CURRICULUM

FOR

DIPLOMA PROGRAMME

IN

ARCHITECTURAL ASSISTANTSHIP

1st Year (1st & 2nd Semester)

FOR THE STATE OF HIMACHAL PRADESH

Implemented w.e.f. Session 2017-18

Prepared by:-

Composite Curriculum Development Centre

Directorate of Technical Education,
Vocational & Industrial Training, Sundernagar(H.P.)

In collaboration with NITTTR Chandigarh

1st YEAR OF THREE YEAR DIPLOMA PROGRAMME ENGINEERING DISCIPLINE

1. SALIENT FEATURES

1) Name of the Programme : Three year Diploma Programme (Technical Stream)

2) Duration of the Programme : Three years (06 Semesters)

3) Entry Qualification : As prescribed by H.P. Takniki Shiksha Board/AICTE

4) Intake : As approved by H.P. Takniki Shiksha Board

5) Pattern of the Programme : Semester Pattern

6) Curriculum for : 1st year of Three year Diploma Programme (Technical Stream)

7) **Student Centered Activities:**

A provision has been made for organizing Student Centered Activities for overall personality development of students. SCA will comprise co-curricular activities like extension lectures, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, cultural activities and participation in programs like technical and cultural events etc.

2.1 GUIDELINES FOR ASSESSMENT OF STUDENT CENTERED ACTIVITIES (SCA)

Distribution of marks for SCA will be as follows:

i. 20% marks shall be given for general behaviour

ii. 20% marks for attendance shall be based on the following distribution:

Attendance	Marks
Less than 65%	Nil
More than 65%	Proportionate

iii. 60% 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 40% marks
2. For participation in sports/NCC/Cultural/Co-curricular activities at Inter-polytechnic level, shall be rewarded with minimum of 30% marks

3. For participation in two or more of the listed activities, 20% extra marks should be rewarded

Note: These marks are to be sent to the H.P. Takniki Shiksha Board, Dharamsala at the end of semester along with internal assessment.

2.2 GUIDELINES FOR INTERNAL ASSESSMENT

- The distribution of marks for Internal Assessment in theory subjects 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, quiz etc.
  - iii. 20% marks shall be given for attendance/punctuality in the subject concerned.

- The distribution of marks for Internal 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 practical.

- The distribution of mark for internal assessment in drawing subjects shall be as per following guidelines:
  - i. 60% marks for Drawing sheets
  - ii. 40% for test.

STUDY AND EVALUATION SCHEME FOR DIPLOMA PROGRAMME IN ARCHITECTURAL ASSISTANTSHIP

FIRST SEMESTER

Sr. No	Subjects	Study Scheme Hrs/Week		Evaluation Scheme								Total Marks
				Internal Assessment			External Assessment					
		Th	**Pr**	**Th**	**Pr**	**Total**	**Th/Drg**	**Hrs**	**Pr**	**Hrs**	**Total**	
1.1	*English and Communication Skills–I	3	2	30	20	50	100	3	50	3	150	200
1.2	#Applied Sciences (2 Hrs. for Physics& 1 Hr for Chemistry)	3	-	50 (30 for Phy & 20 for Chem)	-	50	100	3	-	-	100	150
1.3	Visual Art & Design	2	6	-	50	50	100	4	50^{+}	3	150	200
1.4	Architectural Graphics	-	10	-	50	50	100	4	50^{+}	3	150	200
1.5	Theory of Design	3	-	50	-	50	100	3	-	-	100	150
1.6	Construction Materials-I	3	-	50	-	50	100	3	-	-	100	150
1.7	Workshop Practice	-	4	-	75	75	-	-	50	3	50	125
** Student Centered Activities		-	4	-	25	25	-	-	-		-	25
Total		**14**	**26**	**180**	**220**	**400**	**600**		**200**		**800**	**1200**

* Common with other diploma programmes

\+ Viva-Voce Only

** SCA will comprise co-curricular activities like extension lectures, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, cultural activities and participation in programs like technical and cultural events etc.

STUDY AND EVALUATION SCHEME FOR DIPLOMA PROGRAMME IN ARCHITECTURAL ASSISTANTSHIP

SECOND SEMESTER

Sr. No.	Subjects	Study Scheme Hrs/Week		Evaluation Scheme									Total Marks
				Internal Assessment			External Assessment						
		Th	Pr	Th/Drg	Pr	**Total**	Th	Hrs	Pr	Hrs	**Total**		
2.1	*English and Communication Skills-II	4	2	30	20	**50**	100	3	50	3	**150**		**200**
2.2	Architectural Mathematics	5	-	50	-	**50**	100	3	-	-	**100**		**150**
2.3	Construction Materials-II	3	-	50	-	**50**	100	3	-	-	**100**		**150**
2.4	Climate & Built Environment	3	-	50	-	**50**	100	3	-	-	**100**		**150**
2.5.	Building Construction-I	2	6	75	-	**75**	100	4	50#	3	**150**		**225**
2.6	Architectural Design-I	2	6	100	-	**100**	100	3	50#	3	**150**		**250**
2.7	Model Making	-	4	-	50	**50**	-	-	50	4	**50**		**100**
** Student Centered Activities		-	3	-	25	**25**	-	-	-		-		**25**
Total		**19**	**21**	**355**	**95**	**450**	**600**	**-**	**200**	**-**	**800**		**1250**

* Common with other diploma programmes

\# Viva-Voce Only.

** SCA will comprise of co-curricular activities like extension lectures, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, technical and cultural events etc.

DETAILED CONTENTS

1.1 ENGLISH AND COMMUNICATION SKILLS – I

L	P
3	2

RATIONALE

Language is the most commonly used medium of self-expression in all spheres of human life – personal, social and professional. A student must have a fair knowledge of English language and skills to communicate effectively to handle the future jobs in industry. The objective of this course is to enable the diploma holders to acquire proficiency, both in spoken(oral) and written language. It is expected that each polytechnic will establish a communication skills laboratory for conducting the practical mentioned in the curriculum.

DETAILED CONTENTS

1. **Facets of Literature**
   - 1.1 Short Stories
     - 1.1.1 Homecoming – R.N. Tagore
     - 1.1.2 The Diamond Necklace -Guy De Maupassant
   - 1.2 Prose
     - 1.2.1 I Have A Dream- Martin Luther King
     - 1.2.2 On Habits- A. G. Gardiner
   - 1.3 Poems
     - 1.3.1 Ozymandias- P.B.Shelley
     - 1.3.2 Daffodils - William Wordsworth
     - 1.3.3 Stopping by Woods on a Snowy Evening – Robert Frost

2. **Grammar and Usage**
   - 2.1 Parts of speech
     - 2.1.1 Nouns
     - 2.1.2 Pronouns
     - 2.1.3 Adjectives
     - 2.1.4 Articles
     - 2.1.5 Verbs
     - 2.1.6 Adverbs
     - 2.1.7 Prepositions
     - 2.1.8 Conjunction
     - 2.1.9 Interjection
     - 2.1.10 Identifying parts of speech
   - 2.2 Pair of words (Words commonly confused and misused)
     - 2.2.1 Identification of Tense
     - 2.2.2 Correction of incorrect sentences
     - 2.2.3 One word Substitution
     - 2.2.4 Active & Passive Voice

3. **Translation**
   - 3.1 Glossary of Administrative Terms (English and Hindi)
   - 3.2 Translation from Hindi into English and English to Hindi.

4. Paragraph of 100-150 words from the given outlines

5. **Comprehension**

   Unseen passages of literary, scientific, data /graph based for comprehension exercises.

6. **Communication**
    6.1 Definition, Elements and Process of Communication
    6.2 Levels of Communication
    6.3 Objectives of Communication

LIST OF PRACTICAL

1. The practice of the sounds of English i.e. the Phonetic Symbols (Vowels & Consonants).
2. How to look up words in a Dictionary: meaning and pronunciation of words as given in the standard dictionary using Phonetic Symbols.
3. How to seek information from an Encyclopedia.
4. Listening to pre-recorded English language learning programme.
5. Paper reading before an audience (reading unseen passages)
6. Spelling rules.
7. Essentials of a good speech to respond and comprehend visual, oral themes, situations or stimulus and practice before select gathering.
8. Exercises on use of different abbreviations
9. Greetings for different occasions
10. Introducing oneself, others and leave taking
11. Exercises on writing Notices.

Note:

1. Communication laboratory may be set up equipped with appropriate audio-video system with facility of playing CDs/DVDS and a video camera with facility to record & play back the performance of each student. A set of CDs from any language training organization e.g. B.B.C, British Council etc. may be procured for use of students.
2. Elements of body language will be incorporated in all practical.
3. The practical exercises involving writing may also be included in Theory Examination.
4. Elements of body language will be incorporated in all practical exercises.

RECOMMENDED BOOKS

1. English and Communication Skills,Book-I By Kuldip Jaidka, Alwainder Dhillon and Parmod Kumar Singla, Prescribed by NITTTR, Chandigarh Published By Abhishek Publication, 57-59, Sector-17, Chandigarh.
2. Spoken English by R.K. Bansal & J.B.Harrison Published by Orient Longman .
3. Essentials of Business Communication by Pal and Rorualling; Sultan Chand and Sons.
4. The Essence of Effective Communication, Ludlow and Panthon; Prentice Hall of India.
5. New Design English Grammar, Reading and Writing Skills by AL Kohli (Course –A and course- B), Kohli Publishers, 34 Industrial Area Phase-II, Chandigarh.
6. New Design English Reading and Advanced Writing Skills for Class XI and XII by MK Kohli and AL Kohli; Kohli Publishers, 34 Industrial Area Phase-II, Chandigarh.
7. A Practical English Grammar by Thomson and Martinet.
8. Spoken English by V Sasi Kumar and PV Dhamija; Tata McGraw Hill.
9. English Conversation Practice by Grount Taylor; Tata McGraw Hill.
10. Developing Communication Skills by Krishna Mohan and Meera Banerji; MacMillan India Ltd., Delhi.
11. Business Correspondence and Report Writing by RC Sharma and Krishna Mohan; Tata McGraw Hill Publishing Company Ltd. New Delhi.
12. Communication Skills by Ms. R Datta Roy and KK Dhir; Vishal Publication, Jalandhar.

Websites for references:

1. http:www.bbclearningenglish.com
2. http:www.mindstools.com
3. http:www.letstalk.com.in
4. http:www.learnenglish.britishcouncil.org/en/

SUGGESTED DISTRIBUTION OF MARKS		
Topic No.	**Time Allotted (Hrs)**	**Marks Allotted (%)**
1	14	40
2	10	15
3	4	10
4	8	10
5	4	10
6	8	15
Total	**48**	**100**

Glossary of Administrative Terms

1.	Senior	वरिष्ठ
2.	Cashier	खजांची
3.	Consent	सहमती
4.	Earned Leave	जमा छुट्टी
5.	Under Consideration	विचार अधीन
6.	Criterion	कसौटी
7.	Staff	कर्मचारी
8.	Tenure	कार्यकाल
9.	Working Committee	कार्य समिति
10.	Estate	संम्पदा
11.	Self-Sufficient	आत्मनिर्भर
12.	Emergency	आपात्तकाल
13.	General Body	आम सभा
14.	Exemption	छूट
15.	Daily wages	दिहाडीदार
16.	Death-Cum Retirement	मृत्यु और निवरती
17.	Despatch Register	रवानगी रजिस्टर
18.	Despatch	रवानगी
19.	Stenography	आशुलिपिक
20.	Assurance	दिलासा
21.	Justify	सही साबित करना
22.	Superior	बढिया
23.	High Commission	उच्चायुक्त
24.	Simultaneous	साथ-साथ
25.	Precautionary	एहतिहाती
26.	Commanding Office	कमांडिंग अफसर
27.	Negligence	लापरवाही
28.	Performance	पुरा करना
29.	Proof Reader	प्रुफ रीड़र
30.	Take Over	काम सभालना
31.	Timely Compliance	समय दौरान पुरा करना
32.	Responsibility	जिमेदारी
33.	Chief Justice	मुख्य न्यायधिश
34.	Disciplinary Action	अनुशासनिक कारवाई
35.	Efficiency Bar	दक्षता रोक
36.	Flying Squad	उड़न दस्ता
37.	Regret	खेद
38.	Inconvenience	असुविधा
39.	Ambiguous	अस्पष्ट
40.	Part Time	अशंकालीन
41.	Academy	अकादमी
42.	Disparity	असमानता
43.	Extraordinary	असाधारण
44.	Provisional	अस्थायी
45.	Income Tax	आयकर
46.	Bonafide	असली
47.	Acting in Official Capacity	बतौर अधिकारिक हैसियत
48.	Contractor	ठेकेदार
49.	On probation	परिवीक्षाधीन
50.	State	राज्य

51.	Administrator	प्रशासक
52.	Admission	प्रवेश
53.	Aforesaid	पूर्वोक्त, उपरोक्त
54.	Affidavit	शपथपत्र
55.	Agenda	कार्यसूची
56.	Alma Mater	विद्यालय जहां किसी व्यक्ति ने शिक्षा प्राप्त
57.	Appointing Authority	मनोनित अधिकारी
58.	Apprentice	शिल्पकारू
59.	Additional	अतिरिक्त
60.	Advertisement	विज्ञापन
61.	Assistant	सहायक
62.	Assumption of Charge	अधिकार ग्रहण करना
63.	Attested Copy	सत्यापित प्रति
64.	Chief Minister	मुख्यमन्त्री
65.	Clerical Error	लेखन सम्बन्धी भ्रम
66.	Code	कानून की किताब, गुप्त भाषा
67.	Corruption	नैतिक भ्रष्टाचार, खोटापन
68.	Craftsman	कारीगर
69.	Compensation	हरजाना
70.	Compensatory Allowance	क्षतिपूरक भत्ता
71.	Compile	संकलन करना, संग्रह करना
72.	Confidential Letter	गुप्त पत्र
73.	Chief Engineer	मुख्य अभिन्यता
74.	Data	स्वीकृत तत्तव (आंकड़े)
75.	Dearness Allowance	मंहगाई भत्ता
76.	Department	विभाग
77.	Dictionary	शब्द कोष
78.	Director	निदेशक, संचालन
79.	Director of Tech. Edu.	तकनीकी शिक्षा निदेशक
80.	Executive Engineer	अधिशासी अभियन्यता
81.	Employment Exchange	व्यवसाय केन्द्र
82.	Head Office	मुख्य कार्यालय
83.	Head Clerk	प्रधान लिपिक
84.	Indian Admn. Service	भारतीय प्रशासनिक सेवा
85.	Legislative Assembly	विधान सभा
86.	Officiating	स्थानापन्न
87.	Office Record	कार्यालय रिकार्ड
88.	Office Discipline	कार्यालय अनुशासन
89.	Polytechnic	बहुतकनीकी
90.	Temporary	अस्थायी
91.	Qualified	योग्यता प्राप्त
92.	Under Investigation	जांच अधीन
93.	Sub-treasury	उप-खजाना
94.	Target Date	लक्ष्य तिथि
95.	Technical Approval	तकनीकी मान्यता
96.	Verification	जांच पड़ताल
97.	Viva-voca	मौखिक परीक्षा
98.	Write off	बटटेखाते डालना
99.	Warning	चेतावनी
100.	Yours faithfully	भवदीय

1.2 APPLIED SCIENCES

L	P
3	-

RATIONALE

Applied Sciences are very essential to develop scientific temper, continued learning skills and appreciation of physical and chemical changes of concern in the field of Architecture. This course covers elements of Applied Physics and Applied Chemistry and Applied Physics contains: units of measurements, force and motion, temperature and its measurement, Acoustics of buildings and fundamentals of light. Applied Chemistry part covers: metals, corrosion and its prevention, plastics, refractory and paints and varnishes.

Teachers, while imparting instructions, are expected to demonstrate various physical and chemical processes to clarify the concepts and principles involved in the course.

DETAILED CONTENTS

Part A - Applied Physics

1. **Units of measurement**
   Physical quantities, Types of physical quantities, Fundamental and derived Physical quantities with their units. Dimensional formula and dimensional equations. Principal of homogeneity. Uses of dimensional analysis

2. **Force and motion**
   Definition of force, Resolution of forces into two component form. Linear momentum, Impulse, Conservation of linear momentum. Four forces in nature (Gravitational, Electromagnetic, weak and strong forces)

3. **Temperature and its measurement**
   Definition of heat and temperature, Different scale of temperature, conversion of temperature in different scale (simple problems), Criteria for selection of a thermometer, Thermal expansion of solids, Linear, superficial and cubical expansions.

4. **Acoustics of buildings**
   Conditions for pleasant effect of sound in big hall or auditorium, Echo, Reverberation, reverberation times and simple problems on reverberation time.

5. **Work, Power, Energy**
   Definition of work, power, energy and their units. Work energy theorem and simple numerical.

Part B - Applied Chemistry

1. Properties and uses of copper, Aluminium, iron and steel. Corrosion: Meaning of corrosion, Electrochemical theory of corrosion, prevention of corrosion by various methods.

2. Polymer and Polymerization, Degree of Polymerization, Classification of polymers-on the basis of origin, synthesis, type of monomers and molecular forces. Natural rubber, Vulcanization of rubber and synthetic rubber. Plastics, Additives of plastics and applications of plastics. Adhesives and its brief classification.

3. Paints and varnishes: Constituents of paint, Characteristics of good paint, Constituents and Characteristics of varnishes, Enamel & its Constituents, uses of paints, varnishes and enamels.

SUGGESTED DISTRIBUTION OF MARKS		
Topic No.	**Time Allotted (Hrs)**	**Marks Allotted (%)**
Part-A		
1	7	15
2	6	12
3	7	15
4	5	10
5	5	8
Part-B		
1	5	12
2	8	16
3	5	12
Total	**48**	**100**

1.3 VISUAL ART & DESIGN

L	P
2	6

RATIONALE

Free hand sketching, colouring and rendering, line sketching, shades and shadows, lettering and printing forms important components of Architecture discipline. This course aims at imparting desired skills in the above areas. Teachers are expected to lay considerable emphasis on practical work so that students attain sufficient skills in sketching, lettering and printing.

DETAILED CONTENTS

1. **Free Hand Sketching**
   - 1.1 Importance of Sketching/Drawing in Architecture
   - 1.2 List of drawing Instruments used
   - 1.3 Free hand sketching of simple geometrical surfaces (1sheets)
   - 1.4 Free hand drawing of three dimensional geometrical objects (2sheets) (Cube, Cone, Prism, Pyramid, Cylinder, Sphere)
   - 1.5 Free hand drawing of a set of objects (1sheets)
   - 1.6 Free hand sketching of simple buildings and landscaping (3sheets)
   - 1.7 Free hand sketching of monuments, buildings and trees in different techniques and mediums (Pencil, pen ink, charcoal, coloured-inks, colours and crayons) (2 Sheets)

2. **Colouring and Rendering Exercises**:
   - 2.1 Definition and perception of colour and colour materials
   - 2.2 Hue values and intensity, value scale, intensity scale and colour circle (2sheets)
   - 2.3 Study of colours; Emotional effects of colours, warm and cool colours, receding and advancing colours; effect of light on colours, colour harmonies and contrasts
   - 2.4 Colour in nature, art and architecture
   - 2.5 Shades and shadows ,indication of surroundings, sky, clouds ,trees ,human figures in pencil, ink, colour and crayons (2 sheets)

3. **Preparation of Forms and Ability to Think in the Round**:
   - 3.1 Simple exercises on murals (2sheets)
   - 3.2 Mural design Exercises

4. **Lettering Practice**:
   - 4.1 Ratio between height and width of letters and numerals, capitals and small (7:4 and 5:40)
   - 4.2 Roman lettering, Gothic and Italics(3sheets)
   - 4.3 Free hand lettering
   - 4.4 Single line lettering
   - 4.5 Stylized lettering
   - 4.6 Spacing
   - 4.7 Lettering with the help of Stencils (1 sheet from 4.2 to 4.7)

5. **Printing Practice:**
   - 5.1 Tracing of a simple building drawing
     - a) In Pencil (1 sheet)
     - b) In Ink (1 sheet)
   - 5.2 Lay out of different types of sheets , preparation and folding of Blue /Ammonia Prints as per standards.

SUGGESTED DISTRIBUTION OF MARKS		
Topic No.	**Time Allotted (Hrs)**	**Marks Allotted (%)**
1	30	20
2	30	20
3	20	15
4	36	30
5	12	15
Total	**128**	**100**

1.4 Architectural Graphics

L	P
-	10

RATIONALE

Architectural Graphics forms a core subject for preparing perspective drawings, scale drawings, three dimensional views, furniture drawings and layouts. Therefore, this course aims at equipping the students with the skills of graphic presentation. Teacher are expected to lay considerable stress on practical work so that student attain desired competencies for preparing good quality perspectives of interior and exterior of buildings in different media. Teachers are also expected to stress upon appropriate line work, properties, dimensioning, lettering, printing, colour rendering techniques, shades/shadows and sciography.

DETAILED CONTENTS

1. Introduction

Introduction to Architectural Graphics -Drawing Instruments – Standard Sizes of Drawing sheets-Layout of drawing sheets-Title block- Types of lines and their applications-Graphical conventions of various materials-Introduction to Dimensioning- Elements of Dimensioning–Types of Dimensioning- Unidirectional and Aligned system of dimensioning as per B.I.S.

2. Plane Geometry:

2 . 1 Geometrical Construction

2.1.1 Dividing line into given number of equal parts and ratios

2.1.2 Construction of polygons without angular measurements.

2.1.3 Inscription of circle in polygons.

2.1.4 Inscription of equal circles in regular polygons touching each other and midpoints of sides of polygon.

2.1.5 Circumscription of circle to regular polygons.

2.2 Scales

2.2.1 Representative fraction

2.2.2 Types of Scales

2.2.3 Plane Scale and Diagonal Scale

2.3 Conic Section

2.3.1 Terminology, Construction of Ellipse, Parabola & Hyperbola by various methods

2.3.2 Hyperbola Construction

3. Solid Geometry

3.1 Ortho Graphics Projections

3.2 Theory of Projection, Orthographic Projection, V.P. and H.P. Front and Top View

3.3 First and Third Angle Projection

3.4 Projection of point, Line and Planes

3.5 Projection of Solids

3.6 Section of Solids

4. Isometric Projections and Perspective Views

4.1 Terminology–Isometric Scale

4.2 Box Methods

4.3 Co-ordinate/offset method.

4.4 Four centre method,

4.5 Isometric projection of areas

4.6 Simple problem of Isometric view of various forms such as cube, box,

4.7 Interior of rooms, tower, stairs

5. Perspective: Exercises on the following

5.1 Fundamentals, dimension, foreshortening and convergence

5.2 Reality and appearance

5.3 Basis of perspective, cone of vision, central visual ray, picture plane, Line of sight through picture plane, spectator

5.4 Principal aids of perspective, vanishing points eye level

5.5 Study of cube in perspective.
5.6 Characteristics of perspective construction, determining vanishing points
5.7 Two-point perspective
5.8 Exercise on one point &Two-point perspective of a simple building
5.9 Relationship between station point (Spectator) picture Plane and comparative study of perspective by changing position of station point from one side and in front of picture plane
5.10 Shadows of plan, elevation and perspective, front lighting, side lighting, back-
5.11 lighting, point-lighting from one light source, reflections in perspective
5.12 Three-point perspective, Bird's eye-view
5.13 Shades and shadows of rounded bodies, shadow in a circular opening, shades and shadows of sphere and hollow sphere

RECOMMENDED BOOKS

1. Engineering drawing by N.D. Bhatt, Charotra Publishers
2. Engineering drawing by P.S. Gill, Kataria Publishers

SUGGESTED DISTRIBUTION OF MARKS		
Topic No.	**Time Allotted (Hrs)**	**Marks Allotted (%)**
1	10	10
2	30	20
3	50	30
4	70	40
Total	**160**	**100**

1.5 THEORY OF DESIGN

L	P
3	-

RATIONALE

Students of Architectural Assistantship at diploma level are supposed to understand basic principles of theory of design while designing the buildings. All students should know the physical aspects of Architecture like: form, function, balance, light and shadow, shape, plane, volume, line, proportions, rhythm, texture, emphasis, contrast, colour and other related elements. Therefore, the subject of theory of design is very important for students undergoing diploma course in Architectural Assistantship because it is the basis of Architecture. Teachers while imparting instructions are expected to teach various elements used in designing buildings. Teachers may make use of models and audio-visual aids to clarify the concepts. Group discussions and seminars may also be organized to discuss various concepts and principles involved in the design. It is recommended that teachers may organize visits to worksites to clarify the concepts and principles involved.

DETAILED CONTENTS

Theory of Design: Definitions, examples and applications of the following

1. **Primary elements of design:**
   - 1.1 Point
   - 1.2 Line
   - 1.3 Figure
   - 1.4 Plane

2. **Design elements:**
   - 2.1 Composition
     - 2.1.1 Shape
     - 2.1.2 Size
     - 2.1.3 Form
     - 2.1.4 Function
   - 2.2 Balance
     - 2.2.1 Symmetry and stability
     - 2.2.2 Formal balance and informal balance
   - 2.3 Texture
     - 2.3.1 Surface Quality
     - 2.3.2 Light, structure, pattern
   - 2.4 Pattern
   - 2.5 Contrast
     - 2.5.1 Light and Shade
     - 2.5.2 Nature and manmade
   - 2.6 Rhythm and movement
     - 2.6.1 Rhythm in nature
   - 2.7 Proportion
   - 2.8 Scale
     - 2.8.1 Monumental Scale
     - 2.8.2 Human Scale
     - 2.8.3 Intimate Scale
   - 2.9 Emphasis
   - 2.10 Colour
     - 2.10.1 Effect of colour on building
     - 2.10.2 Colour chart

2.10.3 Colour variations (Contrasting colours)

2.11 Circulation

SUGGESTED DISTRIBUTION OF MARKS		
Topic No.	**Time Allotted (Hrs)**	**Marks Allotted (%)**
1	4	10
2	44	90
Total	**48**	**100**

RECOMMENDED BOOKS

1. Engineering materials by SC Rangwala, Charotra Publishing House, Anand

1.6 CONSTRUCTION MATERIALS -I

L	P
3	-

RATIONALE

Diploma holders in Architectural Assistantship are supposed to prepare working drawings of buildings. Knowledge of building materials is very essential from the point of construction materials as well providing detailed specifications in the detailed drawings. Therefore, the course in building materials includes imparting basic knowledge in the properties and use of the important materials like; stones, bricks, lime, cement, paints, timber, exterior and interior finishes, glass, plastics, building hardware, roofing materials, additives and admixtures, adhesives etc. Teachers are expected to demonstrate the samples of different materials, discuss their properties with particular reference to their use and appearance in particular situations depending upon climate and environmental conditions of the site where the materials are to be used. Students should be encouraged to collect samples of various materials and efforts should be made to maintain a good building material museum.

DETAILED CONTENTS

1. **Building Stones**
   - 1.1 Utility of stones
   - 1.2 Classification of rocks
   - 1.3 Selection of stones for different building works
   - 1.4 Characteristics of good building stones
   - 1.5 Testing of stones
     - 1.5.1 Water absorption test
     - 1.5.2 Compressive strength test
     - 1.5.3 Durability test
   - 1.6 Natural bed of stones
   - 1.7 Common building stones
     - 1.7.1 Granite, Basalt and Trap, Sand-stone, Lime-stone, Slate, Marble
     - 1.7.2 Composition, properties, uses and localities

2. **Bricks**
   - 2.1 Classification of bricks
     - 2.1.1 Properties and uses of First Class, Second Class, Third Class and over-burnt bricks
   - 2.2 Characteristics of good brick
   - 2.3 Size and weight of a standard brick
   - 2.4 Composition of brick earth
   - 2.5 Test for burnt clay bricks
     - 2.5.1 Compressive strength test, water absorption test and Efflorescence Test
   - 2.6 Fire-bricks, its properties, uses and availability

3. **Lime**
   - 3.1 Uses of lime, classification of lime
   - 3.2 Setting action of fat lime and hydraulic lime
   - 3.3 Field testing of lime : Visual examination
   - 3.4 Storing of lime
   - 3.5 Artificial hydraulic lime
   - 3.6 Important technical terms

4. **Cement:**
   - 4.1 Uses of cement
   - 4.2 Composition of Portland cement
   - 4.3 Setting and hardening of cement
   - 4.4 Types of cement, their properties and uses
     - 4.4.1 Ordinary Portland Cement (OPC)
     - 4.4.2 Rapid Hardening Cement
     - 4.4.3 High Alumina Cement
     - 4.4.4 White Cement

4.4.5 Coloured Cement
4.4.6 Pozzolana Portland Cement
4.4.7 Sulphate Resisting Cement
4.5 Storage of Cement

5. Mortar

5.1 Function of mortar
5.2 Preparation of cement mortar, lime mortar, lime cement mortar and their uses
5.3 Proportion of mortar for different building works
5.4 Different types of sand
5.5 Bulking of sand

6. Concrete

6.1 Mixing, placing and uses of lime concrete and cement concrete, aggregate and its grading
6.2 Placing of concrete
6.3 Compaction of concrete
6.4 Curing of concrete
6.5 Reinforced cement concrete(RCC)
6.5.1 Necessity of providing reinforcement
6.5.2 Properties of RCC

7. Timber

7.1 Characteristics and uses of common Indian timbers i.e.Sal, Deodar, Kail, Chir, Teak etc.
7.2 Characteristics of hard wood and soft wood
7.3 Defects in timber
7.4 Characteristics of good timber
7.5 Different methods of seasoning of timber

8. **Paints**

Properties, covering capacity, trade names, uses and availability of :

8.1 Water based paints
8.2 Dry distemper
8.3 Oil emulsion
8.4 Cement paints
8.5 Plastic emulsions
8.6 Oil paints
8.7 Varnishes
8.8 Enamel
8.9 Lacquers
8.10 Stucco
8.11 Tar and Bitumen Paint

9. **Market Survey:**

Commercial Survey (For all the items1to8)
Tentative Cost
Area Coverage
Comparison of the Material on the basis of
- Quality and Cost
- Suitability to requirement

***Market Survey should be carried out on holiday and after college hours.**

RECOMMENDED BOOKS

2. Engineering materials by SC Rangwala, Charotra Publishing House, Anand

SUGGESTED DISTRIBUTION OF MARKS		
Topic No.	**Time Allotted (Hrs)**	**Marks Allotted(%)**
1	6	20
2	4	10
3	4	10
4	6	10
5	6	10
6	6	10
7	6	10
8	6	10
9	4	10
Total	**48**	**100**

1.7 GENERAL WORKSHOP PRACTICE

L	P
-	4

RATIONALE

This course aims at developing basic manual skills in carpentry, painting, polishing and masonry for creating necessary appreciation of the technology involved. Manual and machining skills of carpentry will also be helpful in making scaled models of buildings by using different materials.

DETAILED CONTENTS

A. Carpentry Shop

1. Introduction to carpentry tools, machines and their application
2. Marking and sawing practice by using handsaw
3. Planning practice by using hand tools and wood planer
4. Chiseling practice by using hand tools
5. Exercises in preparation of joints i.e. lap joint, Mortise and Tennon joint, Dovetail and glued joint
6. Exercises in development and preparation of simple models

B. Painting and Polishing Shop

1. Exercises in preparation of surfaces before painting
2. Exercises in application of primer coat
3. Exercises in polishing wood items
4. Exercises in painting wooden and steel items

C. Masonry

1. Exercise on handling of bricks, cement, sand and aggregate
2. Exercise on preparation of mortar
3. Exercise on laying of bricks in various bonds
4. Exercise on pointing and finishing.
5. Knowledge of various tools used by carpenter mason etc.

D. Welding

1. Introduction,
2. Welding materials
3. Types of welding
4. Scope of welding.
5. Exercises on welding

***Note*:-** *Three periods to be taken at Mechanical workshop and one period to be taken in building construction laboratory.*

SUGGESTED DISTRIBUTION OF MARKS		
Topic No.	**Time Allotted (Hrs)**	**Marks Allotted(%)**
1	18	25
2	18	25
3	18	30
4	10	20
Total	**64**	**100**

SECOND SEMESTER

2.1 ENGLISH AND COMMUNICATION SKILLS - II

L	P
4	2

RATIONALE

Language is the most commonly used medium of self-expression in all spheres of human life – personal, social and professional. A student must have a fair knowledge of English language and skills to communicate effectively to handle the future jobs in industry. The objective of this course is to enable the diploma holders to acquire proficiency ,both in spoken(oral) and written language. It is expected that each polytechnic will establish a **communication skill laboratory** for conducting the practical mentioned in the curriculum.

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DETAILED CONTENTS

1. **Facets of Literature**
   - 1.1 Short stories
     - 1.1.1 The Portrait of a Lady - Khushwant Singh
     - 1.1.2 The Refugees –Pearl S.Buck
   - 1.2 Prose
     - 1.2.1 Forgetting- Robert Lynd.
     - 1.2.2 Walking Tours- Robert Louis Stevenson
   - 1.3 Poems
     - 1.3.1 All The World's A Stage -William Shakespeare
     - 1.3.2 No Men are Foreign- James Kirkup
2. **The Art of Précis Writing**
3. **Grammar and Usage**
   - 3.1 Narration
   - 3.2 Idioms and Phrases
   - 3.3 One Word Substitution
4. **Correspondence**
   - 4.1 Business Letters
   - 4.2 Personal letters
   - 4.3 Application for Job (Resume & Covering Letter)
5. **Drafting**
   - 5.1 Essentials of Report Writing
   - 5.2 Inspection Notes
   - 5.3 Memos, Circulars
   - 5.4 Press Release
   - 5.5 Agenda and Minutes of Meetings
6. **Glossary of Technical & Scientific Terms**
7. **Communication**
   - 7.1 Media and Modes of Communication
   - 7.2 Channels of Communication
   - 7.3 Barriers to Communication
   - 7.4 Listening Skills-Types of Listening
   - 7.5 Body language

LIST OF PRACTICAL EXERCISES:

1. Exercises on conversion of Phonetic Transcriptions to words & vice-versa
2. Group Discussions
3. Mock Interviews
4. Telephone Etiquette-demonstration and practice
5. Situational Conversations with feedback through video recording
6. Presentation on a given theme (using Power Point)
7. Exercises leading to personality development like mannerism, etiquettes, body language etc.
8. Reading unseen passages
9. Writing (developing) a paragraph
10. Just a minute session – Extempore Speech.

Note:

1. ***A*** *communication laboratory may be set up equipped with appropriate audio-video system with facility of playing CDs/DVDS and a video camera with facility to record & play back the performance of each student. A set of CDs from any language training organization e.g. B.B.C, British Council etc. may be procured for use of students.*
2. *Elements of body language will be incorporated in all practical.*
3. *The practical exercises involving writing may also be included in Theory Examination.*

RECOMMENDED BOOKS:

1. *English &Communication Skills, Book-II By Kuldip Jaidka, Alwainder Dhillon and Parmod Kumar Singla, Published By Abhishek Publication,57-59, Sector-17,Chandigarh*
2. *Spoken English by R.K. Bansal & J.B.Harrison Published by Orient Longman*
3. *Essentials of Business Communication by Pal and Rorualling ; Sultan Chand and Sons*
4. *The Essence of Effective Communication, Ludlow and Panthon; Prentice Hall of India*
5. *New Design English Grammar, Reading and Writing Skills by AL Kohli, Kohli Publishers,34 Industrial Area Phase-II, Chandigarh*
6. *A Practical English Grammar by Thomson and Marlinet*
7. *Spoken English by V Sasikumar and PV Dhamija; Tata McGraw Hill*
8. *English Conversation Practice by Grount Taylor; Tata McGraw Hill*
9. *Developing Communication Skills by Krishna Mohan and Meera Banerji; MacMillan India Ltd., Delhi*
10. *Business Correspondence and Report Writing by RC Sharma and Krishna Mohan; Tata McGraw Hill Publishing Company Ltd. New Delhi*
11. *Communication Skills by Ms R Datta Roy and K.K. Dhir; Vishal Publication, Jalandhar*

Websites for references:

1. http:www.bbclearningenglish.com
2.http:www.mindstools.com
3. http:www.letstalk.com.in
4. http:www.learnenglish.britishcouncil.org/en/

SUGGESTIVE DISTRIBUTION OF MARKS		
Topic No.	**Time Allotted (Hrs.)**	**Marks Allotted (%)**
1	**15**	**25**
2	**05**	**05**
3	**15**	**25**
4	**08**	**15**
5	**05**	**10**
6	**05**	**05**
7	**11**	**15**
Total	**64**	**100**

GLOSSARY OF TECHNICAL & SCIENTIFIC TERMS

1. Absolute	परम, अचर, पूर्ण, स्थिर
2. Acceleration	त्वरण, प्रवेग
3. Acid	अम्ल
4. Alkaline	क्षारीय, खारा
5. Air Compressor	वायु-संपीडक
6. Air Conditioning	वातानुकूलन
7. Alignment	सरेखन
8. Alternating Current	प्रत्यावर्ती धारा
9. Altimeter	ऊंचाई मापने का यंत्र
10. Alum	फिटकरी
11. Ammeter	अम्मीटर
12. Ampere	ऐम्पियर
13. Amplication	प्रवर्धन
14. Amplitude	आयाम
15. Angle	कोण
16. Angluar Velocity	कोणीय वेग
17. Angular Momentum	कोणीय संवेग
18. Annealing	तापानुशीतन
19. Anode	अनोड
20. Apex	शीर्ष, शिखर, शिखाग्र
21. Apparent	स्पष्ट
22. Applied Machanics	अनुप्रयुक्त यंत्रिकी
23. Applied Science	अनुप्रयुक्त विज्ञान
24. Archimedes's Principle	आर्किमिडीज़ का सिद्वांत
25. Architecture	वास्तुकला, स्थापत्यकला
26. Armature	आर्मेचर
27. Atom	परमाणु
28. Automatic	स्वचलित
29. Axis	अक्ष
30. Axle	धुरी
31. Balance (Scale)	तुला, तराजू
32. Ball Bearing	बाल-बेयरिंग
33. Bar magnet	छड़-चुम्बक
34. Barometer	वायुदाबमापी
35. Base	आधार
36. Base Plate	आधार पट्टिका
37. Battery	बैटरी
38. Beaker	बीकर
39. Bending Moment	वंकन आधूर्ण
40. Blast Furnace	झोंका भट्टी
41. Bleach	विरंजक
42. Boiler	उबालक
43. Bridge	पुल
44. Burette	ब्यूरेट
45. Callipers	कैलिपर्स
46. Calorie	कैलोरी
47. Canal	नहर
48. Capacitance	धारिता
49. Carburettor	कार्बुरेटर
50. Cast Iron	ढलवा लोहा

51.	Catalyst	उत्प्रेरक
52.	Cathode	कैथोड
53.	Centre of Gravity	गुरुत्वाकर्षण–केन्द्र
54.	Centrifugal	उपकेन्द्रीय
55.	Centripetal	अभिकेन्द्रीय
56.	Centroid	केन्द्रीय
57.	C.G.S. System	सी.जी.एस. पद्धति
58.	Chemical Action	रासायनिक क्रिया
59.	Chai	श्रृंखला, माला
60.	Change of State	अवस्था परिवर्तन
61.	Characteristics	लक्षण
62.	Charge (n)	आवेश
63.	Choke	चोक
64.	Chord, Major	गुरु स्वर–संघात
65.	Chord, Minor	लघु स्वर – संघात
66.	Circular	वृत्ताकार, वर्तुल
67.	Clock-wise	दक्षिणा वर्त
68.	Coagulatio	स्कंदन
69.	Coefficient of Expansion	प्रसार गुणांक
70.	Coil	कुंडली
71.	Combustion	दहन
72.	Compass	दिशासूचक
73.	Compound	यौगिक
74.	Concave	अवतल
75.	Convex	उत्तल
76.	Concentrated (Solution)	गाढ़ा, सांद्रित (घोल)
77.	Concrete	कंकरीट
78.	Conduction	चालन
79.	Conductor	चालक
80.	Cone	शंकु
81.	Connection	सम्बंध, जोड़
82.	Constant (Adj.)	स्थिर, अचल, एकसमान
83.	Convection	संवहन
84.	Coulomb	कूलोम (विद्युत शक्ति की इकाई)
85.	Couple	बल युग्म
86.	Crane	क्रेन
87.	Crystalline	रवेदार
88.	Dehydrate	निर्जल करना
89.	Distil	आसहन करना
90.	Effervescence	बुदबुदाहट
91.	Element	तत्त्व, मूलतत्त्व
92.	Empirical Formula	मूलअनुपाती सूत्र
93.	Equivalent Weight	तुल्यांकी–भार
94.	Flame Test	ज्वाला–परीक्षण
95.	Flash Point	प्रज्वलन–ताप
96.	Flask	फ्लास्क
97.	Spring Balance	कमानी तुला
98.	Soluble	विलयशील
99.	Viscosity	गाढ़ापन
100.	Volumetric Analysis	आयतनी विश्लेषण

2.2 ARCHITECTURAL MATHEMATICS

L	P
5	-

RATIONALE

Architectural Mathematics forms the backbone of engineering students. Basic elements of algebra, trigonometry, coordinate geometry have been included in the curriculum as foundation course. This course will develop analytical abilities to make exact calculations and will provide continuing educational base to the students.

1. **Algebra**

   1.1 Matrices

   1.1.1 Determinants: Elementary properties of determinants up to 3rd order, consistency of equations, Crammer's rule.

   1.1.2 Matrix: Algebra of matrices, Inverse of a matrix, matrix inverse method to solve a system of linear equations in 3 variables.

   1.2 Vector Algebra

   a) Definition notation and rectangular resolution of a vector.

   b) Addition and subtraction of vectors

   c) Scalar and vector products of 2 vectors.

   d) Simple problems related to work, moment and angular velocity

2. **Trigonometry**

   2.1 Concept of angles, measurement of angles in degrees, grades and radians and their conversions.

   2.2 T-Ratios of Allied angles (without proof), Sum, difference formulae and their applications (without proof). Product formulae (Transformation of product to sum, difference and vice versa). T-Ratios of multiple angles, sub-multiple angles (2A, 3A, A/2).

   2.3 Graphs of *sin x, cos x, tan x and* e^x.

   2.4 Applications: - Problems based on calculation of Height & distance

3. **Differential Calculus**

   3.1 Definition of function; Concept of limits.

   Four standard limits

   $$\lim_{x\to a}\frac{x^n-a^n}{x-a},\quad \lim_{x\to 0}\frac{Sin x}{x},\quad \lim_{x\to 0}\left(\frac{a^x-1}{x}\right),\quad \lim_{x\to 0}(1+x)^{1/x},$$

   3.2 Differentiation by definition of $x^n, Sin\,x, \cos x, \tan x, e^x, \log_a x$

   3.3 Differentiation of sum, product and quotient of functions. Differentiation of function of a function.

   3.4 Applications: Maxima and minima

4. **Integral Calculus**

   4.1 Integration as inverse operation of differentiation

   4.2 Simple integration by substitution, by parts and by partial fractions (for linear factors only)

   4.3 Use the following formulas for solving problems Where m, n are positive integers

   $$\int_0^{\pi/2} Sin^n x\,dx,\quad \int_0^{\pi/2} Cos^n x\,dx,\quad \int_0^{\pi/2} Sin^m x\, Cos^n x\,dx$$

   4.4 Applications of integration for: Simple problem on evaluation of area bounded by a curve and axes.

5. **Mensuration**

   5.1 Calculation of area of 2D geometrical figures

   5.2 Surface area and volume of solid shapes.

RECOMMENDED BOOKS

1. *Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi.*
2. *Engineering Mathematics by Vol. I & II by S Kohli, IPH, Jalandhar*
3. *Applied Mathematics by Dr. RD Sharma*
4. *Applied Mathematics, Vol. I & II by SS Sabharwal & Sunita Jain/ M.L. Moudgil & P.C. Chopra, Eagle Parkashan, Jalandhar*
5. *Comprehensive Mathematics, Vol. I & II by Laxmi Publications*
6. *Engineering Mathematics by Dass Gupta*
7. *Engineering Mathematics by C Dass Chawla, Asian Publishers, New Delhi*
8. *Engineering Mathematics, Vol I, II & III by V Sundaram et.al, Vikas Publishing House (P) Ltd., New Delhi*
9. *Engineering Mathematics by N.Ch. S.N Iyengar et.al, Vikas Publishing House (P) Ltd., New Delhi*
10. *Engineering Mathematics, Vol I & II by SS Sastry, Prentice Hall of India Pvt. Ltd.,*
11. *Engineering Mathematics, Vol I & II by AK Gupta, Macmillan India Ltd., New Delhi*

SUGGESTIVE DISTRIBUTION OF MARKS		
Topic No.	**Time Allotted (Hrs.)**	**Marks Allotted (%)**
1	**15**	**20**
2	**15**	**20**
3	**20**	**25**
4	**20**	**25**
5	**10**	**10**
Total	**80**	**100**

2.3 CONSTRUCTION MATERIALS-II

L	P
3	-

RATIONALE

Diploma holders in Architectural Assistantship are supposed to prepare working drawings of buildings. Knowledge of construction materials is very essential from the point of construction materials as well providing detailed specifications in the detailed drawings. Therefore, the course in building materials includes imparting basic knowledge in the properties and use of the important materials like; exterior and interior finishes, glass, plastics, building hardware, ceiling and roofing materials, additives and admixtures, adhesives etc. Teachers are expected to demonstrate the samples of different materials, discuss their properties with particular reference to their use and appearance in particular situations depending upon climate and environmental conditions of the site where the materials are to be used. Students should be encouraged to collect samples of various materials and efforts should be made to maintain a good building material museum.

DETAILED CONTENTS

1. **Floor Finishes**

   Properties, sizes, availability and applications of

   1.1 Terrazzo Tiles
   1.2 Glazed earthen and ceramic tiles
   1.3 CC Tiles
   1.4 Marble stone
   1.5 Kota stone
   1.6 Linoleum
   1.7 Rubber
   1.8 Cast iron grid

2. **Wall Finishes**

   2.1 Wall board homogeneous
   2.2 Laminated fibers
   2.3 Polystyrene wall tiles
   2.4 Plastic wall tiles
   2.5 Wall papers
   2.6 Cork sheets and tiles
   2.7 Thermocoles
      a. Foam rubber tiles and rolls
      b. Glow Walls.

3. **Ceiling Materials**

   Trade names, availability, sizes and applications of

   3.1 Hession cloth
   3.2 Gypsum plaster boards
   3.3 Plain a.c. sheets
   3.4 Plywood
   3.5 Hard Board
   3.6 Cellotex
   3.7 Fibre Boards
   3.8 Glass Roof tiles
   3.9 Asbestos tiles
   3.10 Thermofriz

4. **Building Hardware**

Trade names, availability, sizes and applications of

4.1 Tower bolts
4.2 Hinger
4.3 Door Handles Fan-light catches
4.4 Door springs Latches
4.5 Floor door stopper
4.6 Fan light pivots
4.7 Mortice lock
4.8 Door closer
4.9 Ventilator chains
4.10 Wire gauze

5. **Glass**

Trade names, availability, sizes and applications of

5.1 Sheet glass
5.2 Wired glass
5.3 Laminated safety glass
5.4 Plate glass
5.5 Insulating glass
5.6 Obscured glass
5.7 Coloured glass
5.8 Tinted glass
5.9 Heat absorbing glass
5.10 Glass blocks
5.11 Glazing putty

6. **Roofing Materials**

Trade names, availability, sizes and applications of

6.1 Asbestos sheets
6.2 GI sheets

7. **Additives and Admixtures**

Trade names, availability and applications of

7.1 Water repellants
7.2 Accelerators
7.3 Air entraining agents
7.4 Hardness
7.5 Workability increasing agents
7.6 Fly ash

8. **Adhesives**

8.1 Synthetic resins: their trade names and uses

9. **Steel**

9.1 Mild Steel
9.2 Medium Tensile Steel
9.3 Hard drawn steel wire
9.4 Deformed steel their properties and uses

10. **Aluminum:** its properties and uses

Note:- *Students may be exposed to the latest material available in the market- survey to be conducted for comparative study for quality and cost basis.*

RECOMMENDED BOOKS

1. Engineering materials by SC Rangwala, Charotra Publishing House, Anand

SUGGESTIVE DISTRIBUTION OF MARKS		
Topic No.	**Time Allotted (Hrs.)**	**Marks Allotted (%)**
1	**07**	**15**
2	**04**	**8**
3	**05**	**10**
4	**07**	**15**
5	**05**	**10**
6	**02**	**4**
7	**05**	**10**
8	**05**	**10**
9	**03**	**8**
10	**05**	**10**
Total	**48**	**100**

2.4 CLIMATE & BUILT ENVIRONMENT

L	P
3	-

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.

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

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)

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

5. **Green Buildings: - An ecofriendly concept**
   - 5.1 Introduction
   - 5.2 Edge over conventional
   - 5.3 Elements
   - 5.4 How to create green buildings

RECOMMENDED BOOKS

1. Tropical Architecture by C.P. Kukreja, McGraw Hill, New Delhi

SUGGESTIVE DISTRIBUTION OF MARKS		
Topic No.	**Time Allotted (Hrs.)**	**Marks Allotted (%)**
1	**10**	**25**
2	**10**	**20**
3	**10**	**20**
4	**08**	**15**
5	**10**	**20**
Total	**48**	**100**

2.5 BUILDING CONSTRUCTION-I

L	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

1. **Brick Work and Stone Work**
   - 1.1 Different sizes and types of bricks
   - 1.2 Wall thickness, T-junctions, cross junction and bonds
   - 1.3 Brick jalies
   - 1.4 Stone facings and claddings and classification of masonry

2. **Opening in walls**
   - 2.1 Classification of arches as per finish, shape and material
   - 2.2 Classification of lintels of different materials, precast and cast-in-situ

3. **Damp Proof Course**
   - 3.1 Sources of dampness and effects of dampness
   - 3.2 Classification as per hardness or rigidity of material
   - 3.3 Treatment of building components for effective damp proofing

4. **Foundation**
   - 4.1 Different types of foundations with reference to advantages of one over the other
   - 4.2 Foundations of different types with reference to method of construction
   - 4.3 Foundations for special circumstances

List of Practical

1. Drawing of different shapes and sizes of bricks
2. Drawings of different bonds wall thickens 10,20,30,40 cm thick, T0junctions, cross junction Brick work and jalies, simple brick Jali and RCC Jali
3. Drawings of litels and arches of various materials
4. Drawing of spread foundation and application of DPC on spread foundation and basements
5. Section through lintel, window, Arch door, foundation and basements

RECOMMENDED BOOKS

1. Building Construction by Sushil Kumar, Standard Publishers, New Delhi
2. Course in Civil Engineering Drawing by V.B. Sikka, S.K. Kataria & Sons

SUGGESTIVE DISTRIBUTION OF MARKS		
Topic No.	**Time Allotted (Hrs.)**	**Marks Allotted (%)**
1	**08**	**25**
2	**08**	**25**
3	**08**	**25**
4	**08**	**25**
Total	**32**	**100**

2.6 ARCHITECTURAL DESIGN-I

L	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. Composition of sheet
2. Preparation of plan and elevation from the models of various forms (composition of prisms, cubes, cylinders etc.) (one exercise)
3. Study of spaces required for different human activities (one sheet)
4. Design studies in relation to furniture layout

   All studies to be made through plans

   4.1 Living Area

   4.2 Dining Area

   4.3 Sleeping Area

   4.4 Study Area
5. Design studies of combination of above areas under fixed roofs

   All studies to be made through plans

   5.1 Living, dining and kitchen

   5.2 Study, bedroom and toilet
6. Design of one Bed room house (Ground floor only)

   6.1 Circulation analysis

   6.2 Presentation Drawing

   6.2.1 Plan

   6.2.2 Elevation

   6.2.3 Section

   6.2.4 Isometric View

Note: *Students are required to make model of the above mentioned project in the class of Model Making subject*

SUGGESTIVE DISTRIBUTION OF MARKS		
Topic No.	**Time Allotted (Hrs.)**	**Marks Allotted (%)**
1	**03**	**10**
2	**04**	**15**
3	**03**	**10**
4	**03**	**10**
5	**04**	**15**
6	**15**	**40**
Total	**32**	**100**

2.7 MODEL MAKING

L	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. Draw developmental drawings to appropriate scale of different geometrical shapes/objects
2. Prepare scale down models of residential and interiors to demonstrate skill, workmanship, preciseness to enhance visualization of drawings to reality (Model) Using Wood/ Thermocol/ Cork/ Plaster of Paris/ Photo mount board etc.

Note: *Students are required to make the model of the one bed room house project being designed in this semester in architectural Design -1 subject*