CURRICULUM

for

DIPLOMA PROGRAMME

in

ARCHITECTURAL ASSISTANTSHIP

3rd Year (5rd & 6th Semester)

FOR THE STATE OF HIMACHAL PRADESH

June, 2019

Study & Evaluation Scheme

5th SEMESTER (ARCHITECTURAL ASSISTANTSHIP)

Sr. No.	SUBJECTS	STUDY SCHEME Hrs/Week		EVALUATION SCHEME								TOTAL MARKS IN INT. & EXT.
				INTERNAL ASSESMENT			EXTERNAL ASSESMENT					
		Th	Pr	Th/Drg.	Pr	Total	Th	Hrs	Pr	Hrs	Total	
5.1	*Basics of Management and Entrepreneurship Development	4	-	50	-	50	100	3	-	-	100	150
5.2	Building Construction-IV	1	6	100	-	100	100	4	#50	3	150	250
5.3	Architectural Design-IV	1	6	100	-	100	100	6	#50	3	150	250
5.4	Structural Design-II	3	-	50	-	50	100	4	-	-	100	150
5.5	Green Buildings	3	-	50	-	50	100	3	-	-	100	150
5.6	Working Drawing Using CAD	-	8	-	100	100	-	-	100	3	100	200
5.7	Elective –I 5.7.1 Housing 5.7.2 Construction Management 5.7.3 Vaastu – Shastra	3	-	50	-	50	100	3	-	-	100	150
5.8	*****Practices in communication Skills	-	2	-	50	50	-	-	50	3	50	100
Student Centered Activities		-	3	-	25	25	-	-	-	-	-	25
Professional Training		-	-	-	50	50	-	-	#50	-	50	100
TOTAL		**15**	**25**	**400**	**225**	**625**	**600**	**-**	**300**	**-**	**900**	**1525**

* Common with other diploma programmes.

Viva-Voce only

Note: *Apart from the above mentioned number of hours for each subject (Theory & Practical), at least **TWO** hours/week for each class should be allocated for Library to motivate the students to attend library compulsory. The attendance of library period should be added in master attendance.*

Study & Evaluation Scheme

6th SEMESTER (ARCHITECTURAL ASSISTANTSHIP)

Sr. NO.	SUBJECTS	STUDY SCHEME Hrs/Week		EVALUATION SCHEME								TOTAL MARKS IN INT. & EXT.
				INTERNAL ASSESMENT			EXTERNAL ASSESMENT					
		Th	Pr	Th	Pr	Total	Th	Hrs	Pr	Hrs	Total	
6.1	Structural Design-III	4	-	50	-	50	100	4	-	-	100	150
6.2	Earthquake Resistant Building Design*	4	-	50	-	50	100	3	-	-	100	150
6.3	Town Planning	3	-	50	-	50	100	3	-	3	100	150
6.4	Architectural Professional Practice	3	-	50	-	50	100	3	-	-	100	150
6.5	Computer Graphics-III	-	6	-	50	50	-	-	#100	3	100	150
6.6	Major Project	-	12	-	200	200	-	-	#100	6	100	300
6.7	Elective-II 6.7.1 Architectural Graphics 6.7.2 Interior Design 6.7.3 Hill Architecture 6.7.4 Landscape Design 6.7.5 Advance Model Making	-	4	-	50	50	-	-	#100	3	100	150
Student Centered Activity		-	4	-	25	25	-	-	-	-	-	25
TOTAL		**14**	**26**	**200**	**325**	**525**	**400**		**300**		**700**	**1225**

* Common with diploma in Civil Engineering.

 # Viva-Voce only

Note: *Apart from the above mentioned number of hours for each subject (Theory & Practical), at least **TWO** hours/week for each class should be allocated for Library to motivate the students to attend library compulsory. The attendance of library period should be added in master attendance.*

5.1 BASICS OF MANAGEMENT & ENTREPRENEURSHIP DEVELOPMENT

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RATIONALE

In present scenario, there is an urgent need to develop right kind of attitude, knowledge and skills amongst the Diploma engineers leading them to achieve gainful wage/ self-employment. There is a huge gap in perceptions of employers and employees regarding meeting the job requirements. Also the dual challenges of competing in global working environment and keeping pace with the rapid technological advancements call for re-design of curricula and thus enabling the importance of generic and managerial skills. Entrepreneurship development aim at developing conceptual understanding for setting up owns' business/enterprise to cope up with the problem of unemployment and also to promote the socio- economic development of our country. Both the subject areas, "Basics of Management and entrepreneurship development" are supplementary to each other. Knowledge and skills of these must be imparted to diploma engineering students for enhancing their employability and confidence in their personal and professional life.

DETAILED CONTENTS

1. Introduction to Management (07 hrs)

1.1 Definitions and concept of Management

1.2 Functions of management- planning, organizing, staffing, coordinating and controlling.

1.3 Various areas of management

1.4 Structure of an Organization

2. Self-Management and Development (10 hrs)

2.1 Life Long Learning Skills, Concept of Personality Development, Ethics and Moral values

2.2 Concept of Physical Development; Significance of health, hygiene, body gestures

2.3 Time Management Concept and its importance

2.4 Intellectual Development: Reading skills, speaking, listening skills, writing skills (Note taking, rough draft, revision, editing and final drafting), Concept of Critical Thinking and Problem Solving (approaches, steps and cases)

2.5 Psychological Management: stress, emotions, anxiety and techniques to manage these.

2.6 ICT & Presentation skills; use of IT tools for good and impressive presentations

3. Team Management (10 hrs)

3.1 Concept of Team Dynamics. Team related skills, managing cultural, social and ethnic diversity in a team

3.2 Effective group communication and conversations

3.3 Team building and its various stages like forming, storming, norming, performing and adjourning

3.4 Leadership, Qualities of a good leader

3.5 Motivation, Need of Motivation, Maslow's theory of Motivation

4. Project Management (5 hrs)

4.1 Stages of Project Management; initiation, planning, execution, closing and review (through case studies), SWOT analysis concept

5. Introduction to Entrepreneurship (10 hrs)

5.1 Entrepreneurship, Need of entrepreneurship, and its concept, Qualities of a good entrepreneur

5.2 Business ownerships and its features; sole proprietorship, partnership, joint stock companies, cooperative, private limited, public limited, PPP mode

5.3 Types of industries: micro, small, medium and large

6. Entrepreneurial Support System (Features and Roles in Brief) (7 hrs)

6.1 District Industry Centers (DICs), State Financial Corporations (SFCs), NABARD

6.2 MSME (Micro, Small, Medium Enterprises) – its objectives & list of schemes

7. Market Study and Opportunity Identification (7 hrs)

Types of market study: primary and secondary, product or service identification, assessment of demand and supply, types of survey and their important features

8. Project Report Preparation (8 hrs)

8.1 Preliminary Report, Techno-Economic Feasibility Report, Detailed Project Report (DPR)

LIST OF TUTORIAL EXERCISES

1. Understanding Self-Management and Development (Related to Chapter 02); through examples, cases, exercises, panel discussions, seminars, meditation and yoga techniques.
2. SWOT Analysis.
3. Team Management (Related to chapter 03); through examples, cases, role plays, group discussions and panel discussions.
4. Market Study and Opportunity Identification (Related to Chapter 07); through literature reviewing, making questionnaires, conducting mock interviews and analyzing data for product/service identification and demand assessment.
5. Project Management and Project Report Preparation through exercises on making project reports on micro and small enterprises. Case studies and SWOT analysis of projects can be taken.

RECOMMENDED BOOKS

1. Generic Skill Development Manual, MSBTE, Mumbai
2. Lifelong Learning, Policy Brief(www.oecd.orf)
3. Towards Knowledge Society, UNESCO Publication, Paris
4. Entrepreneurship Development by CB Gupta and P Srinivasan: Sultan Chand and sons: New Delhi
5. Essentials of Management by H Koontz, C O' Daniel , McGraw Hill
6. Principles and Practice of Management by Shyamal Bannerjee: Oxford and IBM

Publishing Co, New Delhi
7. Management by James AF Stoner, R Edward Freeman and Daniel R Gilbert Jr., Prentice Hall of India Pvt. Ltd, New Delhi
8. Entrepreneurship Development by S. L. Gupta and Arun Mittal: IBH Publication
9. A Handbook of Entrepreneurship, Edited by B S Rathore and Dr. J S Saini
10. Entrepreneurship Development and Small Business Enterprises by Poornima M: Pearson Education India
11. Handbook of Small Scale Industry by P M Bhandari

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	07	10
2	10	15
3	10	15
4	05	10
5	10	15
6	07	10
7	07	10
8	08	15
Total	**64**	**100**

5.2 BUILDING CONSTRUCTION - IV

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RATIONALE

Students of Architectural Assistantship at diploma level are supposed to prepare structural drawings, working drawings and detailed drawings of various components of buildings. Also students are expected to design small residential buildings. For this purpose, it is essential that students are taught various components of building construction comprising of: foundations, super structure, openings, roofs, staircases, flooring and finishing and other allied building components. Therefore, the subject of building construction is very important for students undergoing diploma course in architectural Assistantship. Teachers while imparting instructions are expected to show various components of buildings under construction, make use of models or other audio- visual media to clarify the concepts .While preparing drawings, teachers should lay considerable stress on proportioning, dimensioning, specification writing and printing and composition of drawing work. Teachers should also emphasis on environmental aspects like lighting, ventilation and orientation of buildings. Students should be asked to maintain ask etch book for recording the observations from site visits. While conducting viva, teachers should point out specific mistakes done by students in the preparation of drawings.

DETAILED CONTENTS

Theory/ Drawing

1. Doors: Panelled, Glazed and Sliding
Windows: Casement, Fixed, Sliding Windows

1.1 Using different aluminum sections.
1.2 Anodizing of aluminum sections.
1.3 Beadings in conjunction with aluminum section.

2 Drawing

2. Interiors of Buildings

2.1 False ceilings
2.2 Different counters as per usage
2.3 Paneling of wall, side boards and ward robes
2.4 Design and Drawing Partition

4 Drawing

3. Exteriors of Buildings

3.1 Name plate & Letter Box
3.2 Boundary walls and gates
3.3 Drawing of grill, railing, parapet

2 Drawing

4. **R.C.C.**

4.1 Detail of R.C.C in, Foundations, column, beams and slab Along with steel reinforcement details
4.2 Different types of stairs in R.C.C.
4.3 Expansion Joints: Necessity, Location & detailing
4.4 Green Concrete: High Performance, Use of recycled materials and wastes

2 Drawing

5. Pre-Fabricated Elements

5.1 Advantages, Applications

RECOMMENDED BOOKS

1. Building Construction Handbook by Roy Chudley (Publisher Butterworth- Heinemann, 1958)
2. McKay's Building Construction by William Barr Mckay (Publisher Donhead,2005)
3. Building Construction by B.C. Punmia (Laxmi Publications ltd.)
4. Principles of Building Construction by Madan Lal Mehta (Publisher Pearson Education, limited, 2007)
5. Building Construction by Sushil Kumar (published by swastika publications)
6. Civil Engineering Drawing by V.B. Sikka (published by S.K. Kataria &sons)

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	21	20
2	28	20
3	21	20
4	21	20
5	21	20
Total	112	**100**

5.3 ARCHITECTRUAL DESIGN – IV

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1 - 6

RATIONALE

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

DESIGN ASSIGNMENTS

1 Design of a parking area for parking of 200 vehicles along with parking report based on Library data (**14 hrs)**

2 Design of multistory building having minimum three floors .The building can be Hotel/Motel/Hostel, Educational and public buildings. (**42 hrs)**

3 Design of Apartment buildings – 2BHK /3 BHK with parking area (**49 hrs)**

4 Time Problem (**7 hrs)**

RECOMMENDED BOOKS

1. Times –Saver Standards for architectural design by Michael Crosbie, Donald Watson (Published by Tata McGraw Hill Publishing Co.)
2. Architectural Design M. Pratap Rao (Published by Standard Publishes)
3. Time-Saver Standards for Architectural Designc by Joseph De Chiara (Published by McGraw-Hill education- Europe)
4. Space Planning Basics by Mark Karlen , Rob Fleming (Published by J. Wiley & Sons,2004)

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	14	100
2	42	
3	49	
4	7	
Total	112	100

5.4 STRUCTURAL DESIGN–II
(Limit State Method)

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RATIONALE

The students of diploma level are expected to prepare drawings at different levels of sanction and execution of project. The students are expected to design small residential buildings when working in an independent capacity and are involved in complex buildings of larger magnitude when working in large office. The students are also expected to have good knowledge of structural members. Knowledge of structural design is essential as it helps in preparation of various drawings. Teachers while imparting instructions are expected to take the students to the site to explain the position of reinforcement in context with the chapters being undertaken. The students can be asked to prepare models of various reinforcements in a group of 4-6 students.

DETAILED CONTENTS

1. RCC Structural Elements (2 hrs)

1.1 Design philosophies: working stress Method, Ultimate Load Method & limit State Method

1.2 Reinforced concrete materials and properties, grades of concrete

2. Reinforcing materials (2 hrs)

2.1 Suitability of steel as a reinforcing material

2.2 Different types of reinforcing materials including cold twisted deformed bars

2.3 Different Types of loads and IS 875 Codal provisions

3. **Theory of RCC beams (6hrs)**

3.1 Assumptions in theory of simple bending in RCC beams

3.2 Neutral axis, critical neutral axis, balanced, under reinforced, over reinforced sections, lever arms, Moment of resistance

3.3 Shear in beams
- Effects of shear stresses, permissible shear stresses
- Vertical stirrups and inclined bars as reinforcement for shear and diagonal tension as per IS provision
- Length of embedment and anchorage
- Anchorage value of bends and hooks

4. **Singly reinforced beams (12 hrs)**

4.1 Calculation of moment of resistance of a simply supported beam for a given data as load, span and properties of materials used.

4.2 Design of singly reinforced rectangular simply supported beam as per IS from the given data as load span and properties of material used with structural drawing

4.2.1 Design of cantilever beams and its drawings

4.3 Concept of Doubly Reinforced beams

5. **Slabs (14 hrs)**

5.1 Design of one way simply supported slab with drawing

5.2 Design of two way slab with the help of IS:456

6. **Columns (12 hrs)**

6.1 Concept of long and short columns as per IS:456. Effective length of Columns

6.2 Design of axially loaded long and short columns as per IS:456 provision along with drawings

RECOMMENDED BOOKS

1. Building Drawing – Shah M G, Tata McGraw – Hill, 1992.
2. Structural design and Drawing by N Krishnaraju
3. Civil engineering Drawing By Chakraborti
4. (SP34)- Hand book on concrete Reinforcement and Detailing
5. Civil Engineering Drawing - Gurucharan singh
6. Reinforcing Detailing of RCC members- T Rangaraju
7. R.C.C. Design by Birender Singh Kapson publishing house

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	2	10
2	2	
3	6	10
4	12	30
5	14	30
6	12	20
Total	**48**	**100**

5.5 GREEN BUILDINGS

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RATIONALE

One of the most challenging area of concern for the upcoming Architecture students of this country is to think in terms of Energy saving & sustainable planning of the buildings. Students are expected to prepare building plan based up on the Green Building concept. Therefore the course in Green Architecture will equip the student with appropriate technologies to achieve the above said functions. While teaching this subject teacher should show some of the Building plans based upon Green Architecture concept to bring conceptual clarity in the mind of students.

DETAILED CONTENTS

1 Introduction (8 hrs)

Concept of green buildings, Sustainable design to achieve environmental, economic and social benefits. Components of green building

2. Site Selection (8 hrs)

Building envelope and orientation, Fenestrations, shading, Landscaping, day lighting, site preservation

3. Resource Efficiency (8 hrs)

Reduction in waste, Concept of L.C.A (life cycle assessment), recycled materials, Features of ecofriendly materials and types, solid waste management

4. Energy Efficiency (8 hrs)

Active and passive techniques. Importance of passive techniques. Role of orientation, shading and vegetation. Solar gain for winters. Optimization of daylight. Renewal energy, energy efficient appliances

5. Water Efficiency (8 hrs)

Water Efficient appliances, rain water harvesting, water and waste water treatment

6. Indoor Air Quality (8 hrs)

Natural & mechanical ventilation system, Low VOC (Volatile organic compounds) paints
Rating systems of green building
LEED, GRIHA, IGBC: - Points & Certifications

Note: Developing a small residential building plan /layout based up on the concept of Green Architecture

RECOMMENDED BOOKS:

1. Indian Green Building Council
2. Energy Efficient Buildings-TERI India Publications.
3. TEDDY (TERI's year books), TERI, New Delhi.
4. Sustainable Building Design Manual Vol 1 & 2, TERI, New Delhi.
5. Sustainable construction by Charles J.KIEDCT
6. Green Structures by Satyajeet Ghosh CRC Press
7. Energy-efficient Buildings in India Mili Majumdar TERI Press

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	8	10
2	8	20
3	8	20
4	8	20
5	8	20
6	8	10
Total	48	100

5.6 WORKING DRAWING USING CAD

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RATIONALE

Preparation of working drawings and detailing forms the most important activities of diploma holder in Architectural Assistantship. Students are expected to develop mastery of skills in preparing working drawings using cad of different building components and their detailing. Therefore, the course in working drawing and detailing using cad is very important. Teachers while imparting instructions are expected to show various components of building under construction by organizing field visits or use models and other audio- visual media to clarify the concepts involved in preparing working drawings. Teachers are expected to lay considerable stress on proportioning, dimensioning, specification writing, lettering and composition of drawing work whilst supervising students. Students are supposed to make drawings using computers.

DETAILED CONTENTS

To prepare a working drawing of a design project in AUTOCAD

1	Site plan	1 sheet
2	Foundation plan and details	1 sheet
3	Ground floor plan	1 sheet
4	Upper floor plans, one for each floor	
5	Terrace plan with rain water drainage details	1 sheet
6	Sections, cross section through staircase and a section through kitchen	2 sheets
7	Elevations - 4 on all sides	2 sheets
8	**Details**	
	- Toilet (including plan elevation and section)	1 sheet
	- Modular Kitchen details like overhead cabinet, working shelf, (Including plan elevation and section)	1 sheet
	- Flooring Details	
	- Drawings of water supply, Electrical and sanitation disposal layout	3 sheets

RECOMMENDED BOOKS

1. Building Drawing by Shah (Tata Mc Graw Hill Education,1981)
2. Working Drawing Hand Book by Keith Styles(published by Routledge 2015)
3. Auto cad training Guide by Linkan sagar BPB Publication

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	10	10
2	10	
3	18	30
4	18	
5	10	
6	14	20
7	14	
8	34	40
Total	**128**	**100**

5.7.1 HOUSING

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RATIONALE

The students of Architectural Assistantship should have sufficient understanding about the various policies of EWS, LIG, MIG, HIG etc. Through this subject, they shall be given an idea about the housing policy, financing schemes and state housing development agencies.

DETAILED CONTENTS

1. Housing as a human need, social, cultural and economic factors affecting the housing needs. **(10 hrs)**
   - Type of housing
   - Detached, semidetached, Patio Type, Row houses, apartments
2. Layouts of housing **(10 hrs)**
   Row type, curvilinear, cluster, cul-de-sacs, high rise (anyone example of each layout)
3. Housing standards with reference to building codes Zoning, Density, FAR, Setbacks, height **(5 hrs)**
4. Housing for **(7 hrs)**
   - Economically weaker sections
   - Low income group/Middle income group
   - Site and services scheme.
   - Slum clearance/Slum up-gradation
   - Various standards & policy with one example of each type
5. Cost effective building technology and materials in housing. **(5 hrs)**
6. Housing policy & finance
   Role of Government (Hudco and National Housing Board) in housing, public private participation, cooperative housing. **(5 hrs)**
7. Study of housing in a neighborhood unit with reference to circulation pattern, open spaces shopping, health and educational facilities. (E.g. study to be done as a group project) **(6 hrs)**

RECOMMENDED BOOKS

1. The Architecture of Affordable Housing by Sam Davis
2. An introduction to social housing by Paul Reeves ,Butterworth
3. Building system for low income Housing by A.K.Jain
4. urban housing & slums by A.K.Jain

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	10	20
2	10	20
3	5	10
4	7	15
5	5	10
6	5	10
7	6	15
Total	**48**	**100**

5.7.2 CONSTRUCTION MANAGEMENT

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RATIONALE

Many a times the contractors engage the services of Architectural Assistants to manage the construction sites. The students should have sufficient knowledge of CPM/PERT, Safety at site and labor welfare schemes.

DETAILED CONTENTS

1. Introduction to Site Planning & Management **(6 hrs)**

- Significance
- Objectives & Functions of Construction Management
- Resources for construction
- Construction Team

2. Construction Planning **(8 hrs)**

- Introduction to planning
- Latest Breakdown Structure
- Schedule
- Preparation of material, equipment, labor & finance schedules

3. Network Technique **(8 hrs)**

- Introduction
- Critical Path Method (CPM)
- Progressive Evaluation &Review Technique (PERT)
- Introduction network development &analysis (with simple examples)

4. Site Organization **(10 hrs)**

- Principles of organization
- Communication, leadership &Human relation
- Site organization
- Temporary services
- Job Layout

5. Inspection & Quality Control **(10 hrs)**

- Need for inspection & Quality Control
- Principles of inspection
- Enforcement of specification
- Stage of inspection & Quality Control

6. Safety in Construction **(6 hrs)**

- Importance of safety
- Safety measures in different construction activities
- Excavation, Form Work, Shuttering Removal Process etc.

RECOMMENDED BOOKS

1. Construction Planning &Management by PS Gahlot & BM Dhir International (P) ltd., Publisher, New Delhi
2. Construction project management K.K. Chitkara, H.B. Publication

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	6	10
2	8	20
3	8	20
4	10	20
5	10	20
6	6	10
Total	**48**	**100**

5.7.3 VAASTU–SHASTRA

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RATIONALE

Student of Architectural Assistantship at the diploma level are Expected to know Design and execute building interiors. The atmosphere contains lot of energy, such as solar energy, magnetic energy, cosmic energy, wind energy, light energy, sound energy &so on. Man also breaths, vibrates &maintains certain magnetic waves if these waves are in resonance then the inside of the house produces an ambience for happy &wealthy life. Vaastu Shastra is an ancient science of building & town planning. Teacher while imparting instruction are expected to explain concept and principles of Vaastu Shastra.

DETAILED CONTENTS

1. Generals **(16 hrs)**

1.1 Importance of different Directions in Vaastu shastra
1.2 Location of water source etc.
1.3 Location of water storage tanks, Septic Tank, Entrance Gate etc.

2. Site Selection **(16 hrs)**

3. General residential building planning as per Vaastu considering various points like Position of rooms, Position of doors & windows, Staircase etc. **(16 hrs)**

Note: Developing a small residential building plan /layout based up on the concept of vaastu

RECOMMENDED BOOKS

1. Indian Vastu Shastra: Science of Construction & Architecture of Building (Best of India) by Vaibhav Chawadre
2. Hindu Architecture : Vastu & Silpa Sastra by Govind Krishna Pillai
3. Vastu Architecture: Design Theory and Application for Everyday Life by Michael Borden

SUGGESTED MARKS DISTRIBUTION

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	16	40
2	16	20
3	16	40
Total	**48**	**100**

5.8 PRACTICES IN COMMUNICATION SKILLS

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RATIONALE

For successful completion of diploma programme, the students should possess adequate command on language and communication skills so that they are able to express themselves with ease and felicity. The language used by the students should be appropriate to objectives and occasion. The contents of this subject shall provide them practical training through language laboratory.

LIST OF PRACTICALS

1. **Exercises on phonetics** **(8 hrs)**
   - 1.1 Identifications of English phonemes
   - 1.2 Stress and Intonation
   - 1.3 Speaking exercises with emphasis on voice modulation (reading and extempore)

2. **Group Discussion** **(4 hrs)**

3. **Exercises on** **(4 hrs)**
   - Self-assessment using tools like SWOT analysis
   - Listening skills

4. **Internet communication and Correspondence** **(4 hrs)**
   - 4.1 Resume writing
   - 4.2 Covering letter
   - 4.3 Agenda and Minutes of meeting
   - 4.4 Business Correspondence

5. **Exercises on** **(4 hrs)**
   - 5.1 Body language and Dress sense
   - 5.2 Etiquettes and mannerism in difficult situations like business meetings, table manners, Telephone etiquette
   - 5.3 Manners related to opposite gender
   - 5.4 Cross-cultural Communication

6. **Mock interviews** (telephonic/personal) **(4 hrs)**

7. **Role plays for effective Communication** **(4 hrs)**

6.1 STRUCTURAL DESIGN – III
(Limit State Method)

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RATIONALE

The students of diploma level are expected to prepare drawings at different levels of sanction and execution of project. The students are expected to design small residential buildings when working in an independent capacity and are involved in complex buildings of larger magnitude when working in large office. The students are also expected to have good knowledge of structural members. Knowledge of structural design is essential as it helps in preparation of various drawings. Teachers while imparting instructions are expected to take the students to the site to explain the position of reinforcement in context with the chapters being undertaken.

DETAILED CONTENTS

1. Steel Structural Elements (16 hrs)

1.1 Classification of sections in Limit State Method
1.2 Grades of Structural Steel, Terminology & Properties
1.3 Structural steel and steel sections, study of steel tables and reading of data for steel sections

2. Beams/Columns (20 hrs)

2.1 Design of beams with single RS section as per IS:800 and handbook for span and Loads
2.2 Design of axially loaded tension members
2.3 Design of Axially loaded compression members

3. Structural Connections (20 hrs)

3.1 Bolted connections, types of Bolts, forces in Bolts, types of Bolted joints with Sketches
3.2 Welded connections, types of welds, forces in welds, types of welds, defects in welds

4. Hollow sections (8 hrs)

4.1 General Shapes (Hot Rolled & Cold Form) and advantages & Applications

RECOMMENDED BOOKS

- R.C.C. Design by Birinder Singh, Kapson Publications
- Design of Steel Structures by Subramaniam N -Oxford University

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	16	30
2	20	30
3	20	30
4	8	10
Total	**64**	**100**

6.2 EARTHQUAKE RESISTANT BUILDING DESIGN

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RATIONALE

Diploma holders in architecture have to deal with earth quake resistant buildings. Therefore, the students should have requisite knowledge regarding terminology of earthquake and the precautions to be taken while designing/ constructing earthquake resistant buildings

DETAILED CONTENTS

1. **Elements of Engineering Seismology** **(8 hrs)**
   - 1.1 General features of tectonic of seismic regions
   - 1.2 Causes of earthquakes
   - 1.3 Seismic waves
   - 1.4 Earth quake size (magnitude and intensity)
   - 1.5 Epicenter
   - 1.6 Seismograph
   - 1.7 Classification of earthquakes
   - 1.8 Seismic zoning map of India

2. **Seismic Behavior of Traditionally-Built Constructions of India** **(8 hrs)**
   - 2.1 Earth quake effects
   - 2.2 Traditionally built construction in India
   - 2.3 Performance of building during earthquakes and Mode of failure (Out-of plane failure, in- plane failure, Diaphragm failure, Connection failure, Non-structural components failure)

3. **Introduction to IS1893 (Part-I)-2016** **(6 hrs)**
   - 3.1 Introduction
   - 3.2 Assumptions
   - 3.3 Design lateral forces and their calculation methods

4 **Ductile detailing of Reinforced Concrete Buildings (IS 13920-2016) & IS 4326-2013** **(12 hrs)**
   - 4.1 Common modes of failure in reinforced concrete buildings
   - 4.2 General Principal for earthquake resistant buildings & Special construction features
   - 4.3 Types of irregularities
     - 4.3.1 Vertical irregularities
     - 4.3.2 Plan irregularities
   - 4.4 Ductile detailing as per code
   - 4.5 Seismic strengthening arrangements
     - 4.5.1 Horizontal reinforcement
     - 4.5.2 Vertical reinforcement

5. **Introduction to IS13828-1993 & IS13827-1993** **(12 hrs)**
   - 5.1 Advantages and disadvantages of masonry construction
   - 5.2 Behavior of masonry construction during earthquakes
   - 5.3 Earthquake resistance features for burnt clay brick in weak mortar
   - 5.4 Codal Provisions for earthquake resistant earthen construction
   - 5.5 Seismic strengthening features of earthen buildings

6. **Retro Fitting Measure for Traditionally Built Construction** **(10 hrs)**
   - 6.1 Introduction, need of retrofitting
   - 6.2 Retrofitting materials

6.3 Retrofitting measure of traditionally built construction
6.3.1 Retrofitting of masonry buildings
6.3.2 Retro fitting of concrete structure
6.3.3 Retro fitting of low-cost buildings

7. **Disaster Management** **(8 hrs)**

7.1 Disaster rescue
7.2 Psychology of rescue, rescue workers, rescue plan, rescue by steps, rescue equipment
7.3 Safeties in rescue operations
7.4 Debris clearance
7.5 Causality management

RECOMMENDED BOOKS

1. Elements of Earthquake Engineering by Jai Krishana and AR Chandersekaran; Sarita Parkashan, Meerut.
2. Building Construction by BL Gupta and NL Arora, Satya Prakashan, New Delhi
3. Manual Published by Earthquake Engineering department, IIT Roorkee/IIT Kanpur
4. IS 13920, IS:13827,IS:13828,IS 1893-2002, IS4326 (latest edition)
5. Earthquake Engineering by RL Weigel, Prentice Hall Inc., N.I.,1970
6. Dynamics of Structure by AK Chopra, Prentice Hall Inc. New Delhi
7. Earthquake resistant building construction by Neelam Sharma, Katson
8. Earthquake resistant building construction by Jagroop Singh, Rajiv Bhatia, Eagle Publication

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	8	15
2	8	15
3	6	10
4	12	20
5	12	20
6	10	10
7	8	10
Total	**64**	**100**

6.3 TOWN PLANNING

L T P
3 - -

RATIONALE

Sum percentage of students find employment in the state department of town and country planning , housing board and urban development authorities students are expected to prepare master plan and layout of housing schemes road parking etc Therefore the course in Town Planning equip the student with appropriate knowledge to perform above said functions .While teaching this subject teachers should show some of the typical master plan and layout plan to bring conceptual clarity in the mind of students.

DETAILED CONTENTS

1. Introduction to Town Planning (3 hrs)
- 1.1 Objectives of town planning
- 1.2 Importance of town planning
- 1.3 Principles of town planning

2. Origin and Growth of Ancient Towns (3 hrs)

Mohenjo-Daro and Harappa

3. Planning Process (9 hrs)
- 3.1 Site selection
- 3.2 Site planning
- 3.3 Town and Villages
- 3.4 Ancient Form of Village Planning

4. The city of Delhi - Origin and Growth from Ancient to Modern (9 hrs)

5. The Process of Urbanization (3 hrs)
- 5.1 Urban and rural definition
- 5.2 Migration

6. City Development Plan (9 hrs)
- 6.1 Master plan regional plan in relation to Chandigarh
- 6.2 Neighborhood unit concept in housing

7. Urban Traffic Roads Regional Roads Local Street Footpath Cycle Path Junction (3 hrs)

8. Zoning - Use Zoning, Height Zoning, Density Zoning (3 hrs)

9. Smart Cities (6 hrs)
- 9.1 Concept of sustainable development & need for smart city
- 9.2 Components of smart cities: Social, Physical, Institutional & economic Infrastructure
- 9.3 Design Principles:- Transport, water Supply, Sewerage & sanitation, storm water drainage, electricity, IT facilities, health care, education, E-Governance, Emergency Preparedness and facilities

RECOMMENDED BOOKS

1. Town Planning by Rangwala ,Charotar Publishing House Pvt. Ltd
2. Fundamentals of Town Planning by G.K. Hiraskar
3. Town Planning in Ancient India by Benode Behari Dutt
4. A text book of Town planning by Abir Bandyopadhyay
5. Town & country planning by V.N. Modhak
6. Town Planning made plain-Louis Keeble

SUGGESTED DISTRIBUTION OF MARKS

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

6.4 ARCHITECTURAL PROFESSIONAL PRACTICE

L T P
3 - -

RATIONALE

The knowledge of this subject is required for all Architects/engineer/technicians who wish to choose industry /field as their career. This course is designed to develop understanding of various functions of management, role of workers and architects and providing skills with respect to architectural practice, Regulatory bodies governing architectural education& practice, industrial safety, construction management CPM/PERT etc. which are essential attributes for a successful Architect /technician.

DETAILED CONTENTS

1. **Profession of Architect** **(3 hrs)**
   - 1.1 Definition and aspects of Architectural Profession
   - 1.2 Architect duties and liabilities
   - 1.3 Contractors duties and liabilities
   - 1.4 Employer's duties sand liabilities
   - 1.5 Arbitration

2. **Architect's work** **(9 hrs)**
   - 2.1 Structure of an architect's office
   - 2.2 Office and management
   - 2.3 Architects duties to his employees under labor welfare provision
   - 2.4 Copyright

3. **Code, Competition, Fees** **(8 hrs)**

   Architectural competitions, professional conduct, conditions of engagement and Scale of professional fees and charges

4. **Architect Act, 1972** **(3 hrs)**
   - 4.1 Aims & Objectives of AIIA
   - 4.2 COA - Its role of regulating the profession and education in Architecture

5**. Tenders and Quotations** **(21 hrs)**

   Tenders, essential characteristics of a tender notice, types of tender, tender documents, simple exercises on preparation of tender document, comparative statements (technical and cost comparisons), work order, supply order, Inspection, Contract & its types

6. **CPM and PERT** **(4 hrs)**
   - 6.1 Introduction to CPM &PERT
   - 6.2 Development of CPM networks Pertaining to simple building works

RECOMMENDED BOOKS

1. Professional practice by Roshan Namavati
2. Tender Documents by Labour Law
3. Professional practice for Architects by S.C.Garg, satya Prakashan

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	3	10
2	9	20
3	8	20
4	3	10
5	21	30
6	4	10
Total	**48**	**100**

6.5 COMPUTER GRAPHICS-III

L T P
- - 6

RATIONALE

This subject is introduced to make the diploma students of architecture aware of the applications of computer technology in the field of architectural visualization. The aim is to provide an opportunity to the students to learn and develop themselves as professionals who can work of their own and are able to cater the needs of industry. This is a highly skilled field and can generate a lot of job opportunities for the diploma students. The subject will be taught through practical classes using the 3D visualization software such as Revit, 3DS max and Sketch Up etc. The faculty for the subject has to be well trained in developing the architectural 3D models and architectural animation.

DETAILED CONTENTS

Note: *Teachers will give theoretical inputs (instructions) while conducting practicals.*

1. File Management

Import, export, file link, file save, merge etc.

2. Customization

Setting units, grids, snap setting etc.

3. Layer Management

Naming layers, renaming layers deleting layers etc.

4. Creating and Editing Objects and Parameters

Standard primitives, extended primitives compound objects, splines, patches, solid objects, 3D mesh etc. working on AutoCAD drawing to develop 3Dmodel

5. Edit Tools

Mirror, array, align, copy, move, rotate, rename objects, hide, unhide, group objects, ungroup objects etc.

6. Modifiers and Application Simple Exercises

7. Utilities and Application Simple Exercises

8. Materials and Mapping Simple Exercises

9. Rendering

Environment, camera, lights, rendering, saving the views

ASSIGNMENTS

- Develop a 3 D model from an AutoCAD drawing of an existing building or design studio project.
- Develop a 3D model of any building of the final semester Design project.
- Using latest versions of Cad Software's like Revit Series, 3-D Max, sketchup etc.

RECOMMENDED BOOKS

1. Autodesk Auto CAD Architecture 2009 fundamentals by Elise Moss (Published by SDC publications, 2008)
2. Auto CAD Commands may be downloaded in form of PDF Online
3. Auto cad training guide BPB Publications
4. Auto CAD for dummies by Billfan ,John wiley & sons publications

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1,2,3	16	20
4,5,6	24	20
7,8,9	56	60
Total	**96**	**100**

6.6 MAJOR PROJECT

L T P
- - 12

RATIONALE

Major Project Work aims at developing innovative skills in the students whereby they apply in totality the knowledge and skills gained through the course work in the solution of particular problem or by undertaking a project. The individual students have different aptitudes and strengths. Project work, therefore, should match the strengths of students. For this purpose, students should be asked to identify the type of project work, they would like to execute. It is also essential that the faculty of the respective department may have a brainstorming to identify suitable project assignments for their students. The project assignment can be individual assignment or a group assignment. There should not be more than 3 students if the project work is given to a group. The students should identify themselves or accept the given project assignment at least two to three months in advance. The project work identified in collaboration with industry should be preferred. Since the data collection and case study of existing buildings are the integral part of major project ,therefore due credit may be given to the students during the period for which they do the case study work with prior permission from H.O.D./ Principal.(maximum 05 days)

Content

A. The major project will comprise the following:

An illustrated report, which will include the validity and scope of the chosen project, methodology, prototype studies, site analysis, client's and architect's briefs, delineation of programme and design criteria.

A fully worked-out design proposal including consideration of site planning structures, services, and any other aspects/specific to the project.

Stages of Work

1. Approval of project:

The intent of the major project as well as the criteria for selection of the project will be introduced to the students in the previous semester, i.e. 5th Semester or after exams

2. Rough Report, comprising all analytical aspects of the project including the synopsis, library studies, prototype studies, site analysis, delineation of building program, etc.

Evolution of Design, to be worked out in a minimum of four stages.

The original copy of the report, the final drawings and models will be returned to the student after the declaration of the result. The photocopy of the report will be retained for reference in the institute library.

3. Schedule of submissions/examination

Stages of Work			Time allocated	Max. Marks (internal)
1.	**Sessional Work**			
(a)	**Rough Report**			
	i)	Introduction & topic finalization	12	**10**
	ii)	Synopsis	12	**10**
	iii)	Preliminary Library studies	12	**10**
	iv)	Site analysis, Prototypes additional library studies	24	**10**

b)	**Evolution of Design**			
	i)	Design Criteria and Concept	24	**10**
	ii)	**Design Proposal Stage-I (Computer Added Drawing/Site Plan/Plans /Section/RoughSketches Views)**	**12**	**10**
	iii)	Design Proposal Stage-2 (incorporating structures & services) Block model	18	10
	iv)	Pre-final Design	22	30
(c)		**Final submission along with final report** (Incorporating improvements suggested in Rough Report, Design Criteria and explanatory sketches of Evolution of Design). Presentations drawings with computer added /views along with detail model clearing the concept.	**56**	**100**
		Total	**192**	**200**

NOTE:

Students are required to submit the Final Report, all final drawings and model/s in the standard format prescribed

6.7.1 ARCHITECTURAL GRAPHICS

L T P
- - 4

RATIONALE

Students after the diploma are expected to assist in the preparation of presentation of drawings for different purpose in different mediums .Student, expert in this area can use this knowledge even for self-employment. This subject would cover all the aspects concerned with the preparation and rendering of drawings.

DETAILED CONTENTS

1. Rendering of Basic Drawing in Ink and Pencil Separately (32 hrs)

- 1.1 Drawing human figures vehicle and trees
- 1.2 Sciography rendering techniques
- 1.3 Site rendering techniques
- 1.4 Elevational rendering

2. Drawing and Rendering of Views (32 hrs)

- 2.1 Drawing practice of one point and two point perspective
- 2.2 Rendering of perspective in black and white and colour

RECOMMENDED BOOKS

1. Building Drawing by Shah (Tata Mc Graw Hill Education,1981)
2. Working Drawing Hand Book by Keith Styles (published by Routledge 2015)
3. Rendering with pen & Ink by Robert W. Gill, thames & Hudsen publication

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	32	50
2	32	50
Total	**64**	**100**

6.7.2 INTERIOR DESIGN

L T P
- - 4

RATIONALE

Students of Architectural Assistantship at the diploma level are expected to know, design and execute building interiors. Therefore, the basic knowledge of building construction and detailed knowledge of building materials is required. With the knowledge of this subject the students can help in handling interior projects from the concept stage to the project implementation stage. Also this is necessary since the interiors are becoming more integral part of architecture and considerable stress is being laid in interior design. Teachers while imparting instructions are expected to explain concepts and principles introducing various building finishing materials. The course would be supplemented with literature and samples of materials.

DETAILED CONTENTS

1. Space Analysis **(3 sheets)**

a. Living Room
b. Dinning
c. Kitchen
d. Bedrooms, Children bedrooms
e. Toilets (Public, Residential)
f. Restaurants/fast foods
g. Lobbies/Waiting space
h. Office
i. Shops

2. Case Studies of Live projects with respect to circulation, activities, furniture, colour scheme, wall, floor finishes, Electrical fixtures and other items (Paintings, murals, waterfalls etc.)

a. Houses
b. Offices
c. Shops
d. Restaurant/Fast Food

Note: *Any one case study to be taken in the form of report with the help of sketches and photographs.*

3. Materials

Market survey of materials, appropriate uses of materials for wall finishes, flooring/ceiling and arrangement of electrical fixtures and other items. Collection of samples and catalogue from market

4. Interior Design problem of Restaurants, Houses, Offices, Shop (Any one project to taken) . **(5sheets)**

a. Detailed Plan showing furniture, partition, storage and plants etc.
b. Elevations
c. Sectional elevations (wall treatments)
d. Colour schemes and one point perspective
e. False ceiling and electrical layout

RECOMMENDED MAGAZINES

a) Inside out side
b) Indian design magazine
c) Society exteriors
d) A+D
e) Publication of council of Architecture

RECOMMENDED BOOKS

1. Timesever standards for Interior Design and space planning
2. Interior Design by Ahmed Kasu
3. Nufert Archtect's data
4. Time saver for store planning and design-Charles E. Brondy
5. The best interiors and life styles of India-by the Indian and Eastern Engineering Co Ltd.
6. Human Relastion's oliver (latest volume)
7. Indian Interiors by Angelika Tashen
8. Inter-wood (Published by Monica International)
9. Design &decorate: Living room
10. Design &decorate: Bathroom

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	100	20
2	10	
3	8	
4	36	80
Total	**64**	**100**

6.7.3 HILL ARCHITECTURE

LT P
- - 4

RATIONALE

Buildings on the hills have been a challenge to man from time. The constraints of climate, topography and the local building materials produced rich traditions of vernacular architecture. In the present context of environmental concerns that the hills face – a greater responsibility has been thrust on architects and builders. The objectives of this course are to impart a comprehensive knowledge of these aspects and present day concerns.

DETAILED CONTENTS

UNIT-I **(10 hrs)**

Historical perspective of hill architecture and its unique contribution &concerns. The study of Major hill settlements/layouts in various regions of the world.

UNIT-II **(10 hrs)**

Traditional hill settlements of India.

An overview of vernacular hill architecture of Himachal Pradesh.

Building types, techniques and materials of vernacular architecture of Himachal Pradesh.

Study of vernacular architecture and their time tested indigenous technology.

UNIT-III **(18 hrs)**

Study the layout of modern buildings on the hills in India.

Constraints of climate, topography and availability of materials. Design factors such as access, circulation and gradients.

Structural aspects of modern buildings and necessary safeguards. Environmental and ecological concerns and safeguards.

Unit-IV **(26 hrs)**

Study of contours, gradient &layouts of hilly sites/region

Design &detail of retaining walls used in hilly areas

Note:-*The students are required to design a detailed plan of the building situated in hilly region showing various constructional details pertaining to the construction techniques being used in Hilly Region*

RECOMMENDED BOOKS

1. Himalayan cities: Settlement Pattern, Public Places & Architecture by Pratyush Shankar.
2. Himalayan Architecture by Ronald M. Bernier

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	10	10
2	10	10
3	18	20
4	26	60
Total	**64**	**100**

6.7.4 LANDSCAPE DESIGN

L T P
- - 4

RATIONALE

The basic knowledge of elements related to landscaping and their principles are very essential for the students of Architecture Assistantship. Through this subject, the students shall be introduced to relationship of landscaping and climate, besides an understanding of outdoor functional spaces.

DETAILED CONTENTS

1. **Principles & Elements of Landscape Design** **(8 hrs)**
   a. Plants, water, Earth forms and stones, Artificial or man-made elements,
   b. Principles of landscape design with respect to architectural functions form, Symmetry and Balance, Texture, Colour, Contrast, Proportions and scale, Simplicity, Focus, Rhythm, Aesthetics (Visual aspects and functional aspects).

2. **Relationship of Landscape & Climate** **(20 hrs)**
   a. Orientation
   b. Sun Control by Plants
   c. Wind control by plants
   d. Microclimate and Human comfort

3. **Practical** **(36 hrs)**
   a) Landscape design of an outdoor area within an existing building or group of buildings
   b) Park design
   c) Landscape design of the architectural design project students are currently working on.
   d) Representation of Landscape drawings

RECOMMENDED BOOKS

1. Landscape Architecture by symonds published by MC. Graw Hill, Book Company
2. Urban Landscape Design by Garnett Eckko Published by M.C. Graw Hill, Book Company
3. Landscape Design that save energy by Anne Simon Majfat & Marc Schiler
4. Flowering trees of India and beautiful gardens of India by M.S. Randhawa
5. Flowering trees by Rajnish Wattas
6. The Landscape of Man – Geoffrey Jellicoe, Publisher Thames and Hudson London (1995)
7. A Visual Approach to Park Design – Albert J Rutledge, Publisher Garland STPM Press, New York (1981)
8. Landscape Architecture – Simonds John O, Publisher Mc Graw Hill Book Company London (1961)
9. Earthscape: A Manual of Environmental Planning – Simonds John O, Publisher Mc Graw Hill Book Company London (1978)
10. Trees in Chandigarh – Ms Randhawa, Publisher

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	8	10
2	20	20
3	36	70
Total	**64**	**100**

6.7.5 ADVANCE MODEL MAKING

L T P
- - 4

RATIONALE

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. This subject aims at developing advance- model making skills in the students.

DETAILED CONTENTS

1. **Making Models of** **(16 hrs)**
   - 1.1 Detail of jail
   - 1.2 Gate and gril details
   - 1.3 Railing details

2. **Model of anyone design problem** **(24 hrs)**
   - 2.1 Block Model (preferably using thermocol/wooden blocks etc)
   - 2.2 Site Presentation Model including vehicles, roads layout and landscape elements etc of any campus building.

3. Detailed Model of any double storied building; With site, roads, trees, vehicles **(24 hrs)**

Note: *The materials to be used for making models shall be at the discretion of teacher depending on the availability.*

RCOMMENDED BOOKS

1. Model making materials & methods by David Neat ,the Crowwood press ltd. publication

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (hrs)	Marks Allotted (%)
1	16	20
2	24	30
3	24	50
Total	**64**	**100**