"Annexure - A". to Notification No-23-PSC (DR-P) of 2022 dt:-08/09/2022.

SYLLABUS FOR THE POST OF ASSISTANT ARCHITECT

LIST OF SUBJECTS:

1. ARCHITECTURAL DESIGN
2. THEORY OF ARCHITECTURAL DESIGN
3. BUILDING CONSTRUCTION
4. BUILDING BYE LAWS AND BUILDING CODES
5. BUILDING SERVICES
6. HISTORY OF BUILT ENVIRONMENT/HISTORY OF ARCHITECTURE
7. BUILDING MATERIALS
8. BUILDING CLIMATOLOGY
9. PROFESSIONAL PRACTICE
10. CONSTRUCTION MANAGEMENT
11. ELEMENTS OF LANDSCAPE & LANDSCAPE DESIGN
12. SPECIFICATIONS
13. LIGHTING DESIGN
14. SUSTAINABLE ARCHITECTURE
15. TOWN PLANNING
16. TRAFFIC AND TRANSPORTATION
17. DISASTER MANAGEMENT FOR BUILDINGS
18. INTERIOR DESIGN
19. COMPUTER APPLICATONS
20. LOW-COST BUILDING DESIGN
21. STRUCTURAL SYSTEM
22. HILL ARCHITECTURE
23. ARCHITECTURAL CONSERVATION
24. MASTER ARCHITECTS

1. ARCHITECTURAL DESIGN

OBJECTIVE: Understanding the Interdependence of Form, Function, Structure, C rculation, Material, Services and Site-Planning in the process of Architectural design and applying them practically leading to climatically and environmentally responsive architecture.

CONTENTS:

i. Relationship between indoor and outdoor spaces.

ii. Meaning of Anthropometrics studies.

iii. Application of Colour, Texture, Scale.

iv. Importance of climate, building orientation.

v. Evolution of Vernacular Architecture.

vi. Issues of urban renewal.

2. THEORY OF ARCHITECTURE DESIGN

OBJECTIVE: To help differentiate between the practical and the impractical significance of Architectural Design and to help the student delve into he critical analysis and research of the subject before arriving at the solution.

CONTENTS:

i. Basic Art forms, Elements of Design space, Form, Line, Texture, colour etc. Principles of Design, Scale, Balance, Proportion, Rhythm etc.
ii. Objectives of Design, Truth, Beauty, Order, Efficiency and Economy.
iii. Forms and shapes in everyday life.
iv. Proportion, Rhythm, Harmony, Contrast, Balance.
v. Methodology of Creative Design.
vi. Theory of Colour, Colour-Wheel.
vii. Art Appreciation.
viii. Analysis and Classification of Space-Usage.
ix. Inter-relationship of different spaces within a building.

x. Inter-dependence of Function, structure, and form in architectural design.
xi. Elements of Circulation - Analysis and Classification.
xii. Sca e-basics: Architectural Scale, Human Scale, Monumental Scale.

3. BUILDING CONSTRUCTION

OBJECTIVE: To familiarize with traditional and modern construction details of various building components, in various materials and their application in all types of buildings.

CONTENTS:

i. Various components of a building and their types: Foundation, Walls, Floorings, Roofs, Doors, Windows, Terraces etc.
ii. Water-Proofing.
iii. Concepts of Frame Structures in RCC; various types of RCC constructions including construction of basements.
iv. Cement Concrete products such as hollow concrete blocks, t concrete light weight blocks etc.
v. Types of Stairs in various materials.
vi. Various types of durable and decorative floor finishes.
vii. Detailing of toilets, various bathroom fitting types.
viii. False-ceilings incorporating services such as air-conditioning, lighting.
ix. Wall-paneling types, including for thermal and acoustic insulation.
x. Typology of Working drawings like Site Plan, Foundation plan, Floor-plans, elevations & Sections.
xi. Various systems of construction of high rise buildings in d Steel - RCC a vierendeel girder, space frames, air frames, hinged portal trusses etc.
xii. Types and details of Lifts, Escalators, moving-ramps.
xiii. Building Services.
xiv. Installation of Solar Water heating System in Buildings.
xv. Solar activated Facades.

4. BUILDING BYE LAWS AND BUILDING CODES

OBJECTIVE: To familiarize with various kinds of building regulations required to control and promote the ordered growth of a city/ town.

5. BUILDING SERVICES

OBJECTIVE: To create awareness of various services like water-supply , drainage, electrical layout, artificial climate controls etc. and also to familiarize with the new advances in Building Services like Vertical-Transportation System, Fire Control System and Automation System in buildings.

CONTENTS:

1. **Water supply:**

i. Sources, treatment, storage and supply systems for domestic, commercial and industrial use.
ii. **Drainage System:** types for a neighborhood unit/Multi-storied buildings.
iii. Storm-water disposal, waste-water disposal, solid-waste disposal.
iv. Water-supply system - hot and cold water - for multistory residential & commercial buildings.
v. Materials and sizes used for pipes.

2. **Electrical Services:**

I. Types of wiring, fittings and conduits; wiring systems, safety and precautions for fire control.
II. Electrical equipment used in buildings: SB, MDBs, DBs MCBs, ELCB Fuses, Relays, Switches, Motor-starters, delay switches etc.
III. Preparing electrical layout for residential and all other building types.

3. **Vertical and Horizontal mechanical Transportation system in Builc**
ing - lifts, Escalators, Vehicular Elevators and Moving Walk Ways.

4. **Fire-Control System in Buildings:**

i. Various types of Fire Detection System, Fire-Fighting systems.
ii. Study of Fire-Control practice as per NBC (2016).
iii. Fire-Controls - Fire panels, Fire door operation.

5. **Air-Conditioning and Ventilation:**

I. HVAC systems.
II. Ventilation: Natural and Artificial. Forced ventilation in basements.
III. Types of Air Conditioning systems - Window, Split, Central, Packaged.

1148833/2022/O/o CH The VRV or VAV systems.

6. Building Automation Systems:

i. Relevance of Building Automation Systems to architects,
ii. Automated service control, Elevators, Air-Conditioning, lighting etc.
iii. Intelligent Buildings.
iv. Integrated Building Management Systems (BMS).

6. HISTORY OF BUILT ENVIRONMENT

OBJECTIVE: To understand the role of geo-physical, societal, political and technological factors in the evolution of architectural and urban form. T develop a holistic approach to architecture as an integral component of the built environment.

CONTENTS:

A. Man's early attempts to colonize.

i. Examples of Stonehenge and other pre-historic settlements.
ii. Determinants of Built form - geo-physical, societal, political and technological.

8. River-Valley Civilizations:

I. Evolution of their vernacular and urban design manifestations with reference to location, materials and techniques, socio-cultural influences etc.
II. Egyptian Civilization.
III. Mesopotamian Civilization.
IV. Indus Valley Civilization.

C. Buddhist Architecture:

Ashoka and the beginning of Buddhist School of Architecture. Typology like Stupas, Chaityas and Vlharas.

D. Hindu Temple Architecture.

i. Evolution of Temples - Rock Cut and free-standing.
ii. Comparison of temple forms in various regions of India; North Indian and south Indian styles.
iii. Jain Temples of Gujarat and Rajasthan.
iv. Temple towns of Madurai, Srirangam, Mt. Abu.

E. Muslim Architecture in India:

I. Mosque and Tomb Design.
II. Buildings and structures of the Qutb complex like the Qutb Minar, Quwwat-Ul-Islam Mosque.
III. Arrhai Din ka Jhompra, Tombs of Ghiyasuddin Tughlaq, Firoz Sha Tughlaq, Balban, Sikander Lodi.
IV. Firoz Shah Kotla.

The Architecture of the Mughals:

i. Hamayun's Tomb.
ii. Fatehpur Sikri.
iii. Red Fort (Agra & Delhi), Jamia Masjid (Delhi).
iv. Taj Mahal.
v. **Mughal Gardens** at Pinjore, in the Taj Mahal complex and in Kashmir (J&K).

7. BUILDING MATERIALS

OBJECTIVE: For imbibing knowledge of all building materials required for construction. Their uses, properties and applications for different types of situations.

CONTENTS:

i. Stone, artificial stones.
ii. Brick types including fire bricks, sand lime bricks, colored bricks, fly-ash bricks
iii. Cement, concrete-types, Light weight concrete and its applica-ions; high performance concrete, self-compacting concrete (SCC).
iv. Du ability enhancing products: Admixtures; mineral admixtures, water proofing compounds.
v. Clay products like Ceramics, Porcelain, Terracotta, glazed tiles, vi1rified tiles, composite tiles etc.
vi. Industrial Timber: Plywood, laminated board, block board, particle board and batten board etc.
vii. Materials required for sound insulation, mineral admixtures,
viii. Metals and metal products:- Iron, Aluminium, Copper, Zinc, Brass Stainless steel.
ix. 3-D printed material, structural 3-D material.
x. Glass types and glass substitutes like ETFE Polymer. (ethylenetetrafluoroethylene).
xi. Architectural Fabrics.
xii. Building cladding systems, structural glazing,
xiii. Plastics, bio-plastics and PVC, UPVC, Rubber products, HOPE and their uses.

8. BUILDING CLIMATOLOGY

OBJECTIVE: To acquaint the undergraduate student with the concept of c imate as a significant determinant of Built Form.

CONTENTS:

i. Role of Climate with respect to shelter.
ii. Movement of earth around the sun, change of seasons, distribution pressure-belts, global wind movements, global pressure belts, global climatic zones.

9. PROFESSIONAL PRACTICE

OBJECTIVE: To introduce the Professional, Vocational and Legal aspects of architecture practice.

CONTENTS:

i. Social obligations of the Architectural Profession.
ii. Architectural professional associations e.g. the Council of Architecture, Indian Institute of Architects - their role and responsibilities.
iii. Architects Act 1972/1983
iv. Code of Professional conduct.
v. Condition of engagement and scale of fees.
vi. Copyright Act as applicable to architectural work.
vii. Concept of contract and arbitration.
viii. Duties and liabilities of architects, duties and liabilities of contractors.
ix. Articles of agreement, execution of works and payments.
x. Arbitration, Arbitration Act, its application and scope.
xi. Valuation and valuation methods.
xii. Expression of Interest.
xiii. Pre-Tender qualification and registration of contractors.
xiv. Office organization and management, office expenses, structure, salaries, role of design staff and supporting managerial staff, personnel management and tra ning responsibilities.

10. CONSTRUCTION MANAGEMENT

OBJECTIVE: To prepare and plan each construction activity, including man, ging equipment, employees, materials and time.

CONTENTS:

i. Aim, objectives and functions of Construction Management.
ii. Construction stages.
iii. Role of an architect in Construction Management.
iv. What are bar-charts and limitations of bar charts.

v. Programme Evaluation and Review Techniques (PERT).
vi. Critical Path Method (CPM) for Project Management.
vii. Development and Analysis in Network Planning.
viii. Scientific methods of Construction Management.
ix. Project Management for Repetitive type of buildings. Line of Balance Method.
x. Inspection and Quality Control.
xi. Safety in Construction.

11. ELEMENTS OF LANDSCAPE & LANDSCAPE DESIGN

OBJECTIVE: To provide a comprehensive knowledge regarding ecological aspects and environmental concerns in Landscape Design.

CONTENTS:: Introduction and historical backdrop of the evolution of Landscape Design as a process of an interface between man and nature.

i. Introduction to ecology and its importance to Landscape Designers.
ii. A brief history of the gardens the world over - and their relevance in their time, context and social needs.
iii. Advanced knowledge of basic elements of landscape such as earth, rock water and vegetation in the context of their environmental aspects and concerns.
iv. Site Analysis and Site-Structure unity.
v. Environmental Impact Assessment Techniques
vi. National Environmental Policy and Bio-diversity significance in urban areas
vii. Basic knowledge of contour mapping and various methods of documentation of physical features, topography and landscape elements.
viii. Historical and Contemporary Landscape design works and projects in India.

12. SPECIFICATIONS

OBJECTIVE: To acquaint and familiarize the undergraduate student with the techniques and terminology of writing specifications of basic and composite materials, methods and checking specifications of materials etc.

CONTENTS:

i. Importance of Specifications, different types of Specifications, revision of Specifications etc. for building materials like brick, stone, cement, lime, aggregate, timber and other finishes.

ii. Wr ting specifications for civil works of a small building project, sta-, rting with excavation, earth work, foundations, damp-proof course, brick masonry work, concreting, flooring, plastering, painting, varnishes, timber and steel doors and windows.

iii. Writing specifications for Building Services, such as water supply, plumbing, electrification, fire-fighting etc.

13. LIGHTING DESIGN

OBJECTIVE; To apprise the under-graduate student of role of light in our everyday living and about the behaviour of light, both natural and artificial and also to introduce methods for qualitative and quantitative measurement of lighting requirements.

CONTENTS:

i. Functions and the basic anatomy of the eye.
ii. Photometric and other general terms used in lighting - Lumen, Lux, l luminance, Intensity, Colour Rendering Index (CRI), Co-related Colour Temperature (CCT), Ingress-Protection Rating (IPR) etc.
iii. Types of Lamps: Incandescent, Discharge lamps, Fiber-Optics, LEDs etc.
iv. Types of Luminaries.
v. Use of Reflectors, Control-Gear, Connectors etc.
vi. Relation between light and colour. Additive and subtractive colour mixing.
vii. Glare and light-pollution control.
viii. Lighting Controls/automation.
ix. Importance of daylight and designing with daylight.
Study of Le works in Chandigarh.

14. SUSTAINABLE ARCHITECTURE

OBJECTIVE: To understand the importance of natural resources and their use in building construction.

CONTENTS:

i. Reasons for Global Warming
ii. What is Sustainable Development, and, an Architect's role in it.
iii. Green Building and Rating System - GRIHA & LEED Rating systems
iv. Carbon Credits and Rating System,
v. Energy Conservation Act (2001) of India
vi. ECBC/ECBC Rules,
vii. Various issues in Sustainable Development like Energy, natural resources like Water, Earth, Air; and materials.
viii. Quality of Indoor/outdoor environment
ix. Design Strategies like Solar-Passive design, surroundings, optimization use of resources, recycling/re-use, life-cycle assessment.
x. India's approach to sustainable development.

15. TOWN PLANNING

OBJECTIVE: To understand the role of planning in evolution of urban form

CONTENTS:

i. Overview of evolution of settlement design from the River Valley to pre-industrial (17^{th} Century) towns.
ii. Town-Planning Policies in India from the 18^{th} Century till present day.
iii. Methodology for development of new towns involving various stages like population projection, need and quantitative requirement of inf1astructure, distribution of land use, future development.
iv. Issues and strategies of Urban renewal of existing and historical town - need for renewal, problems involved in urban renewal schemes, surveys to be conducted, methods of collection and analysis of data, rehabilitation and compensation, scope for future growth.
v. Case studies of Urban renewal schemes in Indian and Western towns.
vi. Master Town Planners contribution: Patrick Geddes, Patrick Abercrombie, Ebenezer Howard, Clarence Perry, CA Doxiadis, Le Corbusier.

16. TRAFFIC AND TRANSPORTATION

OBJECTIVE:

To make the students conversant with methods, techniques of transportation, the socio-economic and environmental issues related to the movement of human goods in general ad in urban areas in particular.

CONTENTS:

i. Traffic and Urban Environment.
ii. Various kinds of Transportation systems with their qualitative analysis
iii. Problems encountered in Intra-city transport systems.
iv. Road accidents: Causes and remedial measures.
v. Transport policy issues.
vi. Traffic Control devices.
vii. Regulation and Enforcement.
viii. Road design elements: Intersections.

ix. Traffic and Parking surveys.
x. Movement of Human and goods at the Inter-City levels,
xi. Urban Traffic and Transport problems.
xii. Transport problems.
xiii. Use and application of an underground Metro system, a Tramway system and a Bus Rapid Transit System (BRTS).

17. DISASTER MANAGEMENT FOR BUILDINGS

OBJECTIVE: To make the students understand the various pre and p(st disaster design and management measures.

CONTENTS: Earthquake prone area problems and issues; earthquake resistant design - general principles.

i. Special construction techniques.
ii. Fire, Floods, Cyclones, Avalanches:- General requirements and principles for building design and special construction techniques in such areas.
iii. Post-Disaster problems, issues and management.

18. INTERIOR DESIGN

OBJECTIVE: To understand and appreciate the complexities and construction in the design and execution of interiors.

CONTENTS:

i. Principles of Aesthetic Composition in Interiors.
ii. Application of Colour, Form and Texture.
iii. Role of Natural and artificial lighting.
iv. Built-in- Furniture and movable furniture.
v. Interior furnishings,
vi. Decorative elements for Interiors.
vii. Modern and traditional building materials for interior finishes.
viii. Treatments applied to floors, walls, partitions and ceilings for Interior design.
ix. Integration of Electrical and Mechanical Services in Interiors.

19. COMPUTER APPLICATIONS

OBJECTIVE: To teach the student the various computer applications in a Architecture and related softwares.

i. Softwares required for presentations - Power-Point, Sketch Up, Corel Draw, Photoshop.
ii. Fundamentals and basic features of 2D and 3D drawing and modeling
iii. Features of AutoCad/Revit/Archi-CAD, Animation and 3D-Studio Max.

20. LOW-COST BUILDING DESIGN

OBJECTIVE: To create awareness of the use of conventional and non conventional resources for low-cost construction.

CONTENTS:

i. The building processes adopted in different climatic zones of India, resulting in varied Vernacular expressions.
ii. Application of low-cost technologies - use of local materials, traditional techniques, prefabrication etc.
iii. Need for Low-Cost construction.

21. STRUCTURAL SYSTEM

OBJECTIVE: To appreciate and understand the various types of structure systems in theory only.

CONTENTS:

i. Cable Structures - the Catenary, various suspension bridges like fan type, Harp type, self anchored bridges.
ii. Cable Roofs types.
iii. Arched roofs - Barrel roof, Diagonal and Radial arch roofs.
iv. Shells, Domes and membrane structures.
v. Pneumatic Structures, types and shapes.

22. HILL ARCHITECTURE

OBJECTIVE: To familiarize with the challenges of building on the hills, brought about by climate, topography and availability of local building materials. In t e present context of Environmental concerns that the hills face - a greater responsibility Has been thrust on architects and builders.

Contents:

i. Historical background of Hill Architecture and its unique attributes and concerns.
ii. Major hill settlements in various regions of the world.
iii. Traditional hill settlements of India.
iv. An overview of vernacular hill architecture of Jammu and Kashmir, Himachal Pradesh and of the Aravalli hills and Morni Hills of Haryana

23. ARCHITECTURAL CONSERVATION

OBJECTIVE: To understand the significance of Built Heritage in the resent day context and to define the architect's role in the process of its conservation.

CONTENTS:

i. Definition of Cultural Heritage, Historic Buildings, Cultural Landscapes etc.
ii. Heritage as a Cultural Resource.
iii. Purpose of Architectural Conservation.
iv. Various Intervention methods - Preservation, Restoration, Reconstruction, Adaptive Use etc.
v. Role of Architect at various stages of Conservation action.
vi. Preparatory procedures and methods for architectural conservation like Inventories, Inspections, Reports, Research, Analysis and Documentat on.
vii. Causes of Decay in Materials and Structure.

Management of Built Heritage:

viii. Classification of Historic Buildings and Degrees of Protection.
ix. Management of Historic Sites.
x. Problems of Cultural Tourism.
xi. Role of UNESCO, ICOMOS, INTACH etc.

24. MASTER ARCHITECTS

OBJECTIVE: To study how the modern Master Architects of the 20th Century created and evolved their masterpieces in India, their adaptation to the situation in different climatic zones and to assess their contribution by their own criteria.

CONTENTS: Works of:

i. Le Corbusier,
ii. Louis Kahn,
iii. Joseph Allen Stein,
iv. Christopher Charles Benninger,
v. Charles Correa,
vi. BV Doshi,
vii. Raj Rewal,
viii. Laurie Baker,
ix. Anant Raje,
x. Achyut Kanvinde,
xi. Piloo Mody.

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