6.1 QUANTITY SURVEYING, VALUATION AND SPECIFICATIONS

RATIONALE

Diploma holders in Architectural Assistantship are supposed to prepare material estimates for various civil works namely; buildings, irrigation works, public health works and roads etc. In addition, they must have basic knowledge regarding analysis of rates, contracting principles of valuation. Therefore, this subject has great importance for diploma holders in Architecture Assistantship.

DETAILED CONTENTS

1. Introduction to quantity surveying and its importance. Duties of quantity surveyor (2 hrs)

2. Types of estimates (4 hrs)
   2.1 Preliminary estimates
      - Plinth area estimate
      - Cubic rate estimate
      - Estimate per unit base
   
   2.2 Detailed estimates
      - Definition
      - Stages of preparation – details of measurement and calculation of quantities and abstract

3. Measurement (4 hrs)
   - Units of measurement for various items of work as per BIS:1200
   - Rules for measurements
   - Different methods of taking out quantities – centre line method and long wall and short wall method

4. Preparation of Detailed and Abstract Estimates from Drawings (24 hrs)
   - A small residential building with a flat roof
   - Pitched roof with steel truss
   - Timber structure
   - Temporary shelters/sheds
   - Water supply lines for a house
   - Sanitary and water supply fittings
   - Septic tank for a domestic building
5. Calculation of quantities of materials for (14 hrs)

- Cement mortars of different proportion
- Cement concrete of different proportion
- Brick masonry in cement mortar
- Plastering and pointing
- Painting and polishing
- Cement concrete flooring
- Terrazo flooring
- Steel reinforcement of RCC elements – Beam, lintels, slab and column

6. Analysis of Rates (16 hrs)

- Steps involved in the analysis of rates. Requirement of material, labour, sundries, contractor’s profit and overheads
- Analysis of rates for finished items when data regarding labour, rates of material and labour is given:
  - Earthwork in excavation hard/ordinary soil and filling with a concept of lead and lift
  - Cement concrete in foundation
  - RCC in roof slab
  - Brick masonry in cement mortar
  - Cement Plaster
  - Painting and polishing

- Running and maintenance cost of construction equipment

7. Contracts (8 hrs)

- Meaning of contract
- Qualities of a good contractor and their qualifications
- Essentials of a contract
- Types of contracts, their advantages, disadvantages and suitability
- Single and two cover-bids; tender, tender forms and documents, tender notice, submission of tender and deposit of earnest money, security deposit, retention money, maintenance period

8. Measurement Book and Billing (6 hrs)

Entries in measurement book, standard measurement book, checking of measurement, preparation of bill, first and final bill, running account bill, advance payment, secured advance payment, refund of security money
9 Valuation (8 hrs)

- Purpose of valuation, principles of valuation
- Definition of various terms related to valuation like – depreciation sinking fund, salvage and scrap value, market value, fair rent, year’s purchase etc
- Method of valuation
  - Replacement cost method
  - Rental return method

10 Specifications (8 hrs)

General and detailed specifications of :

- Single storey buildings
- Double storey buildings
- General specification 1st, 2nd, 3rd and 4th class buildings

11 Exercises on preparation of comparative statements for item rate contract (2 hrs)

INSTRUCTIONAL STRATEGY

This is an applied engineering subject. Teachers are expected to provide working drawings for various civil works and students be asked to calculate the quantities of materials required for execution of such works. Teachers should conceptualize making analysis of rates for different items of works. It will be advantageous if students are given valuation reports for reading.

RECOMMENDED BOOKS

1. Pasrija, HD; Arora, CL and S. Inderjit Singh, “Estimating, Costing and Valuation (Civil)”, Delhi, New Asian Publishers

2. Rangwala, BS; Estimating and Costing”. Anand, Charotar Book Stall


5. Dutta, BN; “Estimating and Costing
### SUGGESTED DISTRIBUTION OF MARKS

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<tr>
<th>Topic No.</th>
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<th>Marks Allotted (%)</th>
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<td><strong>Total</strong></td>
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</table>
6.2 BUILDING SERVICES-II

L T P Cr
3 - - 3

RATIONALE

Students of Architectural Assistantship at diploma level are expected to prepare working drawings of various fittings and fixtures and 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, domestic 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, charts 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. Heat, Ventilation and Air Conditioning (HVAC) (16 hrs)
   1.1 Behaviour of heat propagation, thermal insulating materials and their coefficient of thermal conductivity
   1.2 General methods of thermal insulation. Thermal insulation of roofs, exposed walls
   1.3 Ventilation: Definition and necessity
   1.4 System of ventilation
   1.5 Principles of air conditioning
   1.6 Air cooling
   1.7 Different systems of ducting and distribution
   1.8 Essentials of air-conditioning system

2. Vertical Transportation Systems (10 hrs)
   Classification and types of lifts, lift codes, rules, structural provision; escalators, their uses, types and sizes, safety norms to be adopted

3. Fire Fighting Services (10 hrs)
   Classification of fire, fire hazards, classification of building materials according to fire load, introduction to fire fighting system, causes of fire in buildings, precaution and controlling devices (fire panels, door and windows automation, fire hydrants and sprinklers fire door operations) fire escape elements (staircases, ramps, lifts), provisions in building from fire safety angle as per BIS; heat detectors, fire alarm systems
4. Sound Insulation (8 hrs)

4.1 Behaviour of sound propagation,
4.2 Acoustics in building, acoustical defects such as echo, reverberation, sound focii, methods of correction, special requirements like auditorium, conference halls, studios etc
4.3 Acoustical material and their use in various building
4.4 Simple exercises on sound insulation

5. Integration of lighting, air-conditioning, acoustics and other services/systems (4 hrs)

Note: Students shall prepare a scrapbook for all the above 4 numbers of topics

INSTRUCTIONAL STRATEGY

Building services are important part of any 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. They may include the detailed specifications, cost and availability of these machines/fittings in their collection. Teachers may also encourage the students to go through relevant BIS codes for each topic.

RECOMMENDED BOOKS


SUGGESTED DISTRIBUTION OF MARKS

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<tr>
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</table>
6.3.1 SITE MANAGEMENT (ELECTIVE-II)

L T P Cr
3 - - 3

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/PET, Safety at site and labour 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 (6 hrs.)
   - Introduction to planning
   - Latest Breakdown Structure.
   - Schedule
   - Preparation of material, equipment, labour & finance schedules.

3. Network Technique (12 hrs.)
   - Introduction
   - Critical Path Method (CPM)
   - Progressive Evaluation & Review Technique (PERT)
   - Introduction network development & analysis (with simple examples)

4. Site organization (6 hrs.)
   - Principles of organization
   - Communication, leadership & Human relation
   - Site organization
   - Temporary services
   - Job Layout

5. Inspection & Quality Control (8 hrs.)
   - Need for inspection & Quality Control
   - Principles of inspection
- Enforcement of specification
- Stage of inspection & Quality Control

6. Safety in Construction (8 hrs.)
- Importance of safety
- Safety measures in different construction activities
- Excavation
- Drilling & Blasting

7. Construction Labour (2 hrs.)
- Status of construction labour
- Trade Union connected with construction industry.

INSTRUCTIONAL STRATEGY

Teachers may invite experts from government organizations and non-government organizations (NGOs), working in the area of transfer of appropriate technologies to the rural areas to deliver lectures and present case studies. Students may be taken to the construction sites in the villages/suburbs, building centres and demonstration yards (like that of developed by CBRI, Roorkee; SCRC, Gaziabad and some of the community polytechnics etc.) to create awareness in them about cost effective building techniques.

Polytechnics may develop their own demonstration yards for this purpose. Students may be encouraged to take up project assignments in collaboration with community polytechnics and other village functionaries in and around the polytechnic.

RECOMMENDED BOOKS

1. Shrinath, LS, "PERT and CPM - Principles and Applications", New Delhi, East West Press


4. Wakhlo, ON; "Civil Engineering Management", New Delhi Light and Life Publishers

5. Verma, Mahesh; "Construction Equipment and its Planning and Application

7. Gahlot PS; Dhir, BM; "Construction Planning and Management", Wiley Eastern Limited, New Delhi

7. MS Project – Microsoft USA

8. Primavera

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6.3.2 INTERIOR DESIGN (ELECTIVE-II)

RATIONAL

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 exercise 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) (4 hrs)
   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 (6 hrs.)
   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 (4 hrs.)
   Market survey of materials, appropriate uses of materials for wall finishes, flooring/ceiling etc.
4. Details (5 sheets)  
   a) Furniture  
   b) Storage  
   c) Partition  
   d) False ceiling  
   e) Panelling  

5. Electrical Layout in Interiors  

6. Interior Design problem of Restaurants, Houses, Offices, Shop (Any one project to be taken)  
   a) Detailed Plan  
   b) Layout (flooring pattern, furniture)  
   c) Sectional elevation (wall treatments)  
   d) One point perspective  
   e) Details of furniture, storage, partition, fake ceiling  
   f) Electrical layout  
   g) Colour Schemes  
   h) Indoor Plants  

Following books/magazines may be used for reference study material:

**BOOKS:**

1. Time saver standards for Interior Design and space planning.  
2. Interior Design by Ahmed Kasu.  
3. Nufert Architect’s data

**MAGAZINES**

a) Inside out side  
   b) Indian design magazine  
   c) Society interiors

**INSTRUCTIONAL STRATEGY**

While imparting the instructions in the class room, teachers should present case studies of some typical interior design works of houses, offices, shops, restaurants and other public buildings of national and international fame. The teacher should procure relevant audio-visual material on the subject and present them to the students. Field visits' to the local buildings with typical interior designs may also be arranged. Experts working in the area of interior design may be invited to deliver lectures and presenting case studies. Students may be encouraged to take up some independent assignment for interiors of local
buildings with the help of practicing interior designers. Students should maintain portfolio and give seminar towards the end of the session

RECOMMENDED BOOKS

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

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6.3.3 BUILDING MAINTENANCE (ELECTIVE-II)

RATIONAL

Besides planning/designing new buildings, the students of Architectural Assistantship working in the estate development have to plan and execute the repair works of existing civil works. The aim is to provide in depth understanding of building repair and maintenance to the students.

DETAILED CONTENTS

1. Principles of Building Maintenance & its economic considerations (6 hrs)
2. Identifying the sources of problems in interiors & exteriors of building (6 hrs)
3. Causes of dampness and remedies for removing dampness (6 hrs)
4. Defects & repair in roofs (10 hrs)
5. Common defects & their repair in buildings (6 hrs)
6. Surface finishes defects & repairs (6 hrs)
7. Maintenance of water supply & Drainage systems (8 hrs)

INSTRUCTIONAL STRATEGY

Efforts should be made to procure audio-visual material of case studies relevant to the contents of the subject. Teacher should arrange field visits to demonstrate to the students some of the typical monuments and historical buildings where the restoration work is under progress. The students should be encouraged to prepare reports/case studies of the observations made by them during the field visits. Independent assignments for drawings and case studies followed by viva voce may be given to the students. Experts from the field may be invited to deliver case studies and presentations.

RECOMMENDED BOOK

1. Building construction by Sushil Kumar
2. Building construction by B.C. Punia
3. Maintenance of building by Gurcharan Singh
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6.4 PORTFOLIO (MAJOR PROJECT) AND PROFESSIONAL TRAINING

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PROJECT WORK

Project work aims at developing skills in the students whereby they apply the totality of knowledge and skills gained through the course in the solution of particular problem or undertaking a project. The students have various 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 session to identify suitable project assignments. 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 for a group. The students should identify a given project assignment at least two to three months in advance. The project work identified in collaboration with industry may be preferred.

Each teacher is expected to guide the project work of 5-6 students.

The purpose of the portfolio (major project) should be to design and represent a chosen a realistic Architectural design problem for presentation to a client and execution on site.

12* WEEKS PRACTICAL TRAINING WITH A REGISTERED ARCHITECT.

This will be carried out in two parts-

- Working in the Architect’s office and producing a minimum of four blueprints on which the student has himself worked. This would be evaluated through a viva voce at the commencement of the sixth semester.

- During the training period, the students’ must identify the case study for his portfolio project and procure its necessary data.

- One project chosen by individual students to be developed in the following stages: (The project should be having coverage of about 1000 Sqm.)

* Of the Twelve weeks, four weeks will be during vacation after the fifth semester and Eight weeks after the commencement of the sixth semester.

* Sixteen Weeks Major Project (Portfolio)

- Pre-design studies culminating in a report comprising study of activity, users, individual space analysis, inter-relationship of spaces, one case study, and conclusions regarding above mentioned aspects. (4 weeks)
- Detailed design of the project to be presented through rendering presentation and detailed model to be presented through preliminary and final stage. (8 weeks)

- Complete working drawings with details of the design project. (4 weeks)

A suggestive criteria for assessing student performance by the external (personnel from industry) and internal (teacher) examiner is given in table below:

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<th>Sr. No.</th>
<th>Performance criteria</th>
<th>Max.** marks</th>
<th>Rating Scale</th>
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<td>Excellent</td>
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<td>Selection of project assignment</td>
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<td>Planning and execution of considerations</td>
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<td>Quality of performance</td>
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<td>Providing solution of the problems or production of final product</td>
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<td>Sense of responsibility</td>
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<td>Interpersonal skills/human relations</td>
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<td>Report writing skills</td>
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<td>Viva voce</td>
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The overall grading of the practical training shall be made as per following table

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<thead>
<tr>
<th>Range of maximum marks</th>
<th>Overall grade</th>
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<tr>
<td>i) More than 80</td>
<td>Excellent</td>
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<td>ii) 79 &lt;&gt; 65</td>
<td>Very good</td>
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<td>iii) 64 &lt;&gt; 50</td>
<td>Good</td>
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<td>iv) 49 &lt;&gt; 40</td>
<td>Fair</td>
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<tr>
<td>v) Less than 40</td>
<td>Poor</td>
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</table>
In order to qualify for the diploma, students must get “Overall Good grade” failing which the students may be given one more chance of undergoing 8 -10 weeks of project oriented professional training in the same industry and re-evaluated before being disqualified and declared “not eligible to receive diploma”. It is also important to note that the students must get more than six “goods” or above “good” grade in different performance criteria items in order to get “Overall Good” grade.

**Important Notes**

1. This criteria must be followed by the internal and external examiner and they should see the daily, weekly and monthly reports while awarding marks as per the above criteria.

2. The criteria for evaluation of the students have been worked out for 100 maximum marks. The internal and external examiners will evaluate students separately and give marks as per the study and evaluation scheme of examination.

3. The external examiner, preferably, a person from industry/organization, who has been associated with the project-oriented professional training of the students, should evaluate the students performance as per the above criteria.

4. It is also proposed that two students or two projects which are rated best be given merit certificate at the time of annual day of the institute. It would be better if specific nearby industries are approached for instituting such awards.

**Note:**

Eight (8) Weeks training in an Architects Office

It will be carried out in 2 parts:

- Working in the Architects office and producing a minimum of four blueprints on which the students has itself worked. This would be evaluated through a viva-voce at the commencement of the VI semester.

- During the training period, the students must identify the case study for his/her major projects and procure its necessary data.