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Syllabus for the posts in School of Architecture in Higher Education Department

ARCHITECTURE

UNIT-I

Architectural Design Principles and Theory

Principles of architecture, Determinants of design, Principles of composition; Significance of the visual in design, principles of visual design, visual perception; Design as a process; Creativity in architectural theory; Ideation in design, Concept formulation; Architectural vocabulary; Principles of aesthetics; Reading the Built Environment, Architectural Styles and their determinants, Modularity in design; Context and its significance; Architectural design principles in history; Contemporary theories in architectural design; philosophy and works of prominent Indian and international architects across time.

UNIT II

Architectural Design and Practice

Anthropometrics, Parameters of architectural design, Human behavior and design; Space standards, Spatial organization; Circulation; Reading the site, context, site planning; Reading the brief, Assessing feasibility; Building regulations: setback, FAR, FSI, density, coverage, occupancy; Universal design, Codes and standards; Architect client relationship; Significance of teamwork, coordination with consultants; Research in architectural design and practice; Architectural graphics, Computer aided design, Software in architectural design, Current global concerns and architectural design climate, sustainability, equity; Technology integration in architectural design: computational design, BIM, digital fabrication, AI.

UNIT-III

Building Construction, Systems and Materials

Foundations; Masonry construction; Walling systems and their materials and types such as bond types, composite walls, cavity walls, partition walls, paneling, cladding systems; Arch, Roofing systems and their materials and types such as RCC slab, truss, frame, roof coverings, ceilings; Fenestration types and their materials and fixing; Flooring types and materials; Materials finishes for interiors; Cost effective materials; Pre-fabrication of building components, Structural Systems and types such as high rise construction, long span structures; Modular construction

UNIT-IV

History and Theory of the Built Environment

Factors and principles of Architecture; Role of natural phenomenon like geography, topography, climate, Human agency in shaping the built environment; Principles of Ekistics; Pre-historic architecture, River valley civilizations: Indian, Egyptian, Mesopotamian, Greek, Roman; History of architecture in the western world: Early Christian, Byzantine, Gothic, Renaissance, Baroque, Rococo, Neo-Classical; History of architecture in the Indian subcontinent: Vedic, Hindu, Buddhist, Jain; Islamic; Colonial, Vernacular building traditions and knowledge systems; Emergence of Modern architecture: Arts and Craft Movement, Art Nouveau, Art Deco, Early Modernism, International Style, Post-War Modernism, Late Modernism, Post-Modernism, Contemporary Architectural Trends and Theories: Critical Regionalism, Green Architecture, Sustainable Architecture, Neo-Vernacular, Architecture without Architects, SlickTech/HiTech, Deconstruction, Building in a globalized world, philosophy and works of prominent Indian and international architects across time

UNIT-V

Building Services

Water supply sources, distribution methods, plumbing equipment and systems, water harvesting, Waste types and their management, recycling and reuse; Drainage and sewage disposal methods, sanitary fittings and fixtures; Electrical systems, distribution, wiring types and circuits, illumination standards, equipment, Air conditioning types and systems; Fire-fighting systems, Risk management in buildings, building safety and security systems; Principles of acoustic design and materials; Natural and mechanical ventilation types and systems; Mechanical movement systems both horizontal and vertical, types and equipment; Thermal, visual and acoustic comfort, psychometric properties; Building performance and simulation, Building management systems; BIM.

UNIT-VI

Construction Management

Definition of project management, Significance, Principles of construction management, Techniques such as PERT, CPM, etc.; Estimating, Costing and Specification; Network Analysis; Construction practices, materials and management as a sustainable phenomenon; Contracts and tenders; Budgeting; Concept of Uncertainty; Optimization Models; Contingency theory; Resource levelling and its types; Workforce motivational theory; Leadership theory; Repair and Retrofitting; Risk management: preparedness, mitigation, Scheduling systems; BIM

UNIT-VII

Urban Design and Conservation

Relevance of Urban Design and Conservation, History of Urban Design and Conservation, Elements, principles, tools and techniques of Urban Design, Urban processes; Urban form and space, Morphology; Pattern, scale, grain and texture; Evolution of the city; Imageability; Urbanism and Conservation theories: Modern, Post-Modern, Neo-Urbanism, Ecological Urbanism, Landscape Urbanism; Sense of Place; Urban development controls, density, FAR, building byelaws, land use; Principles, tools and techniques of Urban Conservation: renewal, redevelopment, revival, re-adaptation, Historic districts, precincts, neighbourhoods, global and national urban conservation paradigms

UNIT-VIII

Urban and Regional Planning

Relevance and definitions of Urban and Regional Planning; Urbanization as a phenomenon; Urban sprawl; Planning theories across time; Ekistics; Urban sociology; Quality of life; Planning history of the world and India; Multiple aspects of planning: physical, infrastructure, housing, transport, environmental; Formulation of Plans and their types, Planning techniques, Institutional framework, legislation and governance mechanism, Definition of the Region, Regional Planning and resource development; Development economics, Participatory planning; Equity in planning, Geo-informatics in Planning: GPS, GIS, Remote Sensing, the contemporary city: Eco-City, Smart City, Resilient City, Healthy City.

UNIT-IX

Landscape Architecture and Environmental Design

Relevance of Landscape Architecture and Environmental Design, Human relationship with nature and its evolution over time, History of landscape design, types of landscapes, Elements and principles of landscape design, Site planning theories, principles and processes, Landscape construction techniques, Landscape services; Urban landscapes; Landscape and sustainability, Landscape Urbanism, Ecological principles and processes, Environment and human behavior; Environmental considerations in planning and design,

Environmental pollution, types, causes, control and mitigation; Environmental legislation and regulations, Environment Impact Assessment, Urban climatology, Blue-green infrastructure; Sustainable development, goals and strategies; Carbon neutrality.

UNIT-X

Professional Communication and Practice

Role and significance of professional communication, Types and formats of communication such as oral, textual and visual, Report writing, types and principles; Presentation skills; Architect's Act; Role of Council of Architecture, Professional conduct; Types of services; Fee structure; Tendering; Arbitration; Valuation, Legislative framework in practice; Role of development authorities and LSGIs; Setting up and running an office; International practice, global collaborations; Architectural competitions; Entrepreneurship.

STRUCTURAL ENGINEERING

Unit 1

Concept of force, resolution and composition of forces, resultant and equilibrium of forces, frictions, Centre of Gravity and moment of inertia for various shapes and sections. analysis of truss, simple lifting machines, Bending moment and shear force.

Unit 2

Simple strain and stress, different types of stresses, elastic constants and relations between them, column and strut – Euler's and Rankine's formula, theory of simple bending, bending and shear stresses, Torsion of shaft, Understanding the behaviour of homogeneous material under direct and bending forces

Unit 3

Concept of working stress method and limit state method of design, design of Reinforced Concrete beam, slab, column and shallow foundations and retaining walls as per IS 456:2000, detailing as per IS 456, SP (34) and IS 13920:2016, design of structural members as per design aids SP(16)

Unit 4,

Fundamentals of structural forms, structure-architecture relationships, structural materials, Characteristics Loads acting on structures as per latest IS 875 (Part 1 to 5) and IS 1893, Structural forms for high rise buildings, reticulated domes, arch and domes, vault structures, shell structures, folded plate structures, membrane structures, pneumatic structures, Structural failures.

Unit 5

behaviour of materials such as brick, stone, sand, lime, cement, mortar, cement concrete, steel, stainless steel. Introduction to basic and contemporary flooring and external paving, understanding of traditional and contemporary waterproofing materials and techniques, Vernacular building materials such as mud, timber, bamboo, thatch, terracotta tiles.

Unit 6

Design of Steel Structures as per IS 800-2007

Introduction to steel structures, properties of structural steel, structural sections and their classification, design of connections: welded and bolted, design of tension members, compression members and beams, design and drawings of simple trusses, purlin, design of plate girders, industrial buildings.

Unit 7

Introduction to pre stressed concrete structures, analysis and design of prestressed members as per IS 1343:2012, Introduction to pre-cast, prefabricated building system; Jointing, tolerances and modular coordination. design of timber structures as per IS 883:1994.

Unit 8

Analysis of indeterminate structures like fixed beam, continuous beam, portal frames, gable frames using classical methods.

Introductions to modern methods of analysis like matrix methods, finite elements methods etc

Unit 9

Soil mechanics and foundation engineering, earth pressure and retaining structures, soil exploration, soil classifications, soil bearing capacity, types of foundations (shallow and deep).

Unit 10

Design of unreinforced reinforced masonry structures, concept of earthquake resistant design of buildings, non-destructive testing of structures, repair and retrofitting of buildings. Explanation of latest IS 4326, IS 13935, IS 13827, IS 13828 and IS 1893.

FINE ARTS

Unit-I

General characteristics of visual arts /Fundamentals of Visual Arts: Space, Form, Size, Shape, Line , Colour, Texture ,Tonal Value, Perspective, Design and Aesthetics, organization of visual elements in Art composition .The uses of two and three dimensions in Visual Art , tactile quality in Art, perceptual and conceptual aspects in Art.

Unit-II

Interrelationship of various Arts: Rhythm ,Structure, Use of Space , Visual properties, Materials, techniques(Traditional and Modern), ideas, themes, conceptual , Abstract elements between performing ,Literary and Plastic Art .

Unit-III

Application of techniques, colors and color theory and the application of Color theory in Art Activities .

Colour Harmony, traditional application of colour and the application of colour reasoning. Color preparation, technical aspects of pigment .Sources and influences of various traditions. Study and understanding of artistic value, construction of forms, shapes, planes ,volume and totality ,understanding of two and three dimensional approaches and the purpose

Unit-IV

Relevance of the study of history of World Art (Including history of Advertising and Marketing) for the students of Visual Arts in general and Art History as an area of specialization .Relevance of the study of Aesthetic and critical theories of Art for students of Visual Arts (including students of Applied Arts)and student of Art History and Aesthetics

Unit-V

Importance of Applied Art in Visual communication . Understanding of all the elements of an Advertising design/graphic design such as Typography and Calligraphy (Headline, copy), photography, illustration logo and symbol. Outdoor advertising – Its importance in communication .Various kinds of media of outdoor advertising with its advantage over other media. Advertising campaign, product packaging design awareness along with all the media available with new technologies such as computer designing digital printers etc.

Unit-VI

Relevance of the study of Aesthetics in Fine Arts / Visual Arts .The early philosophical thoughts in Indian culture. Nature and function of works of Art in society .Concepts of Rasa, Dhvani ,Alankara, Auchitya etc. Concept of Art and beauty ,idea imagination, intuition, form and content ,sublime, Sympathy, Empathy ,creativity Allegory , myth etc .

Unit-VII

Prehistoric Indian painting, classical Indian paintings, mural of Ajanta, Manuscripts painting, miniature Painting ,folk and traditional paintings .Company school of paintings, Raja Ravi Varma ,Bengal School ,Major phases in Western Art – Egyptian Art, Greek Art, Roman Art, Byzantine Art, Gothic ,Renaissance and its background ,Baroque, Cubism, Impressionism , Fauvism, Futurism, Dadaism, Surrealism, Abstract Art, Abstract Expressionism . Types of paintings, Open Air paintings, portrait paintings, study of head and full length figure, male and female. Landscape paintings, patronized Art.

Unit –VIII

What are genres?

- Hierarchy of the genres, type of picture is a genre painting, the difference between a landscape and a genre painting?
- Portraiture, still life painting, method of gouache painting, acrylic painting, oil painting.
- Fresco, ink and wash painting, panel painting, tempera painting(sometimes known as Egg tempera). The advantages of using oil paints, the benefits of using Water colours, Mosaic Art, Figurative painting.

Unit- IX

- The main types of Sculpture, the difference between free standing sculptures and reliefs.
- Methods of Sculpture making like Lost Wax, Dokhra casting, Fibre Casting, Wood Carving, Paper Machie .The World's best sculptures and greatest Sculptors Renaissance to Early 20th century.

Unit-X

- The visual art, plastic art, decorative art, Applied Art, Liberal Arts, Folk Arts.
- The best Art photographers (Indian contemporary)

Unit-X

- The visual art, plastic art, decorative art, Applied Art, Liberal Arts, Folk Arts.
- The best Art photographers (Indian contemporary)

- Photography as an Art form
- Calligraphy ,Collage(Western) , Conceptual Art (Indian and Western) , the main style of Architecture and Art Nouveau 19th century (arts and craft movement in Britain)
- The Art Deco, The Bauhaus ,Art Brut , Religious art(Gothic, Renaissance)