

**SYLLABUS FOR GOVERNMENT POLYTECHNIC
FOR THE POST OF LECTURER (INTERIOR DESIGN)
AND DECORATION)**

PAPER 1

1. BASIC DESIGN FUNDAMENTALS

Role of an Interior Designer in the built environment; Information about I.I.D. and its role in profession.
Elements of design in 2-D and their definitions; Point, line, shape, form, space, texture, value, colour and material etc.;
Principles of design in 2-D and 3D - unity, balance, symmetry, proportion, scale, hierarchy, rhythm, contrast, harmony, focus, etc.; Use of grids; Creating repetitive patterns; Different 3-D forms and primitive forms, shapes and understanding the behavior when combined; Transformation of 2-D to 3-D; Principles of composition using grids, symmetrical / asymmetrical, Rule of Thirds, Center of Interest, Gestalts Theory of visual composition, etc.
Theory of Colours - Visible spectrum; Coloured light; Colour temperature; Colour interaction; Colour blindness; Colour wheel - primary, secondary, tertiary colours; Colour schemes; Colour value; Colour intensity, etc.; Colour hues - tints, shades, neutralization; Color charts - types, making and using; Color harmony, use of color harmony; Psychological impact of colour - warm, cool and neutral colours; Impact of specific hues; Meanings of colour; Colour and form; Colour and light; Colour and surface qualities; Colour and distances and scales, etc.

2. MATERIALS

Complete understanding of constituents, properties and application of traditional building materials e.g. Mud including stabilised earth, Burnt Bricks, Brick Tiles, Brick Ballast, Surkhi, Lime, Cement, Sand etc.
Complete understanding of application of building materials e.g. Timber and its Classification, Characteristics, Defects, Preservation; Hardware e.g. Hinges, Handles, Knobs, Bolts, L-drops, Locks, Stoppers, Stays, Silencers, Chain guards, Closers, Catchers, Knockers etc. in various furniture items;
Stone and its classification, availability, characteristics and application etc.
Surface (Wall) Finishing & Polishing - Types and application of plasters; Jointing and Pointing; Cladding; Preparation of variety of surfaces; Application of various coats; Finishes - Lime / Colour wash; Dry distemper; Oil bound distemper; Cement paints; Acrylic emulsions; Synthetic enamels; Wall textures etc. Polishes and Varnishes.
Roof Coverings and their constituents, properties and application of - Clay Tiles (Country, Allahabad, Mangalore tiles etc.); Stone Slating; Shingles; Thatch etc.
Timber Products and their constituents, properties and application of - Variety of Plywood; Ply-board; Block board; Particle board; Wood wool cement board; Fiberboard; Compressed straw board; Cement fiberboard; Mineral fiber board; Veneers; Laminates etc.
Glass & Ceramics Glass and their constituents, properties and application of - Translucent; Transparent and Special glasses; Glass bricks; Patch fittings for glazed partitions and shutters.
Ceramics and their constituents, properties and application of - Terracotta; Faience; Fireclay; Stoneware; Earthenware; Vitreous China; Porcelain etc.
Adhesives and their constituents, properties and application of -
Natural Adhesives - Animal; Casein; Bituminous etc.
Thermoplastic Adhesives - Polyvinyl Acetate etc.
Thermosetting Adhesives & Plastics - Urea Formaldehyde; Phenol Formaldehyde; Melamine Formaldehyde, Resorcinol Formaldehyde; Epoxide Resins etc. Rubber Adhesive.

3. INTERIOR CONSTRUCTION

Element of Building - Terminology, Nomenclature of various parts of building from foundation to roof
Brick Work - Brick Terminology; Simple Bonds e.g. English bond & Flemish (single and double) bond in brick work for up to two brick thick walls; Details at quoins and junctions in English bond and Flemish bond for up to two brick thick walls; Details of piers (attached and detached); Lintel and Sill; Brick jaalis; Corbelling; Coping; String courses; Arches in brick and stone; Elementary principles; Centering; Cavity walls etc
Timber - Elementary carpentry; Common joints; Details of framed, ledged, braced and batten doors etc.
Stone Work - Elementary Stone Masonry; Types of joints; Random, Course and Ashlar Stone Work in walls etc.
Door, Window & Ventilator (Timber) - Types and details of Panelled door shutters and Mosquito proof door shutter; Types of Windows & Ventilators and details of glazed window and ventilator shutters and frames etc.
Door (Timber Products) -Types and details of Flush door shutter with finishes.

Door (Operational Mechanism) - Understanding of operational mechanism (automatic and manual) of variety of Sliding door shutters; Sliding-folding door shutters and Revolving doors shutters.
Partition - Terminology; Partitioning methods with use of different materials e.g. Timber and Timber Products, Clay and Terracotta Brick / Block, Pre-cast Concrete Block, Wood Wool Cement Board, Compressed Straw Board, Glass and Glass Brick.
Panelling (Timber & Timber Products) - Terminology; Panelling methods with use of materials e.g. Timber and variety of timber products.

4. DRAWING

Basic Technical Drawing - Concept and types of line; Division of lines and angles; Drawing polygons; Inscribing and circumscribing circles in polygons; Drawing geometrical curves helix; Conoid etc.
Orthographic Projections - Vocabulary and concepts of Planes of Projections, First angle projections, Projection of points, Lines and planes in different positions; Projection of regular rectilinear and circular solids (prisms, pyramids, cones, cylinders, spheres etc.) in different positions; Sections of regular rectilinear and circular solids (prisms, pyramids, cones, cylinders, spheres etc.) in varying conditions of sectional plane etc.
Development of Surfaces - Vocabulary and concepts of cubes, prisms, cylinders, pyramids, cones and spheres etc.
Solid Geometry - Vocabulary and concepts for construction of section, Intersection and interpenetration of solid forms

5. APPLIED MATHEMATICS FOR INTERIOR DESIGN

Trigonometry - Measurement of angles in degree and radian and their conversion; Trigonometrical ratios and their relations; Ratios of allied angles (without proof); Sum and differences formulae and their applications; Product formulae, from product to sum difference and vice versa; Multiple and sub multiple angles ($2A$, $A/2$).
Matrices - Definition and types of matrices, addition, subtraction, and multiplication of matrices; Inverse of a 3×3 matrix by adjoint matrix method; Solution of linear equations containing up to 3 unknowns only.
Co-ordinate Geometry -
Point - Cartesian and polar co-ordinates and their conversion; Distance b/w two points; Internal and external division formula; Co-ordinates of centroid, in centre and circum-centre; Conditions of colinearity of points.
Straight line - Equation of a straight line in various standard forms; Angle b/w straight lines; Perpendicular distance formulae.
Circle - Equation of circle in standard and general form; Finding the equation of circle when its centre and radius are given & when any 3 points on it are given.
Conics - Definition of conics, parabola, ellipse and hyperbola and their standard equation; Finding the equation of parabola when its focus and directrix or focus and vertices are given; Finding the equation of an ellipse or hyperbola when focus, directrix and eccentricity are given; Given the standard equation of conic to find its focus, directrix, vertex, axis, eccentricity and the length of latus rectums.
Centre of Gravity - Definition; Calculation of CG of plane figures, like I, T, L.C, O hallow and Box sections;
Moment of Inertia (MOI) - Definition; Calculation of CG & MOI of plane figures about the principal axes e.g. rectangle, triangle & circle; Parallel axes theorem, Perpendicular axes theorem.
Algebra: Mensuration -
Area of plane figure - Triangle, Rectangle, Circle, Parallelogram.
Calculation of volume and surface area of a right rectangular prism - Pyramid, Cylinder, Cone, Sphere and area of irregular figures.
Arithmetic and Geometrical Progression - Definition and simple problems.

6. ART IN INTERIOR DESIGN

Vocabulary of art; Relevance of art in interior design;
Elements of Design - Line, Direction, Shape, Size and Form etc.
Principles of Design - Unity, Texture, Colour, Tone Direction, Proportion, Form and shape, Solids and Voids etc.
Different eras and movement in Art - Renaissance; Baroque; Realism; Impressionism; Fauvism; Cubism; Expressionism; Surrealism etc.
Contemporary arts and artist in India - Works of Rabanindra Nath Tagore, Nand Lal Bose, Jamini Roy, Amrita Sher Gill, M.F. Hussain, Satish Gujral, S.H.Raza etc.
Suitable materials for murals, sculptures, furniture, pottery and fountains for indoors and outdoors.

7. ECOLOGY & ENVIRONMENT

Vocabulary of ecology and environment; Basic concepts of ecology; Ecological factors – light & temperature, precipitation, humidity, gases/wind, topography etc.; Global warming & climate change; Loss of bio-diversity; Desertification; Deforestation etc.

Ecosystem - Kind of ecosystem; Structure; Function and energy flow of ecosystem; Ecological succession; Ecosystem development; Climax concept etc.

Soil – Edifice Factors - Definition of soil; Formation of soil; Soil profile; Classification; Soil complex; Soil depletion, degradation and conservation; Relation of soil and built environment etc.

Water Regimes - Water in nature; Water balance problem; Surface / ground water; Sources of water pollution; Ground water pollution; Marine pollution; Prevention control of pollution; Conservation & management; Impact of human intervention on water.

Air Pollution - Kinds of air pollution; Sources of air pollutants; Effects – Depletion of Ozone; Acid Rain; Prevention & control of air – pollution; Noise pollution; Effect of human habitat and human activity on atmosphere etc.

Built Environment and Ecology - Interrelationship between man, nature and built-form etc.

8. SERVICES

WATER SUPPLY

Vocabulary of water supply; Need to protect water; Requirements of water supply to different types of buildings; Sources of water supply; Quantity and quality of water; Conveyance and distribution of water; Overhead tank; Underground tanks; Pipe appurtenances; Hot and cold water supply system in a low rise and high rise buildings; Distribution system in campus; Pipes and their size; Jointing and different fittings etc.

Rainwater harvesting in buildings and building premises etc.

SANITATION

Vocabulary of sanitation; Purpose and principles of sanitation; Collection and conveyance of waste matter; Quantity and Quality of refuse; Design and construction of sewer's and sewer appurtenances; Garbage and sewage disposal; Roof and surface water drainage; Rain water storage and water harvesting principles and methods; Sanitary appliances; Traps their variety; Pipes and joints; Sanitary pipes works below and above ground level.

Knowledge of plumbing and sanitary system for a residence.

ELECTRICAL

Terminology and symbols (as per NBC/NEC) for electric installations in buildings; Need to generate and save electricity; Transmission and distribution of electricity (single and three phases); Procuring service connection etc.

Lighting accessories - Wires and cables; Metering; Distribution panels / boards etc. for single and three phase supply; Guidelines for installation of fittings etc.

Design of simple light and fan circuits; System of connection of appliances and accessories e.g. series and parallel connection; Joint box system; Looping-in system etc.

Various types of internal wiring systems e.g. cleat, casing and capping, batten and conduit (surface & concealed).

Protection against excess current, short circuit earth fault and protection against electric shock; Various types of protection devices e.g. switches, fuses and circuit breakers; Need for earthing of domestic fittings and appliances; Earthing and its relation with soil resistivity; Earth electrodes; Earth wires etc.

Load assessment and selection of appropriate cross section of the conductor.

ILLUMINATION

Terminology and units; Light and its characteristics – scattering, propagation, transmission, reflection, absorption, refraction and dispersion of light; Electromagnetic spectrum and visible radiation.

Types of illumination schemes e.g. Ambient, Task, Focal and Decorative etc.; Design considerations for illumination Schemes.

Methods for lighting calculation – Watts per square meter, Light flux and Point to point method.

Sources of light (Electrical) – Incandescent; Halogen; Low pressure (fluorescent, compact fluorescent, sodium, cold cathode neon); High pressure (mercury, metal halide, sodium); LED; Fiber optics etc.

Types of Luminaries – Indirect; Semi-indirect; General diffusing; Semi-direct and Direct etc.

Electrical and Illumination needs for individual spaces e.g. Living room, Dining room, Bed room, Kitchen, Toilet, Staircases, and Corridors etc.

Types of electrical luminaries e.g. Recessed mounted luminaries; Spot / Projectors; Surface mounted luminaries; Decorative luminaries; Pendant luminaries; Free-floor-standing luminaries; Up lights; Trunking lighting systems; Down Lights etc.

AIR CONDITIONING SYSTEMS

Vocabulary of air conditioning services; Principles of Air Conditioning System Design; Refrigeration Cycle; Psychometric chart; Cooling load etc.

AC systems - Comfort cooling systems & their working - Unitary air conditioning - window AC & split AC; Package AC system; Evaporative cooling systems; Central air conditioning their parts- A.H.U.; Cooling plant; Cooling tower etc.

Air Distribution Systems – Fans; Filters; Fan coil units; Ductwork; Outlets; Dampers etc.

LIFT SERVICES

Vocabulary of lift services; Average travel lift carrying capacity; Rated load; Rated speed; RTT etc.; Grouping of lifts and design standards of a lift lobby; Types of Lifts; Working of lifts with details of lift section describing various parts of lifts.

Types of Escalators; Function and working of Escalators.

9. HISTORY OF INTERIOR FURNITURE

Indus Valley Civilization - Methods of planning decorative features figures and forms used Cultural features and life styles.

Indian Handicrafts and Handlooms; Analysis of Hindu, Buddhist, Indo-Islamic interiors with special emphasis on decoration, ornamentation and motifs

Different Construction technique and materials used in interiors as part of structure/decorations with reference from influence of different factors or architectural forms and decorations such as Doors, Windows, Pillars, Columns, Panelling, Ceiling, Cornice frieze, Dado, Stone inlay and architectural decoration.

Different schools of Paintings in India. Influence of British Architectural on Indian Interiors and then gradual change in Architectural features in "British India".

10. PRODUCT DESIGN

Understanding of product design, design by evolution & design by innovation; Essential factors; Morphology of design; Primary design phases; Flow charting, etc.

Product Strategies & Analysis - Standardization; Industrial design organization; Role of aesthetics in product design; Functional design practice; Strength, stiffeners and rigidity considerations in product design, etc.

Review of Production Processes - Primary, machining & non-traditional machining processes; Manufacturing requirements in design of machine components; Design for forging, pressed components, casting & machining; Designing with plastics, rubber, ceramics & wood, etc.

Economic Factor and Anthropometrics Effecting Design - Product value; Design for safety; Reliability and environmental considerations; Economic analysis; Human considerations in product design; Anthropometry, etc.

Product Development - From concept to product designing for function, production, handling, use and maintenance, etc.

11. PHOTOGRAPHY

Vocabulary of photography. Various types of compositions framing, silhouette photography etc.

Types of Camera - Use of various cameras; Lenses and accessories; SLR, DSLR cameras; lenses for different focal lengths for various contexts; Use of wide angle, normal, tele, zoom, macro, close up lenses etc.

Filters-UV, Skylight, Colour filters, special effect filter etc.

Shutter speeds - Slow, normal and high and their various applications etc.

Apertures - Application of various apertures to suit different lighting conditions and to enhance depth of fields etc.

12. SPECIFICATIONS, COST ESTIMATION AND BUDGETING

Estimate - Different Types; General Principles of approx methods of costing for various interior works for all types of old & new works.

Specification – Definition; Principles of specification; Types of specification – Partition, Partitional walls commercial Plywood, block board Laminated Sheet, glass, etc., Plastering with cement mortar, Flooring - Cement concrete, marble, mosaic, Distemping & Colours washing, Wood work - Doors, window, partition, cabinet sets, false ceiling, furniture wall Partitions, wall paneling, table, chair etc., Water supply & Sanitary Fitting etc.

Taking out Quantities –

Units of measurement - cubic meter, square meter, running meter; General rules for measurements.

Quantity Survey - Spot item, Prime cost, Provisional sums, Costing of work.

Estimation & Schedule of Quantities for furniture pieces

13. SOCIOLOGY

Vocabulary of sociology; Sociology and Design; Basic concepts – Society, Group, Community (Rural and Urban), Association, Institution etc.

Culture and Society - Concepts of culture, Cultural identity and cultural diversity, Factors of socio-cultural changes etc.

Social Development - Concepts of social development; Types of development - rural, urban and rural etc.

Demography - Population growth and its impact; Population subsistence; Migration etc.

Social Institutions – Family; Marriage; Religion etc.

Social Infrastructure – Education; Health; Recreation etc.

14. ANTHROPOMETRICS & ERGONOMICS

Need for study – Vocabulary of Ergonomics; Need for study of anthropometric and ergonomics; Design today- Human aid to lifestyle etc.

Ergonomics in India - Environmental factors influencing human performance; Ergonomics in India; Ergonomics / human Factors fundamentals; Physiology (work physiology) and stress etc

Human physical dimension - Human physical dimension concern; Human body - structure and function; Anthropometrics, body growth and somatotypes; Static and dynamic anthropometry; Postures – Standing erect, Sitting, Squatting, Cross-legged etc.; Anthropometric measuring techniques; Statistical treatment of data and percentile calculations etc.

Human Body Structure and Function - Posture and job relation; Posture and body supportive devices; Chair characteristics; Vertical work surface; Horizontal work surface; Movement; Work Counter etc.

Behaviour and Perception - Communication and cognitive issues; Psychosocial behavior aspects; Behavior and stereotype; Information processing and perception; Cognitive aspects and mental workload; Human error and risk perception etc.

15. MANUFACTURING & ASSEMBLY

Properties, composition and industrial applications of engineering materials – Metals (Ferrous) - Cast iron, Tools, Steels and stainless steels; (non-ferrous) - Aluminum, Brass, Bronze; Polymers - Thermoplastics and thermosetting polymers; Ceramics; Glass; Optical fiber; Cement; Composites - Fiber reinforced composites; Metal Matrix Composites Smart materials - Piezoelectric materials, Alloys; Semiconductors and insulators etc.

Joining processes – Understanding of Soldering, Brazing and Welding; Classification and methods of soldering, brazing and welding; Arc welding, Oxy-acetylene welding, TIG welding, and MIG welding, etc.

Drives & Lathe – Belt drives - Open & crossed belt drives; Slip, creep, velocity ratio; Derivations for length of belt in open and crossed belt drive; Ratio of tension in flat belt drives; Advantages and disadvantages of V belts and timing belts; Gear drives – Types - spherical, bevel, worm and rack and pinion; Velocity ratio; Advantages and disadvantages over gear drives; Lathe - Principle of working of a center lathe; Parts of a lathe; Operations on lathe - Turning, Facing, Knurling, Thread Cutting, Drilling, Taper turning by Tailstock offset method and Compound slide swiveling method; Specification of Lathe etc.

Milling & CNC – Principle of milling; Types of milling machines; Working of horizontal and vertical milling machines; Milling processes - Plane milling, End milling, Slot milling, Angular milling, Form milling, Straddle milling, and gang milling etc.

Computer Numerical Control (CNC) - Components of CNC; Open loop and closed loop systems; Advantages of CNC; CNC Machining centers and Turning centers etc.

Robots - Robot anatomy; Joints and links; Common robot configurations; Applications of Robots in material handling, processing and assembly and inspection etc.

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PAPER 2**

1. DESIGN FUNDAMENTALS

Transformation of forms - dimensional transformation, subtractive, additive forms, organization of additive forms - Articulation of forms, etc.
Space defining elements - Horizontal, Vertical, Openings in space defining elements, Spatial relationship, Spatial organization, etc.
Ordering principles - Axis, Symmetry, Hierarchy, Datum, Rhythm & Repetition etc.
Organisation of forms -
Spatial Relationships - Space within space, interlocking spaces, Adjacent spaces, Space linked by a common space;
Spatial Organization - Influencing factors and their types Centralized, Linear, Radial, Clustered, Grid;
Articulation of forms and spaces types - Edges and corners, Surface, etc.

2. MATERIALS

Metals (Ferrous) - Constituents, properties and application of - Iron (Pig, Cast & Wrought); Variety of Mild Steel sections - Sheets (plain & corrugated), Flats, Bars (round & square), Angles (Equal and Unequal), R.S. Sections (I beams, Channels, Tees); Hollow Tubular sections available for application in building industry; Stainless steel and Alloys.
Floor & Floor Finishes - Constituents, properties and application of - Brick; Cement Concrete; Stone; Terrazzo; Chequered Tile; Ceramic Tile; Vitrified Tiles; Wooden etc.
Metals (Non Ferrous) - Constituents, properties and application of - Copper & Copper based alloys (Brass & Bronze); Tin; Cadmium; Chromium; Zinc; Lead and Nickel etc.; Metal Coatings - Electroplating, Anodizing etc.
Equipments and their application - Electric hand tools e.g Drills, Saws, Chase cutters etc.
Gypsum & Asbestos Products - Constituents, properties and application of Gypsum Board, Suspended Ceiling (Board & Tiles), Gypsum Plaster; Their components and accessories; Their jointing and finishing; Constituents, properties and application of Asbestos Cement products etc.
Water Proofing Compounds - Constituents, properties and application of Neoprene, Butyl, EPDM, PVC, Polyurethane etc.
Plastics and Rubbers Thermoplastics - Constituents, properties and application of Polythene, Polyvinyl chloride, Polypropylene, Polymethyl methacrylate, Acrylonitrile butadiene styrene etc.; Thermosetting Plastics - Constituents, properties and application of Phenol formaldehyde, Urea formaldehyde, Melamine formaldehyde, Polyurethane, Silicone resin etc.; Constituents, properties and application of Rubber etc.
Fabrics and other furnishing materials - Properties, uses and application in the interiors of Fibers - Natural (silk, cotton, linen, damask, furs, etc.), Artificial (polyester, nylon, rayon, etc.), Textiles; Fabric treatments; Carpets; Durries; Tapestries; Drapery; Upholstery; Wall coverings etc.
Soft furnishing materials - Properties, uses and application in the interiors of Draperies; Curtains; Blinds; Types of stitches; Valences; Linings; Tiebacks; Hangings etc.

3. INTERIOR CONSTRUCTION

Doors & Windows (Metals) - Mild steel L and Z section; Pressed steel section etc.
Shutters (Operational Mechanisms) - Application of operational mechanism (automatic and manual) of variety of Rolling shutters and Collapsible shutters etc.
Floor/Dado/Skirting - Complete process of laying of floor and skirting - Brick, Cement Concrete, Mosaic and Terrazzo floors. Laying and fixing of Stone slabs, Chequered Tile, Ceramic tiles, Vitrified tiles and Wooden (parquet and plank) on subfloors and walls.
Doors, Windows & Partitions (Aluminium) - Classification, availability, characteristics and uses of Doors frames and shutters; Windows Frames and Shutters; Partitions Framework & fixing with other suitable materials etc.
Partitions & False Ceilings (Gypsum Board) - Classification, availability, characteristics, uses and construction details of Metal Stud Partition (single layer); Suspended Ceilings etc.
Doors & Windows (P. V. C.) - Classification, availability, characteristics, uses and construction details of Door Frame and Shutters; Windows Frames and Shutters etc.

Defects and Remedies - Classification, availability, characteristics, uses and construction details of various defects in buildings and their remedies; Defects caused by dampness, Defects caused by applied forces and changes in size.

4. DRAWING

Metric Drawing - Vocabulary and concepts of types, uses and advantages; Isometric, Axonometric and Pictorial view etc.

Perspective Drawing - Vocabulary and concepts of application and use; Differences with metric projections; Anatomy of a perspective e.g. cone of vision, station point, picture plane, eye level, horizon line, ground line, vanishing point, etc.; Types of perspective - One point, Two points, and Three point perspectives etc.

Shades and Shadows - Vocabulary and concepts of values in shades and shadows; Constructing shadows in plan, elevations and 3-D etc.

5. APPLIED PHYSICS FOR INTERIOR DESIGN

Units of measurement in SI system Dimensions and sue of dimensional analysis.

Force and Motion - Newton's Law; Conservation of momentum; Work and energy; Forms of energy; Conservation of energy; stress, strain, elastic modulus.

Spring mass system, Vibration of bodies - amplitude, frequency and energy of Vibrations; Free and forced vibrations; Resonance; vibration of structural members.

Temperature and its measurement.

Expansions of solids, thermal stresses, specific heat and heat capacity and concept of thermal time lag in buildings; Laws of thermodynamics; Principles of heat engines and refrigeration and air - conditioning system; Humidity and its control.

Electrical nature of matter; Molecular forces - Cohesive and adhesive forces; application to water proofing; Electromagnetic waves, infrared and ultraviolet rays; Coated glasses and their Characteristics.

Light as waves; Solar energy, solar cells and green house effects; Colour - primary colours; Colour mixing; Radiant light flux, luminous intensity, illumination, light efficiencies, standards of illumination.

Introduction to Statics - Forces, their definition; Characteristics & types, composition and resolution of Forces; Moment and couple; Concepts of resultant and equilibrium of forces - Parallelogram and polygon, laws of forces, conditions of equilibrium, Lami's Theorem.

Stress & Strain Hooke's Law - Concept of direct forces (compression & tension), Elasticity, Plasticity etc., Hooke's Law, modulus of Elasticity, Elastic limit stress/ strain curve for mild steel under Constant tension.

6. ART APPRECIATION

Grammar of the language of art - Natural; Realistic; Symbolic; Abstract; Modern; Contemporary etc.

Ideologies of Aesthetics in Art - Understanding of Ideologies of aesthetics in art while discussing the art of Western and Oriental;

Plato, Aristotle, Baumgarten, I.A. Richards, Leo Tolstoy, Sigmund Freud; Shadanga: Six limbs of Indian painting; Rasa theory of 'Bharat Muni'; Iconography etc.

Development of Art Development of art over the period of time; Tracking the progress in art in aspects of the Functional diversity of styles; Art as form of social consciousness; Impact of Cultural and Religion on art; Understanding the role of art in contemporary society etc.

7. SUSTAINABLE DESIGN

Sustainable development - Social, economic, environmental factors, ecological footprint, local and worldwide sustainable benchmarks.

Principles and strategies - site design, energy management, renewable energy, Sustainable material selection, water management, indoor air quality, alternative Energy.

Solar geometry and built form - Various techniques of shading to reduce heat gain in tropical climate.

Various methods of Maximising exposure to solar radiation in cold & temperate climate.

Heating & cooling loads - Energy conservation methods - Efficient daylighting.

Energy Codes and Rating System ECBC Code, LEED, IGBC, GRIHA, NBC, Internal load, ASHRAE 90.1 - compliance Paths.

Building Envelope Building envelope components - Wall, roof, floor, door, and window & skylight.

Role of envelope in interior design for Energy efficiency.

8. SERVICES

FIRE PROTECTION

Causes and spread of fire; Fire triangle / tetrahedron; Classes of fire; Combustibility of materials and fire resistance etc.

Fire Detection & Alarm Systems; Equipment - Heat & Smoke sensors etc.

Firefighting equipment & Extinguishing techniques; Ladders; Snorkel ladder; Firefighting pump and water storage; Hose and hose fittings; Dry and wet risers; Automatic sprinklers; Portable fire extinguisher etc.

Means of escape; Fire escape staircase; Fire doors; Water curtain etc.

ELECTRONIC SECURITY AND SURVEILLANCE SYSTEMS

Perimeter Protection - Barriers, Doors, Gates, Turnstiles and Fences; Intrusion Detection Sensors and Systems - Outdoor & Indoor.

Access Control Systems; Locks & Emergency Exits; Visitor Management Systems; Identification Systems - PIN, Card, Wireless and Biometric systems etc.

Security Lighting; Illumination including Infra-red; Understanding CCTV cameras - Pan, Tilt & Zoom mechanisms; Digital and Analog Recording etc.

ADVANCED SERVICES

Gas Installation - L.P.G / Bio-gas installations, their location and layouts in residential and non-residential buildings etc.

Automated Parking System - Vocabulary; Types; Working and Advantages of automated parking systems etc.

Mechanical Ventilation - Standard requirements of ventilation for different conditions of living and work places; Conditions for comfort; Control of quality, quantity, temperature and humidity of air etc.

Waste Treatment & Management - Vocabulary; Reduce-Reuse-Recycle; Waste collection; Treatment & disposal; Thermal treatment; Dumps and Landfills; Biological waste treatment; Waste water treatment etc.

Integrated Building Management System - Objectives of the Integrated Building Management System, Various components of IBMS; Types of integration with the utility, safety and security systems and its designing and installation etc.

9. HISTORY OF INTERIOR FURNITURE

Occidental Interiors -

Introduction to the periods of History, Cultural, Architectural & Interior Planning from ancient to middle ages, Renaissance, Modern Periods.

Concepts and Architectural characteristic of Ancient, Medieval, renaissance period explaining different factors.

Influence ornamentations- Motifs, Furniture, Doors, Windows, Pillars, Columns, Paneling, Ceiling, Cornices, Frieze, stone or wood inlay etc.

Study of period furniture and motifs -

European Furniture - (Renaissance onwards), Italian, Spanish, French

Renaissance and its influence on ornamentation and furniture.

English, 15-18 Century (from Tudor to Victorian) style of furniture & decoration.

American Colonial period furniture and Ornamentation 19th and 20th century - French, English and American Styles.

English, 15th - 18th Century (from Tudor to Victorian) style of furniture & decoration; American Colonial period furniture and Ornamentation 19th century

Oriental -

19th and 20th century - French, English and American Styles; Difference in basic shapes, form & motifs of East and West; Wood & other materials used, familiarity with methods of gilding, embossing, moulding, Stenciling;

Demonstration of marquetry, Brass, Ivory, Mother of Pearl, Inlay, Wood etc.

10. INTERIOR LANDSCAPE DESIGN

Factors affecting Landscape; Elements of Landscape Design - Natural and design elements; Principles of Landscape Design - Unity, Symmetry, Balance, Hierarchy, Repetition, Sequence etc.; Different garden styles etc.

Landscape Engineering - Road and Parking; Paths and Plazas; Wall, Steps, Ramps and Decks; Planters, Bed edges and Terraces; Pools and Water bodies; Terrace landscape and Vertical garden; Garden furniture; Lamp poles etc.

Classification of Plants - Trees, shrubs, groundcovers, flowering plants, creepers and climbers etc.

Visual Perception - flowers and its colors, texture and its visual perception in various indoor spaces; Science of flower arrangement; Indoor plants in indian context; Plant biology; Soil; Moisture; Light; Nutrient; Atmospheric conditions;

Growing medium; Pests & diseases; Botanical nomenclature, anatomy and physiology of plant growth etc.

11. ACOUSTICS

Vocabulary of acoustics; Science of sound; Characteristics of audible sound – Propagation, Velocity, Frequency, Pitch, Quality/timbre, Loudness and Intensity; Behavior of audible sound in enclosures – Reflection, Absorption, Diffraction and Transmission of sound;

Common acoustical defects and recommended remedies - Echo, Sound foci, Dead spots, Sound shadows, Resonance, Insufficient loudness, External noise and Reverberation; Sabine's expression for calculation of Reverberation time; Absorbents and absorption coefficient etc.,

Noise control – Noise and its types; Noise pollution; Sources of indoor noise; Indoor noise levels; Planning and design against indoor noise; Sources of outdoor noise; Traffic noise levels; Planning and design against outdoor (traffic & buildings in built-up area) noise.

Constructional measures for sound insulation of buildings - Materials, Hollow & composite wall construction, Floors & Ceilings; Properties of good acoustical materials.

Sound system - Sound reinforcement system; Public address system; Sound system equipment e.g. Amplifiers, Microphones, Speakers, Mixers, Conference systems and accessories etc.

Acoustical design principles and factors - Acoustical design principles for Auditoriums, Cinema halls, Conference rooms etc.; Factors e.g. Site selection & planning, Dimensions, Shape, Seats & seating arrangements; Treatment of interior surfaces; Reverberation & sound absorption etc.

12. LEGAL ETHICS & PROFESSIONAL PRACTICE

Conditions of engagement of an interior designer – Duties, responsibilities and liabilities of an interior designer towards the profession and society; Scale of professional charges and mode of payment; Code of professional conduct and ethics; Need and types of competitions; Procedure for conducting competitions etc.

Tenders and Contracts - Concept of contract and essential elements of contract; Tenders, their need and types; Preparation of tender documents and procedure for awarding tenders and award of projects; Type of contracts; Preparation of contract document - General conditions of contract, defect liability period, running & final payment, retention amount and virtual completion etc.

Office organisation and Management - Setting up practice e.g. Business organization, Types of offices - Proprietorship, Partnership, Private Limited etc.; Salaried appointments - Public sector, Private sector; Understanding of Income tax and GST; Understanding of office accounting procedures; Office procedure in government organization etc.

Concepts of Valuation; Classification and types of valuation; Elements and factors affecting valuation; Valuation of immovable properties; Techniques for valuation of landed and building property etc.

Concept and need of Arbitration; Law governing arbitration in India – Salient features of the Indian Arbitration Act 1940 and provisions in subsequent amendments; Role of arbitrator; Nature of arbitration; Appointment of arbitrator and umpires, Conduct, powers and duties of arbitrators and umpires; Procedure of arbitration and preparation of awards etc.

13. ECONOMICS

Vocabulary of Economics; Scarcity; Utility - Marginal, Total & Average; Laws of Demand and Supply; Economic system in India; Building Efficiency; Building Life-cycle; Costs and Benefits of Building – Monetary and Non-Monetary etc.

Project Financing – Equity; Financing Institutions in Financing Process; Interim Finance and Permanent Financing; Bank Loan - Simple Interest and Compound Interest; Types of Mortgage; Lease Arrangements etc.

Economic performance of building - Decision Making using techniques of economic performance to measure tangible and non-tangible issues - Cost-Benefit Analysis, Incremental Analysis and Multi-Criteria analysis etc.

14. UNIVERSAL DESIGN

Need of universal design; Understanding of universal design; Principle of equal status.

Barrier free & Inclusive design; Various disabilities - Non Ambulatory, Semi Ambulatory, Sight, Hearing etc.; Old age persons, Women & Children in terms of effected persons, Dependency, Repercussions and Psychological needs, etc.

Challenges to Interior Designers; Principles of universal design; Universal Design standards and Bye Laws, etc.

Space requirements for persons with various disabilities - Non Ambulatory, Semi ambulatory, Sight, Hearing etc., Old age persons, Women & Children etc.

15. PROJECT MANAGEMENT

Vocabulary of construction management; Project management concepts—objectives & scope, planning /monitoring and control, scheduling / Quality and cost; Theory of probability and statistics; Cost model and cost optimization etc.

Construction Management Techniques - Construction Planning scheduling and controlling phases; Levels of details & time scale Resource scheduling; Smoothing & levelling; Project execution; Monitoring & progress reporting; Use of Management techniques – Bar charts and limitations of bar charts; Mile Stone Chart etc.

PERT and CPM – Event; Activity; Dummy; Network rules; Graphical guidelines for network; Numbering of events; CPM network analysis & PERT time estimates; Time computation & network analysis; Cost time analysis in network planning using CPM etc.

Resource Allocation & Quality Control - Resource usage profile - Histogram, Resource smoothing and Resource levelling; Planning of temporary services at the site; Safety precautions at construction sites; Security of materials at building site; Stages of inspection and quality control etc.

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