

Curriculum for

Diploma Programme in

ARCHITECTURAL ASSISTANTSHIP

For

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Kendra

Prepared by:

Haryana State Board of
Technical Education
Bays 7-12, Sector 4
Panchkula-134 112

FIRST YEAR (Architectural Assistantship)

Sr. No.	SUBJECTS	STUDY SCHEME HOURS / WEEK			CREDIT	MARKS IN EVALUATION SCHEME									Total Marks of Internal & External
		L	T	P		INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT						
						Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot		
1.1	English	2	-	2	6	40	25	65	60	3	50	3	110	175	
1.2	Architectural Drawing-I	-	-	4	4	-	50	50	-	-	100	3	100	150	
1.3	Sketching and Model Making	-	-	4	4	-	50	50	-	-	100	3	100	150	
1.4	Architectural Design-I	-	-	6	6	-	50	50	-	-	100	3	100	150	
1.5	Building Materials	3	-	-	6	40	-	40	60	3	-	-	60	100	
1.6	Environmental Studies	2	-	1	5	40	25	65	60	3	50	3	110	175	
1.7	Applied Science and Mathematics	3	-	-	6	40	-	40	60	3	-	-	60	100	
1.8*	Information Technology	-	-	2	2	-	50	50	-	-	50	3	50	100	
1.9	Building Construction-I	-	-	4	4	-	50	50	-	-	100	3	100	150	
#	Student Centered Activities(SCA)	-	-	2	2	-	25	25	-	-	-	-	-	25	
Total		10	-	25	45	160	325	485	240	-	550	-	790	1275	

*Common with other diploma programmes

SCA will comprise of co-curricular activities like extension lectures, games, hobby clubs, seminars, declamation contests, educational field visits, N.C.C., N.S.S., Cultural Activities and Disaster management etc.

THIRD SEMESTER (ARCHITECTURAL ASSISTANTSHIP)

Sr. No	Subject	STUDY SCHEME			EVALUATION SCHEME						Total Marks
					Internal Assessment		External Assessment (Examination)				
		Hrs/week			Theory	Practical	Written Paper		Practical		
		L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
3.1	History of Architecture-I	3	-	-	50	-	100	3	-	-	150
3.2	Architectural Drawing-III	-	-	6	-	50	-	-	+100	3	150
3.3	Surveying	2	-	3	25	25	100	3	50	3	200
3.4	Climatology	3	-	-	50	-	100	3	-	-	150
3.5	Building Services	4	-	-	50	-	100	3	-	-	150
3.6	Building Construction-II	-	-	6	-	50	-	-	+100	3	150
3.7	**Architectural Design-II	-	-	6	-	50	-	-	+100	3	150
Soft Skills-I		-	-	2	-	25	-	-	-	-	25
Total		12	-	23	175	200	400	-	350	-	1125

+ Includes 25 marks for Viva-voce

** Topic for Architectural Design will be displayed on the Notice Board one week before the examination

FOURTH SEMESTER (ARCHITECTURAL ASSISTANTSHIP)

Sr. No	Subject	STUDY SCHEME			EVALUATION SCHEME						Total Marks
					Internal Assessment		External Assessment (Examination)				
		Theory		Practical		Written Paper		Practical			
		Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs				
Hrs/week		L	T	P							
4.1	History of Architecture -II				3	-	-	50	-	100	3
4.2	Structural Mechanics	5	-	-	50	-	100	3	-	-	150
4.3	Building Bye-Laws	3	-	-	50	-	100	3	-	-	150
4.4	Working Drawing-I	-	-	6	-	50	-	-	+100	3	150
4.5	Computer Applications in Architecture – I	-	-	4	-	50	-	-	+100	3	150
4.6	Building Construction –III	-	-	6	-	50	-	-	+100	3	150
4.7	**Architectural Design-III	-	-	6	-	50	-	-	+100	3	150
Soft Skills-II		-	-	2	-	25	-	-	-	-	25
Total		11	-	24	150	225	300	-	400	-	1075

+ Includes 25 marks for Viva-voce

** Topic for Architectural Design will be displayed on the Notice Board one week before the examination

Industrial Training - After examination of 4th Semester, the students shall go for training in a relevant industry/field organization for a minimum period of 6 weeks upto 8 weeks and shall prepare a diary. It shall be evaluated during 5th semester by his/her teacher for 50 marks. The students shall also prepare a report at the end of training and shall present it in a seminar, which will be evaluated for another 50 marks. This evaluation will be done by HOD and lecturer incharge – training in the presence of one representative from training organization.

FIRST YEAR

1.1 ENGLISH

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RATIONALE

Knowledge of English Language plays an important role in career development. This subject aims at introducing basic concepts of communication besides laying emphasis on developing listening, speaking, reading and writing skills as parts of Communication Skill.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

- Understand the importance of good communication
- Describe process of communication.
- Identify and match the parts of speech
- Rewrite sentences correctly
- Modify sentences and relate them with real life situations.
- Reproduce and match words and sentences in a paragraph.
- Re-write the sentences according to given situation.
- Relate and use various words using proper vocabulary and grammar.
- Write the various types of paragraphs, notices, memos, email writing & resume writing.

DETAILED CONTENTS

- 1. Basics of Communication** (06 Hrs)
 - 1.1. Definition and process of communication
- 2. Functional Grammar** (22 Hrs)
 - 2.1. Noun and Pronoun
 - 2.2. Preposition
 - 2.3. Tenses (verb (Main verb and Auxiliary verb)
- 3. Reading Skills** (12 Hrs)
 - 3.1. Unseen passage for comprehension. Based upon the passage, following aspects may be covered
 - Questions from the passage
 - One-word substitution
 - Prefixes and Suffixes
 - Antonyms and Synonyms etc.

4. Writing skills

(30 Hrs)

- 4.1. Correspondence – Business and official
- 4.2. Notice, including Press Releases
- 4.3. Memos
- 4.4. Resume Writing
- 4.5. Writing E-mail
- 4.6. Paragraph writing

LIST OF PRACTICALS

1. Self and Peer Introduction
2. Situational Conversations: Offering - Responding to offers; Requesting – Responding to requests; Congratulating; Expressing sympathy and condolence; Apologizing and Forgiving; Complaining; Warning; Asking and giving information; Getting and giving permission
3. Newspaper reading
4. Mock Interviews: Telephonic and Personal

INSTRUCTIONAL STRATEGY

Student should be encouraged to participate in role play and other student centered activities in class room and actively participate in listening exercises

MEANS OF ASSESSMENT

- Assignments and quiz/class tests, mid-term and end-term written tests
- Actual practical work, exercises and viva-voce
- Presentation and viva-voce

RECOMMENDED BOOKS

1. Communicating Effectively in English, Book-I by Revathi Srinivas; Abhishek Publications, Chandigarh.
2. Communication Techniques and Skills by R. K. Chadha; Dhanpat Rai Publications, New Delhi.
3. High School English Grammar and Composition by Wren & Martin; S.Chand & Company Ltd., Delhi.
4. e-books/e-tools/relevant software to be used as recommended by AICTE/HSBTE/NITTTR.

Section	Percentage of syllabus to be covered	Units to be covered	Type of assessment	Weightage of Marks	Pass Percentage
A	20%	Unit 1.1, 2.1	1 st Internal	40%	40% (Combined in internal & final assessment) with minimum 25% marks in final assessment)
B	20%	Unit 2.2, 2.3, 4.1	2 nd Internal		
C	60%	Unit 3.1, 4.2, 4.3, 4.4, 4.5, 4.6	FINAL	60%	

1.2 ARCHITECTURAL DRAWING – I

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- - 4

RATIONALE

Architectural Drawing forms a core subject for preparing scale drawings, three dimensional views, furniture drawings and layouts.

Teachers are expected to lay considerable stress on practical work so that students attain sufficient skills in lettering, printing and desired competencies for preparing good quality architectural drawings.

Teachers are also expected to stress upon appropriate line work, dimensioning and lettering.

DETAILED CONTENTS

1. Introduction and relevance (need and importance) of the architectural drawing
2. Introduction to the Studio Environment
 - i) Basics of drafting instruments, starting off
 - ii) Basics of stationery (Pencils, sharpening, types of sheets, erasers, cutter etc.)
 - iii) Demonstration by the teacher on holding pencils, fixing parallel bar and handling other tools and equipment used in Architectural Drawing

(Demonstration sheet to be put up for better understanding)

3. Line Work (4 sheets)

Basic line work, with different pencil thickness & intensities H, HB, 2B, 4B, 6B

- i) Horizontal lines
- ii) Vertical lines
- iii) Grid
- iv) Diagonal lines
- v) Composition, pattern making in line work

(Using different grades of pencils to understand the tonal variation)

4. Lettering using different pencils & pens, stencils (3 sheets)
Different styles, heights & intensities
5. Introduction to Scale (1 sheet)
Use of the modular scale - both metric system and FPS

6. Geometric Shapes (Plan, elevation etc) (2 sheets)
 - i) Simple geometric (cubes, cylinder, cones etc)
 - ii) Complex (fusion of the basic shapes) (Incorporating the use of scale both feet & metric)
7. Orthographic Projections (Introduction to Planes) (2 sheets)
 - i) Projection of points
 - ii) Projections of lines
 - iii) Projection of solids
8. Reviewing orthographic projections (plans, line projections, solids) (1 sheet)
9. Section of Solids (3 sheets)

Simple geometrical shapes e.g. cube: Elementary building sections highlighting line intensities for sectional and elevational components. (Example: parapet, chajjas in section and elevation behind)
10. Development of surface (1 sheet)

Development with an aim to calculate areas if required
11. Isometric Views (2 sheets)

Conversion of 2D geometrical shapes into 3D isometric views (30° – 30° , 30° – 60°) to realize the potential of each from simple to complex solid to basic building forms
12. Axonometric Views (3 sheets)

Conversion of 2D geometrical shapes into 3D axonometric views at different angles (45° – 45°) to realize the potential of each from simple to complex solid to basic building forms. Isometric/axonometric use of any building form, from a given base plan – to be developed as per the student's imagination of the exterior/interior components (with roads, landscape elements)

INSTRUCTIONAL STRATEGY

This subject is one of the most important, fundamental and practical subject for diploma in Architectural Assistantship. Teachers should lay emphasis on practical work by the students and give repetitive exercises in free hand sketching, colouring and rendering like sketching, shades and shadows, lettering, printing forms and other important component of architecture. Teachers should lay stress upon perfect line work, properties, dimensioning, lettering and printing by the students in the classroom. Students should maintain portfolio of the work done by them throughout the session. Viva voce examination may be conducted by the teacher on completion of each assignment

RECOMMENDED BOOKS

1. Engineering Drawing by N.D. Bhatt; Publisher Charotar Publishing House Pvt.Ltd., New Delhi
2. Engineering Drawing by G.S. Virdhi; Khanna Publisher, New Delhi
3. Building Construction by Sikka; Publisher Tata McGraw Hill Publisher, New Delhi
4. Time Saver Standard for landscape architecture: Design and construction by Charles W.Harris Published by Mc Graw-Hills Publishers, New Delhi
5. Time Saver Standards for Building Types by Joseph De Chiara and John Callendera Published by Mc Graw Hill, New Delhi
6. Rendering with Pencil and Ink by Gill Robert W., Published by Thomas and Hudson, New Delhi
7. Architects Data by Neufert, Published by Oxford BSP Professional Books, New Delhi

1.3 SKETCHING & MODEL MAKING

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RATIONALE

Free hand sketching plays very important role to inculcate interest among the students in the field of drawing. It also helps in developing the skills required for preparing various types of drawings and design. Considerable emphasis on outdoor sketching should be given to attain the required skills in the subject. Students of Architectural Assistantship at diploma level are expected to assist in the preparation of architectural models of various kinds in their professional career. This skill can also form a basis of self-employment. Architecture models as three- dimensional representations are made in different mediums. The students should be acquainted with all of these mediums/materials

DETAILED CONTENTS

Free Hand Sketching Exercises in pencil only:

1. Free-hand line exercises of different types of lines (horizontal, vertical, diagonal grid) (1 Sheets)
2. Free hand sketching of two-dimensional geometrical figures. (Square, circle, Triangles and Ellipses etc.) (1 Sheets)
3. Free hand sketching of three – dimensional geometrical objects. (Cube, Cones, Prisms, Pyramids, Spheres Cylinders etc). (1 Sheets)
4. Introduction & study of anthropometrics (1 Sheets)
5. Free hand sketching of human figures, trees furniture and vehicles etc One in - door . (2 Sheets)
6. Free hand sketching of small buildings with shade and shadow sheets. (1 Sheets)
7. Free-hand sketching of buildings with trees, human figures, sky, clouds and birds and other land-scape elements, using various mediums like pencil, ink and colours (water colours and pencil colours etc)
8. Free-hand sketches of various scenes such as railway-station, parking places, bus stand etc.
9. Introduction and Demonstration of model making materials and techniques.
10. Block models of basic geometrical shapes like prisms, pyramids, cubes, cylinders etc., using the following materials:
Thermo coal (1 Exercise)
Mount Board/Sun Board/Balsa Wood strips (1 Exercise)
11. Composition of various geometrical shapes in different materials (1 Exercises)
12. Sculpture Making (2 Exercises in all)

- 12.1 Thermocol (Styropor)
- 12.2 sun board
- 12.3 Clay modeling
- 12.4 Miscellaneous materials such as copper wire, board, toothpicks,

13. Introduction to carpentry (1 Exercise)

Introduction and Demonstration of materials, tools, machines and techniques such as sawing, chiseling and planning etc.

Exercise in joint preparation under close supervision

14. Brick Masonary (1 Exercise)
Laying of bricks in different bonds

15. Painting and Polishing (1 Exercise)

Introduction regarding painting tools and equipments used for preparation of different colours surfaces

Exercise in

- Surface preparation before painting (steel and wood)

Total Number of Exercise: 08

Note: Students are also required to maintain sketchbooks for outdoor sketch

INSTRUCTIONAL STRATEGY

This subject is one of the most important, fundamental and practical subject for diploma in Architectural Assistantship. Teachers should lay emphasis on practical work by the students and give repetitive exercises in free hand sketching, colouring and rendering like sketching, shades and shadows, lettering, printing forms and other important component of architecture. Teachers should lay stress upon perfect line work, properties, dimensioning, lettering and printing by the students in the classroom. Students should maintain portfolio of the work done by them throughout the session. Viva voce examination may be conducted by the teacher on completion of each assignment

RECOMMENDED BOOKS

1. Time Saver Standard for landscape architecture: Design and construction by Charles W.Harris Published by Mc Graw-Hills Publishers, New Delhi
2. Time Saver Standards for Building Types by Joseph De Chiara and John Callendera

Published by Mc Graw Hill, New Delhi

3. Rendering with Pencil and Ink by Gill Robert W., Published by Thomas and Hudson, New Delhi
4. Architects Data by Neufert, Published by Oxford BSP Professional Books, New Delhi

1.4 ARCHITECTURAL DESIGN-I

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- - 6

RATIONALE

Students of diploma in Architecture Assistantship are supposed to have the knowledge about the basic elements and the principles of design and other related elements to develop skills for designing the various types of buildings. Teachers while imparting instructions/giving assignments are also expected to show various types of design of small buildings for the better application of the subject.

Teachers while imparting instructions/giving assignments to students are expecting to teach various elements of design like form function, balance, light of shadow, shape, plane, volume, line, rhythm, proportions, textures and other such related elements. Teachers are also expected to show various types of designs of small building to develop and appreciation for this subject.

Teachers should also motivate students to maintain sketch book/portfolio of all the assignments given to the students.

DETAILED CONTENTS

Definition, examples and applications of the following:

1. Primary Elements of Design
 - 1.1 Point
 - 1.2 Line
 - 1.3 Figure
 - 1.4 Plane
 - 1.5 Volume

2. Design Elements (2 sheets)
 - 2.1 Form
 - 2.2 Space
 - 2.3 Colour

3. Principles of Design (2sheets)
 - 3.1 Harmony
 - 3.2 Balance
 - 3.3 Rhythm
 - 3.4 Texture
 - 3.5 Contrast
 - 3.6 Monotony
 - 3.7 Unity
 - 3.8 Scale
 - 3.9 Proportion

4. Relationship of form and functions
 5. Relationship of Aesthetics and utility
 6. Colours (4sheets)
 - 6.1 Colour chart showing primary, secondary and tertiary colours
 - 6.2 Warm and cool colours
 - 6.3 Psychological effects of colours
 - 6.4 Effects of colours on building (interior and exterior)
 7. The subject includes the elements of Anthropometrics with respect to: (3sheets)
 - 7.1 Human body
 - 7.2 Furniture and fitting (standards)
 - 7.3 Vehicles (all angles movement, parking, turning, sizes etc)
 - 7.4 Street furniture
 8. Proportion of Components of Human Body (1 sheet)
The proportions of the different components of the human body; Examples from Le Corbusier Modular Man, Vitruvius Marco Pollione, Vastu Pursha Mandala
 9. Human Activities (2 sheets)
Requirement of space (2-D, 3-D) for various human activities (Single and multiple use of spaces such as queues etc.)
 10. Furniture Standards (1sheets)
Furniture standards (sizes of domestic and public furniture); Toilet and Kitchen equipment - sizes and standards; Doors and windows - sizes, standards and locations.
 11. Vehicles (1 sheet)
Vehicles in motion, parking along with turning radii for two-wheelers, cars etc. Standard road width.
 12. Street furniture (2sheets)
Standards for drinking fountains, waiting queues at bus stops, garden seats, waste bins, telephone booths, public walkways etc.
 13. Graphic Representation of plant material (ground cover, foliage, shrubs, trees) human figures and vehicles. (1sheets)
- Note:** Teachers are required to supplement the teaching process through demonstration of the existing buildings.

Note: Minimum of 15 sheets should be made.

INSTRUCTIONAL STRATEGY

This is one of the most important practical oriented subject for diploma in architectural assistantship. While imparting instruction, special visits may be arranged to demonstrate and explain important architectural features of different types of residential, commercial and public buildings. Practicing architects may be invited from time to time to present case studies and to deliver expert lectures on important elements like form, function, balance, light of shadow, shape, plane, volume, line, rythem, proportions, textures and other such element appropriate to various designs. Teacher may present some of the already completed design works of practicing architects to the students and explain the important features and elements. Audio- visual material available in this field may be procured and presented to the students from time to time. Students should be encouraged to visit relevant web-sites and teachers should develop the design problems/assignments which can be taken up by the students using relevant and appropriate software. Students should be given group and independent design/drawing assignments and they should also maintain sketch book/portfolio of all the assignments given to them throughout the session. Teachers may conduct viva-voce on completion of each assignment. Students may present seminars towards the end of the session

RECOMMENDED BOOKS

1. Time Saver Standards for Building Types by Joseph De Chiara and John Callendera
2. Architects Data by Neufert
3. Space, Time and Order by DK Ching
4. Architectural Aesthetics by Sangeet Sharma, Abhishek Publication, 57-59, Sector 17, Chandigarh

1.5 BUILDING MATERIALS

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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 for providing detailed specifications in the working drawings. Therefore, the course in building materials includes imparting basic knowledge in the properties and use of the basic 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.

NOTE

The students are also expected to refer to Architecture Journals like inside – Outside, Interiors today, Design and Interiors, Architect and builder, Builders Friend etc. They should make scrapbook of relevant brochures

DETAILED CONTENTS

1. Building Stones (6 hrs)
 - 1.1 Utility of stones
 - 1.2 Classification of rocks
 - 1.3 Characteristics of good building stones
 - 1.4 Natural bed of stones
 - 1.5 Common building stones
 - 1.6 Storage systems/stacking system

2. Bricks (8 Hrs)
 - 2.1 Classification of bricks – properties and uses of first class, second-class, third class.
 - 2.2 Characteristics of good brick
 - 2.3 Size and weight of a standard brick and commonly available brick
 - 2.4 Composition of brick earth
 - 2.5 Fire bricks, its properties, uses and availability
 - 2.6 Availability of various types of bricks in the market e.g. machine made bricks, handmade firebricks.
 - 2.7 Brick Tiles

3. Lime (4 Hrs)
 - 3.1 Uses of lime requirements with respect to its use as mortar since ancient times; structural strength and economics; classification of lime.
 - 3.2 Setting action of fat lime and hydraulic lime
 - 3.3 Present day use of lime, its strength and curing segments with respect to its use as mortar since ancient times; structural strength and economics
4. Cement (6 Hrs)
 - 4.1 Uses of cement
 - 4.2 Composition of Portland cement
 - 4.3 Types of cement, their properties and uses
 - 4.4 Storage of cement – transportation and carriage capacities
5. Aggregates (types, uses and transportation) (2 hrs)
 - 5.1 Course Aggregates
 - 5.2 Fine Aggregates
6. Mortar (4 hrs)
 - 6.1 Different types of sand and other Puzzolona material
 - 6.2 Functions of Mortar
 - 6.3 Preparation of cement mortar, lime mortar, lime cement mortar and their uses.
 - 6.4 Proportion of mortar for different building works
7. Concrete (8 hrs)
 - 7.1 Definition of concrete, workability of concrete
 - 7.2 Water - Cement Ratio
 - 7.3 Compaction of concrete
 - 7.4 Curing of concrete
 - 7.5 Mixing, placing and uses of lime concrete and cement concrete, aggregate and its grading including Flyash and cement concrete
 - 7.6 Reinforced cement concrete (RCC), M15, M20
 - 7.7 Properties of RCC
 - 7.8 Introduction to Ready Mix Concrete (RMC), Self-comparing concrete and Light-weight concrete.
8. Timber (8 hrs)
 - 8.1 Characteristics and uses of common Indian timbers i.e. Sal, Deodar, Kali, Tali, Chir, and Teak etc.

- 8.2 Characteristics of hard wood and soft wood
 - 8.3 Defects in timber
 - 8.4 Characteristics of good timber
 - 8.5 Different methods of seasoning of timber
 - 8.6 Preservation of timber/preservative materials for timber
 - 8.7 Availability of different types of timber and their comparative market prices.
9. Plastics (2 hrs)
- 9.1 Natural (Shellac, casein and cellulose) and synthetic plastics
 - 9.2 Thermosetting and thermoplastics and their uses
 - 9.3 Plastics used as materials in building, industry e.g. flooring, roofing, etc
10. Alloys and Metals (2 hrs)
- Ferrous and non-ferrous metals (Aluminum, copper, lead, zinc, tin etc) their Uses.
11. Glass (8 hrs)
- Types, thickness, various uses in building. Basic characteristics visual and physical. Availability, sizes, usage, measurements systems and market prices transportation cost application in the construction industry.
- Wired glass
 - Laminated safety glass
 - Insulating glass
 - Coloured glass
 - Tinted glass
 - Heat absorbing glass
 - Glass blocks
 - Toughened glass
 - Structural glazing
 - Stained glass
 - Mirrors
 - E-glass
12. Paints and Varnishes, Drying Oil, Pigment, Drier, Thinner , Adhesives Synthetic resins (their trade names, uses of synthetic resins, costs, application in various situations as compared to traditional materials and methods . Packing sizes, as given by the manufacturer and collection of catalogues and their covering capacity, uses and availability of paints and varnishes. (8hrs)
- Water based paints
 - Distempers
 - Oil based paints and emulsions
 - Cement paints
 - Acrylic emulsions

- Varnishes
 - Spirit polish, wax polish
 - Stucco
 - Tar and Bitumen paint
13. Floor Finishes (Laying sizes, availability, popular brand names, quality of polish, uses and current market rates) (6 hrs)
- Terrazzo Tiles and Flooring
 - Glazed terracotta
 - Cement Concrete Tiles
 - Marble stone, Kota stone, slate, red sand stone, granite – their tiles and slabs
 - PVC
 - Heavy duty flooring for industrial building
14. Wall Finishes (along with application method) (6 hrs)
- Wall board homogeneous
 - Laminated fiber boards – types
 - Plastic wall tiles – tiles available
 - Wall papers
 - Thermocol
 - Foam rubber tiles and rolls
 - Textured paint finishes
15. Ceiling Materials (Size, quality, their availability, types of finishes, uses, trade names, market rate and application methods.) (8 hrs)
- Hessian cloth
 - Gypsum plaster boards plaster of Paris board
 - Plain AC sheets – E board etc.
 - Plywood
 - Fibre Boards
 - Asbestos tiles
 - Medium density fibre board (MDF)
16. Roofing Materials (8 hrs)
- Asbestos sheets
 - GI sheets
 - Ferro-cement sheets
 - Fibre sheets
 - Corrugated PVC sheets
- Their standard sizes, uses, availability, prices and knowledge about supporting system

17. Additives and Admixtures (3 hrs)
- Water repellants and water proofing agents
 - Accelerators
 - Hardeners
 - Fly ash
- Their availability, uses, costs, performance specifications, and properties used under various conditions.
18. Kitchen and Toilet Fixtures (8hrs)
- Market survey of various materials and collection of data, sizes, etc. (Specifications of kitchen and toilet fittings and fixtures, their popular brand names, shapes and sizes)
- Note:
- Sizes, specifications and availability of sanitary fittings e.g. W.C/ Cisterns/Urinals/Wash basins/Kitchen sinks, related accessories their types, brands and costs.

INSTRUCTIONAL STRATEGY

This is one of the fundamental subject covering basic building construction and finishing materials. Teachers should demonstrate samples of various materials while imparting classroom instruction. Teachers may also arrange some field visits to manufacturing/production units and retailer shops like cement, kilns, timber saw mills and seasoning plants, hardware shops, glass houses etc. Students should be encouraged to collect samples of various materials and catalogues of manufacturer. The students may maintain a scrapbook for this purpose. A museum of building construction, materials may be developed where samples of latest materials their specifications, characteristics, rates, manufacturer (supplier and relevant codes may be kept) to enhance the level of understanding of the students

RECOMMENDED BOOKS

- 1) Sharma, SK; and Mathur, GC; "Engineering Materials;" Delhi-Jalandhar, S. Chand and Co.
- 2) Surendra Singh; "Engineering Materials;" New Delhi, Vikas Publishing House Pvt. Ltd.
- 3) Choudhary, N; "Engineering Materials;" Calcutta, Technical Publishers of India.
- 4) Bahl, SK; "Engineering Materials;" Delhi Rainbow Book Co. New Delhi
- 5) TTTI, Chandigarh "Civil Engineering Materials:" Tata McGraw Hill Publication, New Delhi
- 6) Kulkarni, GJ"Engineering Materials;" Ahmedabad, Ahmedabad Book Depot.
- 7) Shahane; Engineering Materials; Poona, Allied Book Stall.
- 8) Gurcharan Singh; Engineering Materials, Standard Publishers Distributors, New Delhi
- 9) A course in Civil Engineering by VB Sikka, published by SK Kataria and Sons Publishers, New Delhi

Section	Percentage of syllabus to be covered	Units to be covered	Type of assessment	Weightage of Marks	Pass Percentage
A	20%	Unit 1to 5	1 st Internal	40%	40% (Combined in internal & final assessment) with minimum 25% marks in final assessment)
B	20%	Unit 6 to 10	2 nd Internal		
C	60%	Unit 11 to 18	FINAL	60%	

1.6 ENVIRONMENTAL STUDIES

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2 - 1

RATIONALE

A diploma holder must have knowledge of different types of pollution caused due to industries and constructional activities so that he may help in balancing the ecosystem and controlling pollution by various control measures. He should also be aware of environmental laws related to the control of pollution. He should know how to manage the waste. Energy conservation is the need of hour. He should know the concept of energy management and its conservation.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

1. Comprehend the importance of ecosystem and sustainable development
2. Demonstrate interdisciplinary nature of environmental issues
3. Identify different types of environmental pollution and control measures.
4. Take corrective measures for the abatement of pollution.
5. Explain environmental legislation acts.
6. Demonstrate positive attitude towards judicious use of energy and environmental protection
7. Practice energy efficient techniques in day-to-day life and industrial processes.
8. Adopt cleaner productive technologies
9. Identify the role of non-conventional energy resources in environmental protection.
10. Analyze the impact of human activities on the environment

DETAILED CONTENTS

- 1. Introduction (4 hrs.)**
Basics of ecology, eco system- concept and sustainable development, Energy Resources-renewable and non-renewable - definition, advantages and disadvantages.
- 2. Air Pollution (7 hrs.)**
Sources of air pollution, Effect of air pollution on human health, plants and animals. Control of air pollution.
- 3. Water pollution (11 hrs.)**
Impurities in water, Causes of water pollution, Effect of water pollution on human health, Concept of DO, BOD, COD, Water treatment processes, water qualities standards for domestic use, control of water pollution.
- 4. Soil Pollution (9 hrs)**
Sources of soil pollution
Types of solid waste-Household, Industrial, Agricultural, Biomedical,

Effects of solid waste
Disposal of solid waste
E- Waste

5. Noise Pollution (4 hrs.)

Sources of noise pollution, Unit of noise, Effects of noise pollution, Acceptable noise levels, control of noise pollution

6. Environmental Legislation (10 Hrs)

Introduction to Water (Prevention and Control of Pollution) Act 1974, Introduction to Air (Prevention and Control of Pollution) Act 1981 and Environmental Protection Act 1986, Role of State Pollution Control Board and National Green Tribunal (NGT), Environmental Impact Assessment (EIA).

7. Impact of Energy Usage on Environment (6 Hrs)

Global Warming, Green House Effect, Depletion of Ozone Layer, Acid Rain. Recycling of Material, Concept of Green Buildings.

LIST OF PRACTICALS:

1. Determination of pH of drinking water
2. Determination of TDS in drinking water
3. Determination of TSS in drinking water
4. Determination of acidity in drinking water
5. Determination of pH of soil
6. To measure the noise level in classroom and industry.
7. To segregate the various types of solid waste in a locality.
8. To study the waste management plan of different solid waste
9. To study the effect of melting of floating ice in water due to global warming

INSTRUCTIONAL STRATEGY

In addition to theoretical instructions, different activities pertaining to Environmental Studies like expert lectures, seminars, visits etc. may also be organized.

MEANS OF ASSESSMENT

Assignments and quiz/class tests, mid-term and end-term written tests

RECOMMENDED BOOKS

1. Environmental and Pollution Awareness by Sharma BR; Satya Prakashan, New Delhi.
2. Environmental Protection Law and Policy in India by Thakur Kailash; Deep and Deep Publications, New Delhi.
3. Environmental Pollution by Dr. RK Khitoliya; S Chand Publishing, New Delhi
4. Environmental Science by Deswal and Deswal; Dhanpat Rai and Co. (P) Ltd. Delhi.
5. Engineering Chemistry by Jain and Jain; Dhanpat Rai and Co. (P) Ltd. Delhi.
6. Environmental Studies by Erach Bharucha; University Press (India) Private Ltd., Hyderabad.
7. Environmental Engineering and Management by Suresh K Dhamija; SK Kataria and Sons, New Delhi.

Section	Percentage of syllabus to be covered	Units to be covered	Type of assessment	Weightage of Marks	Pass Percentage
A	20%	Unit 1,2	1 st Internal	40%	40% (Combined in internal & final assessment) with minimum 25% marks in final assessment)
B	20%	Unit 3	2 nd Internal		
C	60%	Unit 4,5,6,7	FINAL	60%	

1.7 APPLIED SCIENCE AND MATHEMATICS

L T P
3 - -

RATIONALE

Applied Sciences and Mathematics are very essential to develop scientific temper, continued learning skills and appreciation of physical and chemical changes of concern in the field of Architecture. It is basic to all engineering and technology programmes to develop analytical approach and cognitive abilities in the students so that they are trained to make exact calculations, may be angular, areas and volumes and calculations of quantities of different items of building works. This course is also helpful in developing continued learning skills in the students. The course contains the knowledge of Algebra, mensuration, trigonometry, differential and integral calculus. Applied Physics contains units of measurements, force and motion, Acoustics of buildings and fundamentals of light.

Teachers while imparting instructions are expected to demonstrate various physical processes to clarify the concepts and principles involved in the course. They will also include examples of application of Mathematics as applied to engineering/ technology and architectural fields. The teachers should lay more stress on basic fundamentals and applications of applied sciences and mathematics by providing considerable amount of practice in problem-solving.

DETAILED CONTENTS (APPLIED PHYSICS)

1. Units of measurement in S.I system . Dimensions and use of dimensional analysis (3HRS)
2. Force and motion (9hrs)
Newton's laws, work and energy , forms of Energy and conservation of energy; stress , strain,
3. Spring mass system (8hrs)
Vibration of bodies ; amplitude , frequency and free and Forced vibrations , Resonant vibrations
4. Expansion of Solids (9hrs)
Thermal stresses; specific heat and heat capacity and concept of thermal time lag in buildings; laws of thermodynamics; Principles of heat engines and refrigeration Humidity and its control.
5. Acoustics (9hrs)

Acoustic of buildings and simple calculation of reverberation times; principles of acoustic modeling , sources of sound

6. Light as waves, solar energy, solar cells and green house effects; colour: primary colours, colour mixing. (9 hrs)

Radiant light flux, luminar intensity, illumination

7. Electrical nature of matter; molecular forces - cohesive and adhesive forces; application to water proofing and wetting. (6 hrs)

APPLIED MATHEMATICS

8. Algebra (7hrs)

Logarithms, laws of logarithms(without proof),use of logarithms to solve Problems of engineering nature.

Solution of three linear simultaneous equations by elimination. Binomial Theorem(without proof) for positive integral index(expansion and general term).

9. Mensuration(15hrs)

9.1 Mensuration of Plane figures:

Definition : Units of Measurement, Definition and formulae of perimeter and area etc. in connection with plane figures: rectangle, square, triangle, rhombus, circle,

9.2 Mensuration of Solids : Definition : Units : Volume : surface, including curved surface area, areas of solids : Rectangular or parallelopiped, Cubes, Cuboids, Cylinders and sphere (simple problems)

10. Trigonometry (12hrs)

Measurement of angles in degrees and radians and their conversions. Trigonometric ratios and their relations. Allied angles(without proof). Trigonometric tables and their use, trigonometric ratios of angles between 0 degree and 360degrees, addition and subtraction of angles in trigonometric ratios formulae and their applications (without proof). Transformation of product of sine and cosine to sum/difference and vice versa. simple problems on heights and distances

11. Differential Calculus (10hrs)

Meaning and scope of differentiation . concept to limits. Direct Differentiation of

x^n , $\sin x$, $\cos x$, $\tan x$, $\log_a x$, $\log_e x$. Differentiation of sum, product and quotient of functions.

12. Integral Calculus(8hrs)

Integration as inverse operation of differentiation. Simple integration by substitution method. Evaluation of definite integrals (simple problems) Applications such as area when limit are given

INSTRUCTIONAL STRATEGY

Teachers should lay emphasis on fundamentals of Sciences and Mathematics, with their relevance and applications in engineering and technology.

RECOMMENDED BOOKS

1. Applied Physics Vol. I, TTTI Publication Tata McGraw Hill, New Delhi
2. Basic Applied Physics by RK Gaur; Dhanpat Rai Publications, New Delhi
3. Concepts in Physics by HC Verma; Bharti Bhawan Ltd., New Delhi
4. Applied Mathematics Vol.I by SS Sabharwal and Others by Eagle Prakashan, Jalandhar
5. Engineering Mathematics Vol.I by Ishan Publishing House
6. Engineering Mathematics Vol.I by S Kohli and Others; IPH, Jalandhar
7. Engineering Mathematics by C Dass Chawla; Asian Publishers, New Delhi

Section	Percentage of syllabus to be covered	Units to be covered	Type of assessment	Weightage of Marks	Pass Percentage
A	20%	Unit 1,2,8	1 st Internal	40%	40%(Combined in internal & final assessment)with minimum 25% marks in final assessment)
B	20%	Unit 3,9	2 nd Internal		
C	60%	Unit 4 to 7 & 10 to 12	FINAL	60%	

1.8 INFORMATION TECHNOLOGY

L T P
- - 2

RATIONALE

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

Note:

Explanation of Introductory part should be demonstrated with practical work. Following topics may be explained in the laboratory along with the practical exercises. There will not be any theory examination.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

- Identify Computer hardware components, network components and peripherals.
- Explain the role of an operating System.
- Install system and application software.
- Explain the function of the system components including processor, motherboard and input-output devices.
- Use Word Processing software to prepare document.
- Use spreadsheet software to create workbooks and automate calculation.
- Use presentation software to create interactive presentation.
- Perform fundamental tasks common to most application software including print, save, edit, cut, copy, paste, format, spell and grammar check.
- Find and evaluate information on the Web.
- Install antivirus.
- Safeguard against online frauds, threats and crimes.

TOPICS TO BE EXPLAINED THROUGH DEMONSTRATION

1. Basic Concepts of IT and Its Application

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

2. Computer Hardware:

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

3. Software Concepts:

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

4. Internet Concepts:

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

LIST OF PRACTICAL EXERCISES

1. Given a PC, name its various components and peripherals. List their functions .
2. Installing various components of computer system and installing system software and application software
3. Installation of I/O devices, printers and installation of operating system viz. Windows/BOSS/ LINUX
4. Features of Windows as an operating system
 - Start
 - Shut down and restore
 - Creating and operating on the icons
 - Opening, closing and sizing the windows and working with windows interfacing elements (option buttons, checkbox, scroll etc.)
 - Using elementary job commands like – creating, saving, modifying, renaming, finding and deleting a file and folders
 - Changing settings like, date, time, colour (back ground and fore ground etc.)
 - Using short cuts
 - Using on line help

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

6. Spread Sheet Processing (MS Office/Open Office)
 - a) Starting excel, open worksheet, enter, edit, data, formulae to calculate values, format data, save worksheet, switching between different spread sheets
 - b) Menu commands:

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

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

- Editing a worksheet, copying, moving cells, pasting, inserting, deletion cells, rows, columns, find and replace text, numbers of cells, formatting worksheet, conditional formatting
- d) Creating a chart:
Working with chart types, changing data in chart, formatting a chart, use chart to analyze data
Using a list to organize data, sorting and filtering data in list
- e) Retrieve data with query:
Create a pivot table, customizing a pivot table. Statistical analysis of data
- f) Exchange data with other application:
Embedding objects, linking to other applications, import, export document.

7. PowerPoint Presentation (MS Office/Open Office)

- a) Introduction to PowerPoint
- How to start PowerPoint
 - Working environment: concept of toolbars, slide layout & templates.
 - Opening a new/existing presentation
 - Different views for viewing slides in a presentation: normal, slide sorter.
- b) Addition, deletion and saving of slides
- c) Insertion of multimedia elements
- Adding text boxes
 - Adding/importing pictures
 - Adding movies and sound
 - Adding tables and charts etc.
 - Adding organizational chart
 - Editing objects
 - Working with Clip Art
- d) Formatting slides
- Using slide master
 - Text formatting
 - Changing slide layout
 - Changing slide colour scheme
 - Changing background
 - Applying design template
- e) How to view the slide show?
- Viewing the presentation using slide navigator
 - Slide transition
 - Animation effects, timing, order etc.
- f) Use of Pack and Go Options.

8. Internet and its Applications

- a) Establishing an internet connection.
- b) Browsing and down loading of information from internet.
- c) Sending and receiving e-mail

- Creating a message
 - Creating an address book
 - Attaching a file with e-mail message
 - Receiving a message
 - Deleting a message
- d) Assigning IP Addresses to computers and use of domain names.

9. Functioning of Antivirus

- a) Installation and updation of an antivirus.
- b) How to scan and remove the virus.

INSTRUCTIONAL STRATEGY

Since this subject is practice oriented, the teacher should demonstrate the capabilities of computers to students while doing practical exercises. The students should be made familiar with computer parts, peripherals, connections and proficient in making use of MS Office/Open Office in addition to working on internet. The student should be made capable of working on computers independently.

RECOMMENDED BOOKS

1. Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
2. Computers Fundamentals Architecture and Organisation by B Ram, revised Edition, New Age International Publishers, New Delhi
3. Computers Today by SK Basandara, Galgotia publication Pvt Ltd. Daryaganj, New Delhi.
4. A First Course in Computer by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
5. Computer Fundamentals by PK Sinha; BPB Publication, New Delhi
6. Fundamentals of Information Technology by Leon and Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
7. Fundamentals of Information Technology by Vipin Arora, Eagle Parkashan, Jalandhar

1.9 BUILDING CONSTRUCTION – I

L T P
- - 4

RATIONALE

The aim is to develop an understanding of the behaviour and function of various components of buildings. For this it is essential that the students are taught the various components of building such as foundations, floors, super structure, joints, opening, roofs etc. The first year timber construction and RCC will be dealt with.

Teachers must supplement their lectures with models, audio-visuals and on site study of various building components.

For drawing work, stress must be laid on scale, dimensioning, lettering, and composition of the drawing.

At the end of the first year, the students should be able to draw a complete vertical section through a simple single storied flat roof building.

The subject teacher shall introduce the theory component of the topic to the students before drawing sheets are attempted by the students.

DETAILED CONTENTS

Note: The theoretical constructions should be imparted to the students along with building construction drawings

1. Masonry Construction
 - 1.1 Brick work (2 sheet)
 - Study of standard brick (FPS and MKS system) its dimensions
 - Brick moulding and manufacturing technique in a brick kiln
 - Specially formed bricks
 - 1.2 Brick work in Foundation (2 sheet)
Trenching concrete bedding and brick work in Section and Plan.
 - 1.3 Stone work (1 sheet)
Various types of stones used for masonry work with special reference to locally available stone. Exposure to cutting of stones and their finishing. Classification of stone masonry.
 - 1.4 DPC (1 sheet)
 - Sources of dampness and effects of dampness
 - Treatment of building components for effective damp proofing
 - 1.5 Brick work in super structure (Different Bonds) (4 sheets)

- 1.6 Openings in Walls (1 sheets)
Classification of Arches and Lintels (2 sheets)
- 1.7 Basement (2 sheets)

2. Joinery (3 sheets)
- Doors and windows frames – their fixing

3. Building hardware (sizes, applications) (2sheets)

- Tower bolts
- Hinges including concealed hinges
- Door springs
- Latches
- Fan light pivots
- Mortice lock
- Ventilator chains

4. Flooring (2 sheets)

- types of flooring and constituents (ground and upper flooring)
- different type of floor finishes.

Note: Minimum 20 sheets should be made

THIRD SEMESTER

3.1 HISTORY OF ARCHITECTURE - I

L T P
3 - -

RATIONALE

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 political, physical, social, economical and technological change affect the architecture, materials and construction techniques. The course covers broad topics like: pre-historic architecture, important civilizations, (Indian, Egyptian, Greek and Roman), medieval architecture in Europe, and temple architecture and Budhish architecture in India.

The teacher should try to create interest among the students for this course by organizing site visits to the local old monuments. Audio-visual aids should also be used to explain various architectural developments. While imparting instructions, teacher should stress upon the context of form and space, construction methods structural systems and materials. The teacher should motivate the students to take general reference for form, drawings structural solutions and materials from the history, while designing their project.

DETAILED CONTENTS

1. Pre Historical Architecture and Introduction to History of Architecture (6 Hrs)
 - 1.1 Importance of history to understand the Architecture.
 - 1.2 Examples of Early shelters, Stone Age, Tumuli, etc. as expression of man's physical and spiritual needs.
 - 1.3 Determinants of built form – geo physical, societal, technological etc. (Early caves, timber huts, stone houses etc).**
2. Western Civilization (8 Hrs)
 - 2.1 Egyptian Civilization Concept of the Royal Necropolis, locational context and architectural characteristics of public buildings, e.g. Mastabas (master of sakara) pyramids and temples (rock – cut and structural) – one example of each type to be chosen.
 - 2.2 Mesopotamian Civilization the urban context and architecture of public buildings (Ziggurats and palaces) - one example of each.
3. Greek Civilization (8 hrs)
 - 3.1 Greek towns, location and characteristics of typical civic spaces such as Agora, Acropolis, Theatres etc.

- 3.2 Significant characteristics of Greek Architecture such as Materials, construction systems, system of proportioning, Greek orders, architecture of Greek temples – Parthenon, Athens.
4. Roman Civilization (8 hrs)
 - 4.1 Significant characteristics of Roman Architecture. Concept of monumentality, materials and construction systems, Roman orders.
 - 4.2 Building analysis – Colosseum, Thermal, Basilicas, Pantheon Rome, The Roman villa – their form, scale and constructional/structural systems.
5. Indian Civilization (10 Hrs)
 - 5.1 Indus Valley Civilization: Form of the Harappan city, location and role of public buildings.
 - 5.2 Architecture of the typical Harappan dwelling, Great Granary and Great Bath.
 - 5.3 The Vedic Village, building typology and construction.
6. Buddhist Architecture in India (8 Hrs)
 - 6.1 Buddhist settlements in India, factors in selection of sites of Buddhist architecture.
 - 6.2 Building typology – stupas, Chaityas and Viharas - suitable examples from each; geographical context to illustrate differences in form, construction methods and ornamentation.

Note:

While imparting instructions wherever possible, in this subject, the teachers should organize site visits to the old monuments and buildings with extra-ordinary architectural features. Experts/Guides should be invited to deliver lectures on the relevant themes in order to generate interest in the students. Audio-visual materials available on the subject, in the country and abroad, be procured and presented to the students from time to time to enrich the quality of classroom instructions. Special architectural features of some old/ historical famous Indian and International buildings may be presented to the students as case studies. Students may be encouraged to prepare case studies of at least one famous old/historical building. The teachers and students may visit web sites, relevant to the history of architecture.

INSTRUCTIONAL STRATEGY

While imparting instructions in this subject, the teachers should organize site visits to the old monuments and buildings with extra-ordinary architectural features. Experts/Guides from state and national Archaeology departments may be invited to deliver lectures on the relevant themes in order to generate interest in the students. Audio-visual material available on the subject, in the country and abroad, may be procured and presented to the students from time to time to enrich

the quality of classroom institutions. Special architectural features of some old/historical famous Indian and International buildings may be presented to the students as case studies. Students may be encouraged to prepare case studies of at least one famous old/historical building. Web sites, relevant to the history of architecture may be visited by the teachers and students.

RECOMMENDED BOOKS

1. History of Architecture by Sir Banister Fletcher, Architectural Press, Oxford, UK
2. Indian Architecture (Hindu Period) by Percy Brown, Read Books Design, 2010
3. Indian Architecture (Hindu and Buddhist Period) by Satish Grover, Vikas Publishers, New Delhi
4. Encyclopedia of Architecture, (ed) Dennis Sharp, Mc. Graw Hiss Publishers, New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	06	12
2	08	18
3	08	18
4	08	16
5	10	20
6	08	16
Total	48	100

3.2 ARCHITECTURAL DRAWING-III

L T P
- - 6

RATIONALE

The students of diploma holder in Architectural Assistantship should have sufficient skills to draw perspective drawings. Besides this they should also be introduced to sciography in plans, elevations. They should be given sufficient exercises in rendering of perspective drawings, so that they are able to perform well in the field/industry.

DETAILED CONTENTS

1. Perspective
 - Introduction to basic terminology (picture plane. Vanishing point. Station point, cone of vision)
 - Introduction to types- 1 point. 2 point (vanishing point method)
2. Simple Perceptive
 - Geometrical shapes incorporating all views: cone, cubes, cylinders etc.
 - Birds eye view
 - Normal eye view
 - Worms eye view to clarify concepts (02 sheets)
 - 2 point perspective of a given plan (vanishing point method) (02 sheets)
 - 1 point perspective of a given plan (drawing room and kitchen) (02 sheets)
3. Introduction to Sciography (in plans and Elevations)
 - Basic Geometrical shapes (cube, cylinder, cone, etc). (01 sheet)
 - Difference between shade and shadow on basic geometrical shapes (01 sheet)
 - Shade and shadow of a basic building
 - (a) Drawing (Plan and elevation) supplied by teacher (01 sheet)
4. Introduction to Rendering
 - Demo by teacher in different mediums-colour pencils, crayon. Colour wash, markers etc.
 - Rendering techniques in pen and inks/ Different colour mediums (01 sheets)
 - Rendering of a given perspective (01 sheet)

Total no. of sheets = 11

INSTRUCTIONAL STRATEGY

This subject is one of the most important, fundamental and practical subject for diploma in Architectural Assistantship. Teachers should lay emphasis on practical work by the students and

give repetitive exercises in free hand sketching, colouring and rendering like sketching, shades and shadows, lettering, printing forms and other important component of architecture. Teachers should lay stress upon perfect line work, properties, dimensioning, lettering and printing by the students in the classroom. Students should maintain portfolio of the work done by them throughout the session. Viva voce examination shall be conducted by the teacher on completion of each assignment

RECOMMENDED BOOKS

1. Engineering Drawing by P.S Gill; Publisher S K Kataria and Sons, Ludhiana
2. Building Construction – by Sikka; Publisher Tata McGraw Hill Publisher, New Delhi
3. Rendering with Pen and ink by Arthur L. Guptill, Susan E. Meyer

3.3 SURVEYING

L T P
2 - 3

RATIONALE

The important functions of a diploma holder in Architecture Assistantship includes the jobs of detailed surveying, plotting of survey data, preparation of survey maps and setting out works

While framing the curriculum for the subject of surveying, stress has been given to the development of the skill in each type of survey like chain surveying, compass surveying and leveling that the diploma holder in Architectural Assistantship will normally be called upon to perform. Plane table surveying, contouring, theodolite surveying, curves and use of minor instruments have also been included in this subject.

Field work should be a selected one so that student can check his work and have an idea of the extent of error in the work done by him. As far as possible, the surveys done should be got plotted, as this will also reveal errors in the work and develop skill in plotting.

DETAILED CONTENTS THEORY

Part – A:

1. Introduction: (03 hrs)
 - Basic principles and types of surveying and types of surveying
 - Concept of surveying, purpose of surveying, measurements-linear and angular, units of measurements
 - Instruments used for taking these measurement, classification of survey based on instruments
 - System of conversion of land measurements from traditional revenue maps/records to MKS.
2. Chain surveying: (04 hrs)
 - Purpose of chain surveying, principles of chain surveying
 - Errors in chain surveying
 - Corrections to chain length, simple related problems.
3. Compass surveying: (06 hrs.)
 - Purpose of compass surveying. Construction and working of prismatic compass, use of prismatic compass: Setting and taking observations
 - Concept of:
 - a) Meridian - Magnetic and true
 - b) Bearing - Magnetic, True and Arbitrary
 - c) Whole circle bearing and reduced bearing
 - d) Fore and back bearing

- Local Attraction-causes, Detection & precautions against local attraction

4. Leveling: (06 hrs)

- Purpose and concept of levelling, reduced level and bench marks
- Construction of Dumpy level
- Concepts of line of collimation, axis of the bubble tube, axis of the telescope and vertical axis
- Temporary adjustment: setting up and leveling
- Concept of back sight, foresight, intermediate sight, station change point, to determine reduced levels
- Level book and reduction of levels by
- Height of instrument method and
- Rise and fall method,
- Arithmetic checks, problems on reduction of levels,
- Computations of Areas of regular figure and irregular figure. Simpson rule

Part – B

5. Plane Table Surveying: (06 hrs)

5.1 Purpose of plane table surveying, equipment used in plane table survey:

- (a) Plane table and its accessories

5.2 Setting of a plane table:

- (a) Centering
(b) Leveling
(c) Orientation

5.3 Methods of plane table surveying

- (a) Radiation,
(b) Intersection
(c) Traversing

5.4. Two Point Problem

6. Contouring: (02 hrs)

Concept of contours, contour interval and horizontal equivalent.

7. Instruments: (02 hrs)

Demo and uses of : Theodolite

8. Use of Modern Surveying equipment (Auto Level, Micro-optic Theodolite, Total station, (03 hrs)

NOTE:

- a) For various surveying equipment relevant practices should be followed
- b) No sketch of the instruments may be asked in the examination

PRACTICAL EXERCISES

I. Chain surveying:

- i)
 - a) Ranging a line
 - b) Chaining a line and recording in the field work
 - c) Testing and adjustment of chain
 - d) Taking offsets - perpendicular and oblique (with a tape only)
 - e) Setting out right angle with a tape
- ii)
 - a) Chaining of a line involving reciprocal ranging
 - b) Taking off sets and setting out right angles, with cross staff and Indian optical square
- iii)
 - a) Demarcation of land at site and cross checking the dimension/ diagrams/levels/set-backs etc of a building lay out.

II. Compass Surveying:

- i)
 - a) Study of prismatic compass
 - b) Setting the compass and taking observations
 - c) Measuring angles between the lines meeting at a point
 - d) Plotting of readings and applying corrections.

III. Leveling:

- i)
 - a) Study of dumpy level and levelling staff (single piece and folding)
 - b) Temporary adjustments of a Dumpy level
 - c) Taking staff readings on different stations from the single setting and finding differences of level between them
- ii)
 - a) Study of Tilting Level (IOP) level
 - b) Its temporary adjustments
 - c) Taking staff readings on different stations from the single setting and finding differences of level between them
- iii) Exercise of finding R.L's of different components of an existing building e.g. Plinth, chhajja, ceiling, approach road, boundary wall etc w.r.t a given bench mark.

- IV. Plane Table Surveying:
- i) a) Setting the plane table
 - b) Plotting a few points by radiation method

 - c) Orientation by
 - Trough compass
 - Back sighting
 - d) Plotting a few points by intersection method

 - (ii) Two point problem
 - (iii) Computing of areas by planimeter
- V. Demonstration of digital instruments like Autolevel, digital Planimeter, micro-optic theodolite, total station, EDM instruments.

INSTRUCTIONAL STRATEGY

This is highly practice-oriented course. While imparting theoretical instructions, teachers are expected to demonstrate the use of various instruments in surveying, stress should be laid on correct use of various instruments so as to avoid/minimize errors during surveying. It is further recommended that more emphasis should be laid in conducting practical work by individual students

RECOMMENDED BOOKS

1. "Surveying"; Narinder Singh; New Delhi, Tata McGraw Hill Publishing Co Ltd.
2. "Text Book of Surveying"; Hussain, SK and Nagraj, MS; New Delhi, S Chand and Co Ltd.
3. "A Text Book Surveying and Levelling"; Deshpande, RS; Poona, United Book Corporation
4. "A Text Book of Surveying" Kocher, CL; Ludhiana, Katson Publishing House
5. "Surveying and Leveling, Kanetkar, TP and Kulkarni, SV., ", Poona, AVG Parkashan
6. "Surveying and Leveling-Vol.2" Kanetkar, TP; and Kulkarni, SV; Poona, AVG Prakashan
7. "Surveying and Leveling - Vol. 2", Punima, BC; Delhi Standard Publishers Distributors, Delhi
8. "A Text Book of Surveying Vol. 2", Shahai, PB; Oxford and IBH Publishing Co.

9. Fundamentals of Surveying by Roy SK; Prentice Hall of India (P) Ltd., New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	03	10
2	04	16
3	06	20
4	06	20
5	06	20
6	02	10
7	02	02
8	03	02
Total	32	100

3.4 CLIMATOLOGY

L T 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.

DETAILED CONTENTS

1. General Introduction (08 hrs)
 - Introduction to Climatology
 - Movement of earth around sun.
 - Different elements of climate like: Wind, temperature, humidity, precipitation and pressure.
 - Different climatic zones
 - Orientation of building with respect to above mentioned elements of climate
 - Effect of climate on man and shelter.

2. Relation of Climate and comfort (06 hrs)
 - Macro-micro climatic effects
 - Concept of comfort zone and bio-climatic chart
 - Climatic evaluation by season

3. Sun Control and shading devices (without calculations) (10 hrs)
 - Solar Chart (sun path diagram)
 - Orientation for sun
 - Internal and external sun protection devices
 - Natural lighting
 - Introduction and objectives of Solar Passive Design
 - Passive solar heating and cooling

4. Wind control (04 hrs)
 - Orientation with respect to wind
 - Wind protection devices

5. Use of building materials with respect to climate (06 hrs)
 - Concrete
 - Brick
 - Glass
 - Plastics
 - Stone
 - Insulating material

6. Criteria for site selection (04 hrs)

7. Environment and Ecology (10 hrs)
 - Basic elements of ecology
 - Concepts of natural cycles in Eco-system
 - Source of noise and air pollution, their effects and controls
 - Use of landscape elements for micro and macro climate control
 - Introduction to climate change, principle causes and effects- methods of mitigating climate change.

STUDY REPORT AS AN ASSIGNMENT

A study report on the effect of climate and environment on contemporary buildings such as residential, commercial and public buildings should be prepared by the students. The study should emphasize on orientation of court-yards, windows, jallies, chajjas, landscape and various other sun and wind control devices.

INSTRUCTIONAL STRATEGY

Audio-video should be used for explaining various component of climatology and environment. Teachers are expected to impart instructions of the above course keeping in view the effect of above course in the design of buildings. The course contents should be taught with reference to tropical climates.

RECOMMENDED BOOKS

1. Environmental Engineering and Management by Santosh Sarkar
2. Tropical Architecture by Wolfgang Lauber; Publisher: Prestel Publishing, ISBN: 3791331353, ISBN-13:
3. Tropical Architecture by C.P. Kukreja; Publisher: McGraw-Hill, New Delhi
4. Ecology: The Link Between The Natural And The Social Sciences by EP Odem; Oxford and IBH Publishing Co. New. Delhi.
5. Design With Climate by Arvind Krishan, Publisher, Tata McGraw-Hill, New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	08	18
2	06	14
3	10	20
4	04	08
5	06	12
6	04	08
7	10	20
Total	48	100

3.5 BUILDING SERVICES

L T P
4 - -

RATIONALE

Students of Architectural Assistantship at diploma level are expected to prepare working drawings for fixing of various fittings and fixtures, water supply and sanitary installations. Also students should be well conversant with electrical and mechanical installations in the buildings. For this purpose, it is essential that the students are taught various aspects of building services like: sanitation, water supply, electrical layout and air conditioning. Therefore, the subject of building services is very important for students undergoing diploma courses in Architectural Assistantship.

Teachers while imparting instructions are expected to show various fixtures and fittings, water supply and sanitary installations at work sites and by making use of literature, models, chart and other audio-visual aids so that students are able to comprehend the hardware used. Teacher should specifically point out problem areas and other environmental considerations while teaching this subject.

DETAILED CONTENTS

1. Water Supply (12 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 (16 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 (08 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 (10 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

INSTRUCTIONAL STRATEGY

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.

RECOMMENDED BOOKS

1. Handbook of Designing and Installation of Services in Building Complex – High-rise Buildings by VK Jain, Publication. Khanna Publishers, New Delhi Khanna Publishers, New Delhi.
2. Water and Waste Water Technology by Mark J. Hammer and Mark J. Hammer(Jr.); Prentice Hall of India (P) Ltd., New Delhi – 110 001
3. A Text Book of Environmental Science by Subramanian; Narora Publicity (Pvt.) Ltd., New Delhi – 110 002
4. National Building Code

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	12	18
2	16	22
3	08	12
4	10	18
5	08	12
6	04	6
7	04	6
8	02	6
Total	64	100

3.6 BUILDING CONSTRUCTION – II

L T P
- - 6

RATIONALE

Students of Architectural Assistantship at diploma level are supposed to prepare structural drawings, working drawings and detailed drawings to 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 foundations, super structure, openings, roofs, staircases, floorings 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 to 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 proper toning. Dimensioning, specification writing and printing and composition of drawing work. Students should be asked to maintain a sketch book for recording the observations from site visit. While conducting viva, teachers should ask specific questions on various topics.

DETAILED CONTENTS

1. Flooring
 - Types of flooring and constituents (ground and upper flooring)
 - Different types of floor finishes (3 sheets)

2. Roof and roof coverings
 - Pitched roof and terms related to roof
 - Types of timber roofs
 - Lean to roof
 - Double collar roof
 - King post and queen post trusses
 1. Drawing details of fixing and layout of AC, GI sheets, slates, tiles and locally available materials. (1 sheet)
 2. Drawing of king post and queen post trusses along with their constructional details (2 sheets)

3. Staircases and ramps
 - Definition and types of staircases as per nomenclature
 - Staircases of different materials
 - Relation between different components
 - Definitions, purpose, slopes, types of ramps and moving walks
 3. Drawing a dog leg wooden staircase
 4. RCC staircase cast-in-situ and also precast (3 sheets)

4. Expansion joints
 - Expansion joint in walls and roof, framed structure (1 sheet)
5. Form work and steel work
 - Definitions of form work, shuttering and centring
 - Form work for different structural members
 - Bending of bars, formation of hooks and cranks

Total Number of Drawings: 09

INSTRUCTIONAL STRATEGY

This subject is of practical in nature. While imparting instruction for preparation of various drawings of different types of buildings and their components, the teacher should organize demonstration and field/site visits to show various stages, sizes and scales of operations involved in building construction. The teacher should involve the theoretical aspects of the instructions to the students before drawings are attempted by the students. Students may prepare the port-folio of the work done by them throughout the session. Teacher may also organize viva-voce after each drawing assignment so as to test the level of understanding of the students about underlying concepts, principles, and procedures.

RECOMMENDED BOOKS

1. Building Construction by WB Mackay; Khanna Publisher, New Delhi
2. Building Construction by SP Bindra and SP Arora; ; publisher Dhanpat Rai & Co. New Delhi
3. Building Construction by BC Punmia; Publisher Laxmi Publication, New Delhi
4. Building Construction by Sushil Kumar; Standard Publisher, New Delhi
5. Construction of Buildings (Vol I and II) by Barry
6. Building Construction by VB Sikka; Publisher Tata McGraw Hill Publisher, New Delhi
7. Building Construction by Rangwala; Publisher Charotar Publishing House Pvt. Ltd., New Delhi

3.7 ARCHITECTURAL DESIGN - II

L T P

- - 6

RATIONALE

Diploma holders in Architectural Assistantship find employment with private architects and also majority of them go for self-employment. Therefore, they are required to develop aptitude/skills to design residential, commercial and other public buildings. Teachers while imparting instructions/giving assignments to students are expecting to teach various elements of design like form function, balance, light of shadow, shape, plane, volume, line, rhythm, proportions, textures and other such related elements. Teachers are also expected to show various types of designs of small building to develop and appreciation for this subject. Teachers should also motivate students to maintain sketch book/portfolio of all the assignments given to the students.

DETAILED CONTENTS

1. Study of spaces and layout of furniture for various activities in small structures comprising public utilities like Fuel Station, Milk Bar, Florist Kiosk and Guard House. The study is to be presented through plans, elevations, sketches etc.
2. Introduction of Structure Systems (Briefly): Design of a single storey structure such as weekend cottage, milk bar etc.
Drawings to be produced:
 - Site plan
 - Plans
 - Elevations
 - Sections
 - Views
 - Block Model**(Minimum two projects to be done).**
3. Time Problem: Plan showing furniture layout and section through a given mono-functional space such as a Café, classroom in a nursery school, parking lot etc.

INSTRUCTIONAL STRATEGY

This is one of the most important practical oriented subject for diploma in architectural assistantship. While imparting instruction, special visits may be arranged to demonstrate and explain important architectural features of different types of residential, commercial and public buildings. Practicing architects may be invited from time to time to present case studies and to deliver expert lectures on important elements like form, function, balance, light of shadow, shape, plane, volume, line, rhythm, proportions, textures and other such element appropriate to various designs. Teacher may present some of the already completed design works of practicing architects to the students and explain the important features and elements. Audio-visual material available in this field may be procured and presented to the students from time to time. Students should be encouraged

to visit relevant web-sites and teachers should develop the design problems/assignments which can be taken up by the students using relevant and appropriate software. Students should be given group and independent design/drawing assignments and they should also maintain sketch book/portfolio of all the assignments given to them throughout the session. Teachers may conduct viva-voce on completion of each assignment. Students may present seminars towards the end of the session.

RECOMMENDED BOOKS

1. Time Saver Standards for Building Types by Joseph De Chiara and John Callendera; Publisher Tata McGraw Hill Publisher, New Delhi
2. Architects Data by Neufert; Publisher Blackwell Publishing Ltd. 9600 Garsington Road, Oxford, OX4 2DQ, UK ..
3. Space, Time and Order by DK Ching; Publisher John Wiley & Sons, Wiley
4. Architectural Aesthetics by Sangeet Sharma, Abhishek Publication, 57-59, Sector 17, Chandigarh

SOFT SKILLS – I

L T P
- - 2

RATIONALE

The present day world requires professionals who are not only well qualified and competent but also possess good communication skills. The diploma students not only need to possess subject related knowledge but also soft skills to get good jobs or to rise steadily at their work place. The objective of this subject is to prepare students for employability in job market.

LEARNING OUTCOMES

After undergoing this course, the students will be able to:

1. Identify components of effective verbal communication
2. Prepare a report
3. Learn the techniques of enhancing memory
4. Set goals for overall personality development
5. Understand the concept of quality and its implementation in an organisation.

DETAILED CONTENTS

- Soft Skills - Concept and Importance
- Communication Skills- Improving verbal communication
- Report Writing
- Method to enhance memory and concentration
- Component of overall personality- Dressing sense/etiquettes/body language etc.

In addition, the students must participate in the following activities to be organized in the institute.

- Sports
- NCC/NSS
- Camp – Blood donation
- Cultural Event

Note: Extension Lectures by experts may be organized. There will be no examination for this subject.

FOURTH SEMESTER

4.1 HISTORY OF ARCHITECTURE – II

L T P
3 - -

RATIONALE

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 political, physical, social, economical and technological change affect the architecture, materials and construction techniques. The course covers broad topics like: pre-historic architecture, important civilizations, (Indian, Egyptian, Greek and Roman), medieval architecture in Europe, and temple architecture and Budhish architecture in India.

The teacher should try to create interest among the students for this course by organizing site visits to the local old monuments. Audio-visual aids should also be used to explain various architectural developments. While imparting instructions, teacher should stress upon the context of form and space, construction methods structural systems and materials. The teacher should motivate the students to take general reference for form, drawings structural solutions and materials from the history, while designing their project.

DETAILED CONTENTS

1. Temple Architecture in India. (20 hrs)
 - Evolution of temple and its various parts
 - Dravidian style (Southern) General characteristics, planning, motifs and treatment of different parts, construction methods and materials (e.g. shore temple at Mahabalipuram, Madurai Temple.)

Indo Aryan Temple

 - Lingaraja Temple at Bhubhaneshwar, Kandariya Mahadeo at Khajuraho, Sun Temple at Modhera; These examples must be studied with reference to:
Architectural form, planning components, construction methods, materials, motifs (ornamentation)

Jain Temple

 - Dilwara Temple at Mount Abu, Ranakpur Temple. General architectural characteristics, construction methods, materials and ornamentation.
2. Early Christian Architecture (04 hrs)
 - Development of church plan (Basilican), construction methods and general architectural characteristics of St. Peters, Rome
3. Byzantine Architecture (04 hrs)
 - Centralized plans and construction methods for dome of St. Sophia Church)

4. Romanesque Architecture (04 hrs)
 - General architectural characteristics, materials and construction methods for the Pisa group of buildings.
5. Gothic Architecture (06 hrs)
 - Main visual and construction vocabulary of Gothic Arch at Notre Dame Paris, and Reims Cathedral)
6. Renaissance Architecture (10 hrs)
 - Early Renaissance Architecture. General architectural characteristics (Florence cathedral)
 - Late Renaissance architecture. General characteristics and Role of Michael Angelo & Palladio (eg. St. Peter's Rome).

INSTRUCTIONAL STRATEGY

The subject may be taught through audiovisual aids, slides, PowerPoint presentations so as to explain salient architecture features and techniques. Emphasis must be laid on freehand drawing and each student should maintain a sketchbook.

RECOMMENDED BOOKS

1. Urban Pattern: - Arthur B, Gallion and B Fischer, Publisher McGraw Hill Book, New Delhi
2. History Builds the Town:- Arthur Kohn; Khanna Publisher, New Delhi
3. A history of Architecture: Settings and Rituals-Spiro Kostof; Oxford University Press *UK* -
4. Town Building in History:-Hirons; Vikas Publishing House Pvt., New Delhi
5. World Architecture:- Michael Raeburn, LBS Ltd. Faraday Close Durrington Worthing West Sussex
6. Internet Sources/Various search engines may also be used for additional information on some topics.
7. History of Architecture:- Sir Banister Fletcher, Vikas Publishing House, New Delhi
8. History of Architecture:- Satish Grover(Hindu), Publisher Roli Books(P) Ltd. Delhi
9. History of Architecture:-Percy Brown; Publisher, Taraporevala Sons, New Delhi
10. Indian Architecture (Hindu and Buddhist):- Percy Brown

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	20	30
2	4	10
3	4	10
4	4	10
5	6	15
6	10	25
Total	48	100

4.2 STRUCTURE MECHANICS

L T P
5 - -

RATIONALE

This is a fundamental course. Which covers principles of Applied Mechanics and Strength of Materials. The course covers force systems, Centroid and Moment of Inertia, Stress and Strain, Shear force and Bending moment calculations/diagrams and Bending Stresses. After going through this course the student shall be able to appreciate the behavior of different structural elements.

DETAILED CONTENTS

1. Force system and Equilibrium (12 hrs)
 - 1.1 Force: Definition, effect, characteristics, representation and types of forces
 - 1.2 Force Systems: Coplanar and Non coplanar force systems
 - 1.3 Types of coplanar Forces: Collinear, Concurrent, Parallel, Non concurrent and Non parallel.
 - 1.4 Resultant force and components of a force
 - 1.5 Laws of forces: Parallelogram, Triangle and polygon Laws of forces
 - 1.6 Free Body Diagram, Lamis theorem (No proof)
 - 1.7 Calculation of resultant of coplanar force systems
 - 1.8 Concept of Moment, Characteristics of moment, resultant moment, Varignon's theorem (No proof)
 - 1.9 Concept of couple, moment of a couple
 - 1.10 Equilibrium of rigid bodies

2. Centroid and Moment of Inertia (14 hrs)
 - 2.1 Definition of centre of Gravity and Centroid
 - 2.2 Centroid by method of moments of areas for square, rectangular, triangular, L-shape, T-shape and I shape cross- sections.
 - 2.3 Moments of Inertia by methods of moments and Radius of Gyration.
 - 2.4 Parallel axis theorem (no derivation)
 - 2.5 Moment of Inertia of rectangular section.
 - 2.6 Moment of inertia of a Triangular section (no derivation)

- 2.7 Moment of Inertia of a Circular section.
- 2.8 Perpendicular Axis Theorem (no derivation)
- 2.9 Numerical on moment of inertia of Rectangular, Triangular and Circular laminas only.
- 3. Stress and Strain (06 hrs)
 - 3.1 Elasticity, Elastic limit
 - 3.2 Definition of stress and strain
 - 3.3 Types of stress and strain
 - 3.4 Stress strain curve for mild steel
 - 3.5 Hook's Law (Numerical)
- 4. Shear Force and Bending Moment (26 hrs)
 - 4.1 Types of loads- Dead load, Live load, snow, wind and seismic loads as per IS: 875
 - 4.2 Types of loading: Point load, Uniformly distributed load and uniformly varying load.
 - 4.3 Types of Supports: Hinged, fixed supports, types of reactions provided by each type of support.
 - 4.4 Types of Beams: Simply supported, cantilever, overhanging and continuous beams (description only)
 - 4.5 Concept of bending moment and shear force.
 - 4.6 Bending moment and shear force diagrams for simply supported, cantilever and over hanging beams subjected to point loads and uniformly distributed loads only
 - 4.7 Calculation of location and magnitude of Max Bending moment and point of contraflexure
- 5. Bending stresses in Beams (14 hrs)
 - 5.1 Introduction: Tension, compression
 - 5.2 Simple Bending and assumption of Simple Bending Theory.
 - 5.3 Position of Neutral Axis.

- 5.4 Section Modulus. Moment of Resistance. Application of flexure equation ($M/I = f/y = E/R$) (no derivation)
 - 5.5 Maximum and permissible bending stresses.
6. Analysis of Perfect Frames (8 hrs)
- 6.1 Types of pin jointed frames. Assumptions in computing the forces in members of a perfect frame. Analysis of perfect frames by method of joints.

INSTRUCTIONAL STRATEGY

This subject is introduced so that diploma holder in Architectural Assistantship may appreciate the concepts and principles of structural design of various elements of building and are able to apply the knowledge gained through the subject for the design of simple and small components. Teacher should give simple exercises involving the applications of various concepts and principles being taught in the subject. Efforts should be made to prepare tutorial sheets on various topics and students should be encouraged/guided to solve the tutorial problems independently. Teacher may conduct weekly small quiz sessions to know the students' level of understanding and if need be teacher may reinforce the concepts and principles related to structural behaviour of elements/members of building components.

RECOMMENDED BOOKS

1. Structure Mechanics for Architects – Prof. Harbhajan Singh, Pub. Abhishek Publications, Chandigarh
2. Mechanics of Solids- DK Singh-Galgotia Publications Pvt. Ltd., New Delhi.
3. Fundamentals of Applied Mechanics- AS Sarao Victor Gambhir Gaurav Agrawal. By Satya Prakashan New Delhi.
4. Structural Mechanics-VS Prasad-Golgotia Publication Pvt. Ltd., New Delhi.
5. Engineering Mechanics and strength of Materials-Dr RK Bansal –Laxmi Publications Pvt. Ltd., New Delhi.
6. A text book of Engineering Mechanics- RK Rajput-Dhanpat Rai Publications Pvt. Ltd., New Delhi
7. Introduction to structural Mechanics- PS Smith-Macmillan Press Ltd., (UK).
8. Applied strength of Materials-Alfred Jensen and Harry Mcgraw- Hill Book Company London.
9. Theory of Structures by Rajeev Kumar; Satya Prakashan, New Delhi.
10. Structural Analysis (Vo. 1 & 2) by SS Bhavikatti; Vikas Publishing House Pvt. Ltd., New Delhi – 110 014
11. Computational structured Machines by S. Rajasekran & G.Sankar Subramanian; Prentice Hall of India (P) Ltd., New Delhi – 110 001

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	12	16
2	14	18
3	06	08
4	26	30
5	14	18
6	08	10
Total	80	100

4.3 BUILDING BYE-LAWS

L T P
3 - -

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.

Teachers should refer to local bye-laws/building bye-laws while teaching this subject.

DETAILED CONTENTS

1. Need of building byelaws for urban development. (03 hrs)
2. Basic Terminology (06 hrs)
3. Factors affecting planning of byelaws: (06 hrs)
 - Light and ventilation
 - Mass
 - Volume
 - Open space
 - Skyline
 - Setbacks.
 - Parking and Fire Safety
 - Floor Area Ratio & Floor space index
4. Bye laws (06 hrs)
 - Study Building Bye-laws of local development authorities
 - Introduction to National Building Code.
5. Zoning (06 hrs)
 - Concept of zoning
 - Objectives of zoning
 - Types of zoning
6. Case Study of existing residential and commercial building with respect to implementation of local Bye laws (04 hrs)
7. Study of various Performas to be used (03 hrs)

8. BIS and CPWD By-laws/standards for removing Architectural barriers for persons with disabilities (PWDs) (04 hrs)
9. Introduction to earthquake resistant regulations, Code provisions (IS-1893), seismic zoning (04 hrs)
10. Preparation of one set of municipal drawing of a residential building already designed in A.D. showing all services along with performas. (06 hrs)

INSTRUCTIONAL STRATEGY

This is a practical oriented subject. The teacher should make efforts to procure local bye-laws/building bye-laws and refer them to the students while imparting instructions in the class room. The relevant theory/instructions should be dovetailed with the design/ drawing exercises. Experts working in the Municipal Corporations/Municipal Committees/ State Public Works Department/Consultants/Professional Architects may be invited to present case studies to the students. Students may be taken to some typical sites where the municipal drawings are maintained to demonstrate to them the real life applicability and importance of the subject. Some real life municipal drawings may also be presented to the students in the classroom. The students should maintain portfolio of the work done by them throughout the session. The teachers may conduct viva voce on completion of each assignment. The students may be given group and independent assignments.

RECOMMENDED BOOKS

1. Architect's Hand Book by Charanjit Shah; S Shah Publisher: New Delhi
2. PUDA Bye Laws; Publisher Mc Graw Hill Book, New Delhi
3. N.B.C.; Publisher. Frank J Catanzaro Publishing
4. Local Bodies Legislation; Allied Publishers, New Delhi
5. Chandigarh Bye laws; Charotar Publishing House Pvt. Ltd., New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	03	06
2	06	12
3	06	14
4	06	14
5	06	12
6	04	08
7	03	06
8	04	08
9	04	08
10	06	12
Total	48	100

4.4 WORKING DRAWING - I

L T P
- - 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.

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.

DETAILED CONTENTS

1. Preparation of working drawings for a simple single storeyed residential building:

1.1 Site Plan

Preparing site plan on a suitable scale with complete dimensioning showing plot area, covered/built-up portion within the site, Approach road, side roads, adjoining buildings/features, boundary wall with gates layout of sewage pipes, water supply pipes, rain-water pipes. (01 sheet)

1.2 Preparation of foundation layout plan with benchmark, section details of foundations for brick external wall, brick internal wall, brick partition wall, brick toe wall, brick boundary wall and R.C.C Column. (02 sheet)

1.3 Ground Floor Plan

Preparation of Ground Floor plan with dimensions and specifications of various building components, schedule of joinery i.e. doors, window ventilators etc. along with showing the layout of sewage pipes, water supply pipes, Rain water pipe. (01 sheet)

1.4 Terrace Plan:

Preparation of terrace plan with the rain water disposal details and overhead water tank (Tile Terrace/Gola/Coba etc) (01 sheet)

1.5 Section:

Cross and longitudinal sections representing relationship with plans and elevation showing all heights, specifications, cill/lintel details etc. (01 sheet)

1.6 Elevations:

Front and rear elevations showing all the levels on faced to relate it to plan and section (01 sheet)

1.7 Details of:

-Toilet (Plan, Elevations and Sections as required) (01 sheets)
with specifications and details

- Kitchen (Plan, Elevations of Sections as required) (01 sheets)
with specifications and details

Total No. of Sheets: 09

INSTRUCTIONAL STRATEGY

This subject forms the basis for making the students ready to work in the field and is highly practical oriented. Teachers, while imparting instructions in the class room, should lay emphasis on proportioning, dimensioning, specification writing, lettering and composition of the drawing work of the students. Field visits may be arranged to .the construction sites of residential, commercial and public buildings to demonstrate various components/stages of buildings under construction. Students should be exposed to: the system of preservation and maintenance of working drawings at the site during the fielq visits. Teachers may procure some working drawings of existing/live buildings and present the same to the students. The students should be encouraged to maintain portfolio ,)f the work done by them throughout the session and give seminar. Teachers may conduct viva voce on completion of each assignment. Experts from the design organizations may be invited to present case studies, to motivate the students. Repetitive exercises should be given to the students, till they develop confidence and attain proficiency. Relevant BIS codes and conventions may be referred/followed, while imparting instructions. Teachers may introduce the topics by giving simple set of instructions before giving any assignment to the students

RECOMMENDED BOOKS

1. Construction Details by DK Ching, Standard Publishers, New Delhi
2. Building Drawing by MG Shah, CM Kale, SY Patki; Tata McGraw Hill Publisher, New Delhi

4.5 COMPUTER APPLICATIONS IN ARCHITECTURE - I

L T P
- - 4

RATIONALE

In the present times an architectural assistant should be capable of drafting drawings on the computer. Due to increasing need for computerized drawings by most architects 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 AutoCAD versions.

DETAILED CONTENTS

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

1. Introduction to AutoCAD (Latest version or AutoCAD2007) (02 hrs)

- Input devices
- Graphics
- Starting AutoCAD
- Inside the drawing editor
- Commands in the menus (Tool bars)
- Accessing Commands
- Entity selection
- Entering coordinates
- Folders for organizing drawings and files

Exercise: Creating folders and sub folders

2. Creating and Saving a new Drawing (02 hrs)

- Commands and options to create new drawings
- Units
- Limits
- Snap
- Grid
- Ortho
- Layer
- Application of layers
- Open a new, existing drawing
- Save, save as, quit, close, exit
- Customization of tool bars

Exercise: Setting up a new drawing with units, limits etc

3. Drawing Commands (12 hrs)

- Line
- Poly line/Double line.
- Arc
- Ellipse
- Polygon
- Rectangle
- SP line
- Circle
- Sketch.
- Hatch
- Donuts

Exercise: Making a composition of different geometrical shapes using various drawing commands

4. Viewing an Existing Drawing (04 hrs)

- Zoom
- Pan
- Redraw and Regen all
- Regen Auto
- View

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

5. Modifying an Existing Drawing (16 hrs)

- Undo Redo/Oops
- Trim
- Move
- Offset
- Rotate
- Array
- Stretch
- Divide
- Champher
- Erase
- Break
- Copy, multiple copy

- Mirror (Mirror test)
- Change (change properties)
- Extend
- Explode
- Blip mode
- Scale
- Fillet

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

6 Making and Inserting Blocks (12 hrs)

- Blocks
- Insert block
- Base
- Using library for blocks
- W-block
- X-ref
- Explode

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

7. Dimensioning and Text (08 hrs)

- Dimension type, style, units
- Dimension utilities
- Dimension variables
- Dimensioning of different elements like (Horizontal, vertical, inclined). Arc. Circle Radius, diameter), continuous dimensioning etc.
- Editing dimension text and updating (adding new text and editing existing text)
- Text style – font types, height, width factor etc. as per plotting paper size.

Exercise: Dimensioning and editing text in composition made in Sections 5 and 6.

8. Plotting Drawings (08 hrs)

- Plot command
- Selecting area for plotting
- Scale of plot, scale to fit
- Selecting plotting device
- Selecting paper size and type
- Selecting black and white or colored plots

- Selecting appropriate print speed, quality
- Print preview
- Working in Paper space and plotting

INSTRUCTIONAL STRATEGY

This is a highly practical oriented subject. Efforts should be made by the teachers to procure relevant softwares and give practical exercises to individual students, so that they develop proficiency in operating computer softwares as applied to the profession of architecture. The theoretical instructions should be dovetailed with practical work. Towards the end of the session each student should be given independent computer based project assignment. Experts from practicing architectural field may be invited to deliver talks and for presentation of live case studies on computers to motivate the students and increase their level of awareness. Special efforts should be made by the teachers to develop well defined small tutorial exercises on each topic and supervise the exercises being performed by the student throughout the session. If need be some basic operational fundamental exercises may be repeated in the beginning of the session. Special emphasis may be laid on training the students through availing help from the user friendly architectural softwares so that they develop confidence and are able to work independently.

Note :- The Board will set the Question Paper for exercises for external examination

4.6 BUILDING CONSTRUCTION - III

L T P
- - 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 building. For this purpose, it is essential that students are taught various components of building construction comprising of foundation, 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.

Students should be asked to maintain a sketchbook for recording mistakes done by students in the preparation of drawings.

DETAILED CONTENTS

- | | | |
|----|--|--|
| 1. | Finishes | Stone cladding and Tile lining (1 sheets) |
| | <ul style="list-style-type: none">• Plastering and pointing• Stone cladding and tile lining• Gravel and wash marble finish• Panellings and fibrous board finishes | |
| 2. | <ul style="list-style-type: none">• Interiors of Buildings• False ceiling and partitions• Different counters as per usage• Paneling and fibrone board finishes | Drawing of false ceiling details (1 sheet)
Drawing of counter (1 sheet)
Panelling (1 sheet) |
| 3. | Doors and Windows | Drawing of aluminum door and window showing fixing, beading, hardware's etc. Drawing of sliding, and revolving doors (3sheets) |
| | <ul style="list-style-type: none">• Using different aluminum sections• Anodizing of aluminum sections• Beadings in conjunction with aluminum section | |
| 4. | Earthquake resistant building configuration (Principles of earthquake resistance, effect of building form on seismic behaviour, building configuration for improved | (01 sheets showing Architecture and Structural details/sketches) |

earthquake resistance)

Total Number of Drawings: 08

INSTRUCTIONAL STRATEGY

This subject is of practical in nature. While imparting instruction for preparation of various drawings of different types of buildings and their components, the teacher should organize demonstration and field/site visits to show various stages, sizes and scales of operations involved in building construction. The teacher should involve the theoretical aspects of the instructions to the students before drawings are attempted by the students. Students may prepare the port-folio of the work done by them throughout the session. Teacher may also organize viva-voce after each drawing assignment so as to test the level of understanding of the students about unlying concepts, principles, and procedures.

RECOMMENDED BOOKS

1. Building Construction by WB Mackay; Khanna Publisher, New Delhi
2. Building Construction by SP Bindra and SP Arora; Publisher Dhanpat Rai & Co. New Delhi
3. Building Construction by BC Punmia; Publisher Laxmi Publication, New Delhi
4. Building Construction by Sushil Kumar; Standard Publisher, New Delhi
5. Construction of Buildings (Vol I and II) by Barry
6. Building Construction by VB Sikka; Publisher Tata McGraw Hill Publisher, New Delhi
7. Building Construction by Rangwala; Publisher Charotar Publishing House Pvt. Ltd., New Delhi

RATIONALE

To develop an understanding of the inter-relationship of the various components of a small public building upto 2 storey.

DETAILED CONTENTS

Three exercises on architectural design spanning to 3-4 weeks duration to be done individually. The public building to be designed may be a small health-centre, nursery school, local neighbourhood shopping market or the like. The activity requirements should be laid down by the subject teacher. While the areas required for each activity should be worked out by the student on his learning from the anthropometric studies carried out earlier. The building must not exceed two storeys. Emphasis to be laid on space analysis and technical aspects of the design.

- Note:
1. The emphasis must be on site visits and case studies
 2. The final submission should be in the form of rendered drawings to explain the scheme and block/ detailed model must be included for each project.
 3. Each Design project must include the following drawings: Site plan, Detailed floor plans showing furniture layout, Sections, Elevations, Freehand 3-D views, Perspectives

INSTRUCTIONAL STRATEGY

This is one of the most important practical oriented subject for diploma in architectural assistantship. While imparting instruction, special visits may be arranged to demonstrate and explain important architectural features of different types of residential, commercial and public buildings. Practicing architects may be invited from time to time to present case studies and to deliver expert lectures on important elements like form, function, balance, light of shadow, shape, plane, volume, line, rythem, proportions, textures and other such element appropriate to various designs. Teacher may present some of the already completed design works of practicing architects to the students and explain the important features and elements. Audio-visual material available in this field may be procured and presented to the students from time to time. Students should be encouraged to visit relevant web-sites and teachers should develop the design problems/assignments which can be taken up by the students using relevant and appropriate software. Students should be given group and independent design/drawing assignments and they should also maintain sketch book/portfolio of all the assignments given to them throughout the

session. Teachers may conduct viva-voce on completion of each assignment. Students may present seminars towards the end of the session.

RECOMMENDED BOOKS

1. Time Saver Standards for Building Types by Joseph De Chiara and John Callendera
2. Architects Data by Neufert; Publisher Blackwell Publishing Ltd. 9600 Garsington Road, Oxford, OX4 2DQ, UK
3. Space, Time and Order by DK Ching; Publisher: John Wiley & Sons, New Delhi
4. Architectural Aesthetics by Sangeet Sharma, Abhishek Publication, Chandigarh

SOFT SKILLS – II

L T P
- - 2

RATIONALE

The present day world requires professionals who are not only well qualified and competent but also possess good communication skills. The diploma students not only need to possess subject related knowledge but also soft skills to get good jobs or to rise steadily at their work place. The objective of this subject is to prepare students for employability in job market.

LEARNING OUTCOMES

After undergoing this course, the students will be able to:

5. Develop Communication Skills
6. Work in a team
7. Learn to resolve conflict by appropriate method
8. Identify leadership traits and learn self motivation
9. Follow ethics

DETAILED CONTENTS

- Concept of team building, behavior in a team
- Developing Interpersonal Relations- empathy, sympathy
- Communication skills-improving non-verbal communication
- Conflict Management
- Motivation
- Leadership
- Professional Ethics and Values
- Health, Hygiene, Cleanliness and Safety

In addition, the students must participate in the following activities to be organized in the institute

- Sports
- NCC/NSS
- Camp – Environment awareness
- Cultural Event

Note : Extension Lectures by experts may be organized. There will be no examination for this subject.

INDUSTRIAL TRAINING

Industrial training 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.

For this purpose, students at the end of fourth semester need to be sent for industrial training for a minimum of 6 weeks upto 8 weeks duration to be organized during the semester break starting 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 teacher may guide a group of 4-5 students. 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 behavior, 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. The components of evaluation will include the following.

- | | |
|--------------------------------------|-----|
| a) Punctuality and regularity | 15% |
| b) Initiative in learning new things | 15% |
| c) Relationship with workers | 15% |
| d) Industrial training report | 55% |