15ARC 3.1–ARCHITECTURAL DESIGN-III

CONTACT PERIODS: 9(Studio) per week
VIVA MARKS: 150
PROGRESSIVE MARKS: 150

OBJECTIVE: To enable students to understand the processes involved in the transformation of space into place.

OUTLINE:

The student after having familiarized with aspects like space, light, movement, scale and structure involved in formulating and articulation of spaces relating to health (Clinic), food (Restaurant), services (Bank, Post Office) and education (Primary / Nursery School) in the 2nd semester, needs to move on to tackle larger issues in 3rd Semester. The third Semester work relates to transforming “Space” into “Place”. The factors influencing this process like context, site, surroundings etc will have to be considered. Further, techniques of reading cultural and physical meaning leading to the built environment assume importance.

COURSE OF STUDY – Placemaking as an architectural goal

KEYWORDS – Need, function, activity and place

Mode of study: Place (i) Permanent (full time), (ii) Temporary (seasonal/periodic) (iii) Transient (few hours, days)

Elements promoting sense of “place” – colors, textures, shapes and forms, materials (e.g.: tents), enclosures (fences, walls, roofs, etc.), nodes (trees/platforms etc.), anthropometry and role of sensory aspects like sound, light, smell, texture etc. in creating “memory” of space

FIRST ASSIGNMENT – 3 weeks

Public spaces (bus shelter/station, streets etc.)

Semi-public spaces – college campus, institutional (hospital) etc.

Private spaces – Apartments, common spaces, lobby etc.

Any one of the above to be the assignment – to study any one set of factors promoting the idea/sense of space
NOTE: Nature of work and its mode to be explained before commencement

COURSE OF STUDY – To identify factors (contextual) influencing the design of built environment.

KEYWORDS – Physical, functional and social factors, streetscape, old areas, conflicting aspects, zoning, scale, hierarchy, compatibility, contrast.

Mode of study: (i) Physical factors (location, access, slope etc.) (ii) Functional (Dynamic, static, single/multiple) etc. (iii) Social (traditional, end users, age group etc.) (iv) Streetscape (v) zoning (based on activity, levels etc.) (vi) Scale/hierarchy/contrast (in terms of functions, structure etc.)

SECOND ASSIGNMENT – 3 weeks

Contextual configuration of above factors affecting “DESIGN” – one of the following:

- Exhibition pavilions (Open, partially covered)
- Museums (open air, partially covered)
- Yatri Niwas/Youth camp/youth hostel etc.
- Rural/urban weekly shandy /market (part open, partly enclosed) etc.

COURSE OF STUDY – To explore the meaning of built environment through physical and cultural contexts and techniques to read them.

KEYWORDS – Techniques, layered, comparative, historical, location, size, networks, visual layer, perception (scale, forms etc.), functional.

Mode of study:

- Techniques – layered, comparative, historical
- Physical layer – location, networks, size, hierarchy, temporal functions
- Perception: Density, volume, crowding, conflicting/conforming aspects
- Visual layer: scale, contrast, forms and spaces and their hierarchy
- Functional: core and auxiliary, formal/informal, incidental/intentional
THIRD ASSIGNMENT – 6 weeks

- A small/medium size resort/hotel in a given context e.g.: Nandi hills, Srirangapatna, Hampi etc.
- Residential facility cum training center in a slum.
- Museum (enclosed) in Belur, Banavasi, Udupi, Pattadakkal, Gokarna etc.
- Nature cure/Health resort in Coorg/Chikamagalur, Dandeli etc.
- Application of one particular technique (preferably layered technique for its comprehensiveness).
- Analysis and ensuing strategy for the CONTEXT to be an outcome of physical and cultural parameters through the chosen technique. Any ONE of the suggested topics to be attempted.

COURSE OUTCOME

At the end of the third semester, the student through EXPOSURE and ANALYSIS is capable of converting SPACE into PLACE through functions and elements, converting and extending place into built environment through organizational factors contextually and finally enhance and carry to end the idea “contextualise”, culturally and physically to enable one to READ the context.

SHAPE OF THINGS TO COME – 4th Semester

This exposure would help the student in the next semester to create a context e.g.: Housing / neighbourhood etc. using the "MULTILAYERED" and SCALED UP approach to tackle several parameters simultaneously.

REFERENCES:

15ARC3.2–MATERIALS AND METHODS IN BUILDING CONSTRUCTION-III

CONTACT PERIODS: 6 (1 Lecture + 5 Studio) per week
THEORY MARKS : 100
PROGRESSIVE MARKS : 50
DURATION OF EXAM : 4 Hrs

OBJECTIVE: To acquaint the students with construction practices pertaining to RCC, floors, roofs and flooring alternatives, masonry plastering and paint finishes.

OUTLINE:

MODULE 1

Introduction to RCC Slabs: one way, two-way slabs, cantilever slabs, sloping RCC roof, one way continuous, and two ways continuous.

1. RCC one way slab and one-way continuous slabs : Principles and methods of construction.
2. RCC two way slab and two-way continuous slabs: Principles and methods of construction.
3. RCC cantilever slabs and sloping slab: Principles and methods of construction.

MODULE 2


MODULE 3

6. Introduction to Floor finishes including Toilet flooring: Mud flooring, Murrum flooring, and Stone flooring in marble, granite, tandur/kota stone, other flooring in mosaic, terrazzo, ceramic tiles, wooden flooring and polished concrete: Laying, Fixing and Finishes.
7. **Introduction to Paving:** Cast in situ concrete including vacuum dewatered flooring, concrete tiles, interlocking blocks, clay tiles, brick and stone.

**MODULE 4**

8. **Introduction to internal and external masonry plastering and paint finishes:**
   
   Materials – Paints, varnishes and distempers, emulsions, cement based paints. Constituents of oil paints, characteristics of good paints, types of paints and process of painting different surfaces. Types of varnish, methods of applying varnish and French polish and melamine finish.

**MODULE 5**

9. **Method of plastering (Internal and External):** smooth, rough, textured, grit plaster etc. Use of various finishes viz., lime, cement, plaster of Paris, buffing etc.

10. **Introduction to wet Cladding:** wet cladding in stone, marble, etc. including toilet cladding.

11. **Alternative roofing:** Jack Arch, Madras terrace, and stone slab roof.

**Note** – Minimum one plate on each construction topic. Site visits to be arranged by studio teachers. Study of material applications in the form of portfolio. This is for progressive marks.

**REFERENCES:**

1) Chudley, Construction Technology, ELBS, 1993

2) Barry, Construction of Buildings, East West Press, 1999
15ARC 3.3 – CLIMATOLOGY

CONTACT PERIODS: 3(Lecture) per week
DURATION OF EXAM: 3 Hrs
THEORY MARKS:100
PROGRESSIVE MARKS : 50

OBJECTIVE: To develop the knowledge required for understanding the influence of Climate on architecture including the environmental processes which affect buildings, such as thermal, lighting, etc.

OUTLINE:

MODULE 1

1. Introduction to Climate-1: The Climate-built form interaction; some examples. Elements of climate, measurement and representations of climatic data. Classifications and Characteristics of tropical climates.

2. Introduction to Climate-2: Major climatic zones of India. Site Climate: Effect of landscape elements on site/micro climate.


MODULE 2

4. Thermal comfort-2: Calculation of Overheated and Under heated period (based on air temperature only) for locations in Climatic zones and their optimization in terms of solar heating and Passive cooling desired.

5. Sun-path diagram: Solar geometry & design for orientation and use of solar charts in climatic design.

MODULE 3


MODULE 4

8. **Shading devices**: Optimizing Design of Shading devices effective for overheated periods while allowing solar radiation for under heated periods for different wall orientations.

9. **Natural ventilation**: Functions of natural ventilation, Stack effect due to thermal force and wind velocity. Air movements around buildings, Design considerations and effects of openings and external features on internal air flow and Wind shadows.

MODULE 5


11. **Climatic Design considerations-1**: Literature study of relevant traditional and contemporary building examples.

12. **Climatic Design considerations-2**: Two Indian case studies and one international for each climatic zone.

REFERENCES:


15ARC 3.4 – HISTORY OF ARCHITECTURE – III

CONTACT PERIODS: 3 (Lecture) per week
DURATION OF EXAM: 3 Hrs
THEORY MARKS: 100
PROGRESSIVE MARKS: 50

OBJECTIVE: To provide an introduction to the culture and architecture of Islamic and Colonial periods in India and to provide an understanding of their evolution in various stylistic modes, characterized by technology, ornamentation, and planning practices.

OUTLINE

MODULE 1

1. Islamic Architecture – Early phase; It’s emergence in 11th century AD in India. General characteristics of Indian Islamic Style.


MODULE 2

4. Provincial style – I – Jaunpur and Bengal – Architectural character
   a) Monumental arch : Atala and Jami masjid Bengal – Adina masjid Pandua, Ek Lakhi Tomb b) Civic Space : Elements like entrance pylon : Jaunpur, Dakhil – Darwaza at Gaur, space within & outside of examples like Gunmount or Badasona Masjid.

5. Provincial style – II – Ahmedabad and Bijapur – Architectural characteristics-
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MODULE 3


MODULE 4

8. **Mughal Architecture-II** - Monumental arch: Akbar’s tomb, Taj mahal, Itmaud Daula b) Civic space: Mughal Gardens, Diwan-I-am, Red Fort, Meena bazaar, Red Fort, Guesthouse (Taj mahal complex) c) Domestic: Public elements like ‘Serai’-traveler’s shelters, Nobles’ houses etc.

9. **Colonial Architecture-I** – Early phase- Establishment of forts, warehouses etc- Building typologies and general architectural character of Colonial Indian Architecture.

MODULE 5


11. **Colonial Architecture-III** – a) Design of New Capital of Delhi- Contributions of Edward Lutyens, Herbert Baker (Rashtrapati Bhavan), Layout of New Delhi, Parliament House, North Block and South Block at Rashtrapathi Bhavan. B) Monumental: Civic space-Rajpath, Janpath, India Gate etc.

**NOTE:** *The following are for progressive marks*

1) A Portfolio containing analysis of spaces, functions, and forms (Individual submission).

2) Group studies through Photographic documentation of local/ regional examples or study models of the examples.

**REFERENCES:**

1) Tadgel, C. History of Architecture in India, Phaidon Press, 1990
15ENG 3.5 BUILDING STRUCTURES – III

CONTACT PERIODS: 4(2 Lecture+2 Studio) per week
VIVA MARKS: 75
PROGRESSIVE MARKS: 75

OBJECTIVES:

1) To understand the fundamental principles and structural behaviour of concrete buildings in withstanding gravity, lateral (seismic and wind), and other environmental forces.

2) To understand the mechanics of reinforced concrete, and the ability to design and proportion structural concrete members including slabs, beams, and columns.

OUTLINE:

1) RCC Materials: Basic Characteristics of Concrete & Reinforcing Steel Materials including specifications and testing. Basics of mix design, water-cement ratio, strength, durability, workability requirements and formwork.

2) Mechanics of Reinforced Concrete: Concept of Concrete as a brittle, composite material that is strong in compression and weak in tension. Structural behavior under load and the need for reinforcement.

3) Structural Analysis and Design to satisfy Building Codes and Standards; Introduction to National Building Code and IS456: Calculation of dead weight and live loads on structure as per IS875 (Part1&2). Determination of the general loads to be considered in the design of the structure based on the type of occupancy specified for each area. Introduction to safety factor and design philosophy.

4) Concrete Structural System design: Introduction to the Project: Design of two story RCC frame office building with dimension of 15m X 30m and 3 m storey height using different Concrete Structural Systems including a framing plan, column, beam and slab arrangements and dimensions for all the different Concrete Structural systems already introduced(Indicative).

5) One way Concrete slab system: General framing arrangement of beams, columns and slabs for 15m X 30m building by One-way concrete slab system and design of singly reinforced beams using SP 16: Design Aids for Reinforced Concrete to IS 456:1978.
6) **One way Concrete slab Joist System:** General framing arrangement of beams, columns and slabs for 15m X 30m building by One-way Joist System and design of singly reinforced slabs using SP 16: Design Aids for Reinforced Concrete to IS 456:1978.

7) **Two-way Concrete Floor and Roof Systems:** General framing arrangement of beams, columns and slabs for 15m X 30m building by Two-way Slab-Beam, and design of short columns using SP 16: Design Aids for Reinforced Concrete to IS 456:1978.

8) **Two-way Concrete Flat Plate System:** General framing arrangement of beams, columns and slabs for 15m X 30m building by Two-way solid Flat Plate system design, and design of Isolated footings using SP 16: Design Aids for Reinforced Concrete to IS 456:1978.

9) **Two-way Concrete Flat Slab System:** General framing arrangement of beams, columns and slabs for 15m X 30m building by two-way solid Flat slab system, and formwork design and detailing.

10) **Two-way Concrete Waffle slab Systems:** General framing arrangement of beams, columns and slabs for the 15m X 30m building by two-way (waffle) slab design.

11) **Reinforcement Design:** Approximate calculation of Column, Beam and Slab reinforcement.

12) **Reinforcement detailing and placement:** Preparation of working drawings showing the type, size and location of the reinforcement in a concrete structure.

13) **Design Review:** Review of design of Column, Beam and Slab, total concrete volume, reinforcement tonnage and costing.

**Note:** Class work on loading calculation of each Concrete Structural System including structural system elements, slab, beam, column and footing, will be assessed during the Viva examination.

**REFERENCES:**

1. STRUCTURES - Martin Bechthold, Daniel L Schodek, PHI Learning Private limited.
2. IS 456-2000 Plain and Reinforced Concrete - Code of Practice
15ARC 3.6 – THEORY OF ARCHITECTURE-II

CONTACT PERIODS: 3(Lecture) per week
PROGRESSIVE MARKS : 50
DURATION OF EXAM: 3Hrs
THEORY MARKS: 100

OBJECTIVE: To acquaint the students with architectural theory from antiquity to the present and to identify issues which shaped the approach to architectural design in a particular context and age.

OUTLINE:

MODULE 1


1) 18th Century Theory: Ideas of Laugier, Boullee, Ledoux

2) 19th Century Theory: Concepts of Viollet Le Duc, John Ruskin, Quatramere de Quincy and Gottfried Semper

MODULE 2


MODULE 3

5) Post Modern Theory-2: Contribution to architectural thought: Ideas of Kenneth Frampton and Christopher Alexander

MODULE 4

7) **Architectural Criticism:** Definition & Sources, to examine fundamental questions of what Architectural criticism actually is, its role and function in architecture and the relationship between criticism and judgment. Specifically in terms of, thinking, discussing, and writing on architecture, social or aesthetic issues. Positive and Normative theories of Jon Lang,

8) **Architectural Criticism types:** Definition, Sources, Types of Criticism according to Wayne Attoe.

MODULE 5

9) **Design Logic:** Design generation process: Role of logic and intuition in concept generation. Step by step development of design from problem definition, site analysis to post occupancy evaluation as the last stage of design.

10) **Contemporary Significant Theory:** Ideas of Hassan Fathy who pioneered the use of appropriate technology for building in Egypt, especially by working to re-establish the use of mud brick (or adobe) and tradition as opposed to western building designs and layouts and Paolo Soleri's concept of "Arcology", architecture coherent with ecology. Shape of built environment to come. Floating, walking, plug-in, satellite settlements, earth sheltered etc. Works of Archigram, Paolo Soleri, Kenzo Tange, Moshe Safdie etc.

**REFERENCES:**

1) Broadbent, Geoffrey. Design in Architecture, John Wiley & Sons Ltd, 1977
3) “ A moment in Architecture” and Other Books by Gautam Bhatia.
15ARC 3.7 – COMPUTER APPLICATIONS IN ARCHITECTURE -I

CONTACT PERIODS: 5 (Practical) periods/ week with 1-2 periods of instruction and Remaining hrs of working on CAD workstation for submission of Assignments.

PROGRESSIVE MARKS : 100

OBJECTIVE: To develop and train students to use computers and digital media as tools to explore, develop, evaluate and present architectural ideas. To equip the student with a range of digital tools and techniques in 2D drafting, 3D modelling, and vector graphics.

OUTLINE:

1. Introduction to 2D drafting software: Using latest version of relevant CAD software:
   a. 2D commands, viewports, dimensions, annotations. Time problem introduction;

   Classroom exercises such as measured drawing of studio (windows, doors and staircases included), architecture School (windows, doors and staircases included) etc.

   b. Understanding layers, paper space Vs model space, line weights, print set up and Modelling of Walls, Doors, Windows, Stairs etc.

2. 2D drafting: Presentation of time problem; plan, sections, elevations of a floor of a single storied building of II / III semester architectural design studio project.

3. Introduction to 3d modelling: Latest version of relevant 3D modelling software – software interface, demonstration of 3D modelling commands required to convert 2D project (of 2D drafting) into 3D as a time-problem.

4. Simple 3D modelling: Presentation of time problem; drawing quickly with basic shapes in 3D, viewing models in 3D, adding detail to Models in 3D space, use of cameras, material applications. Presenting models.

5. Rendering & Visualization: Presentation of time problem, generating 3d Model and introduction to concepts of visualization using rendering engines such as VRay, Flamingo,3D studio Max, or any other appropriate software.
6. Introduction to concepts of Building Information Modelling (BIM) using REVIT or other relevant BIM software.

7. Introduction to graphics editing tools:
   
   a. Introduction to appropriate techniques to model walls, insert fenestration, curtain walls & staircases.
   
   b. Lecture and Classroom exercise to convert into BIM project, relationship of other Industry standard file types (.dwg for AutoCAD or Trimble Sketchup input files or from any other relevant software.).

   c. Lecture and Classroom exercise to further utilize rendering and visualization.

8a. Concepts of image scanning, image editing, effects and filters.

   b. Classroom exercise to demonstrate use of Image editing for simple architecture design project projects. For e.g., rendering of 2D drawings, adding nature to 3D visualizations.

9. Graphics editing tools: – Presentation of any simple project to illustrate skills attained in 2D drafting, 3D modeling, graphics editing tool.

NOTE: A portfolio of exercises and assignments done in the class to be submitted for progressive marks.

REFERENCES:

1. Website and training material of relevant Image/Graphics editing software
2. Learning resources on Building Information Management (BIM).
3. Vast amount of CAD learning resources available on the Internet.
4. Vast amount of learning resources for Graphics editing tools available on the Internet.
15ARC3.8- ELECTIVE I

CONTACT PERIODS: 3 per week
PROGRESSIVE MARKS: 50

a. ARCHITECTURAL PHOTOGRAPHY

OBJECTIVE

To impart the skills of taking aesthetically appealing and creative architectural photographs through the use of appropriate cameras/ lenses and lighting conditions.

OUTLINE

1. Introduction to architectural photography. Various types of compositions framing, silhouette photography.
2. Use of various cameras, lenses and accessories, handling of equipment.
   a. SLR, DSLR cameras, lenses for different focal lengths for various contexts
   b. Use of wide angle, normal, tele, zoom, macro, close up lenses.
   c. Filters- UV, Skylight, colour filters, special effect filter.
3. Shutter speeds- slow, normal and high and their various applications.
4. Apertures- use of various apertures to suit different lighting conditions and to enhance depth of fields.
5. Selection of ISO rating to match various lighting conditions.
6. Optimizing selection of shutter speed, aperture and ISO.
7. Twilight and night photography.
8. Various uses of photography- documentation, presentations, competitions, lectures, etc.
9. Creative photography/ photo renderings, for special effects using software.
10. Play of light and shadows to achieve dramatic pictures.
11. Effects of seasons, inclusion of greenery, foliage, clouds, human scale etc.
12. Architectural photography as a profession, law on photography.

REFERENCES:

b. VERNACULAR ARCHITECTURE

OBJECTIVE:

*To inculcate an appreciation of vernacular architecture; as an expression of local identity and indigenous traditions of the culture*

OUTLINE:

The course would be conducted through seminars and field work.

1. Introduction to the approaches and concepts to the study of vernacular architecture, history and organisation of vernacular buildings of different regions in the Indian context; with an understanding of forms, spatial planning, cultural aspects, symbolism, colour, art, materials of construction and construction techniques. Study of factors that shape the architectural character and render the regional variations of vernacular architecture - geographic, climatic, social, economic, political and religious aspects, local materials and skills available in the region etc.

2. Methods of observation, recording, documenting and representing vernacular architecture with examples.

3. Study and documentation of vernacular architecture of selected building typologies. Rigorous documentation, accuracy in measuring, collating the recorded information and drawing them up in specified formats and scales are part of this module.

4. A critical review of the relevance and application of vernacular ideas in contemporary times. An appraisal of architects who have creatively innovated and negotiated the boundaries of ‘tradition’ while dynamically responding to the changing aspirations and lifestyles of the world around.
REFERENCES:


c. VISUAL COMMUNICATION

OBJECTIVE: To impart the techniques of visual communication.

OUTLINE:

1. Visual communication used in day to day life, print, electronic media, advertisement and in art / architecture context - differences and similarities.
2. Understanding meaning generation process in visual language.
3. Devices of visual language - space, context, scale, associate, transform, crop, frame, distort, abstract, fragment, exaggerate, and subvert, irony.
4. Pictograms and ideograms.
5. Understanding the differences between logo and symbol. Process of logo creation.
6. Hierarchy in visual content being presented.
7. Relationship between text and images and their interrelationships.
8. Cultural context of meaning generation and aesthetic principles involved.

REFERENCES:
