

### **Basic Design & Visual Arts**

**Objective-** Developing skills in manual presentation techniques, use of various media of presentation, Principles of 2-D & 3-D compositions, Principles of Design.

**Theory of Basic Design-** The study of this subject is aimed to understand the Visual & aesthetic qualities of Art and relating these to Architectural Design situation. This subject forms the direct input to Design as 'Basic Design' is the foundation of all Professional courses which deals directly or indirectly with Aesthetic.

**Visual Art-** Visual Art is aimed at providing knowledge and understanding of various visual arts and its importance. It further aims at developing the freehand drawing and rendering skills in different medium and using it as tool of expressing ideas visually.

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**Unit-I:**

Brief historical review of development of fine arts (visual and performing arts.) and Interdependency of visual arts, architecture, painting and sculpture

**Unit-II:**

Introduction to basic elements of design—point, line, plane, form

**Unit-III:**

Principles of Design and its role in expression (architectural expression)

Introduction to principles of organization/composition

Repetition, Variety, Radiation, Rhythm, Gradation, Emphasis & Subordination, Proportion, Harmony, Balance

**Unit-IV:**

Study of Visual Properties of 2-Dimensional forms both geometrical and non-geometrical surfaces and visual textures, optical illusion etc.

**Unit-V:**

Free hand line sketching and drawing of natural and manmade. Study of shades and shadows, Sketching of Historic or new built up structures of Architectural importance using different mediums.

**Unit-VI:**

Study of classification of colours with different hues, values, and shades. Colour wheel and colour composition, properties of colour.

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**Sessional Work- Plates, Sketches and models to understand basic design principles, elements and their expressive qualities**

Creative Exercises of 2d to 3d composition

Exercise related to positive and negative spaces

Product Design.

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### **Construction Technology & Materials – I:**

**Objective:** To develop understanding about construction principles. The subjects should also focus on developing design abilities by applying basic principles of construction and choosing appropriate materials and techniques. Construction technology and appropriate materials for structural systems, roofing, enveloping and interior finishes shall be considered under this subject from simple examples to complex.

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For first year the focus shall be on basic building materials and basic construction principles.

**Unit I:**

General Idea / Introduction to various elements of building from foundation to roof.  
General idea about basic building materials such as stone, wood, concrete, steel etc.

**Unit II:**

Introduction to "Construction" as a subject and its relevance to architectural design.

1. Construction and the logic of stability as its basis.
2. Concept of load bearing: Support and Supported building elements
3. Concept of Span

**Unit II:**

Understanding the basic construction principles with respect to structural stability and its applications/ extensions /manifestations in terms structural systems and then building elements  
Construction Principles- construction systems-building elements- building materials

**Unit IV:**

General conditions at site level such as site topography, climatic conditions and soil conditions and its implications on construction techniques, building materials, building elements, construction systems to be adopted.

**Unit V:**

Basic Structural systems such as load bearing and frame structure.

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**Sessional Work:** Site visit reports, tutorials, notes, sketches and market surveys.

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**1S-A-3**

**Structural Design & Systems – I**

**Objectives:** Emphasis will be more on structural concepts vis-à-vis stability of forms rather than intricate numerical calculations. While dealing with different structural concepts, their importance shall be related to architectural requirements by giving examples from history of architecture / contemporary architecture. Wherever application is mentioned examples from architecture typologies shall be referred to.

**Unit I:**

Basic Structural forces : Study of types of Coplanar & non- coplanar forces.

**Unit II:**

Co-Planer forces – resolution and resultants – Lami's Theorem – Application

**Unit III:**

Equilibrium of 2 D elements : Basic Principles, condition of equilibrium, free body diagram

**Unit IV:**

Equilibrium of 3 – D elements – understanding of basic principles of resolution and equilibrium of 3 D force system no mathematical calculation.

**Unit V:**

Types of Structural Supports and support reactions – Theoretical and practical – Study of reactions of simple support, hinge support, roller support and fixed support, study of types of beams and types of loads.

**Unit VI:**

Static Friction: Basic Principles: Application for elements on horizontal plane, inclined planes and ladders.

**Unit VII:**

Properties of plane sections

- a) Centre of gravity
- b) Moment of inertia (second moment of area) – section modulus, radius of gyration, polar moment of inertia.

**Unit VIII:** Application for

- c) Perfect frames (Method of joints, Method of Sections and graphical methods.)
- d) Simply supported beams – Analytical and graphical
- e) Weight less cables / strings

Sessional work: Sketches, notes, tutorials, tests and presentations

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**1S-A-4**

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## **History of Art & Architecture –I**

**Objective:** Study of evolution of various styles of art and architecture as a response to climate, culture and socio-political conditions by taking examples from river valley civilizations.

The emphasis will be on the development of the understanding of fundamental design principles (visual art principles) and resulting architectural expression; appropriate to place and people.

**Aim:** To understand architecture as an outcome of Physical factors like geography, climatology, location, Building Materials and available Technology and also the influence of Art, Culture and Society.

**Unit I:**

Introduction to Art, Culture, Society, Civilization and Architecture.

**Unit II:**

Earlier attempts of man for shelter during the prehistoric period.

**Unit III:**

Indian Art and Architecture.

**Unit IV:**

Western Art and Architecture.

**Unit V:**

Elements of Art & Principles of Design studied from historic examples.

**Sessional work:** Sketches, notes, tutorials, tests and presentations

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**1S-A-5**

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## **Architectural Graphics I**

**Objective:** Ability to present in graphic form all elements of building design- study of shades and shadows, textures, tones, colours , geometrical form, perspectives and projections, free hand drawing and rendering in different media.

The understanding about representation of 3D objects in 2D by graphical way should first be developed from real world experiences and then technical aspects of solid geometry can be taught.

**Unit -1 Free hand drawings:-**

Simple exercise in object drawing, light and shade of simple, natural and geometric forms. Out door sketches of simple bldg. forms.

### Unit – 2 Architectural symbols :-

Architectural representations of trees, hedges, foliage, human figure in different postures, vehicles, furniture etc. their integration to presentation drawings.  
Representation of building elements, openings, materials, accessories etc. terminology and abbreviation used in architectural presentation.

### Unit – 3 Scale Drawing :-

Study of scales, their use in practice and construction of Plain and Diagonal scale.  
Architectural and stencil lettering in varying heights and thickness and dimensioning.  
Applications of scales to enlarge or to reduce the objects in drawing.

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Sessional work: Sketches, notes, tutorials, tests and presentations

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**1S-A-6**

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### Workshop Practice- I

Workshop Practice- I: (1S-A-6)

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Objective:- Developing skills to understanding various tools, processes and material.

- Understanding various basic tools used for carpentry joinery and fabrication.
- Understanding workshop rules, safety norms and care in handling various manually operated and motorized tools.
- Basic understanding of wooden joints, evolution of joints, needs of joints, making simple wooden joinery parts.
- Understanding various building materials and their tools used for cutting, joining and extension. Handling materials like wood, marble, steel, MS, plywood, POP, Aluminum etc.
- Understanding nailing, screwing, riveting and their various conditions and types of applications.

Expression of forms- By handling various materials.

Sessional work: Model Making

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**1S-A-7**

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### Computer Application(NG)

**Objective:** Developing skills in non-graphic applications of computer as required for architectural profession and office management.

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Sessional work: Assignments

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**1S-AA-1**

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Elective a presentation skills/ public speaking/ English I/ sketching and rendering

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**1S-AA-2**

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Elective b Mathematics/ statistical methods/ Numerical ability/ scale and proportion

**Architectural Design I**

**Objectives:** Development of space visualization

Application of materials to simple architectural forms.

Application of the knowledge gained in other subjects and basic design to design of buildings of single/ simple activity .

**1) Anthropometry :**

- a. Study of Human dimensions, concept of percentile in Indian standards, space required for various simple activities, circulation spaces.

**2) Form and Space :**

- a. Volumes, elements of volumes, enclosure of space, semi – enclosed spaces, defining space by elements, light as a factor of shape, Color, texture & form, view, visual relationship. Properties of forms and their impact on spatial experience.

**3) Elements of built form :**

- a) Basic Elements: Walls, Floors, windows, doors, staircase, facade, etc.
- b) Support Elements: Courtyards, balconies, canopy, patio, Sitouts, water bodies, pergola, etc.
- c) Relevance of all such elements on architectural expression and spatial quality

**4) Principles of Design :**

- a. Basic principles or spatial organization , symbiosis of form and function concept generation convergent & divergent thinking in design

**5) Furniture & Facilitation :**

- a. Need of furniture as an aid to enhance activities, study of various furniture in isolation & combination.

**6) Climate & design :**

Orientation, climatic coordination and architectural elements, like chajjas, fins, fenestration etc,

**Sessional work:** Assignments on each head with presentation, lecture and site visits.

Design of simple single activity spaces like residence, school, canteen etc.

Small modules of short design projects based on the understanding developed about above mentioned topics.

**Construction Technology & Materials –II**

**Unit I:** Study of basic building materials, such as brick, stone, cement, lime, concrete, Glass w.r.t classification, composition and general idea about their chemical, physical properties leading to structural strength and aesthetic qualities.

Emphasis should be on developing understanding about making choice of appropriate building materials in a given situation.

**Unit II: Masonry:** Basic principles/rules of masonry for its load bearing capacity and stability

1. Various types of Building materials used in masonry such as stone, brick, mud blocks, concrete blocks – size, shape, strength and aesthetic quality of each of them
2. Types of Stone masonry with dressed and undressed stones, Composite masonry
3. Types of Brick masonry used in load bearing walls such as Flemish, English bonds, cavity walls and use of piers in load bearing walls
4. Types of masonry used in partition walls

**Unit III:** Concept of span and its application in creating openings in masonry walls with lintels and arches. Structural difference in the behavior of lintel, arch and relieving arch.

Basic terminology and types of lintels and arches and materials used for them such as stone, brick, wood, steel.

**Unit IV:** Principles of wooden/ timber Joinery. Types of timber and wood used in structural wood work. Basic types of joints and its applications in various building elements such as timber doors, windows and timber roofs.

Timber paneled, partly paneled and partly glazed and fully glazed doors and windows with its fixtures and fastenings.

Sessional Work: Site visit reports, tutorials, notes, sketches and market surveys.

Plates of Small modules of design based on the construction principles of masonry, joinery etc.

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**2S-A-3**

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## **Structural Design & Systems- II**

**Unit I:** Stability of Masonry Structural elements

**Unit II :** Simple stresses and strains : Concept and application – Definition of stress, strain, study of stresses & strains, Hook's law. Principle of superimposition & stresses in composite sections.

**Unit III :** Thermal stresses and strains : Simple and composite section, concept and application.

**Unit VI :** Elastic Constants: definitions, Poisson's ratio, Bulk Modulus, Modulus of elasticity, Modulus of rigidity.

**Unit V:** Shear Stresses: Shear stresses and its distribution in Rectangular, Circular, I & T section only. Concept and application

**Unit VI :** Bending stresses – circular bending: Concept and application ( study of concept of Flitched beams no mathematical calculation.)

**Unit VII :** Torsional stresses: Torsion of solid and hollow circular shafts of same material. Concept and application

Sessional works: Sketches, notes, tutorials, tests and presentations

## **History of Art & Architecture –II**

Study of evolution of various styles of art and architecture as a response to climate, culture and socio-political conditions then by taking examples from Western architecture and architecture of the Indian sub continent.

**Unit I:** Progression of art and architecture of the River valley Civilizations.

**Unit II:** Study of visual art principles, scale and proportions, technological development emphasizing on architectural expression and its relevance on the society quoting examples from:

- I. Greek period
- II. Roman period
- III. Christian architecture up to Renaissance Period.

**Unit III:** Role of culture and art on architecture in Indian context Study of visual art principle, monumental and human scale. Study of Impact of religious philosophy on the physical form.

- I. Buddhist architecture
- II. Jain architecture
- III. Hindu Temple Architecture
- IV. Islamic architecture

Sessional works: Sketches, notes, tutorials, tests and presentations

## **Architectural Graphics II**

### **Unit – I Orthographic Projections :-**

Study of reference planes, projectors, orthographic projections of object/objects in different positions and method of drawing the same.

Angular Projections :- Isometric and Axanometric projection.

### **Unit – II Complex Projections :-**

Section planes in different angles, drawing of true section and introduction of slicing method.

Development of solids/ solids with voids and drawing the same to scale.

Interpenetration of solids, solids and voids , development of surface and section at a junction.

### **Unit III: Architectural Drawing**

Development of Drafting skills for architectural drawings.

Sessional work :- Plates, sketches, & tests.

### **Workshop Practice – II (2S-A-6)**

**Objective:-** Developing understanding of various material and efficiency in technique.

- Finishing Surfaces: Understanding various surface finishing techniques and processes received by different material like wood, steel, aluminum, stone etc.
- Paints and Polish: Surface preparation, use of sand paper, application of putty, application of base coat, middle coat and final coat, understanding oil paints, decopaints, acrylic paints etc.
- Study of various application techniques like brush, pads, scalpel, spray paints, working on highlights for painting.
- Design and executing prototype of simple objects like pen stand, projector stand, lamp shades, paper tray, CD stand, knife holder, kitchen accessories and finishing of selected material.

#### **Evaluation shall be done on following heads:**

Simplicity, honesty of material, originality, workmanship, junction, structure.

Sessional work: Model Making of identified architectural projects

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**2S-AA-1**

Elective a - presentation skills II/ public speaking II/ English II/ sketching and rendering II/ foreign languages

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**2S-AA-2**

Elective b - fundamentals of painting/ fundamentals of sculpture/fundamentals of drawing techniques/ fundamentals of photography

### **Third Semester B.Arch.**

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**3S-A-1**

#### **Architectural Design-II**

The study of design shall continue with further progress and complexity in aesthetic qualities but with more emphasis on architectural and functional aspects like

- a) Complexity in circulation- and pattern of horizontals as well as vertical movement.
- b) Integration in terms of facilitation, planform, volume, concept and space organization.
- c) Application of basic building materials to evolve a design with their aesthetic appeal, functional quality and elementary structural concepts to evolve specific form.
- d) Climatic consideration for the design, orientation of building on site, simple concepts of sun shading devices, their application in elevations as functional / aesthetic solutions.

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Sessional work : Exercise on one or few aspects at a time followed by at least two design problems arranged in sequence leading to more and more complexity.

Type of Design Problems:

- a) Small Residence, Guesthouse, Block of Flats.
- b) Primary School, Dispensary, Club.
- c) Post office, Bank, Office etc.



**Construction Technology & Materials –III:****Objective:**

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**Unit I:**

Tiles, Steel, Aggregate, Reinforcement Bars.

**Unit II:**

Concept of vertical connector – Study of staircases – Types on the basis of geometry, materials and structural systems used for it.

**Unit III:**

Concept of spanning and its extension in formation of roofs and floors. Traditional methods of flooring such as timber floors, mud floors, jack arch floors. Types of timber roofs, trussed roofs in timber and steel, north light roofs, sky lighting.

**Unit IV:**

Principle of framed structure: R.C.C. as a building material and all R.C.C. elements, steel framed structures.

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**Sessional Work:** Site visit reports, tutorials, notes, sketches and market surveys.

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**Structural Design & Systems – III****Unit I:**

Principal stresses and strain : Application of Mohr's Circle method and study of concepts by analytical method.

**Unit II:**

Direct and bending stresses: Concept and application

**Unit III:**

Stability of Retaining walls : Stresses at base and minimum base width (without surcharge).

**Unit IV:**

Stress strain curves for concrete and steel ( MS and TS)

**Unit V:**

Column and struts: Eulers and Rankins theory – concept and application

**Unit VI:**

Hoop stress / longitudinal stress in cylinders and pipes.

**Unit VII:**

Simply supported beams – BM and SF Diagrams, Cantilever beams

Sessional work: Sketches, notes, tutorials, tests and presentations

### **History of Art & Architecture –III**

**Objective:** Study of social changes on architecture

**Unit I:** Islamic Architecture: 11<sup>th</sup> Century AD. Architectural forms conceived by Qutub Dynasties at Delhi.

**Unit II:** Development of regional styles noticed in various provinces such as Bengal, Jaunpur, Gujrat and Central India.

**Unit III:** Architecture under Mughals - Humayun, Akbar, and Shahjahan.

**Unit IV:** Contemporary Architecture (in West)

**Unit V:** Architecture in *Post Independence* era, city planning of Chandigarh, Delhi and study of its important administrative buildings.

**Unit VI:** Study of various schools of thoughts and philosophies of modern architects and its impact on contemporary architecture.

**Unit VII:** Industrial revolution in Europe and emergence of the Modern movement and its impact on contemporary Indian Architecture.

Contemporary Architecture in India. Study of works of Indian Architects, new developments like Navi Mumbai. **Sessional work:** Sketches, notes, tutorials, tests and presentations

### **Architectural Graphics-III**

Perspective :

**Unit-I:** Perception and registration of an object when viewed.

**Unit-II:** Introduction to picture planes, standpoint, eye level etc.

**Unit-III:** Types perspective views such as one point, two point, three point, worm's eye view, Bird's eye view, normal view, etc.

**Unit-IV:** Methods of drawing perspective views such as conventional method, measuring point method, shortcut and approximation in perspective drawing, simple problems based on geometrical solids

**Unit-V:** Measured Drawing: Measurement techniques of existing object (such as building, plot, etc.) and preparing measured drawing to suitable scale.

**Unit-VI:** Sciography: Introduction to Sciography, principle of conventional angle of light and its rays acting as a projectors to cast shadow of simple plane lamina e.g. square, circle, hexagon etc.

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Sessional work: **Sketches, notes, tutorials, tests and presentations**

## **Surveying & Levelling**

**Unit I:** Introduction to surveying and leveling, types of surveying methods and application,

**Unit II:** Chain and compass survey, methods and instruments used, plotting and adjustment of closing error.

**Unit III:** Plane table survey, method and instruments used.

**Unit IV:** Levelling, methods of levelling -dumpy level and its uses.

**Unit V:** Contours, use of theodolite, contour survey.

**Unit VI:** Planimeter and its use.

Practicals:

- a) Chain and compass survey, traversing.
- b) Plane table survey of cluster of buildings.
- c) Levelling using dumpy level and water table.
- d) Setting out site layout.
- e) Contour survey, plotting contour maps.

Sessional work: Practical record book, plates and notes

## **Climate and Architecture**

**Objective:** This part of the subject provides a scope to apply the knowledge of basic Climatology gained earlier for designing in different climatic conditions, with emphasis on tropical climate.

**Unit I:**

Study of traditional / vernacular architecture in relation with the climate types, with emphasis on vernacular architecture in Indian Context.

**Unit II:**

Understanding climate data, its analysis and method of presentation.

**Unit III:**

Study of passive cooling techniques, techniques of solar radiation control and heat transfer and insulation.

**Unit IV:**

Study of effect of orientation, topography, vegetation, form, building materials and surfaces on the building design in response to the climate.

**Unit V:**

Approach to climate responsive built environment.

Sessional work: Notes, Plates, Case studies etc.

Sessional work: Notes, plates, practicals & case study.

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3S-AA-1

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Elective a - environmental studies/ rural architecture/ vernacular architecture/ environmental impacts

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3S-AA-2

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Elective b - history of Indian traditional art and crafts/art appreciation/ architectural documentation/critical appreciation

## **Fourth Semester**

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4S-A-1

### **Architectural Design III**

This course will be in continuation with the previous semester i.e. Architectural Design II

**Sessional work:** Assignments on each head with presentation, lecture and site visits.

Design of simple single activity spaces like residence, school, canteen etc.

Small modules of short design projects based on the understanding developed about above mentioned topics.

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4S-A-2

### **Construction Technology & Materials –IV**

#### **Unit I:**

Metals: Aluminium, copper, steel, titanium etc.

#### **Unit II:**

Doors Windows – Steel, aluminium and sliding doors, sliding and folding doors, revolving doors, revolving shutters, collapsible gates.

#### **Unit III:**

Partitions – Aluminium, timber, steel.

#### **Unit IV:**

Temporary Structures and temporary supports – Timbering to trenches, formwork, centering, shoring and underpinning.

Sessional Work: Site visit reports, tutorials, notes, sketches and market surveys.

Plates of Small modules of design based on the construction principles.

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4S-A-3

### **Structural Design & Systems- IV**

**Unit I:** Concept of fixity – independent fixed beams with different loadings - BM and SF diagrams.

**Unit II:** Concept of continuity – three moment theorem - BM and SF diagrams.

**Unit III:** Method of Moment distribution for

- a) For continuous beams
  - b) Single portal frames
- BM. And SF. Diagrams.

**Unit IV:** Deflection of beams – simple supported and cantilever beams by using Macaulay's method.

**Unit V:** Determinate and indeterminate structures – degree of indeterminacy.

**Unit VI:** Study of Arches

- a) Study of behaviour fixed arch and Two hinged arch.
- b) Analysis of three hinge arches.

**Unit VII:** Study of IS 875 Part I, Part II and Part III

**Unit VIII:** Concept of load distribution for structural systems and overall stability like:

- a) One way
- b) Two way
- c) Suspension Structures
- d) Arch Action

Sessional works: Sketches, notes, tutorials, tests and presentations

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**4S-A-4**

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## **Building Services–I**

**Objective:** Aim of this subject is make the students aware of the importance, installation and working of essential services in buildings, and a way building services help in generating a cleaner and healthier built environment. The students should also be made familiar with I.S. codes related to services. The first part deals with the basic aspects of water supply, sewage disposal, refuse and storm water disposal in buildings.

**Unit I:** General idea of sources of water supply, qualitative & quantitative aspects, impurities, hard & soft water, standards for quality of water. Study of standards regarding water demand and consumption in different types of buildings, computing demands for domestic use, connection from municipal supply, domestic water supply systems, types, capacity-design-construction of suction & storage tanks.

**Unit II:** Down take supply, water supply pipes, and their sizes, jointing, fixing and laying. Various valves, fittings and fixtures like taps, showers etc. Domestic hot water supply system, water heaters.

**Unit III:** Principles of sanitation, water carriage systems, collection of waste matter in buildings. Various sanitary fittings and fixtures like water closets, urinals, wash hand basins, sinks, flushing cisterns, shower trays, bath tubs, bidets, drinking water fountains etc.

**Unit IV:** Various traps and their function, sewage collection and disposal system for individual buildings. Various types of sanitary pipes and their jointing, fixing and laying, manholes, inspection chambers, intercepting chambers.

**Unit V:** Self cleansing velocity, invert levels, drains on sloping sites, sewage disposal system in un-sewered localities- septic tank, soak pits, cesspools, aqua-privy, leeching pits for individual building of urban and rural areas.

**Unit VI:** Refuse disposal- Sources, types, collection, storage and transport, provisions for refuse disposal individual building level, refuse chutes. Storm water drainage- collection and disposal.

Sessional works: Sketches, notes, tutorials, tests and plates

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**4S-A-5**

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## **Architectural Graphics IV**

### **Sciography:**

**Unit-1:** Study of visual effects of shades and shadows when cast by Sight rays on solids and planes.

**Unit-2:** A principle of conventional angle of light and its rays acting as a projector to cast a shadow on simple geometrical object including shadow cast partly on horizontal and vertical plans.

**Unit-3:** Study of combination of shades and shadows.

**Unit-4:** Complex problems on-buildings, building projections, louvers, chajjas, canopies etc. rendered in appropriate medium.

**Unit-5:** Study of shades and shadows cast by artificial light on solids and planes.

### **Perspective :**

**Unit-6:** Perspective of interior of buildings rendered suitably.

**Unit-7:** Parallel and angular exterior perspective views of objects of buildings in different materials rendered with appropriate colours showing shades and shadows.

**Unit-8:** Bird's eye view showing a building or any object with surrounding landscape, buildings etc. rendered

Sessional works: Sketches, notes and plates

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**4S-A-6**

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## **Theory of Design-I**

**Unit I: Introduction to Architectural Design:** Definition of Architecture; Elements of Architecture backed by need and followed by fulfilment of need.

**Unit II: Scope of Architectural Design:** Architectural Design – An analysis – Integration of aesthetic and function

**Unit III: Architectural Space and Mass:**

Mass and space, Visual and emotional effects of geometric forms and their derivatives – Sphere, Cube, Pyramid, Cylinder, Cone, etc.

**Unit IV: Aesthetic Components of Design**

Proportion, Scale, Balance, Rhythm, Symmetry, Hierarchy, Pattern, Axis with building examples.

**Unit V: Application of Colour in Architecture**

Effect of colour in architecture – Colour symbolism

Sessional work: Notes, case studies and presentations

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**4S-A-7**

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**Theory of Landscape Architecture****Objectives:**

The scope of the subject is to make students aware of architecture beyond buildings, in the outdoor environment and spaces, and, the role and importance of landscaping and site planning in enhancing and improving the quality of building environs, functionally and aesthetically.

**Unit I:** Introduction to Landscape Architecture, definitions, importance, need and scope. Levels of landscape planning and design. Landscape architecture and ecology. Relationship between landscaping and environmental planning, regional planning, urban planning, urban design , architecture and interior design.

**Unit II:** Historical development of landscape architecture. Origins of gardens. Design Principles, salient features and elements of various gardens in history - like Egyptian, Persian, Spanish, Italian, French, English, American, Japanese, Moghul Indian etc.

**Unit III:** Modern garden development. Changed scenario for modern garden designs. Effect of industrialization on garden designs. Company towns, parks movement, green belts, urban parks, residential gardens, small gardens.

**Unit IV:** Different factors and components of a landscape. Social and economical factors. Psychological considerations of spaces and enclosures. Brief idea about man made components like walls, fences, entrances, gates, barriers, screens, planters, roads & pathways, street furniture, signage, services-electrical, water supply and drainage. Basic natural components - land, trees, water and climate.

**Unit V:** Land. Different aspects of land as a landscape element - soils, geology, topography, earth forms, levels, foundations, grading, drainage, paved and unpaved surfaces. The importance and use of the aspects as a landscape design element.

**Unit VI:** Plants. Different aspects of trees, shrubs, climbers, hedges, lawns as landscape elements. Basic horticultural idea about plants, plant selection, planting design and care of plants. Importance and use of the aspects as a landscape design element.

**Unit VII:** Water. Various forms of water elements in a landscape - fountains, waterfalls, pools, cascades, channels irrigation etc. Importance and use of water as a landscape design element. Construction of various water elements.

**Unit VIII : Climate.** Macro and micro-climatic considerations in landscape architecture. Effect of climate on landscape and various components of landscape on the microclimate. Relationship between climate and landscape and architecture.

**Reference Books:**

Landscape Architecture By J.O.Symonds.McOraw Hill Publications.  
Earthscape by J.O,Symonds,McGraw Hill Publications,  
Architecture-A manual of site planning and design by J.O.Symonds, McgrawHill Publications,  
Site Planning by Kevin Lynch,  
Site Planning by R.Genebrooks, Prentice Hall.

Sessional Work: Notes, sketches, tests and seminars based on the above topics.

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**4S-A-8**

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Elective a - graphic softwares/ web design/ building simulations and modeling/

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**4S-A-9**

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Elective b - anthropometrics and ergonomics/ product design/ design of building elements

**Fifth Semester B.Arch.**

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**5S-A-1**

**Architectural Design-IV**

**Objective-**

The study of this subject will continue further with-greater emphasis on functional aspects involved in complex design situations. The main objective is to understand effect of climate, topography and services on the buildings, to understand relationship between form and function of buildings, The design process to deal with the following:

1. Effect of sun, rain and wind on buildings.
2. Functional organization of activities with respect to site, its topography and surroundings.
3. Development control rules, building byelaws and standard codes
4. Functioning of building services like drainage, water supply and electricity
5. Form to suit the purpose of building.

Session at work: Study of the above aspects in the form of book study, case study etc. followed by a relevant design problem. Minimum two major design problems and two short/time problems to be tackled in each-semester.

Type of design problems:

Design problems on sloping sites such as Duplex residence, Yatri niwas, Library etc.  
College building, Hostel, Primary health center, Museum,  
Club, Holiday resort, Memorial, Multistoried apartment, Office/Commercial complex.

**Reference Books:**

Time Saver Standards for Building Types by J.H. Calendar, Mc-Graw Hill Publications



Time Saver Standards Design data, by J.H, Calender, Mc. Graw-Hill Publications,  
Neuferts Architects Data, By Rudolph Herg Crosby, Lockwood and Sons.  
A.J. Metric Handbook.

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**5S-A-2**

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### **Construction Technology & Materials –V:**

#### **Unit No. I:**

Cement, paints, various types of plasters, paints, varnishes and finishes.

#### **Unit No. II:**

Plasters and finishes.

#### **Unit No. III:**

Expansion Joints, Water-Proofing, earthquake resistant structures.

#### **Unit No. IV:**

False Ceiling, Suspended ceilings, roofs.

#### **Unit No. V:**

Foundations, footings and all advanced foundations.

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**Sessional Work:** Site visit reports, tutorials, notes, sketches and market surveys.

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**5S-A-3**

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### **Structural Design & Systems – V**

#### **Unit I:**

Structural properties of: a) Concrete b) Reinforced Concrete

#### **Unit II:**

Concepts in RCC Design: a) Elastic b) Ultimate Load c) Limit State

**Unit III:** Different Limit states, partial safety factors, permissible stresses

**Unit IV:** Design of Singly Reinforced RCC Sections

**Unit V:** Design of doubly reinforced sections

**Unit VI:** Design of 'T' and 'L' beam sections

**Unit VII:** Design of shear reinforcement in beams.

**Unit VIII:** Design of RCC Sections in Tension

**Unit IX:** Study of IS 456 – Section III – Design Considerations.

Note: It is expected Concrete as a building material shall be dealt in Materials in detail.

Sessional work: Sketches, notes, tutorials, tests and presentations

**Building Services –II**

**Objective:** The second part of the subject continues with the services related to electricity. The students are required to design the service layouts so as to get a deeper insight into the working of the various services at a larger magnitude, with students getting information related to large campuses, complexes, high-rise buildings and special uses like swimming pools, fire fighting etc.

**Unit I:** Electrical services, various wiring systems, calculation and distribution of loads, electric fittings and appliances, detailed layout of electrical services in a residence.

**Unit II:** Schematic water distribution system from treatment plants to town, group housing etc. Computing demands for group housing schemes and high-rise building, design of storage and distribution system, Detailed layouts of water supply systems.

**Unit III:** Hot water supply in high-rise buildings, boilers, furnaces, solar water heaters, computing a special demands of water for swimming pools, air conditioning plants, fire fighting, street washing, fountains and gardens etc. and their systematic layouts.

**Unit IV:** Sewage collection and disposal for large campuses, complexes, high-rise buildings etc, Mechanical methods for removal of sewage from special areas like basements (shones ejector).

**Unit V:** Rain water harvesting.

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**Sessional work:** Sketches, notes, tutorials, tests and presentations

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**Architectural Graphics-V**

**Objective:** The objective of this subject is to train the students for *the preparation of* :

1. Submission drawing as per the local building bye laws
- 2) Working drawings required for carrying out actual construction *work*. The graphics of the drawings will be with specific reference to the code of practice for Architectural and Structural drawings as laid down in B.I.S. No.962 of 1960. The course of this subject shall be completed in two semesters i.e. Semester-5 and Semester-6. The course to be completed shall be as follows:

**Unit I:** Study of building bye-laws, building regulations, requirements of parts of Buildings etc. as per the National Building Code.

**Unit II:** Understanding the concept of Ground coverage, Built-up area, FSI/ FAR etc:

**Unit III:** Preparations of submission drawings for a single storied residence with approximate 75 Sq.Mt. built-up area..

**Unit IV:** Preparation of working drawings for the same building. The set of drawings to be prepared shall include Foundation / centre line plan (considering Load Bearing as well as R.C.C. Frame structure type), Floor Plan, Lintel level plan, Terrace Plan showing roof drainage arrangement. Sections, All elevations, Details of stair, Doors and windows, Flooring pattern, Kitchen, Architectural features etc. (Set of min. 10 drawings of imperial size prepared to facilitate the execution of building)

Sessional Work: Plates on above topics.

## Theory of Design-II

### Unit I: Organization of Forms and Spaces

- a) Spatial relationships: i) Space Within Space ii) Interlocking Space iii) Adjacent Space iv) Space linked by common space
- b) Spatial Organization- influencing factors and their types: i) Centralised ii) linear iii) Radial iv) Clusterd v) Grid
- c) Articulation of Forms and Space types: i) Edges and Corners ii) Surface

### Unit II: Character and Style in Building

Factors influencing the Character and Style in Buildings, study of examples in Contemporary Architecture ( Including Modern and Post Modern)

### Unit III: Principles of Composition:

**Unit IV:** Harmony and specific qualities of design to include dominance, punctuating effect, dramatic effect, fluidity, climax, accentuation and Contrast with building examples.

### Unit V: Circulation

Study of circulation pattern and its relation to organisation functional spaces and activities.

Sessional work: Case Studies, notes, plates and presentations

## Specifications

**Objective:** Art of writing specifications for materials and works is very important in which emphasis on the required qualities of materials and proper sequence of construction should be brought out.

**Unit I:** Introduction, importance of specifications building construction activity. Types of specifications and its applications,

Method of writing specifications (contents, correct order and sequence), use of Indian standard codes and specifications, PWD specifications.

**Unit II:** Specifications of basic building materials such as bricks, stones, aggregate, cement, steel, timber etc. Specifications of materials used in flooring and finishing such as ceramic tiles marble-mosaic tiles, paints and varnishes.

Specifications of materials used in roofing and roof covering such as tiles, A.C, G.I. and Aluminum sheets etc.

**Unit III:** Specifications for fixtures and fastenings; Study of proprietary materials along with manufacturer's specifications, trade names of such materials.

**Unit IV:** Specifications of works for a residential building of load bearing type or R.C.C. framed type. Specification of construction of steel structure, ceilings and partitions, paneling insulation and Water proofing.

**Unit V:** Specifications for items of services such as drainage, wafer supply, electrical installation.

**Unit VI:** Specifications for demolition-work, temporary construction like sheds, exhibition stalls, gateways.

Reference Books:

Estimating & Costing by B. N. Dutta, B.S. Publishers.

Estimating and Costing by S.C. Rangawala, Charotar Publishing House..

Red Book of Public Works Department Government of Maharashtra.

Estimating and Costing in Civil Engineering by Chakravarti, Bhaktivedanta Book Trust.

IS – 1200

Sessional work: Notes and tests on above topics.

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**5S-AA-1**

Elective a - building automation systems/advanced building materials/ specialized services/

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**5S-AA-2**

Elective b - appropriate technology/ eco-friendly architecture/regional architecture/ sustainable development/

## **Sixth Semester**

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**6S-A-1**

### **Architectural Design V**

Course work to be continued and completed in this semester as mentioned in Architectural Design-IV Syllabus.

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**6S-A-2**

### **Construction Technology & Materials –VI**

#### **Unit I:**

Cladding Materials

#### **Unit II:**

Bamboo, mud, ferro-cement, vault domes, flat slabs etc.

#### **Unit III:**

High rise construction

#### **Unit IV:**

Advanced R.C.C. Structures

Sessional Work: Site visit reports, tutorials, notes, sketches and market surveys.

Plates of Small modules of design based on the construction principles.

**Structural Design & Systems- VI**

**Unit I:** Study of IS 1893 – Earthquake Resistant Structures

**Unit II:** Design of: a) One Way Slab b) Two Way Slab c) Continuous Slabs

**Unit III:** Design of RCC Sections in Compression – Columns: a) Short Columns b) Limitation of Long Columns c) Columns subjected to Uniaxial bending ( using charts)

**Unit IV:** Design of Independent Column Footings

**Unit V:** Design of RCC Grid Structures – Simple Concept

**Unit VI:** RCC Building frames – Structural Behaviour

**Unit VII:** Design of RCC Sections for Retaining Wall a) Continuous b) Supported in one direction c)Supported in both directions

**Unit VIII:** Structural Behaviour of Large Span RCC Structural Systems like: a) Portal Frames b) Arches c) Open Web Sections d) Bow String Girders e) Shell Roofs – Cylindrical, Conical, Hyperbolic Paraboloid and others f) Space Structures g) Innovative Structural Forms

Sessional work: Sketches, notes, tutorials, tests and presentations

**Building Services -II**

**Unit I:** Communication systems in buildings, Video conferencing, Computer networks and trenches and conduits to accommodate the systems. Security and Surveillance.

**Unit II:** Introduction to building automation systems, components and application of BAS, Architectural implications.

**Unit III:** Causes of fire in buildings, types of fire, spread of fire, production of smoke and poisonous gases. Fire safety and preventive measures.

**Unit IV:** Fire fighting regulations with reference to National Building code. Fire escape, stairways and escape routes, dry and wet risers, Water demand for fire fighting, storage tanks, fire hydrants etc.

**Unit V:** Study of Fire detection systems, smoke detectors, heat detectors, fire alarms etc. Fire extinguishing systems, Unit fire extinguishers, Chemical and foam extinguishers, Chemical and foam extinguishers.

**Unit VI:** Ventilation of buildings, Natural and mechanical ventilation, Need of mechanical ventilation, Exhaust fans, Axial flow fans, Blowers for industrial ventilation.

Sessional works: Sketches, notes, tutorials, tests and plates

### **Architectural Graphics VI**

In continuation of previous semester, students shall be required to handle the projects of greater magnitude in this semester and they shall be trained to prepare working drawings of a class problem already completed in design class having Multi-storeyed R..C.C. framed structure. A set of working drawings shall contain the followings.

**Unit I :** Centreline plan, all floor plans, lintel and slab level plans.

**Unit II:** Sections, elevations and large- scaled details,

**Unit III:** Site development Plan showing landscaping roads .

**Unit IV:** Toilet details, Drainage Layout showing soil, waste and rain water drainage system. Sanitary fittings, traps, inspection chambers etc.

**Unit V:** Water supply layout indicating supply tapping point with meter, supply line to storage tanks and connections to different equipment in building.

**Unit VI:** Electrical layout showing meter board and power supply lines to different parts of building and different equipment.

Sessional Work : Plates on above topics.

### **Design of Human Settlements**

**Objectives:** The study aims at introducing students to the development of planning thought from that of historic to present age. It also gives emphasis on stressing broad principles of settlement in such period. The study of this subject continues with emphasis on planning philosophies and the student to carry out the further studies in the specialized field of Urban Planning.

**Unit I:** Man's role in designing and developing the towns and cities from ancient times through Medieval, Renaissance and Industrial revolution to present day development.

**Unit II :** Town planning in India, Pre-historic, Vedic, Pre- British and British Planning in India, Planning after independence.

**Unit III:** Pioneers and their works, Planning concepts of Patric Geddes, Ebenezer Howard, Abereronmbie, Le-corbusier, C. A. Parry, Clarence Stein, Doxiadis, Kevin Lynch, F.L. Wright, Lewis Mumford, Rob Krier and Victor Gruen.

**Unit IV :** Present concept of planning at various levels, Planning as a team work, Role of Architects/ Planners in a team , Importance and methodologies of surveys in the planning process, Factors governing the location and growth of towns.

**Unit V :** Understanding the process of development plan making, general ideas of implementation of such plans and planning agencies, study of planning legislation and administration, town and

regional planning acts., M.R.T.P Act., Development control rules, zoning, density, height, FSI Structures, Role of local and planning authorities.

**Unit VI :** Introduction to the problem of urban and rural housing in India, Analysis of demand and supply, General study of Planning consideration of housing and area development and housing infrastructure such as utilities and services.

Sessional works : Notes and Seminar of above topics, Critical appraisal of existing proposed housing schemes, planning exercise of residential community.

Reference books :

Fundamentals of Town Planning by G.K.Hiraskar, Danpatrai & Sons.

Town Planning by S.C.Rangwala and K.S.Rangwala

Town Planning by Abir Bandhopadhaya, Books and Allied (P) Ltd.,

Urban Pattern City Planning and Design by Gallion and Eisher.

Sessional work :- Sketches, assignments & tests.

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**6S-A-7**

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### **Estimating and costing**

**Unit I:** Purpose of Estimating, types of estimates

**Unit II:** Bill of quantities for single story structures - (a) Load bearing (b) R.C.C, frame.

**Unit III:** Study of IS-1200.

**Unit IV:** Estimation of quantities for R.C.C. structural members like footing, column, beam and slab.

**Unit V:** Estimation for electrification, water supply & sanitation, (only for residential buildings)

**Unit VI:** Rate Analysis - general, factors affecting the rate of an item, rate analysis for R.C.C. work, brick work, plaster work, flooring painting, doors and windows

**Unit VII:** Brief specifications and schedule of rates.

Sessional work: - Plates, sketches, & tests.

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**6S-AA-1**

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Elective a - project management/ data management techniques/computer applications in estimating and costing/

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**6S-AA-2**

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Elective b - advanced spatial analysis/ environmental psychology/ man-environment relationship

### Architectural Design-VII

**Objective-** Study of this subject shall conclude with emphasis on urban development, design problems of increasing structural and design complexity will be set with full opportunity, coordination, collection and analysis of data. Emphasis will be on preparation of design programme, preparation of drawings and detailing.

The process will deal with

- 1) Design orientation of advance and specialized buildings and environmental services, climate and acoustical system oriented buildings, their appropriate structural buildings and construction techniques.
- 2) Orientation on development control rules like, density, zoning, FSI etc. redevelopment and urban conservation techniques.
- 3) Study of urban environment, complex building forms, their design including positive and negative space relationship, Parking Provision, Precincts concept and pedestrian movement.

**Sessional work :** will include appropriate exercises on one or more of the above mentioned aspects followed by at least 3 design problems arranged in a sequence of complexity and as a problem solving approach.

Site visits audio, visual presentation and library reference is emphasized.

**Design problem will be like :**

- a) Public buildings : Theatre, museum, auditorium, recreation, complexes, stadium, etc.
- b) High rise apartment, offices, hospitals, laboratories, campuses etc.
- c) Urban design level problems such as commercial complexes, group housing, area development etc.

### Construction Technology & Materials –VII:

**Objective:** Study of this subject is aimed at teaching the students the advanced and more complex aspects of construction. It also aims at making students aware of systems and techniques of construction used to cover the large spans.

**Unit I:** Introduction to space structures, possibilities in different materials, types of space structures and possibilities in different materials to cover large spans. General study of shell structures and folded plate structures in concrete, various types, constructional aspects, merits and demerits etc.

**Unit II:** General study of Grid structures and Skeletal structures, space frames, domes etc. in steel, various types, constructional aspects, merits and demerits, etc.

**Unit III:** Pre-cast concrete, Design considerations and constraints, advantages over cast-in-situ construction, construction techniques and jointing details, applications. Modular coordination, RCC pre-fabricated proofing systems to cover large spans, with or without north light.



- Unit IV:** Study of pre stressed concrete, principals and methods of pre-stressing, system of pre-stressing, advantages and disadvantages and applications.
- Unit V:** Temporary structures, materials and techniques used, constructional aspects using timber and M.S Sections, design and detailing problems on small temporary structures.
- Unit VI:** General study of various external cladding materials and systems, curtain walling in various materials, construction details of glass curtain.

Reference books :

- Advanced Building Construction by Mitchell, Allied Publishers.
- Construction Buildings by R.Barry, Orient Longman.
- Space structures by N. Subramaniam, Wheeler.
- A.J.Handbook of Building Structures by A. Hodgkinson.
- Pre-stressed Concrete Structures by P.Dayaratnan.
- Building Construction illustrated by Francis D.K.Ching, Van Nostrand.
- Concrete Technology by M.S.Shetty, S.Chand and Co.
- Erection of Pre-fabricated Reinforced Concrete Structures by Y.Bessar & V.Proskurnin.
- Structures by Daniel L.Segodak, Prentice – Hall, Inc.
- Structural Concepts and Systems for architects and Engineers by T.Y.Lin and Stotesbury.

Sessional work : Notes, plates, assignments (Problems) and test.

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**7S-A-3**

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#### **Building Services-IV**

**Unit I:** Principles of Psychometrics and heat transfer, Study of Air conditioning systems and their applicability, Unit A.Cs, Central A.Cs, Split A.Cs.

**Unit II:** Components of A.C. systems such as chilling plants, cooling towers, air handling units, etc. Calculation of A.C. loads and Air distribution systems, ducts and ducting layouts, space requirement, integration of A.C. system in design, Water demand for A.C.

**Unit III:** Electric supply and distribution for group housing projects, urban complexes, high-rise building etc. Study of load calculations and distribution systems for larger areas as mentioned above.

**Unit IV:** Importance and functions of bus bar, set up, step up and step down transformers, electrical substation, lightning conductors, stand by generators, automatic relays, invertors, circuit breakers etc.

**Unit V:** Electromechanical means of vertical transportation in buildings, requirements, occupant load, study of elevators, various components of elevators, standard space requirements, various types of elevators, various components of elevators, standard space requirements, various types of elevators and architectural implications.

**Unit VI:** Escalators and Trav-o-lators, its components arrangements and functioning, space requirements, construction detailing.

Sessional work: Sketches, notes, tutorials, tests and presentations.

## **Structural Design & Systems – VII**

**Unit I:** Study of IS 800 – Design Considerations.

**Unit II:** Steel Connections – Welded Joints

- a) Types of Welds
- b) Concentric Sections
- c) Eccentric Sections
- d) Sections in Bending
- e) Sections in Torsion

**Unit III:** Design of Tension Members

**Unit IV:** Design of Compression members – Struts / Independent

**Unit V:** Design of Built in Columns

**Unit VI:** Design of Sections in Bending

**Unit VII:** Sections Subjected to Biaxial Bending (design of purlin)

**Unit VIII:** Structural behaviour of Types of Large Span Steel Structures like:

- a) Arches
- b) Open Web Sections
- c) Bow String Girders
- d) Suspension Structures
- e) Geodesic Dome
- f) Space Structures

Sessional work: Sketches, plates, notes, tutorials and tests

## **Research Skills & Project Introduction**

**Objective:** Perspective on research framework and methods in architectural planning and design which can be quantitative, qualitative as well as techniques in visual, special and contextual evaluation.

**Unit I:** Identification of the investigation to be done in research, methodology in sequence to achieve to acquire desired results.

**Unit II:** Assessment of data to be used in formation of the total thesis profile.

**Unit III:** Data collection methods like reference books, internet resource, monographs, microfilms, tables and charts and statistical data.

**Unit IV:** Concluding part of research comprising of the data used in the case study for final presentation in presentable format through similar case studies.

Sessional work: Sketches, notes, tutorials, tests and presentations

## Acoustics and Illumination

**Objectives:** Study of this subject will make students realize the importance of acoustics in interior spaces and necessity of manipulating acoustical environment in buildings. And also to impart knowledge of basic illumination design & illumination system for the indoor spaces.

### Acoustics

**Unit I:** Frequency range of audible sounds. Propagation of sound, sound reflection, diffusion, diffraction. Sound Isolation, Mass law, Transmission loss, STC rating, TL for single and double walls sound leaks and flanking.

**Unit II:** Acoustical Material and interior finishes, Sound absorbing materials & their properties. Constructional and planning measures for good acoustical design of building in general, Acoustical treatment of Auditorium / Lecture Halls / Conference hall.

### Illumination

**Unit III:** Light radiation, its units, Laws of illumination, inverse square law and cosine law. Artificial light calculation by Lumen Method. Light sources, various types of Lamps and their characteristics.

**Unit IV:** Types of lighting systems, task lighting, accent lighting, general lighting, lighting for mood etc. Luminaries, their types , properties and uses.

#### Reference Books:

Acoustics In Building Design by K.A. Siraskar.

Architectural Acoustics by David Egan.

Auditorium Acoustics and Architectural Design by M. Barron.

Sessional Work : Notes & problems based on acoustical design theory, tutorials, Sketches.

Survey of various sound insulating materials for interior elements.

Survey of various lighting fixtures.

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7S-AA-1

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Elective a - Architectural education/ design process/ interior design/ landscape design/advanced spatial analysis II

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7S-AA-2

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Elective b - urban planning/ conservation/urban design/ urban aesthetics/infrastructure planning

**Practical Training**

**Details of Practical Training:**

- (1) The Practical Training of six months duration (under a Registered Architect only) envisages the following varied experience in order to ensure exposure of a student to various tasks.
    - a) Office experience in respect of preparation of working drawing, detailing drawings of perspective, preparation of architectural models, study of filing systems of documents, drawings, ammonia prints and preparation of tender document.
    - b) Site experience, in respect of supervision of the construction activity, Observation, layout on site, study of the staking methods of various building, materials, taking the measurement and recording.
  - (2) Student will have to maintain a weekly record of their engagement for the period of training. This will be recorded in an authorized log-book to be counter-signed by architect at the end of each month.
  - (3) At the end of the training period, student will have to procure a certificate of training and satisfactory performance from the concerned office in the prescribed form.
  - (4) Certificate of satisfactory completion of training same shall be submitted to the principal of the College, immediately after training, through Head of Architecture Department along with the report and drawings made during the training period and appear for Viva-voce at a prescribed date by the university.
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**Tenth Semester**

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**Project**

Every student shall select a subject for Research project of an Architectural interest, Experimental work, dissertation or a combination. The nature of the problem shall be based on the synthesis of their total experience and knowledge gained from the allied subjects. Emphasis, shall be laid on the approach to the design solution rather than the end-result. The subject of the project shall be approved by the Department at the commencement of the term.

The students shall have to give at least one seminar on their subject.

On the prescribed date students have to submit to department a bound report of the project, containing identification of the problem scope of the work, data collection, case studies, analytical studies, and its application to the final design solution. On the date prescribed by the Nagpur University, final and finished drawings with models etc. shall be submitted in the department, for the Final Viva-Voce.

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**Construction Technology & Materials –VIII**

- Unit 1 :** General study of Construction techniques to cover large spans using short length timber and laminated timber material, lamella roofing, portal frames, solid beams and web beams.
- Unit 2 :** General study of suspension structures, membrane structures and pneumatic structures, types, materials used, merits – demerits and examples.
- Unit 3 :** High rise buildings, foundations structural systems and architectural design considerations.
- Unit 4 :** Study of causes of defects in buildings such as cracks, seepage, deflection etc. and their remedies. General idea of non destructive tests such as Rebound test, Penetration test etc. Rehabilitation methods, Grouting, Guniting, Jacketing etc. General Study of special chemicals used in construction and repairing work.
- Unit 5 :** Earthquakes and its effects on buildings, earthquake zones in India, Architectural design considerations and construction detailing for earthquake resistance.
- Unit 6 :** Design and detailing of additions and alterations in existing buildings put to new use Process of modification and precautions to be taken.

Reference Books :

Structure in Architecture by M.Salvadorri.

Advances in Tall Buildings by L.S.Beedle

Construction Technology 1-4 Vol. Bu R.Chudley, British Library Cataloguing.

Explanatory Handbook on Codes for Earthquake Engineering, IS-1893-1975 & is 4326 -1976, Bureau of Indian Standards.

National Building Code.

Sessional Work: Site visit reports, tutorials, notes, sketches and market surveys.

Plates of Small modules of design based on the construction principles.

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**10S-A-3**

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## **Professional Practice**

**Objective:** The study of this subject is to enable the student to acquaint with the various responsibilities of an architect and understand the technicality of the profession.

**Unit I :**

Nature of profession, difference between trade, business and profession, taking instructions from the client, its interpretation, design process and its stages.

Role of professional society, Professional code of conduct, Ethical ways of getting architectural commission, Importance of conduct of architectural competitions, architectural copy right.

**Unit II :**

Responsibilities and Liabilities of an architect towards the client. Scale and basis of fees. Professional charges of various jobs. Stages of Architectural design and the specific task in each of such stage.

**Unit III :**

Architects Office, Organisation and Administration., Office set up,

Correspondence, filing, preparation of drawing, standardization and documentation

Professional partnership, various options, advantages. Partnership deal, responsibilities and liabilities of partners. Provisions of Professional Tax, Service Tax, Income Tax rules.

**Unit IV:**

Tender, types of tender, tender document, tender notice, procedure for opening and selection of tender, analysis bids, comparative statement, report to owner, work order.

**Unit V :**

Contract, type of contract, contract document, Detailed knowledge of various condition of contract as published by Indian Institute of Architects with special reference to responsibilities and liabilities of architect, contractor and the client.

**Unit VI :**

Architects Act 1972 , its effects on profession and education. General information and introduction to various acts and laws such as land acquisition Act, urban land ceiling Act. Building bye-laws, Sale deed procedure, owner ship documents.

Reference Books :

Professional Practice by Roshan Namavati  
COA Handbook of Professional Documents.

Sessional Work : Notes, Tutorials & Report writing on above topics.

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**10S-AA-1**

Elective a - industrial architecture/ long span structures/ high rise buildings/ housing/ campus planning