First Semester B.Arch.

1S-A-1

Architectural Design I

Objectives: The primary objective shall be to develop in students the understanding and relevance of human scale and space formation, elements of built form and its role in spatial realms.

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 and shade as contributing factors, 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, façade, etc.
   b. Ancillary Elements: Courtyards, balconies, canopy, patio, sitouts, water bodies, pergola, etc.
   c. Relevance of all such elements on architectural expression and spatial quality.

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

References

- Ching Francis D. K., Form Space and Order.
- Ching Francis D. K., A Visual Dictionary of Architecture.
- Pierre Von Meiss -Elements of Architecture from form to place.
- Yatin Pandya- Elements of Space Making

1S-A-2

Allied Design Studio I

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

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

Unit I: Introduction to basic elements of visual arts – point, line and plane. Study of Visual properties of 2-Dimentional forms both geometrical and non-geometrical surface and visual texture and optical illusion.

Introduction to principles of organization/composition- Repetition, Variety, Radiation, Rhythm, Gradation, Emphasis & Subordination, Proportion, Harmony, Balance.

Unit II: Free hand line sketching and drawing of natural and manmade objects. Study of shades and shadows. Sketching of structures with architectural importance using different medium.

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

Sessional Work – Plates, Sketches and models to understand basic principles of visual composition.
Creative Exercises of 2d to 3d composition.

1S-A-3

Building Construction and Materials I

Objectives: To develop understanding of building materials and its application in construction of various building elements. The subject also aims at introducing students with design ability for a certain building element integrating with architectural space and demand of time and place.

Unit I: Introduction to construction as a subject and its relevance to Architectural Design.

Construction and the Logic of stability as its basis, construction principles with respect to structural stability. Support and supported elements, concept of span and span - loading co-relation.

Building elements, types and subtypes, basic understanding of elements from foundation to roof vis-à-vis its purpose, function, utility and necessity.

Unit II: Building materials, Categories – Natural, Processed, Manufactured and Designed. Availability, Composition, General know-how with respect to physical, chemical and structural properties; utility and criteria for selection in design and construction of various elements of building. (Market survey and study of catalogues)

Manufacturing of clay bricks, **Bricks** made from other materials and blocks.

Building **Stones**, its quarrying process, preservations, dressing and artificial stone(s).

Manufacturing of **Lime, Cement** - its setting time; importance and need for curing.

Aggregate Coursed and fine, sources, grading and selection criteria, various uses and mix.

Concrete types (based on materials), Preparation and mix – criteria, its various uses, Manufacturing of **Glass,** various types, forms, applications.

Unit III: Basic Structural Systems, Load Bearing, Frame Structure and Composite structure, load transmission, suitability, merits, demerits etc. Introduction and understanding of various Subsystem such as Horizontal, Vertical and Foundation, Sub systems with respect to stability, utility and its application in building design and construction.

Unit IV: Masonry, definition and types; purpose / function their role in building design and construction. Standard terminology used for masonry work

A complete study of principles and rules of Brick Masonry (up to 2 brick thick) and Piers.

A complete study of principles and rules of Stone Masonry and Pillars.

Composite masonry and masonry out of various walling blocks.

References

- 'Building Construction' by Mackay W. B., Vol. 1 – 4
- 'Building Construction' by Barry, Vol. 1 – 5
- 'Construction Technology' by Chudley, Vol. 1 – 6
- 'Building construction Illustrated' by Ching Francis D. K.
- 'Engineering Materials' by Chaudhary

1S-A-4

Architectural Graphics I

Objectives: To introduce students to architectural drawing techniques with due emphasis to scale, annotations, labeling and dimensioning.

To enable students to express simple three dimensional objects and building components through technical drawings, using various graphic projection systems such as orthographic, Isometric and Axonometric projections.

Unit I: Introduction to graphic language and its components

Line types: meaning and application
Architectural Lettering and dimensions in techniques
Architectural annotations and conventions including representation of various building materials and building components
Graphic scales and their application

Unit II: Plane and Solid geometry

Introduction to graphical construction of various plane geometrical shapes.
Introduction to various projection systems used in Architectural drawing; such as Orthographic, Isometric and Axonometric projections to draw and represent various three dimensional geometrical objects/forms.

Unit III: Scale Drawing

Scale drawing (plan/s section/s and elevation/s) of a simple G+1 building of sufficient size (drawings of which has to be provided) to demonstrate use of various metric scales, conventions and standard annotations especially indicating the vertical circulation & toilet details in section.

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

References

- Ching Francis D.K.: Architectural Graphics
- Gill Robert: Rendering with pen and ink
- H. Joseph and Morris: Practical plane and solid geometry

1S-A-5

Structural Design & Systems I

Objectives: This course provides students with a basic knowledge of structural systems used in buildings. Emphasis will be on structural concepts vis-à-vis stability of forms rather than intricate numerical calculations while dealing with different structural concepts. The subject intends to familiarize students to concepts of basic structural mechanics.

Unit I: Overview of the Structural System in Architecture.

Study of types of loads and types of beams.
Load bearing structure, RCC frame structure, Steel trusses in residential & industrial buildings,
With suitable examples from historical and contemporary architecture.

Unit II: Introduction to Structural Mechanics

Introduction of forces, composition, resolution, moments and couples,
Resultant of forces, Concurrent and non-concurrent co-planar force systems,
Principle of moments, Varignon's theorem.

Unit III: Principle of equilibrium. (2D Elements)

Basic principles and conditions of equilibrium, study of Lami's theorem and Free Body Diagrams.
Study of structural support reactions:- Study of reactions of simple support, hinged support, roller support and fixed support.

Unit IV: Geometric Properties of plane sections
Centre of gravity
Moment of inertia (second moment of area) – section modulus, radius of gyration, polar moment of inertia.

Unit V: Analysis of Trusses
Perfect frames (Method of joints)

Sessional work: Sketches/ Notes/ Tutorials &Presentations
Desirable: Site visits to develop better understanding of above.
Laboratory exposure wherever possible.

References:

- Khurmi, R. S.(2006). A Textbook Of Engineering Mechanics (SI Units). New Delhi: S.Chand And Co Ltd.
- Reddy, K. Vijaya Kumar; Kumar J. Suresh.(2011). Singers Engineering Mechanics Statics And Dynamics
(SI Units). Hydrabad:B.S Publications.
- Ramamrutham , S. : Narayanan, R.(2008). Engineering Mechanics. New Delhi: Dhanpat Rai Publications Ltd
- Shah, H.J. ;Junnarkar, S.B.(2012). Mechanics of Structures. Anand:Charotar Publishing House Pvt. Ltd.
- Singer, FerndinandL.(1975). Engineering Mechanics Statics & Dynamics. New Delhi :Harpercollins Publishers.
- Ching, Francis D.K.; Onouye, Barry S. Building Structures Illustrated: Patterns, Systems And Design. New Jercey: John Wiley And Sons.
- K. G. Rajashekarappa, S.S. Bhavikatti (1994), Engineering mechanics, New age international publication, Mumbai.

1S-A-6

History of Civilization

Objectives: To provide an introduction to the architecture of early civilisations as an expression of art and culture of that place.

To understand and interpret basic needs and lifestyle as determining factors for growths of early settlements.

Unit I: Prehistoric Architecture- Evolution of architecture. A study of primitive people, shelters, settlements.

Examples: Menhirs, Dolmens, Trilithons, Stone circles, Stone hedge, Cave dwellings. Catal Huyuk

Unit II: Nile Valley Civilization: The impact of the context, culture and society on art and architecture of the Egyptian Civilization. Evolution of tombs, valley of Kings, necropolis.

Unit III: Indus Valley Civilisation: The impact of the context, culture and society on art and architecture during Early Indus settlements in Mehrgarh, Harrapa, Mohenjo Daro, Dholavira.

Unit IV: Euphrates & Tigris river valley Civilisation: The impact of the context, culture and society on art and architecture of Asayrian, Sumerian, Mesopotamian and Babylonian period.

Unit V: Yellow River Civilisation: The impact of the context, culture and society on art sculpture and Architecture during Prehistoric, Xia Dynasty, Shang Dynasty and Zhou Dynasty

Unit VI: Vedic Architecture and Settlements: Rise of cities, Mahajanapadas, introduction to scripture

Exercises: Design of exercises to understand, analyze, interpret, synthesize the study of historical structures to develop understanding of architecture

Test: one at midterm and one at end of term to be conducted at institute level.

The questions should be framed with least emphasis on factual reproduction.

References

- History of World Civilisations by J.E. Swain.
- A Short History of the World – H. G. Wells

1S-A-7

Computer Application I

Objectives: This subject is to empower students with computer software useful for architects to enhance the skills of presentation, drafting and coordination of design and other subjects. To learn presentation software for enhancement of architectural drawings, sketches and convey ideas through presentations.

Unit I: M.S. office – Basics of M.S. office software, M.S word, PPT presentation or equivalent software and Excel

Unit II: Photoshop etc. to enhance presentation skills with help of software.

1S-A-8

Workshop I

Objectives: To develop skills to understand 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.

Evaluation shall be done on following heads:

Simplicity, honesty of material, concept, translation of concept, detailing, workmanship and expression

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1S-A-9

Elective I

Appreciation of Art and Architecture/ Numerical Ability/ Presentation Skills/ Sketching and Rendering/ Public Speaking/ Institutional Project 1

Note: Following are the suggestive contents; institutes have freedom to formulate the content as per their school of thought

Appreciation of Art and Architecture

Key Words: Types of Arts, identification, appreciation, Visual perception, Art and Design, Modern, Contemporary Architecture.

Objectives: The objective of the course is to understand and appreciate art and architecture in terms of its form, content and context through the study of works of art over history in order to develop sensitivity towards aesthetics and techniques developed over the period which plays a important role in architecture.

- To introduce the vocabulary of Art, Architecture and the principles.
- To inform students about the various art forms through the ages within the cultural contexts.
- To study Modern Art and the new directions that evolved in the 19th and 20th centuries.
- To inform the production of art in the Indian context through history and the contemporary manifestations.

Sub topics :

1. Evolution of art and architecture.
2. Introduction to Art Appreciation. The ways of seeing Art.
3. Art and Design- Historical perspective.
4. Expression in Art and Design
5. Indian Art -Pre and post- Independence, Contemporary Indian Art.
6. Indian Art and Architecture- pre and post – Independence, Contemporary Indian Art and Architecture.
7. Role and impact of art and architecture. (History, Expression and relation).

Sessional Work:

Plates, Assignments, workshops, Visits

References:

- The Making of Indian Art – Tapathi Thakurta,
- Kala Swadhane- M.H.Krishnaiah,
- Contemporary Indian Sculptures- Dr. Shivji Panikar
- Cantanese, A. J. and Snyder,
- J. C. (1988). Introduction to Architecture. Ching, F. D. K.,
- Jarzombek, Heidegger,
- M. (1993). The origin of the work of Art-Basic writings. Vitruvius,
- Translation: Morris, H. M. (1960)

Numerical Ability

Key Words: Mathematics and architecture, Nature and mathematics, Geometry

Objectives:

- The objective of this course is to inculcate the interesting application of mathematics in architecture without using the complex mathematical operations and formulae.
- The focus is to make the students understand the mathematics that exhibit in nature.
- The students are introducing to Fibonacci series, Fractals, Tessellation and its application in architecture.
- Further students are introduce to the repeated geometric patterns like squares and circles which may overlapped or interlaced to form intricate complex Islamic Jalis in one of the Exercise.
- The Theories of Golden sections and fractals formed the basis for understanding the fundamentals of basic geometry as found in nature. In later stage, Students

are made to work upon evolving patterns that fallows certain rules through exercises of tessellations.

Sub Topics:

1. Mathematics of architectural aesthetics.
2. Using mathematic as tool for designing.
3. Analyzing the mathematical concept related to architecture.

Sessional Work: Assignments, Plates, Workshops

References :

- The Divine Proportion: a Study in Mathematical Beauty,by H. E. Huntley
- The Golden Ratio and Fibonacci Numbers, R. A. Dunlap
- Geometry of Design, Kimberly Elam
- Fibonacci and Lucas Numbers and the Golden Section, Steven Vajda
- A mathematical history of the golden number, Roger Herz-Fischler
- The Golden Ratio: The Facts and the Myths, Francis D. Hauser

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Presentation Skills

Key Words: Presentation ,Communication, Presentation Techniques, public speaking, Group Discussions.

Objectives: The main objective of this course is to develop the skill of students by Introducing fundamental techniques of Visual representation and to equip them with basic principles of representation which will enhance the quality of graphical language for architecture. This subject will also improve the skill of delivering and engaging crowd.

- To improve on convincing skills of students.
- To enhance the Visualization Skills of students.
- To Improve Advertisement Skills.
- Introduction to public speaking.
- Visual Aids in public speaking.
- The psychology of audience.

Sub Topics:

1. Introduction to Presentation skills and public speaking(methods, use & application, delivering presentation).
2. Presentation Techniques.(Manual skills and digital presentation techniques)
3. Mediums of Presentation (Verbal, Illustrative, Digital,3Dimensional).
4. Software.

Sessional Work:
Assignments , Workshops ,Focused Group Discussions, Plates

References :

- Adrian, D. and Christopher J. (2000). Language in Use,
- Dinsmore, G. A. (1968). Analytical Graphics,
- Edward, J. F. and Lee, J. (2000).

Sketching and Rendering

Key Words: Visual thinking , representation, Geometric Drawings, Rendering techniques.

Objectives:
- Students to equip with fundamental techniques of sketching and rendering.
- To develop a medium for thinking and explorations.

Sub Topics:
1. Learning Sketching, Drawing
2. visual thinking, Design principles and representation techniques.
3. Understanding the complexity of forms.
4. Geometric Drawings and Projections.

Sessional Work:
Assignments , Workshops, Plates

References :

- Robert Gill, Rendering with pen and Ink,
- Thomas & Hudson Publishers, 1993

Public Speaking

Key Words: Speaker, Audience, topic, Skills.

Objectives:
- To develop the skills to address crowd.
- Visual aids in public speaking.
- The psychology of audience.

Sub Topics:
1. Introduction to public speaking
2. Visual aids in public speaking.
3. The psychology of audience.

Sessional Work:
Workshops, Focused Group Discussions.

Institutional Project 1

Institutional project aims at encouraging institutions to explore different areas.

Institution would have freedom to explore into multidisciplinary activities which would explore into other creative disciplines and inter-disciplinary activities.

This would help student of architecture to have insight into different spectrums of people, place, culture, society, technology etc.

Institution has entire freedom to detail out the assignments to be conducted under this elective.

Second Semester B.Arch.

2S-A-1

Architectural Design II

Objectives: The objective is to develop understanding of various concepts of design evolution, understand human interface with various furniture, objects, leading to design of simple built spaces.

1. Principles of Design:

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

2. Furniture & Facilitation:

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

3. Climate & Design:

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

Sessional Work:
Assignments on each unit with presentation, lecture and site visits.
Design of simple familiar activity spaces like residence, school, canteen etc.
Small modules of short design projects based on above mentioned topics.

References:

- Ching Francis D. K., Form Space and Order.
- Peter Streens, Patterns in Nature.
- John R. Mather -Climatology: Fundamentals and Application.

2S-A-2

Allied Design Studio II

Objectives: 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: To understand the visual & aesthetic qualities of design and relating these to Architectural Design situations.

Unit I: Brief historical review of development of Design and its interdependency.

Unit II: Introduction to basic elements of design. Study of shapes and its composition, study of volumes, effects of colour and texture on composition.

Unit III: Analysis of simple objects of daily use, in terms of material, interface, graphics, colour, texture, functionality etc.

Sessional Work – Plates, Sketches and models to understand basic principles Design and Analysis of Product.

2S-A-3

Building Construction and Materials II

Objectives:

1. To understand the basic building elements, their function and behavior under various conditions with specific reference to timber construction.
2. To help students to develop a clear understanding of basic principles of construction and materials suitable for load bearing construction & Concept of span.

Unit I: TIMBER Seasoning, its necessity and various methods, (Market survey to learn various types available, their sizing and costing and application in construction of building elements and furniture).

Types of timber joinery - principles and design considerations, their application in construction of various elements, items of building construction and in design of furniture.

Unit II: A) Wooden Doors - Design criteria and principles. types and Standard Terminologies. Design and detailed drawing work for Single leaf fully paneled doors, Single leaf partly paneled partly glazed doors, Double leaf fully paneled doors; with important joinery details.

B) Wooden Windows - Design criteria and principles. Types and Standard Terminologies. Design and detailed drawing work for Fully Glazed windows with mullion(s) and with Transom. Sash Windows, Centrally pivoted window, Top Hung Window, Louvered Window, with adequate number of important joinery details

Study of various fixtures, fittings, fastenings for doors and windows.

Unit III: Concept of Span and its application in providing / making openings in Masonry walls. Lintels its definition, purpose, basic Terminology, load considerations. Lintel Types such as stones, bricks, wood, steel, R.C.C., Rein. brick with their design criteria and considerations.

Arches: Definition, purpose / function. Standard Terminologies. Load considerations. .Comprehensive study of classification and types of arches. Centering for arches.

Unit IV: Foundation, Basic design considerations. Simple foundations for load bearing walls in stone and brick masonry. Timbering to trenches for various types of soil.

References:

- 'Building Construction' by Mackay W. B., Vol. 1 – 4
- 'Building Construction' by Barry, Vol. 1 – 5
- 'Construction Technology' by Chudley, Vol. 1 – 6
- 'Building construction Illustrated' by Ching Francis D. K.
- 'Elementary Building Construction' by Michell

2S-A-4

Architectural Graphics II

Objectives:

To enable the students to understand and express Composite three-Dimensional objects and buildings formed by additive and interpenetrated solids using various graphical projection systems including sections.

To enable the students to understand the technique of graphical documentation of a built structure / environment through measured drawing/s.

Unit I: Solid Geometry

Understanding and drawing of composite and complex three dimensional objects formed by additions and/or interpenetration of various objects in various planes.

Orthographic projections of true shapes of sectional planes.

Linking of complex three dimensional forms to complex building forms / Building elements through Sectional Planes and Interpenetration of objects.

Unit II: Surface Development of Solids

Surface Development of various simple and complex three dimensional objects.

Unit III: Measured Drawing (Sessional Work)

Measured drawing (Plan/Section/s&Elevation/s), drawn to appropriate scale, of a simple two storied building including a stairway and toilet. Inclusion of basic Area statement to be done.

Sessional work: Plates, sketches, models & tests.

References

- Ching Francis D.K.: Architectural Graphics.
- Kelsey W. E.: Geometrical & Building Drawing.
- H. Joseph and Morris: Practical plane and solid geometry.

Structural Design & Systems II

Objectives: To make students familiar with the basic theorems and mechanical properties of engineering materials, elastic constants, different types of stresses and strains. It also delivers the basic principles of structural mechanics & how Bending moments and Shear force diagrams are used to analyze simple structural behavior.

Unit I : Overview of the Structural System in Architecture.
Study of Types of Slabs (One way& Two way, Grid Slab),
Study of suspension structure,
With suitable examples from historical and contemporary architecture.

Unit II: Mechanical properties of building materials
Simple stresses and strains : Concept and application – Definition and study of stresses & strains, Hooke's law. Principle of superimposition.

Unit III: **Thermal stresses and strains**
Concept and application. (For simple sections only)

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

Unit V: **BM and SF Diagrams**
Simply supported & Cantilever beams (Subjected to Point load & UDL)

Sessional work: Sketches/ Notes/ Tutorials & Presentations

Desirable: Site visits to develop better understanding of above.
To prepare relevant study models on above,
Laboratory exposure wherever possible.

References :

- Ramamrutham, S. : Narayanan, R.(2008). Strength Of Material . New Delhi: Dhanpat Rai Publications Ltd.
- Rajput, R.K.(2012). Strength Of Material (Mechanics And Solids) S.I. Units. New Delhi: S. Chand And Co Ltd.
- Khurmi, R. S.(2006). A Textbook of Strength of Material (SI Units). New Delhi: S.Chand And Co Ltd
- Bansal, R. K.(2011). A Textbook of Strength of Materials (SI Units). New Delhi: Laxmi Publications (P) .
- Shah, H.J. ;Junnarkar, S.B.(2016). Mechanics of Structures Vol. I (Strength of Materials).:Charotar Publishing House Pvt. Ltd.

History of Architecture I

Objectives: To develop the appropriate skills of interpreting the increasing complex structure in a society based on the socio-political, cultural factors and the resultant settlement pattern and architecture.

To analyze and synthesize architecture of an era based on climate and available building materials construction techniques, climate etc. and spatial configurations derived from it.

UNIT I: Early Greek Architecture- Minoan and Mycenaean, The impact of the context, culture and society on art and architecture during Hellenic and Hellenistic period- Greek Temples, Orders, and public spaces.

UNIT II: Roman Architectural style. The impact of the context, culture and society on art, architecture and construction techniques developed during Roman period.

Forum, Temples, Basillicas, Comitiums, Curia, Arches, Thermae, stadia, circus.

UNIT III: Byzantine and Early Christian Architecture: Fall of Rome. The impact of the context, culture and society on art, architecture and construction techniques developed during this period.

UNIT IV: Gothic, Romanesque and Renaissance: The impact of the context, culture and society on art, architecture during Gothic, Romanesque and Renaissance period through comparative study.

UNIT V: Industrial Revolution The Social, economic and political changes effected, new requirements of the society, new materials and technological developments.

School of thoughts – works of Louis Sullivan, Early Industrial buildings, Contributions of Bauhaus, De Stijl movement, Italian Futurism, Art Noueavau movement and Arts and Crafts Movement to Modern Architecture.

Eg: Wain Wright Building, St Louis, Guaranty Building, Buffalo, Crystal Palace, London. Bauhaus school at Dessau, Schroder house by Rietveld, Casa Mila, Casa Batlo, Sagrada Familia, Tassel House, Brussels, Paris Metro Station entrance, Red house, Kent.

Exercises: Design of exercises to understand, analyze, interpret, synthesize the study of historical structures to develop understanding of architecture

Test: One at midterm and one at end of term to be conducted at institute level.

The questions asked in such tests should promote the above mentioned 5 heads of critical thinking and discourage only factual reproduction.

The questions should be framed with least emphasis on factual reproduction.

References

- History of Architecture by Sir Bannister Fletcher.
- History of Architecture by Spiro Kostof.

2S-A-7

Computer Application II

Unit I: Sketch up or equivalent software – Basics of sketch up or equivalent software to strengthen the visualization of third dimension and vice versa. Commands for basic solids, 3d composition and interpenetration of solids. Commands for creating various building elements

Unit II: Sketch up or equivalent software – Advanced commands of sketch up for massing, 3d models of buildings, topography, shadow formation study etc.

2S-A-8

Workshop II

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, deco-paints, 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, projected 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, concept, translation of concept, detailing, workmanship and expression.

Sessional Work: Model Making of identified architectural projects.

Elective II

Art in Architecture/ Graphic Designing/ Fundamentals of Painting/ Fundamentals of Sculpture/ Architectural Photography/ Institutional Project 2

Note: Following are the suggestive contents; institutes have freedom to formulate the content as per their school of thought

Art in Architecture

Key Words: Visual perception, Art and Design, space, Theories, Architecture.

Objectives:
- Broad overview of Art and Design.
- Enabling students to understand visual awareness.
- Understanding of Design as a Multidimensional creative Art.

Sub Topics:
1. Art and Design- A historical perspective.
2. Expression of Art and Design.
3. Relations in Art, Design and Architecture.
4. Introduction to theories.

Sessional Work:

Plates, Assignments , workshops.

References :

- Cantanese, A. J. and Snyder,
- J. C. (1988). Introduction to Architecture. Ching, F. D. K.,
- Jarzombek, Heidegger,
- M. (1993). The origin of the work of Art-Basic writings. Vitruvius,
- Translation: Morris, H. M. (1960)

Graphic Designing

Key Words: Graphics, visual communication, composition

Objectives: To enhance the graphic design abilities among the students.

Sub Topics:
1. Introduction to history of Graphic Design
2. Visual perception theory
3. Principle of Compositions – Colour Theory – Type Design and Typography (Layouts / Format / Calligraphy).
4. Environmental Graphics (Signage / Logo / enhancing the built environment).

5. Lateral thinking for exploration of designing Ideas.

Sessional Work: Assignments, Plates, Workshop

References:

- Webb, Frank, “The Artist guide to Composition”, David & Charles, U.K., 1994**.**
- Ching Francis, “Drawing a Creative Process”, Van Nostrand Reinhold, New York, 1990.
- Alan Swann, “Graphic Design School”, Harper Collins, 1991.

Fundamentals of Painting

Key Words: Visual arts , expression, creativity

Objectives:

- Develop the technical skills and the ability to organize the visual elements necessary to communicate concepts and experiences across various media.
- To translate concepts into visual composition.

Sub Topics:

1. Introduction to basic elements of painting.
2. Various use of colors.
3. Exploring different ways of paintings on different medium.
4. Exploring colors, light, transparency and composition.

Sessional Work: Assignments, Workshop, Plates

References :

- Painting Fundamentals: Fine Art Lesson by V. Hadady
- Fundamentals of Drawing and Painting by Richard Taylor

Fundamentals of Sculpture

Key Words: visual arts , expression, creativity

Objectives: To Develop the Visual skills by examining a sculpture's formal and sensory qualities (i.e. line, color, form, texture, etc.) and analyzing how the elements (i.e. scale, balance, rhythm, proportion, etc.) are organized.

Sub Topics:

1. History of Art
2. Aesthetics
3. Drawing from full life
4. Modelling from Life (Study of Human Head in Clay)
5. Sculptural Design (Modeling & Carving)

Sessional Work: Assignments, Studios, Workshop

References:
- Imagination and the Imaginary Hardcover, Kathleen Lennon.
- Dynamics of Architectural Form.
- Experiencing Architecture 2e, Rasmussen.

Architectural Photography

Key Words: Color, lighting, visual angle, frames

Objectives: Develop the skills of visual Composition, People & nature, Lighting & color and Understand the mechanics of imaging.

Sub Topics:
1. Introduction to photography
2. Photographic techniques.
3. Post processing photo.

Sessional Work: Assignments, Studios, Workshop

References :

- Fundamentals of Photography: The Essential Handbook for Both Digital and Film Cameras.
- Architectural Photography: Composition, Capture, and Digital Image Processing, Adrian Schulz.
- Balthazar Korab: Architect of Photography, John Comazz.
- Architectural Photography the Digital Way, Gerry Kopelow.

Institutional Project 2

Institutional project aims at encouraging institutions to explore different areas.

Institution would have freedom to explore into multidisciplinary activities which would explore into other creative discipline and multidisciplinary activities.

This would help student of architecture to have insight into different spectrums of people, place, culture, society, technology etc.

Institution has entire freedom to detail out the assignments to be conducted under this elective.

Third Semester B.Arch.

3S-A-1

Architectural Design III

This semester shall continue with further complexity in aesthetic qualities with increased emphasis on context and functionality.

Objectives:

- The focus at this stage will be on detailing of various architectural elements in the context of functions, construction techniques, characteristics of material and its implications on architectural form.
- Introduction to organizational, spatial strategies, circulation within and around the built form.
- Conceptual and Contextual exploration with respect to climate, culture, etc.

Sessional Work: Built and un-built spaces for multiple activities.

References:

- C.M. Deasy -Design for Human Affairs.
- Anthony Sealey, Introduction to Climatology.

3S-A-2

Allied Design Studio III

The course content will be developed by the individual colleges as per their choice of allied design scheme.

3S-A-3

Building Construction and Materials III

Objectives: To strengthen student's knowledge about reinforced cement concrete and its applications in buildings. To equip students about the methods of designing various structural members using reinforced cement concrete.

Unit I: Introduction to building materials:
Mild Steel and Reinforcement Bar, Stainless Steel, Aluminum, Copper, Titanium, w.r.t to composition, general know-how with respect to physical, chemical and structural properties their utilities and criteria for selection.

Unit II: Concept of vertical connector- Stairs, Design principles / considerations, proportions. Types on basis of Geometry, material and structural systems used. Stairs in Timber, Mild Steel and Stone. Railing types for stairs etc.

Unit III: Concept of spanning and its application in formation of Floors. Traditional Methods of Flooring such as Timber Floors, Jack Arch Floors, Composite Floors.

Unit IV: Principles of Framed Structures - Reinforced Cement Concrete, Complete Drawing work with typical details of R.C.C. Footings, Columns, Lintels, Chajjas, Beams, Canopies, Slabs, Cantilever Beams and Slabs, Fins etc.

Unit V: Study of form work, shuttering, for above components of R.C.C.

References

- Murthy, V. N. S. Soil Mechanics & Foundation Engineering. Sai Kripa Technical Consultants.
- Punmia, B. C. (2005). Soil Mechanics and Foundation Engineering. Delhi: Laxmi publications.
- Punmia, B. C. (2006). R C C Designs. Delhi: Laxmi Publications.
- Punmia, B. C. (2007). Limit State Design of Reinforced Concrete. Delhi: Laxmi Publications
- Barry, R. (1999). The Construction of Buildings Vol.II. 5th Ed. New Delhi: East-West Press.
- McKay, W. B. (2005). Building Construction Metric Vol.1–IV, 4th Ed. Mumbai: Orient Longman.

3S-A-4

Architectural Graphics III

Objectives: To enable the students to communicate an architectural idea / proposal in a legible and effective manner through perspective projections, use of shades and shadows, and various architectural presentation and rendering techniques.

Perspective:

Unit I: Introduction to picture planes, standpoint, eye level etc. Types of perspective views such as one point, two point, three point, worm’s eye view, Bird's eye view, normal view, etc.

Unit II: Methods of drawing perspective views such as conventional method, measuring point method, shortcut and approximation in perspective drawing, problems based on simple architectural built forms in different materials rendered with appropriate colours.

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

Unit IV: Perspective of interior of buildings suitably rendered.

Sciography:

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

Unit VI: Digital 3d modeling to understand light and its rays acting as a projector to cast shadow on simple building forms; also shadow cast partly on horizontal and vertical planes.

References:

- Holmes John M. : Applied Perspective.
- Themes and Hudson: Perspective for Architects.
- Shankar Mulik: Perspective and Sciography.

3S-A-5

Structural Design & Systems III

Objectives: The course would enable students to understand various principles of strength of materials like various kinds of simple, shear & bending stresses in beams & arches. It gives a fair understanding of behavior of different types of arches in architecture.

Unit I: Overview of the Structural System in Architecture.
To Study the behavior of fixed, two hinged & three hinged arches.
Stability of Structural elements of Dam structure & Retaining wall,
The concept of Flinched beam.
With suitable examples from historical and contemporary architecture.

Unit II:
a) Shear Stresses:
Concept and application of Shear stresses and its distribution in Rectangular, Circular, Triangular, I, L & T section
(Numerical on I& T section only)

b) Bending stresses: Circular bending:
Concept and application.

Unit III: **Direct and bending stresses:**
Concept and application.

Unit IV: Column and Struts:
Euler's and Rankine's theory – concept and application.

Unit V: Analysis of Three hinged Circular Arches
Determination of Normal thrust , horizontal thrust, radial shear force & Bending moment .

Sessional work: Sketches/ Notes/ Tutorials &Presentations

Desirable: Site visits to develop better understanding
To prepare relevant study models,
Laboratory exposure wherever possible.

References:

- Bansal, R. K.(2011). A Textbook Of Strength Of Materials Si Units. New Delhi: Laxmi Publications (P) Ltd.
- Rajput, R.K.(2012). Strength Of Material (Mechanics And Solids) S.I. Units. New Delhi: S.Chand And Co Ltd
- Subramanian, R. (2010). Strength Of Materials. New Delhi: Oxford University Press.
- Reddy, K. Vijaya Kumar; Kumar J. Suresh.(2011). Singers Engineering Mechanics Statics And Dynamics (SI Units). Hydrabad: B.S Publications.
- Ramamrutham , S. : Narayanan, R.(2008). Engineering Mechanics. New Delhi:Dhanpat Rai Publications Ltd
- Shah, H.J. ;Junnarkar, S.B.(2012). Mechanics of Structures. Anand: Charotar Publishing House Pvt. Ltd.
- Khurmi, R. S.(2006). A Textbook of Strength of Material (SI Units). New Delhi: S.Chand And Co Ltd.

3S-A-6

History of Architecture II

Objectives: To provide an understanding of religious typologies in India based on individual philosophies, material and construction techniques.

Interpretation of Spatial Configurations, form or art and the proportioning systems derived from religious symbolism in each belief system.

Unit I: Buddhist Architecture: Rise of Buddhism and role of Emperor Ashok, Spread of Buddhism to South East Asia. Buddhist building typologies, Chaiyas, Viharas, Stupas, Stambha etc. Influence of Silk road on transmission of Buddhism and Architectural language and it's transformation.

Unit II: Jain Architecture: Understanding Importance of material and construction technique in Jain temple architecture.

Unit III: North Indian temple architecture: Classification of North Indian Temples. Examples from Orrisa, Khajuraho, Gujarat and Rajasthan.

Unit IV: Hemadpanthi **Temples Architecture of Central India**. Amruteshwar Temple, Ratangad, Tulja Bhawani Temple, Tuljapur, Trimbakeshwar Temple, Nashik, Bhuleshwar temple, Pune , Bhimashankar Temple, Pune.

Unit V: South Indian temple architecture: Classification of South Indian Temples under various dynasties; Pallava, Chalukyan, Chola, Chera, Vijaynagar and Pandya

Unit VI: Indo-Islamic Architecture during Qutub, Khilji, Tughlaq, Sayyid, and Lodi sultanates.

Exercises: Design of exercises to understand, analyze, interpret, synthesize the historical studies to develop understanding of architecture

The course should culminate in a term paper, documentation or design interpretation and transformation.

References:

- Brown, P. (2010). Indian Architecture: Buddhist and Hindu period. Mumbai: D. B. Taraporevala Sons and Co.
- Fletcher, B. (1996). A History of Architecture on the Comparative Method. 20th Ed. London: B.T. Batsford Ltd.
- Grover, S. (2003). Buddhist and Hindu Architecture in India. 2nd Ed. New Delhi: CBS Publishers.

3S-A-7

Computer Application III

Objectives: To learn drafting skills and design testing methods with the help of computer software

Unit I: Auto CAD and equivalent software –drafting commands on Auto CAD, Appropriate graphical representation with the software as per requirements of architectural drawings.

Unit II: Introduction to simulation and simulation software as a tool to test the response of designed building in given situation. Introduction to Simulation softwares used for building services, climate, acoustics and illumination, construction, structures etc.

3S-A-8

Climatology

Objectives: Understanding fundamentals of climatology and its relation to human thermal comfort, and buildings.

Unit I: Introduction to climatology, climate and weather, importance of climatology in architecture, global climatic factors.

Unit II: Elements of climate such as temperature, wind, humidity, precipitation, solar radiation and various instruments, graphical representations to record climatic data.

Unit III: Scales of climate, global climatic zones, micro-climate.

Unit IV: Climate analysis tools, Mahoney tables ET/CET nomograms, bio-climatic charts, temperature isopleths, horizon and celestial coordinate system, solar geometry, shading device calculations, heliodon solaroscope.

Unit V: Thermal comfort factors, thermal comfort indices, heat exchange process of buildings, building heat gain calculations.

Unit VI: Natural ventilation in and around the building, ventilation systems.

Sessional works: Sketches, tutorials, use of climatology lab instruments, tests and experimentations

References:

- Climate responsive architecture, *Arvind Krishnam.*
- Manual of tropical housing and building, *O H Koenigsbereger.*
- Solar data book*, Roorkee.*

Elective III

Scale and Proportion/ Anthropometrics and Ergonomics/ Rural Architecture/ Traditional Arts and Crafts/ Biomimicry/ Institutional Project 3

Note: Following are the suggestive contents; institutes have freedom to formulate the content as per their school of thought

Scale and Proportion

Key Words: Harmonious relation, Ability to perceive, order, Hierarchy,

Objectives: To improve on certain qualities like Judgment, visual understanding, perfection, proportioning system, Compositional Skill.

Sub Topics:

1. Elements of Design Scale and proportion.
2. Understanding dimensional relationship.
3. Proportioning system.
4. Scale.
5. Importance of different scale(Visual scale, Hierarchical scale, Distorted scale).
6. Vitruvius Theory.

Sessional Work: Assignment, Studios

References :

- Nikos A Salingaros, (2010) twelve lectures on Architecture.
- Building Structures Illustrated: Patterns, Systems, and Design 2nd Edition, Francis D. K. Ching.

Anthropometrics and Ergonomics

Key Words: Comfort, Human needs, factor, socially sensible output

Objectives: To understand the Statics and measurement of Human body, user experience, properties of human capabilities, System performance.

Sub Topics:

1. Introduction to human functions.
2. Ergonomics and design.
3. Disability, Ageing and Inclusive design.
4. Environmental Ergonomics.
5. Health effects of environmental stresses.

Sessional Work: Assignment, Hands-on practices, Model making

References :

1. Chaira, J. D. and Callender, J. H. (1987). Time Savers Standards for Building Types. Singapore: McGraw-Hill.
2. Crosbie, M. J. and Watson, D. (2005). Time Savers Standards for Architectural Design: Technical data for Professional Practice. 8th Ed. The McGraw-Hill Company.

Rural Architecture

Key Words: Indigenous material, Social Structure, Technology Adaption, Social Network, Kinship, Culture, Tradition, Climate, Craftsmanship, Gender, Occupation, Rituals and beliefs, Religion and festival.

Objectives:

- To develop Construction Techniques and planning strategies.
- Understanding of Informal and functional spaces design.
- To understand Climatic responsive design and the use of natural resources.

Sub Topics:

1. Social Structure.
2. Daily life and recreation.
3. Built Spaces- Understanding material and construction techniques.
4. Custom and rituals.
5. Art and artifacts.

Sessional Work: Workshop, Site visit, Assignment, Documentation

References :

1. Edward, S. and Maisel, J. (2004). Universal Design. New York: Taylor & Francis.
2. Preiser, W. (2001). Towards universal design evaluation. New York: McGraw-Hill.
3. Seidle, J. (1996). Barrier-free design. 1st Ed. New York: Routledge.
4. Story, M. F., Mueller, J. L. and Mace, R. L. (1998). The universal design file: Designing for people of all ages and abilities. North Carolina : North Carolina State University Press.
5. Jain, K. and Jain, M. (1992). Mud Architecture of the Indian Desert. Ahmadabad: Aadi Centre.
6. Muthiah, S., Meyappan, M., Ramswamy, V. and Muthuraman, V. (2000). The Chettiar Heritage. Chennai: Chettiar Heritage.

Traditional Arts and Crafts

Key Words: Diversifying culture, heritage, Rituals and beliefs, Religion and festival, Language and custom, food habits, Dressing, History(Early civilisation) or mythology, Heritage

Objectives:

- To develop Techniques and material explorations.
- To generation of creativity, Properties and behavior of material.
- Elements of particular art and craft form.

Sub Topics:

1. History of Traditional Arts in India.
2. History of Craft in India.
3. Various Forms of Art and craft based on region.
4. Methods and processes involved in Different forms of Art and craft.
5. Study of material and instruments requires for particular craft and Art Scope and Limitation.

Sessional Work: Workshop, Site visit, Assignment, Documentation

References :

- The Rich Heritage of Jammu And Kashmir Studies In Art, Architecture, History And Culture of the Region, Somnath Wakhlu Foreword By Karan Singh.
- Handmade in India: Crafts of India, Ranjan Aditi.

Biomimicry

Key Words: Nature, Adaptation, Relationship, Efficiency

Objectives:

- To develop understanding of bio mimicry in Architecture.
- TO develop understanding that simulate and co-opt processes occurs in nature.
- To understand the way biological systems solves the problem.

Sub Topics:
1. Introduction to Biomimicry.
2. The levels of mimicking in nature.
3. What is biomimetic design.
4. Examples of Biomimetics.

Sessional Work: Assignments, Model making

References :
- Biomimicry in Architecture by Michael Pawlyn.
- Biomimicry as a Metaphor for Perfect Integration in Sustainability by Asha Nilani Liyanage.
- Architecture Follows Nature-Biomimetic Principles for Innovative Design (Biomimetics) by Ilaria Mazzoleni.

Institutional Project 3

Institutional project aims at encouraging institutions to explore different areas.

Institution would have freedom to explore into multidisciplinary activities which would explore into other creative discipline and multidisciplinary activities.

This would help student of architecture to have insight into different spectrums of people, place, culture, society, technology etc.

Institution has entire freedom to detail out the assignments to be conducted under this elective.

Fourth Semester B.Arch.

4S-A-1

Architectural Design IV

This semester shall explore community, tradition, theoretical constructs, building systems and its implications on architectural design.

Objectives:

- Exploring the relationship between various building systems and design.
- Studying and understanding integration of building systems with architectural concepts and form.
- Understanding of a community setup, its people, and their spatial requirements.
- Exploring various theories and design process development in architectural design.

Sessional Work: Built and un-built spaces for multiple activities for a large group of people/community.

4S-A-2

Allied Design Studio IV

The course content will be developed by the individual colleges as per their choice of allied design scheme.

4S-A-3

Building Construction and Materials IV

Objectives: To impart knowledge on various types of floors and flooring material, partitions and paneling, various surface finishes. To equip students with advances in building construction methods and its applications.

Unit I: Introduction to Building Materials : -

Roof and Floor Tiles, Plaster, Finishes & all Plastic w.r.t composition, general know-how about their physical, chemical and structural properties, their utility and selection criteria

Unit II: Windows in Steel and Aluminum. Steel doors; design criteria and principles. Standard Terminologies and types.

Special doors such as Sliding, Sliding and Folding, Revolving Doors, Rolling Shutter, Collapsible Gates - Design Criteria and principles. Standard Terminologies.

Unit III: Paneled and Glazed Partitions out of Timber and Aluminum - Types, design principles and considerations, Standard Terminologies. Design details and drawing work, fixing details to surrounding elements / components.

Unit IV: Timber Roofs - Timber Trusses, Standard Terminologies, Types - Design Criteria, principles, construction details. Design details and drawing work of King Post and Queen Post Truss. General and Conceptual drawing work of other types of timber roofs.

Steel Roof - Trusses. types, design principles and considerations, Standard Terminology - Design details and drawing work of M.S. angle and Tubular Trusses.

North Light Truss system. Conceptual and drawing work of types of Steel Trusses.

General study of M.S. Frame and its various joints.

Unit V: Expansion Joints; types, design considerations, location consideration, principles and types.

References:

- Barry, R. (1999). The Construction of Buildings Vol.II. 5th Ed. New Delhi: East-West Press.
- Bindra, S. P. and Arora, S. P. (2000). Building Construction: Planning Techniques and Methods of Construction, 19th Ed. New Delhi: Dhanpat Rai Pub.
- McKay, W. B. (2005). Building Construction Metric Vol.1–IV, 4th Ed. Mumbai : Orient Longman.
- Rangwala, S. (2004). Building Construction. 22nd Ed. Anand: Charotar Pub. House.
- Rangwala, S. C. (1963). Building Construction: Materials and types of Construction, 3rd Ed. New York: John Wiley and Sons.

4S-A-4

Surveying and Documentation

Objectives: To enable the students to get conversant with locating the object positions in horizontal and vertical plane with desired accuracy as needed for architecture professionals.

To help the students understand the technique of graphical documentation of a built structure /environment through measured drawings

Surveying

Unit I: Introduction to surveying and leveling, types of surveying methods and application, Introduction to Chain Survey.

Unit II: Plane table survey, method and instruments used.

Unit III: Leveling, methods of leveling -dumpy level and its uses.

Unit IV: Contours, use of theodolite, contour survey.

Unit V: Planimeter and its use.

Unit VI: Total Station Survey
Practical**:**
a) Total Station Survey.
b) Plane table survey of cluster of buildings.
c) Leveling using dumpy level and water table.
d) Setting out site layout.
e) Contour survey, plotting contour maps.

Documentation
Unit VII: Measured Drawing: Measurement techniques of Heritage Structures and preparing measured drawing to suitable scale.

Sessional works: Practical record book, Sketches, notes and plates.

References

- Arror, K.R. (2004). Surveying Vol. 1-3. Delhi : Standard Book House.
- Chandra, A. M. (2002). Plane Surveying. New Delhi : New Age International.
- Ching Francis D.K.: Architectural Graphics.

4S-A-5

Structural Design & Systems IV

Objectives: To foster the understanding of basic principle of limit state design in RCC structural systems.

To develop the understanding of characteristics of soil on structural behavior.

Unit I: Overview of the Structural System in Architecture.

Study of different types of soils their characteristics, bearing capacities, Settlement of foundation. Study of structural elements like beams, columns & footings.
Theory of Determinate and indeterminate structures – degree of indeterminacy.

Unit II: **Deflection of beams**
Simply supported and cantilever beams by using Macaulay's method.

Unit III: Concept of fixity
Independent fixed beams with different loadings - BM and SF diagrams.
(By using First Principle method).

Unit IV: Method of Moment distribution (BM diagrams only)
a) For continuous beams (Up to three spans only, without settlement)

b) For Single portal frames (Without sway moments)

Unit V: Basic Principle of RCC

a) Different Limit states, partial safety factors, permissible stresses Introduction to RCC design, characteristics of RCC, assumptions, Neutral axis; balanced, under & over reinforced sections

b) Design of singly reinforced beams , doubly reinforced beams & Moment of resistance of T beam

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Sessional work: Sketches/ Notes/ Tutorials & Presentations

Desirable: Site visits to develop better understanding.
To prepare relevant study models.
Laboratory exposure wherever possible.

References :

- Punmia B.C.(2005) Soil Mechanics and Foundations Laxmi Publications, Hyderabad.
- Khurmi, R.S.(2010). Theory Of Structures SI Units. New Delhi: S. Chand And Co Ltd.
- Ramamrutham , S. : Narayanan, R.(2018). Theory of Structure. New Delhi: Dhanpat Rai Publications Ltd
- Dr. V. L Shah & Dr. S. R. Karve. (2014) Limit State Theory & Design of Reinforced concrete, Structures publications Pune.
- Punmia, B.C. (2015). R C C Designs. Delhi: Laxmi Publications.

4S-A-6

History of Architecture III

Objectives: To provide an understanding of the implications of the Mughal and Colonial rules in India and its Architecture.

Unit I: Mughal architecture in India, Forts and Cities during Mughal dynasty.

Unit II: Architectural contribution of Akbar, and Shahjahan.

Unit III: Provincial Architecture in India: Bengal, Malva, Mandu, Bijapur, Punjab, Kashmir, Gujarat.

Unit IV: Colonial and Post Independence Indian Architecture: Colonial architecture of Goa, Pondicherry and Bengal. Lutyens Delhi. City planning of Chandigarh.

Unit V: Indian Master Architects, their philosophies and works.

Exercises:

1. Understanding 2. Analysis, 3. Interpretation, 4. Synthesis, and 5. Transform of historical structures, in the form of small exercise and assignments.

The course should culminate in a term paper, documentation or design interpretation and transformation.

References

- Mehrotra, R. (2011). Architecture in India Since 1990. Pictor.
- Benevolo, L. (1977). History of Modern Architecture. 2 Vols., reprint, MIT Press.
- Jenks, C. (2007). The Story of Post-Modernism. London: Wiley and Sons.
- Grover, S. (2002). Islamic Architecture in India. New Delhi: CBS Publications.

4S-A-7

Building Services I

Objectives: 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 shall also be made familiar with I.S. codes related to services. This part of the building services deals with various systems and components of water supply and its drainage. This also focuses upon the Architectural design consideration regarding space allocation and design of building elements to anchor the services so as to achieve balance of functional efficiency and building aesthetics.

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.

Unit II: Layouts of water supply systems and their types, Connection from municipal supply to a building, design-construction of suction & storage tanks for a single tenement residence or bungalow by computing demands for domestic use. Study of Down take supply, water supply pipes, and their sizes, jointing, fixing and laying. Various valves, fittings and fixtures like taps, showers etc. Domestic water heaters and hot water supply system. Design of various spaces and building elements to anchor the services such as shafts, ducts etc.

Unit III: Principles of sanitation, water carriage systems, collection of waste matter in buildings. Study of Various sanitary fittings and fixtures like water closets, urinals, wash hand basins, sinks, flushing cisterns, shower trays, bath tubs, bidets, drinking water fountains etc with respect to building types and users. Design of various building elements to anchor the services such as walls, Floor and their features etc.

Unit IV: Various traps and their function, sewage collection and disposal system for a single tenement residence or bungalow. Various types of sanitary pipes and their jointing, fixing and laying, manholes, inspection chambers, intercepting chambers. Design of various spaces and building elements to anchor the services such as shafts, ducts, immediate surroundings of building etc.

Unit V: Self cleansing velocity, invert levels, drains on sloping sites, sewage disposal system in un-sewered localities- Complete study of septic tank - introduction, design principle, criteria, its working, utility and benefits. Its various types with respect to materials, capacity, design and construction. A Brief study of cesspools, aqua-privy, Soak Pit, leeching pits for individual building.

References

- Birdie, B. S. (1996). Water supply and Sanitary Engineering. Dhanpat Rai and Sons.
- Punmia, B. C., Jain, A. K. and Jain, A. K. (1995). Water Supply Engineering. New Delhi : Laxmi Publications.
- Punmia, B. C., Jain, A. K. and Jain, A.K. (1998). Waste Water Engineering. New Delhi : Laxmi Publications.
- Rangwala, S. C. (2005). Water Supply and Sanitary Engineering. Charoter Publishing.

4S-A-8

Climate and Architecture

Objectives: This part of subject provides scope to apply the knowledge of basic climatology gained in earlier semester, for design in different climatic conditions with emphasis on tropical climate.

Unit I: Study of effect of orientation, topography, vegetation, form, building materials and surfaces n the building design in response to the climate.

Unit II: Classification of tropical climate, its characteristics, shelters in six climatic regions in India.

Unit III: Study of passive techniques for heating and cooling, techniques of solar radiation control and heat transfer and insulation.

Unit IV: Environmental issues in urban areas, Urban climate change, concept of urban heat island, climatic elements and urban microclimate, site climate in urban areas.

Unit V: Climate responsive design approach, process and design detailing.

Sessional Work: Case studies, creative exercises with climatic considerations Use of simulation software.

References:

- Climate responsive architecture, *Arvind Krishnam*
- Manual of tropical housing and building, *O H Koenigsbereger* & Ingersol.
- Urban Microclimate, Evyatar Erell,
- Design with climate, Víctor Olgyay, Aladar Olgyay.
- John R. Mather -Climatology: Fundamentals and Application.

- Climatologically & Solar data for India – T. N. Seshadry.
- Tropical Architecture – Maxwell Fry & Jane Drew.

Elective IV

Regional Architecture/ Furniture Design/ Design of Building Elements/ Building Bye Laws and DCR/ Theory of Design/ Institutional Project 4

Note: Following are the suggestive contents; institutes have freedom to formulate the content as per their school of thought

Regional Architecture

Key Words: Region, architectural style, context, customs

Objectives:
- Developing understanding of context, regional techniques.
- To develop students cultural and custom understanding for particular region.

Sub Topics:
1. Regionalism in architecture
2. context and customs of making buildings in different regions of world.
3. Analyzing the Regional character.

Sessional Work: Assignments, Site visit

References:
- "Design with Climate" bioclimatic Approach to Architectural Regionalism by Victor Olgyay.

Furniture Design

Key Words : Creation, Evolution of object, Human scale, Ergonomics and Anthropometrics.

Objectives:
- To develop the skills by giving opportunity to work with the material and process technology.
- To develop Critical and analytical ability.

Sub Topics:
1. Introduction to furniture design.
2. Aspects of furniture design.

3. Structures and system to human scale.
4. Intricate user centric design.

Sessional Work:
Workshops ,Assignments

References :

- Baiche Bousmaha & Walliam Nicholas, Neufert Architect's Data. Blackwell science Ltd.
- Chiara De Joseph & crosbie. J. Michael. 1990. Time saver standards for building types. McGraw Hill company.

Design of Building Elements

Key Words : Building elements , meanings

Objectives: To develop an understanding of design elements and principles relative to their use in the architectural design process

Sub Topics:
1. Architectural Design Elements.
2. The Concept of Space.
3. Architectural Design Principles.
4. Additional Design Considerations.

Sessional Work: Assignments, Model making, Visits

References :

- Design Through Discovery, The Nature Of Design,
- The City Shaped: Urban Patterns and Meanings through History,
- Vitruvius – Ten Books on Architecture

Building Bye Laws and DCR

Key Words: Regulations , rules , mandatory

Objectives: To develop understanding of rules and regulations .

Sub Topics:
1. Introduction to building bye.
2. Rules and Regulation.
3. Zoning rules and regulations.
4. DCR.

Sessional Work: Assignments, Site visits

Theory of Design

Key Words: Architectural expressions, Social Discipline, Ideology, impact of Isms, revolution, Evolution, Variability of perception.

Objectives:

- To develop understanding of Design principles, Development of design vocabulary, generation of creativity, System integration.
- To give understanding of design as a broader field and the changing role of designer in society.
- To give exposure to methodologies, theories and models of the design process.
- To give deeper understanding of the process of creativity as well as to introduce techniques which will enable creative thinking.
- To help understand creativity with respect to the discipline of architecture.
- To introduce participatory approach to design.

Sub Topics :

1. The genesis of Indigenous Architecture.
2. Architecture as a socially useful discipline.
3. Design Methodology.
4. Design evaluation and criticism.

Sessional Work:

Assignment

References:

- Francis D. K. Ching, Architecture - Form, Space and Order, Van Nostrand Reinhold Company ,1979
- Roger H. Clark, Michael Pause, Precedents In Architecture, Van Nostrand Reinhold Company , 1996
- 1. K.W.Smithies, Principles of Design in Architecture, Van Nostrand Reinhold Company , 1981
- 4. Sam F. Miller, Design Process - A Primer For Architectural & Interior Design, Van Nostrand Reinhold Company , 1995
- Ernest Burden, Elements of Architectural Design – A Visual Resource, Van Nostrand Reinhold 3 company, 1994
- V.S.Pramar, Design Fundamentals in Architecture, Somaiya Publications, New Delhi, 1973.

Institutional Project 4

Institutional project aims at encouraging institutions to explore different areas.

Institution would have freedom to explore into multidisciplinary activities which would explore into other creative discipline and multidisciplinary activities.

This would help student of architecture to have insight into different spectrums of people, place, culture, society, technology etc.

Institution has entire freedom to detail out the assignments to be conducted under this elective.

Fifth Semester B.Arch.

5S-A-1

Architectural Design V

Objectives: The focus will be on exploration and application of various structural systems, building byelaws and building with multiple users.

The design process to deal with following aspects:

- Building byelaws and site surrounding.
- Structural system and exploration in material.
- Services in multistoried buildings

Sessional Work: Design of multiple dwelling units, apartment blocks, hostels or other multistoried buildings.

5S-A-2

Allied Design Studio V

The course content will be developed by the individual colleges as per their choice of allied design scheme.

5S-A-3

Building Construction and Materials V

Objectives: To familiarize the students with the design principles and considerations of advanced RCC structures.

Need for building repair and maintenance, cause and effect of building deterioration and defects, and material, methods and techniques of maintenance, repair and restoration are covered in the course.

Unit I: Advance RCC foundation, Types such as Strip Foundation, combined footings, Eccentric Footing. Foundation system for floating column on cantilever beam. Types of Raft foundations.

General study of Steel Grillage foundation, Machine Foundation, Cellular Foundation, Cassion Foundations.

Design Principles and Considerations for Pile Foundation, its types. Piles in Timber, Steel and R.C.C. both precast and *Cast-in-situ*, Under rimmed piles, pile caps.

Unit II: Design Principles and considerations of Advanced R.C.C. Structures - such as Grid / Coffered Slabs - Various types - Study of reinforcement detailing i) at crossing of beams ii) Grid beams with peripheral beams and columns.

Flat slabs, Flat-plate slabs - all types. Lift slab method of construction.

Unit III: Study of various defects in building - causes and remedies / precautions. Brief study about various Non-Destructive Tests - Concepts, purposes, such as Rebound Test, Penetration Test and Pull out Techniques, Surface Hardness Test.

Study of Building Structure Rehabilitation. Principles / Concepts, Causes / reasons. Various methods such as Grouting, Guniting, Jacketing - construction principles, techniques.

Unit IV: Study of Construction Chemicals / Admixtures, Need, purpose, types. A General study - with emphasis on commonly used chemicals / admixtures, repair solutions.

Water proofing aspect of building for different elements, avoiding dampness.

Unit V: Additions and Alteration in Existing Building. Introduction, Purpose / necessity - Design and Structural principles, techniques of modifications / alternations, precautions, essential studies, data and information required, its collection and analysis. Design, detailing and construction drawings providing solutions for various building elements.

Shoring, underpinning and scaffolding for building work.

References:

- Guha, P. K. (2011). Maintenance and Repairs of Buildings. New Delhi: New Central Book Agency.
- Chandler, I. (1992). Repair and Renovation of Modern Buildings. McGraw-Hill.
- Nayak, B. S. (2013). A Manual of Maintenance Engineering. New Delhi: Khanna Publishers.
- Mitchel “Advanced building construction.”
- V S Foster “advanced building construction.”

5S-A-4

Working Drawing I

Objectives:

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)

Unit V: Business graphics, multimedia presentations of the above work.

Sessional Work: Plates on above topics.

References:

- National Building Code (NBC).
- Latest Local Building Bye-Laws.
- Osamu, A. W., Linde, R. M. and Bakhoum, N. R. (2011). The professional practice of architectural working drawings. 4th Ed. Hoboken: John Wiley & Sons.

5S-A-5

Structural Design & Systems V

Objectives: In continuation of previous semester this course focuses on limit state method for the design of various types of slab, column and footing. Also it delivers the knowledge of basic requirements of earthquake resistant structures.

Unit I: Overview of the Structural System in Architecture.
Study of roof covering like flat slab, vaults and domes, folded plates, Shell roofs & Stair cases,
With suitable examples from historical and contemporary architecture
Study of IS 875 Part I, Part II and Part III and Study of IS 456 -2000.

Unit-II: Basic Concepts and design of different types of slab
Design of one way & two way slabs.
Conceptual study of continuous slab & cantilevered slab showing the reinforcement details.

Unit III: Design of RCC section in compression (Column)
Short column, Limitations of long columns and column subjected to uniaxial bending (by using Interaction curve chart)

Unit IV: Design of Isolated Footing.
Design of RCC Isolated Rectangular & square footing.

Unit V: Basic requirement of Earthquake resistant structures.
Study related to Plan irregularity & Vertical irregularity (Study of IS 1893Part I -2016)

Sessional work: Sketches/ Notes/ Tutorials & Presentations

Desirable: Site visits to develop better understanding regarding the reinforcement details and casting of various structural elements.
To prepare relevant study models on above.
Laboratory exposure wherever possible.

References:

- Bhavikatti, S. S. (2008). Design of RCC Structural Elements. Newade International Publishers.
- Punmia, B. C. (2007). Limit State Design of Reinforced Concrete. Delhi: Laxmi Publications.
- Ramamrutham , S. (2004).Limit State Design of Concrete structures New Delhi: Tata McGraw Hill Education
- Ramachandra, S. (2004). Limit State Design of Concrete Structures. Scientific publishers.
- Varghese, P.C. (2011). Limit state Design of Reinforced Concrete. PHI Learning.
- Design Aid SP 16.
- I S 456-2000.
- I S 1893 Part I -2016.
- I S 875-1987 (Part I, Part II, Part III)

5S-A-6

Contemporary Architecture

Objectives: To provide an understanding and appreciation of Contemporary trends in Indian and Western Architecture in terms of Ideas and directions through the works of outstanding architects.

Post-Independence Architecture in India:

- Le Corbusier in Chandigarh and Ahmedabad
- Louis Kahn's contributions
- Ideas and works of B V Doshi
- Ideologies of Charles Correa
- Raj Rewal, Achyut Kanvinde, Uttam Jain

Works of Contemporary Architects: Architects and their ideologies and philosophies towards architecture –

- Sanjay Mohe,
- Sanjay Puri,
- Brinda Somaya, Anupama Kundoo, Chitra Vishwanathan
- Manit Rastogi, Jaisim, B.S.Bhooshan etc.

Critical Regionalism: Philosophy and works of

- Laurie Baker,
- Hassan Fathy,

- Geoffrey Bawa
- Nari Gandhi

Architectural response to regional climate, culture, local materials, crafts and technology.

Non Indian

- Ideas and works of Richard Meier
- Mie Van der Rohe
- Peter Eisenmen
- Charles Moore
- Frank Gehry
- Zaha Hadid
- Rem Koolhas
- Santiago Calatrava
- Shigeu Ban
- I.M.Pei
- Moshe Safdie
- Ean Nouvel
- Bernard Tschumi
- Norman Foster
- Daniel Leibskind
- Kazuyo Sejima
- Renzo Piano
- Tadao Ando

References:

- Kenneth Framption : Modem Architecture -A Critical History
- Monographs of Modem Architects
- Henri Sterlin: Encyclopedias of World Architecture
- Singh, M. and Mukherjee, R. New Delhi- Making of a Capital. New Delhi: Roli Books
- Mehrotra, R. (2011). Architecture in India Since 1990. Pictor.
- Lang, J., Desai, M. and Desai, M. (2000). Architecture and independence: The search for identity – India 1880 to 1980. New Delhi : Oxford University Press

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5S-A-7

Building Services II

Objectives: This part of the building services deals with various systems and components of complex Sewage collection and its Disposal, hot water supply in high- rise buildings, Electrical services, refuse disposal systems and methods of storm water handling. The students shall be made aware of Architectural design consideration regarding space allocation and design of building elements to anchor these services so as to achieve balance of functional efficiency and building aesthetics.

Unit I: Sewage collection and disposal for large campuses, complexes, and high-rise buildings etc, STP system- comprehensive study of conventional sewage treatment plant, understanding, its principles, systems of treatment, sequence, possible space requirements, location criteria, application, merits and de-merits.

Unit II: Hot water supply in high-rise buildings, solar water heaters and their systematic layouts, various methods/ systems of hot water supply, their thermal

insulation and schematic pipe line network in a building. (for domestic application- small residence and for high rise buildings)

Unit III: Brief introduction to Electricity generation and distribution from Plant to Substation. Various wiring systems, electric fittings and appliances, Electrical Control and safety devices such as Switches, Fuse, Circuit breakers, Earthing- conventional and modern techniques, lightning conductor, etc. Calculation and distribution of loads. Detailed layout of electrical services in a single tenement residence or bungalow. Design of various building elements and their locations to anchor the services such as walls, Floor and their features, ceiling, Shafts or ducts etc.

Unit IV: Storm Water- Introduction, necessity, utility, importance, collection, Drainage- Principles, various methods/ systems, planning and application.

Unit V: Refuse disposal- Sources, types, collection, storage and transport, provisions for refuse disposal individual building level, refuse chutes- introduction, principle, design, construction and locational aspects. Function, utility and application, its limitation, merits and demerits.

References

- Abnwos, F. and Others. Electrical Engineering Hand Book
- Bureau of Indian Standards. (2005). Code of Practice for Electrical Wiring Installations IS-732.
- Punmia, B. C., Jain, A. K. and Jain, A.K. (1998). Waste Water Engineering. New Delhi : Laxmi Publications.
- Birdie, B. S. (1996). Water supply and Sanitary Engineering. Dhanpat Rai and Sons.

5S-A-8

Vernacular Architecture

Objectives: Efforts and activities related to promotion of Sustainable Architecture are underway, and this can be reinforced with the knowledge of Vernacular Architecture. The objective is to instill sensitivity towards the less explored field that is concerned with Architectural building traditions/practices that are local, ecologically sensible and culturally relevant. The course introduces grass root principles of indigenous architecture that has evolved over time in response to environment, climate, culture, economy and basic human needs. The course covers variations in built forms and their environmental performance across different climatic and geographical regions of India.

Unit I: Introduction to Vernacular Architecture: Definitions and theories, Categories, Contextual responsiveness with respect to Climatic, Geographical, Anthropological and Cultural influences.

Unit II: Environment and Materials: Local building materials, Skill set, Built form & elements, Construction techniques & environmental performance.

Unit III: Regional Variations in Built Form: Tribal Architecture: Settlement Pattern, Dwelling Typology, Symbolism, Typical features, Construction materials and techniques in North of Maharashtra – Korku tribe, South-East of Maharashtra- Gond tribe, South - West of Maharashtra – Kolam tribe.

Unit IV: Regional Variations in Built Form: Traditional Architecture: Settlement Pattern, Dwelling Typology, Symbolism, Typical features, Construction materials and techniques in Leh Laddakh, Kutchha, Coastal Telangana, Western Ghats and North East region.

Unit V: Living style, beliefs, festivals and Spaces: Space- Activity relationship; living style and beliefs reflected on space usage and design with respect to Central Indian rural agrarian society; Indian Festivals and built habitat.

References:

- Brunskill, R. W. (1987). *Illustrated Handbook of Vernacular Architecture*. Castle Rock: Faber &Faber.
- Carmen, K. (1986). *VISTARA – The Architecture of India.* The Festival of India Publications.
- Cooper%_ __and Dawson%__. (1998). *Traditional buildings of India*. London : Thames & Hudson.
- Jain, K. and Jain, M. (1992). *Mud Architecture of the Indian Desert.* Ahmadabad: Aadi Centre.
- Kenneth, F. (1983). *Towards a Critical Regionalism: Six points for an architecture of resistance*, In *The Anti-Aesthetic: Essays on Postmodern Culture*. (Ed.) Hal, F. Seattle : Bay Press.
- Muthiah, S., Meyappan, M., Ramswamy, V. and Muthuraman, V. (2000). *The Chettiar Heritage*. Chennai: Chettiar Heritage.
- Oliver, P. (1997). *Encyclopedia of Vernacular Architecture of the World*. Cambridge: Cambridge University Press.
- Pramar, V. S. (1989). *Haveli-Wooden Houses and Mansions of Gujarat*, Ahmadabad: Mapin Publishing.
- Rapoport, A. (1969). *House, Form & Culture*. Eaglewood : Prentice Hall Inc.
- Tillotsum, G. H. R. (1989). *The tradition of Indian Architecture: Continuity, Controversy and Change since 1850.* Delhi : Oxford University Press.

5S-A-9

Elective V

Pattern Language/ Product Design/ Advanced Spatial Analysis/ Behavioural Architectural/ Rhapsodic Architecture/ Vastu Shastra/ Institutional Project 5

Note: Following are the suggestive contents; institutes have freedom to formulate the content as per their school of thought

Pattern Language

Objectives: Aim of this subject is to introduce students to the pattern language and its use to take decisions for different levels of design.

- What is design pattern and reasons to use it.
- Advantages of pattern over design guidelines.
- Vocabulary, syntax and grammar of pattern language.
- Common and optional elements of pattern library.
- Study of selected patterns from reference book and other examples.

Note:

- The concerned teacher may prepare a detailed syllabus based on above key points while referring to books given or any additional, references.
- Use of teaching methods to make subject interesting and absorbing is expected.
- Knowledge application shall be the part of sessional work.

Reference books

1. The timeless way of Building by Christopher Alexander.
2. A pattern language by Christopher Alexander and Sara Ishikqwa.
3. The Oregan Experiment by Christopher Alexander and Sara Ishikqwa..
4. Pattern Theory : Introduction and perspectives on the Tracks of Chiristopher Alexander.

Product Design

Key Words: Historical background, form semantics, bio mimicry, purpose function, systems, human factors, need, recyclability.

Objectives:

- To provide Knowledge about the various styles of furniture manufactured in various materials is vital to an architect.
- Understanding the methods and techniques involved in furniture and product design.
- To develop the skill of material explorations.
- To understand man machine system and human performance and system reliability.
- To Understand applied anthropometrics and ergonomics,
- To understand the multiutility oriented approach.

Sub Topics :

1. Introduction to product design.
2. Human Factors.
3. Aspects of product design
4. Design exercises.

Sessional Work:
Project, Assignment, Site visit

References:

- De Chiara and Callender - Time Savers Standards for Building Types
- De Chiara and Callender - Time Savers Standards for Architectural data
- Time Saver Standards for Interior Design
- Andrew Alpern, Handbook of specialty Elements in Architecture, SMcGrawhill Co., USA, 1982
- Francis D. K. Ching, Interior Design Illustrated, VNR Publications, New York, 1987.
- An invitation to Design, Helen Marie Evans

Advanced Spatial Analysis

Key Words: Complexity, Functionality, Geography, Space, Location, Built Environment, Spatial Analysis, Measurement, Transformation, Tolerance, Buffer, Density Estimation.

Objectives:

- To develop the skill of Modelling & Mapping.
- To study Visualisation, Compilation, Sequences.
- To understand the Methods of examine.
- To study Application of convolution in GIS.

Sub Topics :

1. Introduction.
2. Analysis based on location.
3. Analysis based on distance.
4. Qualitative and quantitative research methodology.
5. Conclusion.

Sessional Work:
Site visit, Assignment, workshop

References:

- Advanced spatial analysis: the CASA book of GIS, P. Longley, M Batty - 2003
- Advanced spatial statistics: special topics in the exploration of quantitative spatial data series DA Griffith –2012.

Behavioural Architectural

Objectives: The aim of this elective is to understand the significance of knowledge of human behaviour while designing the built environments for various activities.

Approach to the issue of mutual relationship between people and the physical environment from the perspective of an inter disciplinary discourse, environmental psychology.

- What is Environmental Psychology.
- Describing the mutual relationship between people and the environment.
- Components of Architecture which affects Human Psychology.
- Study and analysis of examples of behaviour facilitation.

Note:
1. The concerned teacher may prepare a detailed syllabus based on above key points while referring to books given or any additional, references.
2. Use of teaching methods to make subject interesting and absorbing is expected.
3. Knowledge application shall be the part of sessional work.

Reference Books:

1. Environmental psychology: Behaviour and experience in context by Carsidy T. 1997 Psychology Press, Hove, East Sussex.
2. Designing places for people: A handbook on human behaviour for architects, designers, and facility managers by Deasy M.L.
3. Environmental psychology: Principles and practice, by Gifford R. 2002, Optimal Books Publishers. Canada 2002.
4. Creating architectural theory: The role of the behavioral sciences in environmental design by Lang. J. - Van Nostrand Reinhold. New York.
5. Psychology of Architectural Design (Architecture & Design Science) by Akin. O

Rhapsodic Architecture

Vastu Shastra

Key Words: Ancient Hindu System, Science of architecture.

Objectives: To develop understanding of rules and regulations .

Sub Topics:
1. Importance of vastu shatra in Architecture.
2. Terminologies in vastu shatra.
3. Principles in vastu shatra.
4. Examples in Architecture based on Vastu Shatra.

Sessional Work: Assignments, Site visits, Plates

References:

- Indian Vastu Shastra: Science of Construction & Architecture of Building by Vaibhav Chawadre.
- The Miracles of Vaastu Shastra Paperback – 2013 by Shanku Shiva Dass.
- Golden Rules Of Vastu Shastra - Remedies And Solutions – 2004 by Suman Pandit.

Institutional Project 5

Institutional project aims at encouraging institutions to explore different areas.

Institution would have freedom to explore into multidisciplinary activities which would explore into other creative discipline and multidisciplinary activities.

This would help student of architecture to have insight into different spectrums of people, place, culture, society, technology etc.

Institution has entire freedom to detail out the assignments to be conducted under this elective.

Sixth Semester B.Arch.

6S-A-1

Architectural Design VI

Objectives: The focus will be on site planning, contour negotiation and campus planning.

The design process to deal with following aspects
1. Site planning, road geometry, parking lots etc.
2. Design guidelines for sloping site and Contour management.
3. Modules, super-modules, clusters and their relationship.
4. Various horizontal connecting elements.

Sessional Works: Design of schools, resorts, educational campuses and recreational spaces etc.

6S-A-2

Allied Design Studio VI

The course content will be developed by the individual colleges as per their choice of allied design scheme.

6S-A-3

Building Construction and Materials VI

Objectives: To familiarize the students with the advanced building technologies.

Unit I: Space Structures, Introduction, Definition, design and structural principles. Types of Space Structures, in different materials. Skeleton / Grid Structures - definition, design and structural principles. Various types / category / verities - Single layer / Double layer - Constructional and design aspects about Flat Grids, Spatial Grids, Single and Double Curvature skeletons. Advantages, Disadvantages.

Unit II: Prestessing- Introduction to Prestressed Concrete. Need /Reasons and Principles of Prestressing. Different methods and systems of Prestressing such as Pre tensioning, Post tensioning, Chemical and Thermal. Their application Various types / methods of Post Tensioning such as Freyssinet, Magnel Blaton, Gifford-Udal, Lee-McCall, CCL etc. Examples, advantages, disadvantages.

Unit III: Precast Cement Concrete Construction / System: - Introduction, definition. Need / Reason for this system. A complete study (from foundation to roof) of various systems such as Fully Precast and Composite and various types / subsystems under them - their design and structural principles, constructional and joinery techniques/concepts and details with examples. Precautions, advantages, disadvantage over cast-in-situ construction.

Unit IV: Temporary Structures - Utility / Purpose - various functions. Introduction, design and structural principles, Materials, Construction and Joinery Techniques. Design, constructional aspects and detailing. Design and constructional drawing and details for problems on Small temporary Structures, by employing commonly used building materials.

References:

- Hayder, A. R. (2014). Strengthening Design of Reinforced Concrete with FRP. CRC Press.
- Bureau of Indian Standards. (1993). Code of practice for ductile detailing of RC structures subjected to Seismic forces. IS:13920.

6S-A-4

Working Drawing II

Objectives: To strengthen the students' knowledge about preparing detailed working drawings for various building elements.

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: Centerline 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.

References:

- National Building Code (NBC)
- Osamu, A. W., Linde, R. M. and Bakhoum, N. R. (2011). The professional practice of architectural working drawings. 4th Ed. Hoboken : John Wiley & Sons.

Structural Design & Systems VI

Objectives: The course intends to develop understanding about the structural behavior of various types of steel structural systems, that are commonly employed in construction industries.

It also exposes the students to the methods that are used to design the steel structural system for specific condition and loadings.

Unit I: Overview of the Structural System in Architecture.
Study of concept & configuration in steel structure like geodesic dome, space frame, tensile structure and other Innovative structural forms.
With suitable examples from historical and contemporary architecture.

Unit II : Study of IS 800- 1984 – Design Considerations.
(Without Limit state method)

Steel Connections – Welded Joints
1. Types of Welds.
2. Concentric Sections.
3. Eccentric Sections.
4. Sections in Bending.
5. Sections in Torsion.

Unit III: Design of Tension Members
(Using standard sections)

Unit IV: Design of Compression members
(Using standard sections)

Unit V : Design of Built in Columns
(Excluding Design of Battens and Lacings)

Sessional work: Sketches/ Notes/ Tutorials & Presentations

Desirable: Site visits to develop better understanding of above.
To prepare relevant study models on above,
Laboratory exposure wherever possible.

References:

- Ramachandra .S Design of steel structures Vol. I, Standard publication, New Delhi, 1992.
- Vazirani V.N, and Ratwani M. M, Steel structures, Khanna Publications, New Delhi, 1995.
- Duggal S.K. (2017) Design of Steel Structures, Mcgraw Hill Education.

- L. S. Negi (2017) Design of Steel Structures, Mcgraw Hill Education.
- Steel Tables by Ramamrutham , S. New Delhi: Dhanpat Rai Publications Ltd.
- IS 800- 1984.

6S-A-6

Theory of Architecture

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

Unit VI: Organization of Forms and Spaces

a) Spacial relationships: i) Space within space; ii) Interlocking Space; iii) Adjacent Space; iv) Space linked by common space.\
b) Spacial organization – influencing factors and their types: i) Centralised; ii) Liner; iii) Radial; iv) Clustered; v) Grid.
c) Articulation of Forms and Space types: i) Edges and Corners. Ii) Surface.

Unit VII: 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 VIII: Principles of Composition.

Unit IX: 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 organization functional spaces and activities.

Sessional Work: Case studies, notes, plates and presentations.

Building Services III

Objectives: This part of the building services deals with various systems and components of complex Electrical services, ventilation systems, Air Conditioning systems and brief study of Centralized Domestic Gas Piping system for large scale projects. The students shall be made aware of Architectural design consideration regarding space allocation and design of building elements to anchor these services so as to achieve balance of functional efficiency and building aesthetics. This shall also help student to establish a sound communication in terms of design with a wide range of consultants, fabricators, wanders and contractors.

Unit I: Electrical Systems, supply and distribution for group housing projects, urban complexes, high-rise building etc. brief load calculations and distribution systems for areas mentioned above.

Unit II: Importance, functions and design considerations for installation of bus bar. Details of bus bar chamber. locational aspects of Step up and step down transformers, electrical substation, stand by generators, automatic relays, invertors, etc.

Unit III: Natural and mechanical ventilation, Need of mechanical ventilation, Types of fans and Blowers for industrial ventilation. Effects of installation of fan in ventilation such as Exhaust and Plenum effect etc.

Unit IV: Principles of Psychometrics and heat transfer, Study of Air conditioning systems and their applicability as per Regional, Functional and Equipment variation.

Components of A.C. systems such as Chilling plants, Cooling towers, Air Handling units, V.R.V / V.R.F. and Air distribution systems, ducts and ducting layouts, etc. Calculation of A.C. loads, space requirement, integration of A.C. system at design stage, Water demand for A.C. in brief.

Unit V: A brief study of Centralized Domestic Gas Piping system, Introduction-function, utility and its importance, Working principles and its application, merits and de-merits. Design of various building elements and their location criteria to anchor the services such as walls, Floor and their features, ceiling, Shafts or ducts, tranches, chambers etc.

References:

- Bovay, H. E. (1981). Handbook of Mechanical & Electrical systems for Buildings. McGraw-Hill Higher Education.
- Sawhney, G. S. (2006). Fundamentals of Mechanical Engineering: Thermodynamics, Mechanics and Strength of Materials. New Delhi: Prentice Hall of India.
- Abnwos, F. and Others. Electrical Engineering Hand Book.

6S-A-8

Landscape Architecture I

Objectives: To introduce students to the discipline of landscape architecture and its relevance to architecture. To understand the role and importance of landscaping and site planning in enhancing and improving the quality of building environs, functionally and aesthetically.

UNIT I: Introduction
Meanings / Definitions and concepts. Need and Scope, Experience of landscape. Relation with allied fields, Biosphere and Ecology.

UNIT II: Early Civilisations: Babylon, Persian, Mogul, Medieval Europe, Chinese and Japanese.

UNIT III: Western Civilisation, Post Industrial revolution, Park movement.

UNIT IV: Elements of designed landscape- Natural and Manmade elements. Different factors and components of a landscape. Social and economical factors. Psychological considerations of spaces and enclosures. Brief idea about manmade components like walls, fences, entrances, gates, barriers, screens, planters, roads & pathways, street furniture, signage, services-electrical, water supply and drainage.

UNIT V: Basic natural components - Land, Trees, Water and Climate. These elements should become invariable component throughout the study of history of Landscape.

Sessional work: Could be in the form of a write-up, abstracts in 2d /3d, Notes, seminars, etc..

References:

- Appleton. (1996). *The Experience of Landscape*. Wiley.
- Geoffrey, and Jellico, S. (1987). *The Landscape of Man*. Thames and Hudson.
- Holl, G. P. (2006). Questions of Perception Phenomenon logy of Architecture. Richmond : William Stout Publishers
- Laurie. (1986). *An Introduction to Landscape Architecture*. Elsevier.
- Reid, G. (2002). *Landscape Graphics*. New York : Watson-Guptill.
- Simonds, J. O. (2006). *Landscape Architecture: A Manual of Land Planning and Design*.

6S-A-9

Elective VI

Campus Planning/ Interior Design/ Architectural Appreciation/ Green Architecture/ Biophilic Architecture/ Institutional Project 6 Institutional Project 6

Note: Following are the suggestive contents; institutes have freedom to formulate the content as per their school of thought

Campus Planning

Key Words: Flexibility, Efficiency, Synergistic relationship, physical bridging, sustainability, Communication system, Microclimate, Pedestrian friendly, Context.

Objectives:

- To study Adaptable built environment
- To understand the Circulation system
- To study Architectural Element with reference to campus
- To understand Land use distribution and give proper Site guidelines.

Sub Topics :

1. Concept of campus.
2. Ways and theories of campus planning.
3. Consideration for context and planning.

Sessional Work:

Project, Assignment, Site visit

References:

- Campus Architecture: Building in the Groves of Academe, Richard P Dober.
- Educating by Design: Creating Campus Learning Environments That Work, C. Carney Strange and Dr James H. Bannin.
- Campus Landscape, Richard P Dober.
- University Planning and Architecture: The Search for Perfection, Isabelle Taylorand Jonathan Coulson, and Paul Roberts.

Interior Design

Key Words: Aesthetics, typologies and function, historical context, themes and concepts, psychological effects, human comfort, innovations and design ideas.

Objectives:

- To develop Creative ability and sense of usability of spaces.
- To enhance the skill of Furniture detailing, lighting calculation, fixtures study.
- To understand the influence of regional art and craft, Material study, service elements, incidental elements.
- To understand the relationship between space and elements, changing trends and lifestyle.

Sub Topics :

1. Introduction to interior design.
2. History of interior architecture design.
3. Elements of interior architecture- Enclosing elements.

4. Elements of interior architecture- Lighting accessories and interior landscaping.
5. Elements of interior architecture- Space planning and furniture design.

Sessional Work:
Project, Assignment, Site visit

References:

- Ching, F. D. K. (1987). Interior Design Illustrated. New York : V.N.R. Publications.
- Doshi, S. (Ed.) (1982). The Impulse to adorn - Studies in traditional Indian Architecture. Marg Publications.
- Kathryn, B. H. and Marcus, G. H. (1993). Landmarks of twentieth Century Design. Abbey Ville Press.
- Penero, J. and Zelnik, M. (1979). Human Dimension and Interior space: A Source Book of Design Reference Standards. New York : Whitney Library of Design.
- Slesin, S. and Ceiff, S. (1990). Indian Style. New York : Clarkson N. Potter.
- Dorothy, S-D., Kness, D. M., Logan, K. C. and Laura, S. (1983). Introduction to Interior Design. Michigan : Macmillan Publishing.

Architectural Appreciation

Key Words: Human creativity, connoisseur of creation, aesthetic sensibility, cultural context, Historical Background, evolution, Isms, Visual Awareness and perception.

Objectives:
To enhance the Development of vocabulary.
To help in generation of creativity.
To provide knowledge about Cultural understanding.

Sub Topics :
1. Concept of Architectural appreciation & criticism.
2. Parameters for Architectural appreciation & criticism in architecture.
3. Criticism & appreciation of architecture through examples based on Theories.

Sessional Work:
Studio, Lab, Workshop, Practical, Assignments.

References:

- Cantanese, A. J. and Snyder, J. C. (1988). Introduction to Architecture. New York : McGraw hill Books Co.
- Ching, F. D. K., Jarzombek, M. and Prakash, V. (2010). A Global History of Architecture. 2nd Ed.John Wiley & Sons.
- Fred, S. K. (2009). Art through the ages a Global History. 3rd Ed. Clark Baxter.

- Heidegger, M. (1993). The origin of the work of Art-Basic writings. Harper Collins.
- Heskett, J. (2002). Design-A very short introduction. Oxford University Press.
- Rapoport, A. (1969). House Form and Culture. New Jersey : Prentice Hall.
- Salingaros, N. (2009). A Theory of Architecture. Umbau-Verlag.
- Vitruvius, Translation: Morris, H. M. (1960). The Ten Books on Architecture.

Green Architecture

Key Words: Efficiency, Biomimicry, sustainable Habitat, Awareness, Natural resources conservation.

Objectives:
- To understand Eco friendly system.
- To Study the performance of building.
- To study Passive techniques renewable energy system.
- To study the adaptive reuse.
- To study the rainwater harvesting and grey water use.

Sub Topics:
1. Bioclimatic design concept.
2. Passive and active heating techniques.
3. passive and active cooling techniques.
4. Reduce, reuse and recycle concept.
5. Innovative green technologies and case studies.
6. International Rating System (IGBC, Teri, GRIHA, ECBC, IECC).

Sessional Work:
Assignments, Workshops, Studios

References:

- Arvind Krishnan & Others – Climate Responsive Architecture, Tata Mcgraw –Hill New Delhi 2001.
- Ralph M .Lebens – Passive Solar Architecture in Europe – 2, Architecture Press, London 1983. Sandra Mendler, William Odell.
- The Guide Book Of Sustainable Design, John Wiley & Sons, 2000.
- Lawson. B, Building Materials, Energy And The Environment; Towards Ecologically Sustainable Development Raia, Act, 1996.

Biophilic Architecture

Objectives: This elective is to understand the ways and means to connect occupant to the natural environment through the use of direct nature, indirect nature, and space and place conditions.

Introduction and role of Biophilic Design as relation between the human biological science and nature factors influencing biophilic design decisions.

Patterns of Biophilic Design under native in the space; Natural Anologies; and Nature of the space. Case study of patterns of biophilic design and analysis of biological responses.

Note:

1. The concerned teacher may prepare a detailed syllabus based on above key points while referring to books given or any additional, references.
2. Use of teaching methods to make subject interesting and absorbing is expected.
3. Knowledge application shall be the part of sessional work.

Reference Books:

1. The Experience of Nature
   A psychological Perspective
   Author - Terrapin Bright Green LLC.
2. Patterns of Biophilic Design
   Author - Terrapin Bright Green LLC.
3. Building for life.

- Designing and understanding the nature by design
- Human - Nature connection
  Author - Stephen R. Kellert

4. The theory science and Practice of Bringing.
   Buildings to life.
   Author - Stephen R. Kellert
   Martin L

Institutional Project 6

Institutional project aims at encouraging institutions to explore different areas.

Institution would have freedom to explore into multidisciplinary activities which would explore into other creative discipline and multidisciplinary activities.

This would help student of architecture to have insight into different spectrums of people, place, culture, society, technology etc.

Institution has entire freedom to detail out the assignments to be conducted under this elective.

Seventh Semester B.Arch.

7S-A-1

Architectural Design VII

Objectives: Study of this subject will emphasis on design projects of increasing structural and design complexity with full opportunity, coordination, collection and analysis of data. Emphasis will be on preparation of design program considering the technical knowledge & impact of socio-economic factors, preparation of drawings and detailing.

The studios can focus on:

1. Design orientation of advance and specialised buildings and environmental services, climate and acoustical system oriented buildings, appropriate structural buildings and construction techniques.
2. Orientation on development control rules like, density, zoning, FSI etc. redevelopment.

Sessional Work: It will include appropriate exercises on one or more of the above mentioned aspects followed by at least 2 design problems arranged in a sequence of complexity. Site visits, audio, visual presentation and library reference is emphasized.

1. Public Buildings: Theatre, museum, auditorium, recreation, complexes, stadium, etc.
2. High rise apartment, offices, hospitals, laboratories, campus etc.
3. Urban design level problems such as commercial complexes, group housing, area development etc.

7S-A-2

Allied Design Studio VII

The course content will be developed by the individual colleges as per their choice of allied design scheme.

7S-A-3

Appropriate Building Technology

Objectives: The objective of this course is to instill the knowledge of alternate thought process dealt with People, Place and Time. The various appropriate materials and techniques evolved in traditional and modern time having environmental and cost concern with its concept and design criteria. They evolved through situation analysis by traditions, individuals and agencies; will help serve society demanding more conscious efforts in conservation of energy.

Techniques to be taught on the following criteria:

1. Concept / Appropriateness behind the technique.
2. Design Criteria for the technique, Advantages, disadvantages.
3. Agencies / Individuals associated with the technique.
4. Potential area for application and
5. Compatibility with other techniques.

Unit I: Concept of Appropriate Technology and its relevance in present context. Methods and criteria for situation analysis leading to decision making for the choice of the technique.

Unit II: Soil as building material, Sampling Technique, Stabilization of Soil, Various Field and Lab test. Various techniques for foundation as Inverted Arch Foundation, Inverted Saucer Foundation along with marshy and flood prone areas.

Unit III: Walling techniques such as Cob wall, Wattle and Daub, Adobe wall, Rammed Earth wall, Wardha Block wall, Compressed Stabilized Earth block masonry, Pre-cast Stone Block wall, Skew brick masonry, Brick masonry using Joshi Bond, Swastik Bond. Water proofing techniques and methods for soil walls.

Unit IV: Brick floor, Terracotta tile floor, Roofing techniques such as Filler Slab roof, Nubian Vault, Ferro cement vaults, Guna tile vault, RCC Joist Brick panel roofing, etc.

Unit V: Bamboo as building material with elements like Columns, Trusses, Girders and other applications. Openings such as Frameless doors and windows, Jallies in Brick and Terracotta blocks, Boards and panels using agriculture waste, Bamboo Ply etc.

Unit VI: Services such as Bio-gas plant, Solar water heater, Solar PV panels and concept of net metering, Roof top rain water harvesting technique, Spill water recycling technique, Compost latrines, Kitchen platform for Indian cooking, Garbage recycling such as Vermi compost manure (4 pit).

References:

- CBRI, Roorkee Publications and Handbook.
- HUDCO Building Center manual and Publications.
- Publications of Center of Science for Villages such as ‘Building Dreams in Mud’.
- ‘Venu Bharti’ by Ar. Vinoo Kaley, Nagpur and Articles by Ar. Ashok Joshi, Nagpur.
- Publication of Auroville Building Center, Pondicherry.
- Publications and manual of Laurie Baker Center, N. Delhi.
- Handbook and Publication of Bamboo Mission of India.

7S-A-4

Working Drawing III (Interior Design & Detailing)

Objectives: To study the Interior Design principles and their applications in interiors and to foster creative ability and inculcate skills to understand and conceive architectural design.

Unit I: Working Drawing (Interior Design): In continuation of previous semester, students shall be required to produce detailed working drawing (Plans, Elevations and Furniture details) of all the major furnishing items proposed along with specification.

Unit II: Graphical Presentation: To produce business graphics, multimedia presentations of the previous semester project.

Sessional Work: Plates on above topics.

References:

- Joe, B. (Ed). (2002). Details in Architecture: Vol. I-V. Victoria : The Images Publishing group.
- "Human Dimensions and Interior Space" by Panero un Julious & Zclink Martin.
- Living Areas·- Internal Spaces by Shirish Vasat Bapat.
- Ching, F. D. K. (1987). Interior Design Illustrated. New York : V.N.R. Publications.

7S-A-5

Specification

Objectives: 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.

References:

- C.P.W.D. Standard Schedule of Rates.
- Birdie, G. S. (2005). Text Book of Estimating and Costing. Dhanpat Rai Publishing.
- Chakraborty, M. Estimating, Costing, Specification & Valuation.
- Dutta, B. N. (1998). Estimating and Costing in Civil Engineering. 24th Ed. UBS Publishers Distributors Ltd.

7S-A-6

Human Settlement Planning

Preface: This Subject Sets up the premise for domain which is beyond Architecture. Architecture which is confined to a boundary with single ownerships and single land parcels, The domain of Human settlement allows to look at the multiple Owners and Multiple Land parcels.

This domain of humanity which has strong connect with how cities / settlements have grown over times has strong reflections of Culture, History, social Values, Lifestyle and sense of community.

Architecture as integrated part of this Urban Fabric, has strong reflections of cities urban form, values and cultural ethos, which are manifested in built environment with strong sense of belongingness and association. Sensitizing Students to make them aware of broad principles of settlement in such period will help them know how cities have grown and taken shape over a period of time and what has been reflection into Architecture, being integrated part of the urban Domain .

The History of Architecture and theory's are deeply rooted into the settlement pattern of the urban fabric and hence the study of this subject shall focus on 2 major domains:

- **Evolution of Urbanity:** Understanding terminologies and key definitions with parameters. Connecting History with stages of Evolution of Settlement and learning's from the past which offered cities which were process driven, demand driven and evolved out of necessity. This Continues with contribution of Various

Masters and Pioneers in the field of Urban Planning and various tools of reading the city .

- **Urban Design Theories & Present Concept:** This reflects upon the contribution done by Masters and Pioneers in the field of urban design. Develops an understanding about the planning process and how the democratic setup allows people participation and government policies to generate the Urban form which address to the present day demand.

Objectives: The Study aims at Understanding terminologies and key definitions. Connecting History with stages of Evolution of Settlement and learning's from the past which offered cities which were process driven, demand driven and evolved out of necessity. This Continues with contribution of Various Masters and Pioneers in the field of Urban Planning and various tools of reading the city.

Unit I: Introduction to Urban Planning its scope and relevance. Establish Connect between Architecture and Human Settlements. Understanding key definitions of various components which constitutes a settlement. Understanding Culture, Society, Context and Aesthetics. Broad comparison between, Rural - Urban, Local - Global, Urban Planning - Urban Design .

Unit II: Evolution of Urbanity in India and World. **Social and Cultural influence on** designing and development of settlements from ancient times through Medieval, Renaissance and Industrial revolution to present day development.

Unit III: Urban planning in India. Understanding Settlement Planning principles of Vedic & Buddhist settlements. British Planning in India, Planning after independence. Factors governing the location and growth of towns.

Unit IV: Pioneers and their works, Planning concepts of Patric Geddes, Ebnezer Howard, Le-Corbusier, C. A. Parry, Clarence Stein, Doxiadis, Kevin Lynch, F.L. Wright.

Unit V: Planning as a team work, Role of Architects/ Planners in a team, Importance and methodologies of surveys in the planning process Development control rules, zoning, density, height, FSI Structures, Transfer of Development Rights (TDR), Special Economic Zones (SEZ), Transit oriented Development (ToD). Factors governing the location and growth of towns. Overview of Planning Legislation.

Sessional Works: Notes and Seminar of above topics.

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.

Building Services IV

Objectives: This part of the building services deals with various systems and components of Fire detection and Fighting system, provision of essential spaces and elements, Electromechanical means of vertical transportation in buildings, Communication systems etc., for large scale projects. The students shall be made aware of Architectural design consideration regarding space allocation and design of building elements to anchor these services so as to achieve balance of functional efficiency, user safety and building aesthetics. This shall also help student to establish a sound communication in terms of design with a wide range of consultants, fabricators, wanders and contractors.

Unit I: Causes of fire in buildings, types of fire, spread of fire, smoke and poisonous gases. Need of fire safety and preventive measures. Fire fighting regulations with reference to National Building code.

Provision in building such as Fire escape, stairways and escape routes. Study of Fire detection systems such as smoke detectors, heat detectors, fire alarms etc. Water demand for fire fighting, provision for storage tanks.

Fire extinguishing systems, Unit fire extinguishers, Chemical and foam extinguishers, Dry and Wet risers, fire hydrants etc.

Unit II: Electromechanical means of vertical transportation in buildings, requirements, occupant load, study of elevators and types based on operational system and uses. Various components of elevators based on operational system. Standard space requirements and architectural implications.

Unit III: Escalators, Trav-o-lators and Conveyor system, its components, arrangements and functioning, space requirements, construction details.

Unit III: Communication systems in buildings, Video conferencing, Security and Surveillance system, Computer networks. Trenches and conduits to accommodate the systems..

Introduction to Building Automation, Building Management systems, components of BAS, Architectural implications.

Unit IV: Systems of DTH, Introduction, Its classification with respect to Single and multi user. DTH layout and its Architectural implications.

Sessional Work: Layout of Design project including layout for water supply, sanitation, electrical, RWH, Fire Fighting systems, HVAC.

References:

- National Building Code (NBC), chapter 5
- Bovay, H. E. (1981). Handbook of Mechanical & Electrical systems for Buildings. McGraw-Hill Higher Education.

7S-A-8

Landscape Architecture II

Objectives: To make students aware about relationship and response of man to his environment. To develop critical thinking towards the field of landscape and understand its scope in practical.

Unit I: Site Planning And Development.

Site Location: The site must be placed within its proper geographical, political, and functional context. This fixes the site in relation to adjacent land uses, community transportation patterns, utility and infrastructure availability, employment, commercial, cultural and recreational centers.

Existing Conditions: Depending upon the size and complexity of the site, this may be one or a series of base plans or maps that delineates and evaluates the physical attributes and constraints for the parcel of land.

Topography and Slopes: Treatment of these factors requires base information in the form of contours and elevations to a degree of accuracy appropriate to the proposed development.

Geology and Soils: The soils characteristics which are frequently a direct product of the underlying geology. The soils may be important in terms of stability, suitability for structural foundations, erosion susceptibility, surface drainage, and soil fertility to support plant growth.

Vegetation: Detailed plant identification and location of specimen plants may require field study and measurement. The significance of vegetative information relates to a range of development issues. The visual character and spatial definition of a site is impacted by the amount and category of vegetation – from ground cover to canopy, from new growth to mature stands of trees, etc.

Hydrology and Drainage: Surface hydrology is an integral part of the slopes and subsurface drainage systems. The kinds of information normally indicated and analyzed include determination of watersheds (basically a system of ridge lines and valleys or drainage patterns), duration and volume of flow, swales, streams, standing water, and flood plain definition. Susceptibility to erosion and the problem of sedimentation to off-site water flow are also problems to be noted.

Views: A visual analysis is the most practical means of determining positive and negative on-site and off-site views. This study is useful in determining the visual character of the site itself as viewed from the outside as well as the visual impact of its surroundings upon potential on-site development. Factors to be examined include mass and space definition from natural and man-made elements, off-site views to be accentuated or screened, and on-site view opportunities or problems

Unit II: Landscape Design Project
Application and implementation of landscape elements into a design for a residential areas, urban spaces, campus design at institutional & industrial level, reclaimed lands, etc.

Unit III: Understanding and analyzing ***CONTEMPORARY LANDSCAPE DESIGN***. Elements of design, scopes and limitations of the same.

Unit IV: Introduction of ***SUSTAINABLE LANDSCAPE PRACTICES***.
Improve habitats for fauna and flora.
Improve recreational facilities.

Understanding the indigenous practices carried out in and around Indian context.

Sessional Work: Could be in the form of a write-up, abstracts, Sketches, Manifestation of Design into Architectural Drawing, etc.

References:

1. Lynch, K. (1962). *Site Planning*. Cambridge : The MIT Press.
2. Design with Nature, Ian Mcharg.
3. Campus Design in INDIA by *Achyut Kanvinde.*
4. Simonds, J. O. (2006). *Landscape Architecture: A Manual of Land Planning and Design*.

Elective VII

High Rise Buildings/ Architectural Conservation/ Housing/ Industrial Architecture/ High-tech Architecture/ Institutional Project 7

Note: Following are the suggestive contents; institutes have freedom to formulate the content as per their school of thought

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High Rise Buildings

Key Words: criteria, zoning, stacking, systems

Objectives: Ability to understand the process of designing in tall buildings.
Sub Topics :

1. Design philosophy, static and dynamic approach, Structural systems and concepts, Effect of openings. Large panel construction. Foundation superstructure interaction.
2. Gravity and lateral load resisting Structural Systems.
3. Behavior of various structural systems.
4. Basics of stability of tall buildings.

Sessional Work:
Project, Assignment, Site visit

References:

- Taranath B.S, “Structural Analysis and Design of Tall Buildings”? McGraw Hill, New York.
- Jain, V.K. , Designing and installation of services in building complexes and high rise buildings, Khanna Publishers, New Delhi.
- Gupta, Y.P., High rise structures ;design and constructions practices for middle level cities, NewAge International Publishers, New Delhi.
- Bryan Stafford Smith & Alexcoull, “Tall building structures Analysis and Design” John Wiley.
- HojjatAdeli and AmgadSaleh, “Control optimization and smart structures : high performance bridges and buildings of the future”, John Wiley, New York.
- HojjatAdeli and Xiaomo Jiang, “Intelligent infrastructure: neuralnetworks, wavelets and chaos.
  Theory for intelligent transportation systems and smart structures”, CRC Press, Boca Raton.
- Schwartz,Mel, Smart materials, CRC Press, Boca Raton.

Architectural Conservation

Key Words: Heritage, conserve, culture, survey

Objectives:
- To develop understanding about the importance of historical and heritage buildings.
- To provide Knowledge about the various techniques of conservation in architecture and the development of the commitment to conserve old buildings of cultural importance.

Sub Topics:
1. Introduction- Definition of conservation, Need for conservational activities, brief study in India and abroad, Role of architect in conservation program.
2. History- Origin and evolution of conservational programs, survey and studies required - methodology and implementation.
3. Community participation- Social, cultural, historical and economical values of Conservational projects, involvement of community. Conflict and compatibility between conservation and development - the need to strike a balance.
4. Case studies of conservation programs- Case studies of conservation programs which are successful by government and non-governmental agencies.

5. Rules and regulations - Rules and regulation, administrative aspects, new concepts in conservation.

Sessional Work:
Assignments, Studios.

References:
- Bernard Fielder (INTACH), Guide to Conservation.
- Conservation of European Towns.
- Peter Marston – The book of the Conservation – Orion House, London.

Housing

Key Words: Hierarchy, Economy, affordability

Objectives:
- To create awareness about the causes and consequences of housing problems and to impart knowledge about the possible solutions.
- Understanding of the various issues involved in urban and rural housing and knowledge about the planning and design solutions for low income groups.

Sub Topics :
1. Concept of Housing.
2. Housing types.
3. Patterns of housing.
4. Social and cultural and economical factors of housing.

Sessional Work:
Project, Assignment, Site visit.

References:
- Babur Mumtaz and Patweikly, Urban Housing Strategies, Pitman Publishing, London, 1976.
- GeofreyK.Payne, Low Income Housing in the Development World, John Wiley and Sons, Chichester, 1984.
- John F.C.Turner, Housing by people, Marison Boyars, London, 1976.
- Martin Evans, Housing, Climate and Ocmfort, Architectural Press, London, 1980.
- Forbes Davidson and Geoff Payne, Urban Projects Manual, Liverpool University Press, Liverpool, 1983.

Industrial Architecture

Key Words: Factory, occupancy, long span.

Objectives:
- Role of architects in the design of modern industrial buildings.
- A basic knowledge of industries in respect of type and category.
- Planning considerations in the development of master plan including site selection and site layout. Design for loading / unloading area.

Sub Topics :
1. Industrial estates.
2. Integrated aspects of design.
3. Steel structures and concrete structures.
4. Aspects of external environments.

Sessional Work:
Project, Assignment, Site visit

References:

- Adam J., Hausmann K., and Juttner F., A Design Manual – Industrial Buildings.
- Blum M. L., and Naylor J. C., Industrial Psychology, CBS, Delhi.
- Drury J., Factories – Planning, Design and Modernization.
- Hansen D., Indoor Air Quality Issues.
- Munce, J. F., Industrial Architecture – an Analysis of International Building Practice, F. W. Dodge Corporation, New York.
- Philips A., The Best in Industrial Architecture.
- Reid K., Industrial Buildings; The Architectural Record of a Decade; F. W. Dodge Corporation, New York.
- Sinha, R. K. and Heart, S., Cleaner Production – Greening of Industries for Sustainable Development.

High-tech Architecture

Key Words: Structural expression, Modernism, industrial appearance

Objectives:
- To understand and explore the new methods of construction.
- To understand the material explorations and techniques involved in high tech Architecture.

Sub Topics:
1. Evolution of high tech Architecture.
2. Characteristics of high tech architecture.
3. Examples of High tech Architecture.

Sessional Work: Assignments, Site visits, Plates

References :

- Detail in Contemporary Residential Architecture by Virginia McLeod.
- Reyner Banham and the Paradoxes of High Tech by Todd Gannon.
- Eco-tech: Sustainable Architecture and High Technology by Catherine Slessor.

Institutional Project 7

Institutional project aims at encouraging institutions to explore different areas.

Institution would have freedom to explore into multidisciplinary activities which would explore into other creative discipline and multidisciplinary activities.

This would help student of architecture to have insight into different spectrums of people, place, culture, society, technology etc.

Institution has entire freedom to detail out the assignments to be conducted under this elective.

Eighth Semester B.Arch.

8S-A-1

Practical Training

Details of Practical Training:

1. The Practical Training of one semester duration (under a **Registered Architect** or firm headed by an Architect having experience **more than 5 years** 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 filling 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.

8S-A-2

Documentation

In this part of the training, student is expected to undergo documentation and report of a project preferably within vicinity of firm's location with following.

Student shall select a completed project of the architect's office, so as to understand the complete design & working process of the firm carrying a 'Critical Analysis' on

a. Initial sketch design,
b. Sanction drawings,
c. Working drawings,
d. Structural drawings,
e. Photographs – during construction, after completion,
f. Report elaborating entire process, consultants involved and post occupancy analysis.

Nineth Semester B.Arch.

9S-A-1

Architectural Design VIII

Objectives: The objective of this studio is to introduce the complexities of large-scale architectural interventions in specific urban settings, having multiple stakeholders. The projects will focus on how to harmonise and contextualise the architectural design with the immediate built environs and the larger urban fabric along with understanding the interface between public and private domain.

The studios should focus upon:

1. Understanding user aspirations and user affordability.
2. Study of urban environment, complex building forms, and their design including positive and negative space relationship, Parking Provision, understanding of Precincts and pedestrian-vehicular movement.

Sessional Work: Large scale project in the public domain, situated within an existing urban fabric, such as: redevelopment of commercial areas, waterfront development, transit-hubs, market squares, densification along transit corridors, mixed use complexes.

9S-A-2

Allied Design Studio VIII

The course content will be developed by the individual colleges as per their choice of allied design scheme.

9S-A-3

Advance Construction

Objectives: Study is to aim at teaching students the advance and more complex aspects of construction industry. It also aim at exposing them to systems and technology of construction use for large spaces with complex utilities.

Unit I: Stressed Skin Structures - Introduction

A) Suspended / Tensile Roof Structures - Introduction, definition, design and structural principles - All types, a complete architectural study. Constructional aspect, erection of cable roofs. Examples, Merits and Demerits.

B) Tensile Membrane and Pneumatic Structures – Introduction, definition, design and structural principles - all types, a complete architectural study. Constructional aspects, Examples, Merits, Demerits.

Unit II:

A) Shell Roofs : - Introduction, definition, design and structural principles. Types of Shell Structures. Complete study of Single and Double Curvature. Examples, merits, demerits. Terminologies - Ruled Surface Shells, Conoid, Shells of Translation, Rotational Shells, Torus etc.

B) Folded Plate / Slab Construction - Introduction, definition, design and structural principles. Examples, merits, demerits.

Unit III: Timber Engineering- Study of design and construction techniques / systems to cover large spans using short length timber / laminated timber. Design and structural principle. Examples – a brief study of use of these techniques / systems for constructing various structural components such as Beams (all types), Web Beam, Trusses, Portal Frames; Lamella etc.

Unit IV: Introduction to High Rise Buildings, Design and Structural principles. Understanding Lateral Load Effects. Principles / Concepts for resistance to Lateral forces and related optimum Structural Systems / Solutions. Structural Schemes / Systems - various types, their Design and Structural principles, their co-relation and interpretation in Architectural design solutions - a complete study - with examples and comparative summaries. Compatible floor systems, foundation systems - their design and structural aspects.

Unit V: Introduction to Cladding, definition, types and materials for their construction. Design and structural consideration and fixing details.

Glazed Walling / Structural Glazing / Curtain Walling in various materials.

References:

- Hayder, A. R. (2014). Strengthening Design of Reinforced Concrete with FRP. CRC Press.
- Ching, F. D. K. (2000). Building Construction Illustrated. 3rd Ed. Wiley.
- Rai, M. (1986). Advances in Building Materials and Construction. CSIR.

9S-A-4

Professional Practice I

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.

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

Unit III: 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 IV: Architects Act 1972, its effects on profession and education.

Unit V: Architects Office, Organisation and Administration, Office Set up, Correspondence, filing, preparation of drawing, standardization and documentation.

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

Sessional Work: Notes, Assignments and class test.

Reference Books:

- Professional Practice by Roshan Namavati.
- COA Handbook of Professional Documents.
- Architectural Practice and Procedure by Ar. V. S. Apte.
- Architectural Practice in India by Prof. Madhav Deobhakta and Ar. Meera Deobhakta.

9S-A-5

Estimation

Objectives: This course is intended to impart students with the necessary technical knowledge for preparation and calculating estimates and detailed costing for small to medium scale projects.

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-l200.

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.CC. work, brick work, plaster work, flooring painting, doors and windows

Unit VII: Introduction to Estimation digital spread sheets. Study of Tender Document, CSR, SSR, Comparative analysis.

References:

- Dutta, B. N. (1998). Estimating and Costing in Civil Engineering. 24th Ed. UBS Publishers Distributors Ltd.
- Birdie, G. S. (2005). Text Book of Estimating and Costing. Dhanpat Rai Publishing.
- Chakraborty, M. Estimating, Costing, Specification & Valuation.

9S-A-6

Urban Design

Objectives: This reflects upon the contribution done by Masters and Pioneers in the field of Urban Design. Develops an understanding about the planning process, Urbanization and how the democratic setup allows people participation and government policies to generate the Urban form which address to the present day demand.

Unit I: Introduction to Urban Design, its scope and relevance. Elements & Principles of urban design (Streets , Buildings, public Space, transport and Landscape) and Elements and Principles of Urban forms (Grain, Tissue, Texture, Skyline, Massing etc). Comparison between Architect, Urban Designer and Urban Planner.

Unit II: Contributions by Urban Designers in Contemporary and modern urban scenario like Leon Krier, Rob Krier, Christopher Alexander, Jen Jecob.

Unit III: Understanding various theories in Urban Design, through examples like New Urbanism, Pedestrianisation, Malls and Plazas, Public Realms, River Front and Lake Front Developments.

Unit IV: Reading of Urban Fabric through various representation techniques and Methods, parameters and attributes for Urban Analysis.

Sessional works :

Book readings on various Urban Design Theories. Conducting settlement studies of a precinct / neighborhood.

Reference Books :

- History of Urban Form by A.E.J Morris

- Urban Pattern
- Image of City
- Pattern language
- Open Spaces
- Streets
- Sessional work :- Urban Settlement Study

9S-A-7

Acoustics and Illumination

Objectives: Subject is dealt with the study of importance of acoustics in design for acoustically sound environment in both enclosed and open space. And also the importance of illumination in architecture defining and enhancing spaces.

Unit I: Basic introduction of Acoustics, Origin of sound, propagation of sound, Behavior of sound. Inverse square law. Reverberation of sound, Sabins formula and reverberation time calculations. Acoustical defects & their remedies. Noise (Structural Borne noise & Air borne noise).

Unit II: Use of Various Acoustic Calculating instruments to achieve RT with applied material. (For ex. Sound intensity Caliberator, Impedance tube, RT analyser or RT analysis application etc.)

Unit III: Acoustical materials, Surface treatment, 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 / Recording Studio / Broadcasting Studio

Unit IV: Sound Isolation & Insulation. Construction Details and material application for sound isolations of floor, wall and ceilings. For ex. Floating Floors. Study of sound reinforcement systems.

Illumination

Unit V: Fundamental study of lights, its radiation and behavior, inverse square law and cosine law. Artificial light calculation by Lumen Method. Use of Photometer and other equipments to calculate intensity of light.

Unit VI: Natural light its use as direct and diffuse light, analysis & design of openings, daylight prediction techniques.

Unit VII: Light sources, various types of Lamps and their characteristics. Luminaries, their types , properties, uses, Cost and Market survey.

Unit VIII: Artificial Lighting systems: Design issues; Lighting for Various purposes; Interior lighting: Ambient, Task & Accent lighting- scallops, wall washers, luminous ceiling, etc.

Exterior lighting: street, public spaces, heritage buildings, Landscape, sports grounds, facade lighting, etc.

References:

- Eagan, D. M. (2002). Architectural Lighting, 2nd Ed. McGraw-Hill
- Barron. M. (2009). Auditorium acoustics and architectural design. 2nd Ed. Taylor & Francis
- Eagan, D. M. (2002). Concepts in Architectural Acoustics.
- Conceptnine, R. (2008). The Architecture of Light: Architectural Lighting Design Concepts and Techniques. Sage Publications.

9S-A-8

Environmental Science and Architecture

Objectives: Understanding complex relationship between natural and build environment with emphasis on strategies to transform the built environment considering the environmental issues.

Unit I: Nature, man and their relationship with past and present, urbanization and its impact on the environment, urban climate, causes of global warming and ozone layer depletion, its future effects. Pollution, its types, impact of pollution on natural and manmade environment resulting to climate change .Development vs. Growth. Definition of sustainable development.

Unit II: Study of earth's resources such as Land, Water, Air, Vegetation, its composition, qualitative aspects, availability and limitations, consumption of resources in built environment. Study of natural structures and processes in solving manmade problems and enabling design concept of urban ecology and landscape urban studies.

Unit III: Introduction to eco-friendliness of building material accessed through embodied energy. Introduction to natural systems, natural processes like ecology, environment, ecosystems and its composition , various cycles like water, air, energy flow.

Unit IV: Strategies with respect to ISO rating systems, assessment and rating systems like GRIHA, LEED, IGBC, ECBC etc. Environment friendly development practices through D.C. rules to transform the built environment. Integration of renewable energy systems in built environment.

Unit V: Use of building simulation software for energy evaluation at design development stage like ECOTEC, Design Builder. Energy Plus, Radiance, IECC etc.

References:

Earthscape: A Manual of Environmental Planning and Design by J.O.Symonds.
Elements of Air : The nature of Atmosphere & Climate, M.Allaby.

Elective VIII

Sustainable Development/ Earthquake Resistant Architecture/ Architectural Journalism/ Disaster Mitigation and Management/ Composite Technology/ Specialised Services/Institutional Project 8

Note: Following are the suggestive contents; institutes have freedom to formulate the content as per their school of thought

Sustainable Development

Key Words: Natural resources, Ecosystem services, economic development, Social development, condition of site, cultural and religious impact

Objectives:

- To understand the Utilization of design method.
- To study the material & Energy.
- To understand the system of harnessing waste and reuse.
- To study the cost effective ways of construction.
- To understand waste management system.

Sub Topics:

1. Sustainable design method and material optimization.
2. Environmental and social consideration.
3. Energy and water usage optimization.
4. Biomimetics
5. Case studies of sustainable buildings.

Sessional Work:

Assignments, Workshops, Studios.

References:

- Sustainable design manual, Vols 1& 2, The energy and resource institute, New Delhi.
- Charles. J. Kibert, 'Sustainable Construction' John Wiley and sons Inc, USA.
- N.D. Kaushika, Energy, Ecology and Environment, Capital Publishing Company, New Delhi.
- John Fernandez, Material Architecture, Architectural Press, UK.
- Rodney Howes, Infrastructure for the built environment, Butterworth Heineman.
- G.Tyler Miller JR, Living in the Environment, Wardsworth Publishing Company, USA.

Earthquake Resistant Architecture

Key Words: Epicenter, Elementary seismology, structural detailing, site planning, earthquake resistance design.

Objectives:

- To create awareness about the importance of seismic forces affecting building design and to impart knowledge about seismic safety aspects.
- To understand Basic understanding of elementary seismology and behavior of buildings during earthquakes.
- Exposure to seismic design principles, structural detailing and concepts of site planning and architectural design for earthquake resistance.

Sub Topics:

1. Elementary seismology.
2. Site planning, building forms and architectural design concepts for earthquake resistance.
3. Performance of ground and buildings in past earthquakes.
4. Seismic design principles.
5. Structural detailing & earthquake resistant construction details.

Sessional Work:
Assignments, Studios.

References:

- Ed. CVR. Murthy & S.K. Jain, Course notes on Seismic design of Reinforced concrete structures, IIT Kanpur,2000
- Earthquake tips, Learning earthquake design and construction, CVR. Murthy, National information centre of earthquake engineering, IIT Kanpur & BMTPC New Delhi.

Architectural Journalism

Key Words: Themes, critics, architectural writers

Objectives: Develop the skills of interpreting document for the design which actually draws communication between the reader and the architect.

Sub Topics:

1. Introduction to Journalism.
2. To understand the Analysis of works.
3. Literature Review.
4. Architectural Criticism.

5. Project report writing.
6. To carry out interactions with Field experts.

Sessional Work:
Assignments, Studios, Presentations.

References:
- Agarwal V. B., Handbook of Journalism.
- Kamath K. V., Professional Journalism.
- Kamath K. V., Journalist hand book.
- Harold Evens, Handling News Paper Text.

Disaster Mitigation and Management

Key Words: Disaster, Risk, Impact, Vulnerability, Mitigation

Objectives:
- To study design consideration.
- To study adaptable building construction techniques.
- To study codes and practices.
- To study innovative technologies.
- To study awareness program.

Sub Topics:
1. Introduction on Disaster.
2. Risk and Vulnerability Analysis.
3. Disaster Preparedness and Response.
4. Rehabilitation, Reconstruction and Recovery.
5. Role of Architecture in Mitigation (Portable & temporary structures).

Sessional Work:
Assignments, Workshops.

References:
- Dr. Mrinalini Pandey Disaster Management.
- Tushar Bhattacharya Disaster Science and Management.
- Jagbir Singh Disaster Management : Future Challenges and Opportunities.
- Shailesh Shukla, Shamna Hussain Biodiversity, Environment and Disaster Management.
- C. K. Rajan, Navale Pandharinath Earth and Atmospheric Disaster Management: Nature and Manmade.

Composite Technology

Specialised Services

Institutional Project 8

Institutional project aims at encouraging institutions to explore different areas.

Institution would have freedom to explore into multidisciplinary activities which would explore into other creative discipline and multidisciplinary activities.

This would help student of architecture to have insight into different spectrums of people, place, culture, society, technology etc.

Institution has entire freedom to detail out the assignments to be conducted under this elective.

Tenth Semester B.Arch.

10S-A-1

Project

This is culmination of undergraduate studies and hence shall display the capability of the candidate to conceive / formulate a design project with complexity and provide solution, aptly demonstrated through supporting research. The major area of study and research can include advanced architectural understanding, including contemporary design processes, urban design, urban-infill, environmental design, conservation and heritage precincts, housing etc. However, the specific thrust should be architectural design of built environment. Understanding of structural systems, specialized details, universal design considerations, services, fire safety as integral part of the proposal. Preparation of presentation drawings, construction details and schematic layout of services with study model are part of the requirements for submission.

Project shall be effectively demonstrated through drawings, models, walk-through etc. along with project report.

10S-A-2

Seminar and Research

Seminar are intended to develop the capacity of the students to work either in group or individually undertaking research in a given subject relating to architecture and presenting his observation graphically and through a seminar presented in different stages. This is to equip the students finally with a skill to sale his project efficiently and effectively. Guidelines can be as mentioned below.

Seminar I: Subject shall be allotted to group of students from the below mentioned broad categories.

1. History of Architecture / Interior Design.
2. Appreciation / Critical a appraisal of Architectural projects.
3. Research in Architecture.
4. Role of allied / applied science in architecture.
5. Building byelaws and legislation.

Seminar II: This seminar shall be presented by an individual student on the subject relating to architectural understanding of doctrine and work of great Master of Architecture. Review of publications on architecture by eminent authors, Individual project reviews etc.

Marks shall be granted on the basis of documentation / Seminar presentation contents etc.

10S-A-3

Professional Practice II

Unit I: 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 II: 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 III: Arbitration, arbitration Proceeding and award, provision of fire insurance policy, architects responsibility towards fire loss assessment and claim report.

Unit IV: Easements rights, acquisition of such rights, remedies for interference and loss of easement, Dilapidation, procedure for preparing report and schedule of dilapidation, settlement of such claims.

Unit V: General information and introduction to various acts and laws such as land acquisition Act., urban land ceiling Act. Building bye-laws, Sale deed procedure, ownership documents.

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

Reference Books:

- Professional Practice by Roshan Namavati.
- COA Handbook of Professional Documents.
- Architectural Practice and Procedure by Ar. V. S. Apte.
- Architectural Practice in India by Prof. Madhav Deobhakta and Ar. Meera Deobhakta.

10S-A-4

Project Management & BIM

Objectives: To understand the fundamentals of management and its applications in architectural practice, To understand the complexities & challenges of constructability of design is primary focus to learn this subject for students of architecture. To make students of architecture aware about the practical ground realities of construction and maintain the harmony between the design and its construction phase.

Unit I: Historical review of large construction projects and management techniques. Fundamentals of project management, SWOT analysis of project. Stages of project management.

Unit II: Preparation of project proposals (DPR), Different financial models of projects (BOT, PPP, SPV), Role of money lending institutions, Tendering & bidding process.

Unit III: Schedule of construction project, Study of bar charts, milestone charts, Fundamentals of CPM (Critical Path Method), PERT (Project Evaluation and Review Technique).

Unit IV: Management of construction activities at site, Study of Construction Machinery, Equipments and tools.

Unit V: Construction site practices for quality control and HSE practices.

Unit VI: Introduction about BIM (Building Information Modeling), its benefits and application in construction project. Various software available for BIM.

References:

- Callahan, M. T., Quackenbush, D. G., & Rowings, J. E. (1992). Construction Project Scheduling.
- McGraw-Hill.
- Chitkara, K. K. (2004). Construction Project Management: Planning, Scheduling and Controlling. Tata McGraw–Hill Education.
- Punmia, B. C., and Khandelwal, K. K. (2006). Project planning and control with PERT and CPM.
- New Delhi: Laxmi Publications.
- Wiest, J. D., and Levy, F. K. (1982). A Management Guide to PERT/CPM. New Delhi: Prentice Hall of India.

10S-A-5

Valuation

Objectives: The aim of this subject is to introduce the students to **Valuation** as a profession. The study shall include the topics as under.

Unit I: Aims and objectives of valuation in respect of Building and land.

Unit II: Essential Characteristics of value, regarding the building.

Unit III: Factors affecting the value of built up property-supply and demand, cost of reproduction, occupation of value. Gild edged Security.

Unit IV: Methods of valuation, such as rental method of valuation, land building basis, development method of valuation, valuation for rating purpose, valuation for Gov. Taxation, Valuation for mortgage.

Unit V: International Standards of Valuation, types of Assets, Recommendation for valuation of types of Assets.

Unit VI: Insolvency and Bankruptcy Code (IBC), Aims and Objectives of IBBI.

Sessional: Notes, exercise on the above topics. Study and preparation of valuation report.

Reference Books :

- Theory & Practice of Valuation by R. Namavati.
- Valuation of Real Property by S.C. Rangwala.
- Estimating, Costing and valuation by S.C. Rangwala.