/ Public library, Cultural centre (Name of the building is only meant to give idea about size and scope of design)

2.1 Study report

- 2.1.1 Case study of existing building types, Study of site Analysis of requirement and respective areas Circulation Analysis

2.2 Presentation Drawings

- 2.2.1 Plans
- 2.2.2 Elevations
- 2.2.3 Sections
- 2.2.4 Perspective View/Model.

3. Two days time limit sketch design of any small public building.

SUGGESTED DISTRIBUTION OF MARKS		
Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	24	20
2	76	80
3	12	-
Total	112	100

4.5 BUILDING BYE LAWS AND WORKING DRAWING- II

L T P

1 - 4

RATIONALE

In any Architectural organization, diploma holders are expected to prepare the municipal drawings to get it sanctioned from the local development body. For this purpose, diploma holders in Architectural Assistantship must have the knowledge of the set of norms, rules and regulations and building bye-

1. Building Bye Laws:

- 1.1 Study of Building bye laws (IS-1256 /NBC provision and definitions)
- 1.2 Necessity of framing bye laws for urban development. Principles involved in framing bye laws.
 - Study of local bye laws and local zoning plans as applied to buildings their effect on design of building Architect's act 1972 and land ceiling act (main Provision only)
 - Study of Revenue Paper
- 1.3 Case Study of building bye laws of any town.
- 1.4 Terminology used in Building Bye laws:
- 1.5 Calculation of area, FAR,FSI etc.

2 Development/ Building Permit

Requirements for submission (Municipal) drawings – sub division/ layout plan, key plan, Site plan, Floor plans, elevations, sections, Services plans, specifications, Structural stability Certificate, Scale, & coloring; Preparation & Signing of plans; Fees, Duration of sanction; Deviations, Violations and Penalties, Completion Certificate, Qualifications and Competence of professionals, Introduction to compounding.

An exercise in terms of preparation of complete set of Submission (Municipal) drawings for a small project.

SUGGESTED DISTRIBUTION OF MARKS		
Topic No.	Time Allotted (Hrs)	Marks Allotted (Theory + Drawing)
1	16	50
2	64	50
Total	80	100

4.6 STRUCTURAL DESIGN-I

L T P

4 - -

RATIONALE

This is a fundamental course which covers broad elements of Applied Mechanics and Strength of Materials, which are prerequisites to structural design. This subject also develops analytical abilities and continued learning skills in the students. The course covers: force system, centre of gravity, moment of inertia, shear force and bending moments, simple stress and strain and theory of simple bending.

Teachers while imparting instructions should stress on concepts and principles and provide considerable practice in problem solving

DETAILED CONTENTS

1. Resultant of force system & equilibrium:-

- 1.1 Force definition, SI Unit, types, system of force.
- 1.2 Resultant of concurrent forces, law of parallelogram, triangle law of forces, polygonal law of forces, resolution and addition of forces.
- 1.3 Moment of forces, statement of various theorems, resultant of non-concurrent forces- parallel and non-parallel forces.
- 1.4 Equilibrium: Concept of equilibrium, equilibrium of two and more forces, conditions of equilibrium, graphical conditions of equilibrium body, constraints type of reaction.

2. Centre of Gravity:

- 2.1 Centre of gravity by geometrical consideration for rectangular, triangle, semicircle.
- 2.2 Centre of gravity of regular solids, cubes, spheres, semi spheres, right circular cones.
- 2.3 Centre of gravity by method of moments of area, mass or volume of regular figures, composite figures and regular figures with cut out holes.

3. Moment of Inertia:

- 2.1 Meaning of terms - second moment of area, radius of gyration of a section
- 2.2 Theorem of parallel axis and perpendicular axis (statement only without proof)
- 2.3 Second moment of regular figures - rectangle, triangle circle and annular sections (formulae only)

4. Shear force and Bending moment:

- 3.1 Definition and concepts of S.F and B.M, calculations of reactions
- 3.2 SF and BM diagrams for simply supported, overhanging, cantilever beams subjected to concentrated or uniformly distributed loads on entire or partial span.
- 3.3 Calculation of position and magnitude of maximum shear force and bending moment, point of contra flexure.

5. Simple Stress and Strain:

5.1 Concept and definitions, units, types of stresses, axial stresses in bars, strains

Hooks law, tensile test on mild steel, working stress and factor of safety, temperature stresses in composite bars

5.2 Bending stresses, neutral axis

5.3 Symmetrical and asymmetrical sections

5.4 Assumptions in theory of bending

SUGGESTED DISTRIBUTION OF MARKS		
Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	6	15
2	8	20
3	12	20
4	16	30
5	6	15
Total	48	100

4.7 COMPUTER GRAPHICS-II

L T P
- - 4

RATIONALE

The students of Architecture Assistantship should have sufficient knowledge and skills to add dimensions, texts, plot drawings. They should handle one minor and one major project so as to develop confidence.

DETAILED CONTENTS

Note: *Relevant theory may be taught along with practical exercises in each topic.*

- 1. Dimensioning** (8 hrs)
 - 1.1 Dimension type, style, units
 - 1.2 Dimension utilities
 - 1.3 Dimension variables
 - 1.4 Dimensioning of different drawing elements like line (horizontal, vertical, inclined), arc, circle (radius, diameter), continuous dimensioning etc
 - 1.5 Editing dimension text and updating

- 2. Adding Text** (6 hrs)
 - 2.1 D-text, text (adding new text and editing existing text)
 - 2.2 Text style – font types, height, width factor etc.

- 3. Plotting Drawings** (8 hrs)
 - 3.1 Plot command
 - 3.2 Selecting area for plotting
 - 3.3 Scale of plot, scale to fit
 - 3.4 Selecting plotting device
 - 3.5 Selecting paper size and type
 - 3.6 Selecting block and white or colored plots
 - 3.7 Selecting appropriate print speed, quality
 - 3.8 Print preview

- 4. Major Projects** (42 hrs) The students should draft a complete set of drawings of two projects

SUGGESTED DISTRIBUTION OF MARKS		
Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	08	12
2	06	10
3	08	12
4	42	66
Total	64	100

4.8 MODEL MAKING

L T P
- - 4

RATIONALE

Student of Architectural Assistantship at diploma level are expected to assist in the preparation of architectural models of various kind in their professional career. This skill can also for basic of self-employment.

Architecture model as three dimensional representations are made in different mediums. The student should be acquainted with all of these mediums.

DETAILED CONTENTS

1. **Block Model of any design project using any one of the following medium & also show Site presentation details like Ground surfaces, Human beings, vegetation, vehicles, water bodies, roads , street furniture etc.**
 - 1.1 Wood
 - 1.2 Thermocol
 - 1.3 PVC Sheets
 - 1.4 Plaster of Paris
 - 1.5 Photo mount board etc.

2. **Model of Details:**
 - 2.1 Jali details
 - 2.2 Grill details
 - 2.3 Gate details
 - 2.4 Railing details
 - 2.5 Block model of house

3. **Detailed Models of any Architectural Design project building using:**
 - 3.1 Paper sheets of various kinds
 - 3.2 Mount board
 - 3.3 Balsa wood
 - 3.4 Acrylic sheets

Also show Site presentation details like Ground surfaces, Human beings, vegetation, vehicles, water bodies, roads, street furniture etc.

Exercise must be given from each section.

SUGGESTED DISTRIBUTION OF MARKS		
Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	20	30
2	12	20
3	32	50
Total	64	100