# CURRICULUM

FOR

DIPLOMA PROGRAMME

IN

# Architecture Assistantship

## 2nd Year (i.e. 3rd & 4th Semester)

FOR THE STATE OF HIMACHAL PRADESH

Prepared by:-

**Composite Curriculum Development Centre**

Directorate of Technical Education,

Vocational & Industrial Training, Sundernagar(H.P.)

July, 2013

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### THIRD SEMESTER



### FORTH SEMESTER

## PREFACE

*India, in last two decades, has made significant progress in all major spheres of activity. Since 1947, the Technical Education System has grown into fairly large sized system, offering opportunities for education and training in vide variety of trades / disciplines at different levels. Needless to say that well trained technical manpower is the backbone of any growing economy in the era of fast industrialization. It has been the endeavor of the Technical Education Department to take decisive steps to enhance the capacities of technical institutions with major emphasis on quality and excellence in technical education .Our country is the only country in the world which has 50% population below the age of 25 years whereas America has 30% and China 40%.Working Age Population (WAP) is increasing in India whereas it is decreasing in other parts in the world. Challenge before us is to train this WAP for the world of work .Updated curriculum is one of the most powerful tools to improve the quality of training.*

*Curriculum Document is a comprehensive plan or a blue print for developing various curriculum materials and implementing given educational programme to achieve desired and formally pre-stated educational objectives. Moreover it (the document) is the output of exhaustive process of curriculum planning and design, undertaken by the implementers under the expert guidance of curriculum designer.*

*While working out the detailed contents and study and evaluation scheme, the following important elements have been kept in mind:*

*Major employment opportunities of the diploma holders.*

*Modified competency profile of the diploma holders with a view to meet the changing needs due to technological advancement and requirements of various employment sectors.*
*Vertical and horizontal mobility of diploma pass outs for their professional growth.*
*Pragmatic approach in implementing all the curricula of diploma programmes in engineering and technology in the state of H.P.*
*The document is an outcome of the feedback received from field organizations/ industry of different categories viz. small, medium and large scale which offer wage employment for the diploma pass outs. In every stage of planning and designing of this curriculum, suggestions and advice of experts representing industry, institutions of higher learning, research organizations etc. were sought and incorporated as per the requirement of curriculum . The document contains the study and evaluation scheme and detailed subject/course contents to enable the H.P. Polytechnics to implement revised curriculum and to achieve the desired objectives.*
*Time has specifically been allocated for undertaking extra-curricular activities. Emphasis has been laid on developing and improving communication skills in the students for which Communication Lab has been introduced during the first year itself.*
*We hope that this revision will prove useful in producing competent diploma holders in the state of Himachal Pradesh. The success of this curriculum depends upon its effective implementation and it is expected that the managers of polytechnic education system in Himachal Pradesh will make efforts to create better facilities, develop linkages with the world of work and foster conducive and requisite learning environment.*

**Er. L.R. Rana**
**Head(CCDC)**
Directorate of Technical Education,
Vocational & Industrial Training,
Sundernagar, Himachal Pradesh.

## 2nd YEAR OF THREE YEAR DIPLOMA PROGRAMME IN ARCHITECTURE ASSISTANTSHIP.

## 1. SALIENT FEATURES

1) Name of the Programme : Three year Diploma Programme Architecture Assistantship.
2) Duration of the Programme : Three years (06 Semesters)
3) Entry Qualification : As prescribed by H.P. Takniki Shiksha Board
4) Intake : As approved by H.P. Takniki Shiksha Board
5) Pattern of the Programme : Semester Pattern
6) Curriculum for : 2nd year of Three year Diploma Programme(Technical Stream)
7) **Student Centred Activities:**

A provision of 2-4 hrs per week has been made for organizing Student Centred Activities for overall personality development of students. These activities will comprise of co-curricular & other activities such as expert lectures, games, seminars, declamation contests, educational field visits, NCC, NSS and cultural activities & hobby classes like photography, painting, singing etc.

8) **Industrial Training:-**

It is needless to emphasize further the importance of Industrial Training of students during their 3 years of studies at Polytechnics. It is industrial training, which provides an opportunity to students to experience the environment and culture of industrial production units and commercial activities undertaken in field organizations. It prepares student for their future role as diploma engineers in the world of work and enables them to integrate theory with practice. Polytechnics have been arranging industrial training of students of various durations to meet the above objectives.

This document includes guided and supervised industrial training of a minimum of 4 weeks duration to be organised during the semester break starting after second year i.e. after IV Semester examinations. The concerned HODs along with other teachers will guide and help students in arranging appropriate training places relevant to their specific branch. It is suggested that a training schedule may be drawn for each student before starting of the training in consultation with the training providers. Students should also be briefed in advance about the organizational setup, product range, manufacturing process, important machines and materials used in the training organization.

Equally important with the guidance is supervision of students training in the industry/organization by the teachers. A minimum of one visit per week by the teacher is recommended. Students should be encouraged to write daily report in their diary to enable them to write final report and its presentation later on.

An internal assessment of 50 and external assessment of 50 marks have been provided in the study and evaluation scheme of V Semester. Evaluation of professional industrial training report through viva-voce/presentation aims at assessing students understanding of materials, industrial process, practices in industry/field organization and their ability to engage in activities related to problem solving in industrial setup as well as understanding of application of knowledge and skills learnt in real life situations. The formative and summative evaluation may comprise of weightage to performance in testing, general behaviour, quality of report and presentation during viva-voce examination. It is recommended that such evaluations may be carried out by a team comprising of concerned HOD, teachers and representative from industry.

Teachers and students are requested to see the footnote below the study and evaluation scheme of IV Semester for further details.

## 2. GUIDELINES

### 2.1 GUIDELINES FOR ASSESSMENT OF STUDENT CENTRED ACTIVITIES (SCA)

**Distribution of 25 marks for SCA will be as follows:**

i. 5 Marks shall be given for general behaviour

ii. 5 Marks for attendance shall be based on the following distribution:

| | | |
|---|---|---|
| 1. | Less than 75% | Nil |
| 2. | 75-79.9% | 3 Marks |
| 3. | 80-84.9% | 4 Marks |
| 4. | Above 85% | 5 Marks |

iii. 15 Marks shall be given for the Sports/NCC/Cultural and Co-curricular activities/other activities after due consideration to the following points:

1. For participation in sports/NCC/Cultural/Co-curricular activities at National or above level, shall be rewarded with minimum of 10 marks
2. For participation in sports/NCC/Cultural/Co-curricular activities at Inter-polytechnic level, shall be rewarded with minimum of 08 marks
3. For participation in two or more of the listed activities, 5 extra marks should be rewarded

**Note:** *Head of Department shall ensure that these marks are conveyed to the H.P. Takniki Shiksha Board, Dharamsala at the end of semester along with sessional record.*

### 2.2 GUIDELINES FOR SESSIONAL ASSESSMENT

- The distribution of marks for Internal Assessment in theory subjects and drawing shall be made as per the following guidelines:
  i. 60% of internal assessment shall be based on the performance in the tests. At least three tests shall be conducted during the semester out of which at least one should be house test. 30% weightage shall be given to house test and 30% to class test(One best out of two).
  ii. 20% marks shall be given to home assignments, class assignments, seminars etc.
  iii. 20% marks shall be given for attendance/punctuality in the subject concerned.
- The distribution of marks for Internal/External Assessment in practical subjects shall be made as per the following guidelines:
  i. 60% marks shall be awarded for performance in practical.
  ii. 20% marks shall be given for Report/Practical book and punctuality in equal proportion.
  iii. 20% marks shall be for Viva-voce conducted during the practicals.
- The distribution of mark for internal assessment in drawing subjects shall be as per following guidelines:-
  (i) 60% marks for sheets ii. 40% for test.

## *Study & 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 | Pr | Total | Th/ Drg. | Hrs | Pr | Hrs | Total | |
| 3.1 | Climatology | 3 | - | 50 | - | 50 | 100 | 3 | - | - | 100 | 150 |
| 3.2 | Build. Const.-II | 1 | 6 | - | 100 | 100 | 100 | 4 | 50 | 3 | 150 | 250 |
| 3.3 | H.O.A.-I | 3 | - | 50 | - | 50 | 100 | 3 | - | - | 100 | 150 |
| 3.4 | Arch. Design-II | 1 | 6 | - | 100 | 100 | 100 | 4 | 50 | 3 | 150 | 250 |
| 3.5 | Working Drg.-I | - | 6 | - | 50 | 50 | 100 | 4 | - | - | 100 | 150 |
| 3.6 | B.C.A. | - | 2 | - | 50 | 50 | - | - | 50 | 3 | 50 | 100 |
| 3.7 | Surveying | 2 | 2 | 25 | 25 | 50 | 100 | 3 | 50 | 3 | 50 | 200 |
| 3.8 | C.G.-I | - | 4 | - | 50 | 50 | - | 3 | 50 | 3 | 50 | 100 |
| # Student Centred Activity | | - | 4 | - | 25 | 25 | - | - | - | - | - | 25 |
| **TOTAL** | | **10** | **30** | **125** | **400** | **525** | **600** | | **250** | | **750** | **1375** |

**# Viva Only**

## FOURTH SEMESTER (Architectural Assistantship)

| S. NO. | SUBJECTS | STUDY SCHEME Hrs/Week | | MARKS IN EVALUATION SCHEME | | | | | | | | TOTAL MARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | INTERNAL ASSESMENT | | | EXTERNAL ASSESMENT | | | | | |
| | | Th | Pr | Th | Pr | Total | Th/D | Hrs | Pr | Hrs | Total | |
| 4.1 | Building Services | 3 | - | 50 | - | 50 | 100 | 3 | - | - | 100 | 150 |
| 4.2 | Build. Const.-III | 1 | 6 | - | 100 | 100 | 100 | 4 | 50 | 3 | 150 | 250 |
| 4.3 | H.O.A.-II | 3 | - | 50 | - | 50 | 100 | 3 | - | - | 100 | 150 |
| 4.4 | Arch. Design-III | 1 | 6 | - | 100 | 100 | 100 | 4 | 50 | 3 | 150 | 250 |
| 4.5 | B.B.L.&W.D.-II* | 1 | 4 | 50 | 100 | 150 | 50+ 100 | 4 | - | - | 150 | 300 |
| 4.6 | Theory Of Structure | 3 | - | 50 | - | 50 | 100 | 3 | - | - | 100 | 150 |
| 4.7 | C.G.-I | - | 4 | - | 100 | 100 | - | - | 50 | 3 | 50 | 150 |
| 4.8 | MODEL MAKING | - | 4 | - | 100 | 100 | | - | 50 | 3 | 50 | 150 |
| # Student Centred Activity | | - | 4 | - | 25 | 25 | - | - | - | - | - | 25 |
| TOTAL | | **12** | **28** | **200** | **525** | **725** | **650** | | **200** | | **850** | **1575** |

# 3.1 CLIMATOLOGY

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**RATIONALE**

*Understanding of the basic principles of climatology and environment are very important for diploma holders in Architectural Assistantship. The knowledge of this subject will be very useful in the design of buildings. Teachers are expected to impart instructions of the above course keeping in view the effect of above course in the design of Buildings.*

## DETAILED CONTENTS

1. **Earth & Global Climate**:
   - 1.1 Introduction to Climatology
   - 1.2 Form of earth & structure of earth
   - 1.3 Movement of earth around Sun
   - 1.4 Elements of climate(wind, temperature, humidity
   - 1.5 Different climatic zone. (12 Hrs)

2. **Relationship of climate & comfort:**
   - 2.1 Effect of climate on man & shelter
   - 2.2 Macro-Microclimate effects
   - 2.3 Relation of climate elements to comfort
   - 2.4 Concept of comfort zone and Bio-climatic chart
   - 2.5 Criteria of site selection (12 Hrs)

3. **Building Protection devices & system:**
   - 3.1 Orientation of building
   - 3.2 Sun Charts(Sun Path diagram)
   - 3.3 Sun Protection Devices(horizontal & Vertical Louvers)
   - 3.4 Wind Protection Devices
   - 3.5 Introduction to use of Solar Energy in Construction
     - Objective of solar passive design
     - Passive Solar Heating System(direct gain, indirect & isolated gain) (08 Hrs)

4. **Environment and Ecology:**
   - 4.1 Basic elements and principles of ecology
   - 4.2 Sources of air and noise pollution and its effects and control
   - 4.3 Basic knowledge of landscaping
   - 4.4 Basic components of landscape/ecology
   - 4.4.1 Earth
   - 4.4.2 Water
   - 4.4.3 Stone (08 Hrs)

**5. Green Buildings:- An eco friendly concept.**

5.1 Introduction
5.2 Edge over conventional
5.3 Elements
5.4 How to create green buildings

(08 Hrs)

**SUGGESTED DISTRIBUTION OF MARKS**

| Topic No. | Time Allotted (Hrs) | Marks Allotted (%) |
|---|---|---|
| 1 | 12 | 20 |
| 2 | 12 | 20 |
| 3 | 08 | 20 |
| 4 | 08 | 20 |
| 5 | 08 | 20 |
| 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**
   - 1.1 Definitions, functions, sizes, location and classification
   - 1.2 Windows:- Types , location , functions , Sizes ( Bay , Dormer, Sky Light, , Fan Light, Ventilators Etc.)
   - 1.3 Joints

   42 Hrs.

2. **Flooring**
   - 2.1 Various types of timber floors & their construction methods.
   - 2.2 Floor finishes for timber floors & its advantages & Limitations.
   - 2.3 RCC floors
   - 2.4 Floor finishes ( Marble, Granite , Tiles Etc.) 20 Hrs.

3. **Staircases and Ramps:**
   - 3.1 Introduction to various types of staircases with respect to material and shapes with sketches.
   - 3.2 Relation between different components
   - 3.3 Definitions, purpose, slopes, types of ramps
   - 3.4 Calculation stairs and 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 Trusser 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. (4Drawing)
2. Detailed drawings and construction details of Casement windows and Bay windows In Timber (1 Drawing)
3. Single timber floor. (2 Drawing)
4. Stone slab and cast-in- situ floorings. (1 Drawing)
5. Drawing showing details of floor finishings. (1 Drawing)
6. Detailed Drawings and construction details to be made for staircase RCC. (3 Drawing)
7. RCC staircase cast at site and also precast (1 Drawing)
8. Drawing showing details of the ramps in various buildings as per requirements of the physically disabled persons etc. ( 1 Drawing)
9. Drawing details of fixing and layout of AC, GI sheets, slates, tiles and locally available materials. (1 Drawing)
10. Drawing of king post and queen post trusses along with their constructional details. (2 Drawing)

*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 ARCHITECTURE-I

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**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. 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 Indus valley
   - 1.8 Causes of rise and fall of civilizations
   - 1.9 Planning development of Indus valley civilization.

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 of details used in Buddhist Architecture/

3. **Temple Architecture in India**:

3.1 Introduction to Temple Architecture before evolution in India: Development of Temple Architecture Alhole , Badami Pattaddakal. Evolution period & planning concept of Temple Architecture in India

3.2.1 Development of Two order of temple Architecture in India special reference to papanath temple and virupaksha temple.

3.3 **Dravidian Style**

3.3.1 Emphasis on evolution period of temple Architecture siting concept plans, elevations, sections, materials and construction method.

3.3.2 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.

3.4 **Indo Aryan Style or North Indian Style**

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

3.4.2 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 Fuel Station
   - 1.2 Milk bar
   - 1.3 Florist Kiosk
   - 1.4 Guard Home *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 *70 Hrs.*

3. Time Problem: Furniture Layout and section of mono functional space such as café, nursery class room. Etc. *16 Hrs.*

**SUGGESTED DISTRIBUTION OF MARKS**

| Topic No. | Time Allotted (Hrs) | Marks Allotted (%) |
|---|---|---|
| 1 | 32 | 20 |
| 2 | 70 | 80 |
| 3 | 10 | - |
| Total | 112 | 100 |

# 3.5 WORKING DRAWING-I

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|---|---|---|
| - | - | 6 |

## 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 Sheet
   1.1 Centre Line
   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 1 Sheet (Complete vertical section through external wall from foundation to terrace /parapet level.)
7. Elevations - front and rear. 1 Sheet
8. Door and window detail. 1 Sheet
9. Entrance door design and details. 1 Sheet
10. Design and detailing of flooring. 1 Sheet

### SUGGESTED DISTRIBUTION OF MARKS

| Topic No. | Time Allotted (Hrs) | Marks Allotted (%) |
|---|---|---|
| 1,2 | 08 | 05 |
| 3 | 08 | 10 |
| 4,5 | 30 | 35 |
| 6,7 | 30 | 25 |
| 8,9 | 15 | 20 |
| 10 | 05 | 05 |
| Total | 96 | 100 |

# 3.6 BASIC OF COMPUTER APPLICATION

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## RATIONALE

*Information technology has great influence on all aspects of life. Almost all work places and living environment are being computerized. 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 of MS 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. *There will be no theory examination.*
2. *Explanation of Introductory part should be dovetailed with practical work so that following topics may be explained in the laboratory along with the practical exercises.*

## DETAILED CONTENTS

1) Information Technology – its concept and scope
2) Computers for information storage, information seeking, information processing and information transmission
3) Elements of computer system, computer hardware and software; data – numeric data, alpha numeric data; contents of a program, processing
4) Computer organization, block diagram of a computer, CPU, memory
5) Input devices; keyboard, Scanner, mouse etc; output devices; VDU and Printer,Plotter
6) Electrical requirements, inter-connections between units, connectors and cables
7) Secondary storage; magnetic disks – tracks and sectors, optical disk (CD, CDRW and DVD Memory), primary and secondary memory: RAM, ROM, PROM etc., Capacity; device controllers, serial port, parallel port, system bus
8) Installation concept and precautions to be observed while installing the system and software
9) Introduction about Operating Systems such as Windows, Windows NT etc.
10) About the internet – server types, connectivity (TCP/IP, shell); applications of internet like: e-mail and browsing
11) Various Browsers like WWW (World wide web

## LIST OF PRACTICALS

1. Identification of various parts of a computer and peripherals
2. Installation of Windows 98 or 2000 or NT or XP.
   (1) Familiarization with various components of Windows – 7/8 GUI
   - Shutdown
   - Creating and operating on the icons
   - Opening closing and sizing the windows
   - Using elementary job commands like – creating, saving, Booting ( Cold/Warm)
   - Creating and operating on a folder

- Changing setting like, date, time color –using Control panel
- Using short cuts
- File Management:

**7. MS-Word**

Opening, creating and saving a document, locating files, copying contents in some different file(s), protecting files, Giving password protection for a file

- Page Set up:
  Setting margins, tab setting, ruler, indenting
- Editing a document:
  Entering text, Cut, copy, paste using tool- bars
- 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
- Inserting date, time, special symbols, importing graphic images, drawing tools
- 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 rowin a table
- Print preview, zoom, page set up, printing options
- Using Find, Replace options
- Using Tools like:

Spell checker, help, mail merge, thesaurus word content and statistics,

8. **MS-Excel**

- Starting excel, open worksheet & work books, enter, edit, data, formulae to calculate values, format data, create chart, printing chart, save worksheet, switching between different spread sheets
- Menu commands: Create, format charts, organise, manage data,solving problem by analyzing data, exchange with other applications.
- Programming with MS-Excel, getting information while working
- Work books: Managing workbooks (create, open, close, save), working in work books, selecting the cells,
- Copying, moving cells, pasting, inserting, deletion
- cells, rows, columns, find and replace text, numbers of cells, formatting worksheet
- 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

9. **MS PowerPoint**

a) Introduction to Powerpoint

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

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 organisational chart

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 etc.

10. **Internet and its Applications**

a) Various connectivity options search engines/sns ( Facebook,orkut etc.)
b) Navigation for information seeking on www
c) Loading of files from websites
d) Sending and receiving e-mail
- email account
- Creating a message
- Creating an address book
- Attaching a file with e-mail message
- Receiving a message/downloading attachments.
- Deleting a message

**RECOMMENDED BOOKS**


1. *Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi*
2. *Computers Today by SK Basandara, Galgotia publication Pvt ltd. Daryaganj, New Delhi.*
3. *MS-Office 2000 for Everyone by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., NewDelhi*
4. *Internet for Every One by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi*
5. *A First Course in Computer by Sanjay Saxena; Vikas Publishing House Pvt. Ltd.,Jungpura,New Delhi*
6. *Mastering Windows 95, BPB Publication, 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. *Learning MS Office XP by Ramesh Bangia, Khanna Book Publishing Co. (P) Ltd., New Delhi.*
11. *Fundamentals of Information Technology by Vipin Arora, Eagle Parkashan, Jalandhar*

## SUGGESTED DISTRIBUTION OF MARKS

| Topic No. | Time Allotted (Hrs) | Marks Allotted (%) |
|---|---|---|
| 1-6 | 10 | 5*6=30 |
| 7 | 06 | 15 |
| 8 | 06 | 20 |
| 9 | 04 | 15 |
| 10 | 06 | 20 |
| Total | 32 | 100 |

# 3.7 SURVEYING

L T P
2 - 2

**RATIONALE**

*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. **Compass Surveying:**

2.1 Prismatic compass, Surveyor's compass, Bearings of lines, angle measurements, magnetic and true bearings, local attraction, its detection and elimination ,plotting compass traverse by the inc. angle method; their merits and demerits; adjustment of closing errors by graphical methods. Advantages and disadvantages of compass survey 8 Hrs.

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 8 Hrs.

6. Introduction to theodolite and its uses. 2 Hrs.

**PRACTICAL**

1. **Leveling**

1.1 Study of dumpy Level and leveling staff
1.2 Temporary adjustment of a dumpy level
1.3 Taking staff readings on different stations from the single setting and finding difference of level between them. .

1.4 Taking staff readings on different stations from the single setting and finding difference of level between them.
1.5 Find the difference level between two distant points 30 Hrs.

2. **Contouring**

2.1 Preparing contour plan by radial line method by the use of Dumpy level/Auto Level.
2.2 Preparing a contour plan by method of squares.
2.3 Using a planimeter 18 Hrs.

3. **Plane Tabling**

3.1 To study plane table survey equipment
3.2 To set a plane table on a station point
3.3 To make the north directions
3.4 Plotting a few points by radiation method .
3.5 To orient the plane-table by:
a. Through Compass
b. Back-sighting
3.6 Plotting a few points by intersection method 12Hrs

4. **Demonstration of**

4.1Total station
4.2 GPS
4.3 Digital Level

4 Hrs

**SUGGESTED DISTRIBUTION OF MARKS**

| **Topic No.** | **Time Allotted (Hrs)** | | **Marks Allotted (%)** |
|---|---|---|---|
| | Theory | Practical | |
| 1 | 02 | 10 | 13 |
| 2 | 08 | 08 | 20 |
| 3 | 06 | 08 | 20 |
| 4 | 06 | 06 | 20 |
| 5 | 08 | 0 | 15 |
| 6 | 02 | 0 | 12 |
| **Total** | 32 | 32 | 100 |

## 3.8 COMPUTER GRAPHICS - I

L T P
- - 4

**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 rim
5.3 .Move
5.4 Offset
5.5 Rotate
5.6 Array
5.7 Stretch
5.8 Divide
5.9 Champher
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.

# 4.1 BUILDING SERVICES

**L T P**
**3 - -**

## 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 siphonage 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
   - 2.7 Simple exercises on layout plans for toilet and kitchens for public and residential buildings including the placement, distances and fixing details.

3. **Sound Insulation** (04 hrs)

3.1 Behaviour of sound propagation,

3.2 Acoustics in building, acoustical defects such as echo, reverberation, sound foci, methods of correction, special requirements in Bldgs like auditorium, conference halls, studios etc

3.3 Acoustical materials and their uses in various buildings

3.4 Simple exercises on sound insulation

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, CFL 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 Preparation of electrical layout of a simple residential building

4.5 Precautions to avoid electrical accidents

5. **Heat, Ventilation and Air Conditioning (HVAC)** (08 hrs)

5.1 Behaviour 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 Principles of air conditioning

5.6 Air cooling

5.7 Different types of Air conditioning systems and their use in buildings

5.8 Essentials of air-conditioning 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.

8. Integration of lighting, air-conditioning, acoustics and other services/systems in buildings (02 hrs)

**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 | 8 | 15 |
| 6 | 4 | 10 |
| 7 | 4 | 10 |
| 8 | 2 | 5 |
| Total | 48 | 100 |

# 4.2 BUILDING CONSTRUCTION-III

L T P
1 - 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**

1.1 Using standard rolled Sections.
1.2 Using rolled sections as frames and wooden shutters.
1.3 Rolling and collapsible shutter
1.4 Hanging details of different types.
1.5 Fly proof shutters
1.6 Window and doors using pre stressed sheets
1.7 Angle section, T, section of window/Door design. **5 Drawing**

**2. Steel roofs**

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 purloins/rafter/valleys eaves board with gutter and RCC gutter etc. **4 Drawing**

**3. Finishing:**

3.1 Plastering and pointing
3.2 Stone cladding and tile lining
3.3 Gravel and wash marble finish
3.4 Paneling and fibrous board finishes **1 Drawing**

**4. Form Work and Steel Work:-**

4.1 Definitions of form work,shuttering and centring.

4.2 Form work for different structural members.

4.3 Bending of bars, formation of hooks and cranks.

**3 Drawing**

## Practical

1) Drawing different types of doors using different Sections.
2) Drawing a sheet showing rolling and collapsible shutter.
3) Drawing a sheet showing different hanging details of windows using different rolled steel section.
4) Drawing and construction detail of AC and Other Sheet.
5) Drawing stone cladding (with marble and any other).
6) Drawing details of shuttering of columns, beams, slabs and Arches.

**SUGGESTED DISTRIBUTION OF MARKS**

| Topic No. | Time Allotted (Hrs) | Marks Allotted (%) |
|---|---|---|
| 1 | 36 | 30 |
| 2 | 34 | 30 |
| 3 | 10 | 10 |
| 4 | 32 | 30 |
| Total | 112 | 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-Rewas, A.D. Raje.

**Note:-** *Students are required to present a seminar on the No-05 with report/drawing etc.*

**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 No. | 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
1 – 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-laws of the local body. Therefore, this course is essential to be taught to diploma holders.*

**DETAILED CONTENTS**

1. **Building Bye Laws**:

1.1 Study of Building bye laws (IS-1256 provision and definitions)

1.2 Necessity of framing bye laws for urban development. Principles involved 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)Preparation one set of municipal plan up to submission stage .
- Knowledge about all corporation forms.
- Study of Revenue Paper
- Town planning development and its zoning.

1.3 Study of bye laws of any town.

1.4 Forms being used for submission of drawing in Municipal Committee and town planning.

2. **Preparing Municipal Drawings:-**

1.1 Calculating plot area and covered area permissible in each floor

1.2 Preparing plans of different floors to the respective scale

1.3 Preparing elevations on scale

- Front elevation
- Rear elevation
- Side elevation if plot is three side open

2.1 Preparing sections on scale

- Section through staircase and mezzanine if any
- Section through kitchen, toilet and basement if any

2.2 Preparing site plans on scale

- Site plan showing covered area, open area, service lane, front road. Main features of adjoining buildings 6 meters both ways, layout of sanitary pipes, rain water pipes.
- Part layout plans owing surroundings plot in question WRT North

2.3 Preparing Details

- Rain water Harvesting & Solar Passive Design provisions.
- Foundation detail
- Section of RCC Column if any
- Schedule of doors and windows
- Area chart

2.4 Preparing the Drawing for submitting for approval, coloring it, along with revenue record such as Nakal , Jamabandi.

2.5 Address of plot, as per sale deed

- Signature and address of applicant(s)
- Name and address and registration number of architect with signature-Architect's act*72*
- Name and address of plumber
- Scales on which drawing is prepared and north point
- Detail specification and its importance on Drawing sheet.

2.6 Prints and Submission

- Five sets of prints of drawing prepared
- One set of prints cloth mounted
- All sets to be coloured as per BBL
- Obtain signatures of owner, architect and plumber
- Folding of prints as per file cover size
- Following documents and forms duly filled and signed to be enclosed with prints:
    - Notice to erect a building.
    - Notice to erect a building
    - General Specifications
    - Ownership and undertaking requirements under ULCR Act (1976)
    - Attested copy of a receipt for payment of building fee and stacking charges
    - Affidavit and undertaking requirements under ULCR Act (1976)
    - NOC from competent authority regarding land use as per master/zonal Plan
    - Approval from chief inspector of factories (for industrial building only)
    - Indemnity bonds in case of proposal for the construction of basement
    - Supervision certificate of architect

**SUGGESTED DISTRIBUTION OF MARKS**

| **Topic No.** | **Time Allotted (Hrs)** | **Marks Allotted** (Theory + Drawing) |
|---|---|---|
| 1 | 16 | 50 |
| 2 | 64 | 100 |
| Total | 80 | 150 |

# 4.6 THEORY OF STRUCTURES

L T P
3 - -

**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, graphical representation.
   - 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. Provided by each constraints, free body diagram, problem on equilibrium.

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)

3. **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.

4. **Simple Stress and Strain:**

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, problems on above

5. **Theory of Simple Bending:**

5.1 Bending stresses, neutral axis
5.2 Symmetrical and asymmetrical sections
5.3 Assumptions in theory of bending
5.4 Flexural formulae and their applications
5.5 Shear stresses in beams

**SUGGESTED DISTRIBUTION OF MARKS**

| **Topic No.** | **Time Allotted (Hrs)** | **Marks Allotted (%)** |
|---|---|---|
| 1 | 10 | 20 |
| 2 | 08 | 15 |
| 3 | 06 | 15 |
| 4 | 12 | 30 |
| 5 | 06 | 10 |
| 6 | 06 | 10 |
| 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 Cork
   - 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 |