

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.

Allied Design Studio VIII

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

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.

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.C.C. 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 Jacob.

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

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 ECOTECH, 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.
