

18ARC41 – ARCHITECTURAL DESIGN - IV

CONTACT PERIODS: 8(Studio) per week

VIVA MARKS: 150

PROGRESSIVE MARKS: 150

OBJECTIVES: From space to dwelling: An understanding of what it means to dwell in a space/s, and to further explore as to why and how people choose to dwell together.

This semester follows on the heels of the past one, where students have attempted to understand the nature of places with shared memories and purposes.

A. The Dwelling: How spaces change when people stake claim over them, and what boundaries are drawn between what is private and the many stages between that and the common public space?.

What it means to arrive "home", and what is the nature of that feeling of belonging that one gets when we "arrive" and are welcomed in to a familiar space?.

We enquire into the nature of a dwelling space, and what is the nature of spaces outside them? Common rangolis, porches, verandahs, balconies, paths, pavements, plinths, wells, washing areas, vrindavanas, backyards, parking spaces for carts, cattle, and vehicles. We need to enquire in the nature of the spaces in-between these.

Picking from memories, can we recollect and draw spaces that endure, ones that recall the same feelings and create similar expectations as before? Which spaces and behaviours have changed, and which remain. Which are in transition?

B. Dwelling Together:

Explore as to why people live together, and how we have lived together in the past.

Questions to be addressed here are:

How do we make common decisions?

What do we share, and when, where and how does it change to the more intimate, personal space?

Which spaces are "designed"? What is the meaning of "organic" growth?

What is the meaning of Vernacular Architecture?

What is the meaning of the term "sustainable"?

OUTLINE:

1. Continuing on the discussion on 'sense of place'; we move on to further differentiation of space to idea of making a space for dwelling. We address the difference between making a 'house' for people, from making a 'dwelling' for them? It is necessary then to enquire into **what is the nature of a dwelling**, what it needs, and whom it includes and involves, and how places and spaces in a dwelling are different from other places and spaces.
2. We need to enquire into what one needs to support the act of dwelling and the transitions in space and scale that lead one to the dwelling.
3. To understand the needs of sharing land, spaces inside and outside dwellings, common places, common interests like security, economy, services, belonging and

identity. Concepts of varying types of needs for privacy in the dwelling, and the transitions from the public realm to it.

4. To understand the basic reasons for grouping dwellings together. Enquiry into some types and typologies of unifying dwellings: clusters, terraces, linear/ row formations, block formations, semi-detached, and detached, to name a few.
5. To understand the nature of dwellings in organic and planned communities, and to enquire into what the changes are, and how they came about.
6. **Suggested site size: From 1500 - 3000 sqm to allow for a deeper study rather than repetition of typical configuration.**

MODE OF STUDY:

Three component approach to the Design Studio:

A) TRAVEL FOR SITE VISITS: Learning from visiting various settings: urban and rural, traditional, contemporary, permanent and temporary, to introduce them first hand to students.

B) SEMINARS: Seminars are intended to expose the students to a range of real issues that are integral to their understanding of house-form. These should lead students to explore different approaches to house-form.

C) DESIGN TASKS: Emphasis in teaching and learning is placed on bridging the gap between the imaginative and conceptual, the material and formal. Projects should involve activities that encourage students to develop techniques for identifying and negotiating competing demands and prioritizing and ordering variables. An essential part of the studio process should be peer reviews and reviews by practicing architects.

Assignment-1: SITE VISITS

- 1) Two site visits to observe, discuss and document existing residential settlements, housing projects.
- 2) The emphasis should be on both conceptual understanding and accurate measured drawing. However, scale and proportion need to be observed carefully, as a method of understanding buildings.
- 3) Attention should be given to community spaces/common areas and the emergent grouping of individual dwellings.
- 4) Sketches and documentation should show observations and inferences from the studies.

Assignment-2: SEMINARS

- 1) To understand the architect as the facilitator: the architect's role in the process of building a dwelling community.
- 2) To understand some issues related to group housing/dwelling or settlements like basic services[lighting, ventilation & water supply] and building regulation.
- 3) To explore the character of community spaces and their significance in housing projects[points of discussion could include different ways of occupying land: rentals, ownership, temporary squatting, organic settlements, informal urban settlements].

Suggested topics:

- Indigenous building technologies, Post Independence Housing: Otto Koenigsberger.
- Studying housing projects in India [Laurie Baker, BV Doshi, Charles Correa, MN Ashish Ganju, Raj Rewal, Shilpa Sindoor, Revathi Kamath] and other contemporary housing projects from around the world.

Assignment-3: PROJECTS

One major project and one minor/time assignment to be tackled in the semester. Project work could be done in the following four stages of activity interspersed with seminars.

1. Introduction to the initial design parameters which include choice of:

- a. Geography/situation (context),
- b. Understanding the dwellers, their lifestyle, and social context,
- c. Exploring ways in which dwellers come together to live in a small community.

2. Explore issues of community, public and private realms, edge conditions, communication and connectedness.

3. Enquire into individual and family/user group needs and aspirations.

4. The emphasis in the studio has to be on **inclusion** and **integration** of differences in age, gender, mobility, health, economic status. In today's world, there is a need to make buildings equitable to all at the outset, and we should begin with our dwellings.

5. Suggested plot size: From 1500 - 3000 sqm

REFERENCES:

- I. Amos Rapoport, "House Form and Culture", Prentice-Hall, 1969
- II. Christopher Alexander, "Pattern Language", Oxford University Press, 1977
- III. Christopher Alexander, "A Timeless Way of Building", Oxford Uni. Press, 1979
- IV. Gautam Bhatia, "Laurie Baker, Life, Work, Writings", Viking, 1991
- V. Dick Van Gameren & Rohan Verma, "Designs for Housing: Charles Correa", 2018
- VI. Atul Deulgaonkar, "Laurie Baker, Truth in Architecture", Jyotsna Prakashan, 2015
- VII. Otto Koenigsberger, "Manual of Tropical Housing and Building", 1975
- VIII. Geoffrey Bawa, The Complete Works, 2002

18ARC42 –MATERIALS AND METHODS IN BUILDING CONSTRUCTION-IV

CONTACT PERIODS : 5 (1Lecture + 4 Studio) per week

PROGRESSIVE MARKS : 50

THEORY MARKS : 100

Duration of Exam – 4 Hrs

OBJECTIVE: *To acquaint the students with construction practices pertaining to RCC framing systems, and other building elements such as metal doors and windows(In Steel and Aluminium)*

OUTLINE:

MODULE 1

- 1. Introduction to Advanced RCC roofs:** Moment framed, Flat slab and Flat plate, Filler slabs, Waffle slab.
- 2. RCC Moment framed:** Principles and methods of construction including detailing of Reinforcement.
- 3. RCC Flat Plate & Slab:** Principles and methods of construction including detailing of Reinforcement.

MODULE 2

- 4. RCC filler slabs:** Principles and methods of construction. Introduction to different filler materials, Mangalore tiles, Burnt Clay Bricks, Hollow Concrete blocks, Stabilized Hollow Mud blocks, Clay pots, Coconut shells etc.
- 5. RCC Waffle slabs:** Principles and methods of construction.

MODULE 3

- 6. Structural steel as a building material:** Types, properties, uses and manufacturing methods.
- 7. Steel construction:** Steel columns/beam construction; Principles and methods of construction.

MODULE 4

- 8. Steel doors and windows:** Study of joinery details.
- 9. Steel doors for garages and workshops:** uses and manufacturing methods.
- 10. Collapsible gate and rolling shutters:** uses and manufacturing methods.

MODULE 5

- 11. Aluminum as a building material:** Types, properties, uses and manufacturing methods. Detailing of aluminum partitions.
- 12. Aluminum doors and windows:** Casement, Pivot, Sliding type: Study of joinery details.

Note – Minimum one plate on each construction topic. Site visits to be arranged by studio teachers. Study of material application in the form of portfolio.

REFERENCES:

- 1) Chudley, Construction Technology, ELBS, 1993
- 2) Barry, Construction of Buildings, East West Press, 1999

18ARC43 – BUILDING SERVICES – I (Water Supply and Sanitation)

CONTACT PERIODS: 3 (1 Lecture + 2 Pract./Tuto./Semi.) per week

DURATION OF EXAM: 3 Hrs

THEORY MARKS: 100

PROGRESSIVE MARKS: 50

OBJECTIVE: *To impart the knowledge and skills required for understanding the role of essential services of water supply and sanitation and their integration with architectural design.*

OUTLINE:

MODULE 1

1)Introduction to Environment and Health Aspects: History of Sanitation with respect to human civilization, Importance of Health, Hygiene Cleanliness, Waterborne, Water-related, Water based, Epidemic diseases, Conservancy to water carriage system, Urban and Rural sanitation.

2)Water Supply: Source of Water supply – Municipal, bore well, river, etc, Quantity of water for different usages like Domestic, Hot water, Flushing, Gardening, Commercial, Industrial Applications, Assessment of requirement for different uses, Quality of supply for different uses as per national and international standards, Treatment of water for different uses, filtration, softening, disinfection, Storage and pumping – gravity system, hydro-pneumatic system, Distribution of water to fixture and fittings, schematic diagrams, Swimming pool, water bodies, Efficient usage of water.

MODULE 2

3)Sewerage System: Assessment of sewage generated, Collection of sewage / wastewater from all sources, schematic diagram, Conveyance of sewage – gully trap, chamber, manhole, intercepting trap, grease traps, backflow preventer, Materials of construction of sewerage network – PVC, uPVC, HDPE, corrugated PP pipes, Objective of Sewage treatment, type of treatment, aerobic, anaerobic, Ventilation of STP, Space requirements

4)Storm water Management: Assessment, quantification of rainfall, flood control measures, Drainage system – piped drains, open drains, Recharging of storm water, Harvesting of roof top water, first flush, pretreatment, Drainage of basements, podium, paved areas, Collection, Reuse of water within the project, reduction of the load on municipal system, landscape drainages and Rainwater harvesting.

MODULE 3

5) Plumbing: Water supply piping – hot, cold, flushing water, Piping in sunken areas, false ceiling areas, shaft sizes, Drainage – floor traps, drains, P-trap, bottle traps, Single stack, two stack, cross venting, fixture venting, Material of construction like GI, PPR, PB, CPVC, Composite pipes, Copper, Flow control Valves – Gate valve, Globe valves, butterfly valves, Pressure Reducing valves & station, Pipe supports, hangers, fixing, plumbing of small houses.

MODULE 4

6) Sanitary Fixtures, Fittings & Wellness: Soil appliances – Water closets, Bidet, urinals, Cisterns, Flush valve, Waste appliances – wash basin, sink, dishwasher, washing machine, Hot water system – Geysers, boilers, heat pump, Bath & water fixtures – Taps, mixers, single lever, quarter turn, bathtub, multi-jet bath, rain showers, health faucets, Wellness products : Sauna bath, steam bath, Jacuzzi, single and double stack system.

7) Solid Waste Management: Assessment of waste, Waste to wealth concept, Municipal waste, garden waste, organic & inorganic, Commercial waste, Medical waste & Industrial waste, Collection, segregation, treatment, disposal, Organic waste – Biomethanation, Vermicomposting, Organic waste converter.

MODULE 5

8) Introduction to Fire and Life safety: Causes of fire, reasons for loss of life due to fire, development of fire, fire classification of buildings, Fire water storage requirements, Fire control room, Code of practices, Idea of smoke detectors, Fire alarms, Wet risers, Fire escape stair case, equipment used eg: snorkel ladder, materials used to fight fire, Fire rating and Hydrants.

9) Special requirements: Solar Hot Water Generation, Central LPG Supply System, Medical Gases Supply, Storage of High Speed Diesel, Central Vacuum and Waste Collection.

Site Visits:

1. Water Treatment Plants, Sewage Treatment Plants, LPG & HSD Yards.
2. High Rise Residential Building – Plumbing (water supply, drainage)
3. Commercial Buildings like IT Campus, Hotel & Hospital for acquaintance of installation & space requirements.

NOTE: For Progressive Marks, individual submission of the following:

- a) Layout of Water supply and Sanitation with all fixtures in Kitchen, Bath and Utility for a small Residence i.e. Plan and Section, Terrace plan with Rainwater down take pipes, Sump and OHT calculation design.
- b) Schematic diagram of similar study for a Basement floor.
- c) Portfolio on
 - I. Solid waste management and
 - II. Firefighting schematic plans

REFERENCES:

- 1) Deshpande, RS. A Text Book of Sanitary Engineering, Vol:1, United Books, Pune, 1959.
- 2) Birdie, G. S. and Birdie J. S. Water Supply and Sanitary Engineering, Dhanpat Rai Publications, 2010

18ARC44 - HISTORY OF ARCHITECTURE-IV

CONTACT PERIODS: 3 (Lecture) per week

DURATION OF EXAM: 3 Hrs

PROGRESSIVE MARKS:50

THEORY MARKS: 100

OBJECTIVE: *To provide an understanding of the evolution of Hindu Architecture in India in its various stylistic modes, characterized by technology, ornamentation and planning practices.*

OUTLINE:

MODULE: 1

1. **Introduction to Classical (Buddhist):** Mahayana phase, stupa and rock cut cave Architecture.
2. **Buddhist Examples:** Study of principles of design of buildings through study of three kinds of Architecture: a) Monumental; Great Stupa at Sanchi, Chaitya at Karli, Viharas at Ajanta, and Toranas at Sanchi b) Domestic (Built to inhabit) and c) Civic space.
3. **Introduction to Jain Architecture:** Study of principles of design of buildings through study of three kinds of Architecture: a) Monumental; b) Domestic (Built to inhabit) and c) Civic space.

MODULE: 2

4. **Evolution of Hindu temple:** Indo Aryan and Dravidian – Early temples at Udaigiri, Tigawa and Sanchi.
5. **Evolution of Hindu temple:** Dravidian Experiments at Aihole (Durga temple and Ladkhan temple), Deogarh, Bhitargaon and Badami.
6. **Beginnings of Dravidian architecture:** Pallavas, rathas at Mamallapuram, Shore temple, Kailsanatha and Vaikuntaperumal temples at Kancheepuram.

MODULE: 3

7. **The Cholas contribution:** Study of principles of design of buildings through study of three kinds of Architecture: a) Monumental; Brihadeshwara temple at Thanjavur and Gangaikonda Cholapuram b) Domestic (Built to inhabit) and c) Civic space;
8. **The Pandyan & Madurai Dynasties contribution:** Study of principles of design of buildings through study of three kinds of Architecture: a) Monumental; Gopurams Madurai (Meenakshi temple) and Srirangam. b) Domestic (Built to inhabit) and c) Civic space;

MODULE: 4

9. **The Hoysala contribution:** Study of principles of design of buildings through study of three kinds of Architecture: a) Monumental; Eg: Channakesava temple, Belur, Hoysalesvara temple, Halebid, Kesava temple, Somnathpur b) Domestic (Built to inhabit) and c) Civic space;
10. **Indo Aryan Mode:** the beginnings in Orissa – the Lingaraja at Bhubaneshwar.

MODULE: 5

11. **Hindu architecture at Rajputana & Khajuraho group:** (Temple of Surya, Orisa, Marwar) and Gujarat (Temple of Surya, Modhera). The Khajuraho group: Khandariya Mahadev, Jain temples – Chaumukh temple at Ranpur
12. **Later Dravidian period:** The Vijayanagar and– Noted temples at Hampi (Vitthala temple and Hazara Rama temple),

NOTE: Site visit and documentation of a Temple may be made for part assessment of the progressive marks.

REFERENCES:

- 1) “Indian Architecture, Buddhist and Hindu Period” by Brown, Percy
- 2) “Architecture of India – Buddhist and Hindu” by Grover Satish

18ENG 45 – BUILDING STRUCTURES – IV

CONTACT PERIODS: 3(1 Lecture+2 Pract./Tuto./Semi.) per week

VIVA MARKS: 75

PROGRESSIVE MARKS: 75

OBJECTIVE:

- 1. To Gain understanding of Steel Structural Systems including composite construction and fundamental principles and structural behavior of steel buildings in withstanding gravity, lateral (seismic and wind), and other environmental forces.*
- 2. To understand the process of the design of structural steel systems and the design of simple steel structures.*

OUTLINE :

1) Structural Steel: Different kinds of Steel, their Basic characteristics of Steel & Light Gauge Steel materials.

2) Concepts of design of Steel Structures: Introduction to the concept of Working Stress Design and Load and Resistance Factor Design.

3) Steel Structural Systems: Introduction to Rigid Portal Frames design of a one story industrial building 18M X 48m with two-bay mezzanine office floor. Project work to include a framing plan for both the industrial building and the mezzanine, an approximate design of structural frame elements, columns and beams. Introduction to available sections in structural steel used in the design of frame elements(Indicative).

4) Introduction to National Building Code: IS 800: Criteria & Design to satisfy Building Codes and Standards, Dead and Live load calculations as per IS875 (Part1&2). Determine the general loads to be considered in the design of the structure, based on the type of occupancy for each area specified.

5) Rigid Frames design-1: Properties of Indian standard rolled steel section and general framing arrangement of beams and columns for the one story 18M X 48m industrial building.

6) Rigid Frames design-2: Design of Rigid frame including selection of frames according to the span, spacing and frame configuration using steel manuals.

7) Composite Flooring Systems: Discussion on steel-concrete composite construction using steel beams, metal decking and concrete, including the role of shear connectors' attachment to the beam for composite action.

8) Composite flooring systems design for mezzanine: Loading and Analysis (Moment diagram to be provided) and design of composite steel decking with concrete topping.

9) Rigid frame elements design-1: Steel Structural Column design using IS special publication for the design of steel structures [SP-6 (1)].

10) Rigid frame elements design-2: Steel Structural Beams and trusses design using IS special publication for the design of steel structures [SP-6 (1)].

11) Drawings and Specifications for the Rigid frame design: Structural design criteria, including loads used, calculations, drawings and detailing, and steel tonnage calculation.

12) Field Inspection of Steel Construction Site: *The project work to include documentation and a report about the observations, learning and findings at Site*

Note: Minimum one plate on loading calculation on each Structural steel topic.

REFERENCE:

- 1) Martin Bechthold, Daniel L Schodek, STRUCTURES - PHI Learning Private limited.

18ARC46 – THEORY OF ARCHITECTURE -II

CONTACT PERIODS : : 3 (Lecture) per week

DURATION OF EXAM : 3 Hrs

THEORY MARKS: 100

PROGRESSIVE MARKS:50

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

Introduction to Theory in Antiquity: Marcus Vitruvius and his multi-volume work entitled De Architectura. Mayamata: Indian Treatise on Housing & Architecture.

Introduction to Theory in Renaissance: Leon Alberti, Andrea Palladio – Jacques Francois Blondel and Claude Perrault of French Academic Tradition.

- 1) **18th Century Theory:** Ideas of Laugier, Boullée, Ledoux
- 2) **19th Century Theory:** Concepts of Viollet Le Duc, John Ruskin, Quatremere de Quincy and Gottfried Semper

MODULE 2

- 3) **Modern Movement Theory:** Ideas of Adolf Loos, Eero Saarinen, Erich Mendelsohn, Richard Neutra, Otto Wagner, Kenzo Tange.
- 4) **Post Modern Theory-1:** Ideas on Post-Modern Classicism by Robert Venturi and Charles Jencks. Deconstruction: Fundamental beliefs and philosophy and ideas of Peter Eisenman.

MODULE 3

- 5) **Post Modern Theory-2:** Contribution to architectural thought: Ideas of Kenneth Frampton and Christopher Alexander
- 6) **Post Modern Theory-3:** Contribution to architectural thought: Ideas of Amos Rapoport, Geoffrey Broadbent-his design generation theories.

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
- 2) Lang, Jon , Creating Architectural Theory, Van Nostrand Reinhold Co, New York 1987
- 3) " A moment in Architecture" and Other Books by Gautam Bhatia.

18ARC47 – COMPUTER APPLICATIONS IN ARCHITECTURE – II

CONTACT PERIODS: 3(Pract./Tuto./Semi.) 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 awareness and familiarity with Advanced Computer applications in Architecture and to equip students with skills required in using digital tools to conceive, develop and present architectural ideas.*

OUTLINE:

- 1) **Introduction to advanced popular 3D modelling software**– e.g. 3DStudio Max, Maya, Rhinoceros and other appropriate software. Introduction to online resources, blogs, tutorials.
- 2) **Concepts of NURBS modelling:**(curves and surfaces), curve / surface editing, solid modelling, layer management, etc.
- 3) **Classroom exercise to demonstrate 3D modelling of transformed/modified/complex 3D objects:** for e.g. Twisted tower, deformed cube, sliced cylinder. Introduction to file conversions and interdependencies between 3D modelling software and 2D drafting software, e.g. Rhinoceros to AutoCAD, or any other relevant CAD software. Conversion of 3D model(of transformed/modified objects) to 2D drawings (e.g. plan, section, elevation)
- 4) **Conversion of Architecture/interior design project into NURBS modelling project:** For e.g. measured drawing of classroom, Architecture School, computer room etc.
- 5) **Working on 3D modelling & Visualisation software with rendering:** such as 3DS Max OR Maya or any other appropriate software.

Concepts of solid modelling: polygonal modelling, modifier, application of materials, simple timeline animations.

Techniques of 3D visualisations – Introduction to tool settings in 3D rendering engines for photo-realistic rendering. Application of materials and Simple Timeline animations, For e.g. using V-Ray, Maxwell, Flamingo, Mental Ray or any other appropriate software, Classroom demonstration of objects, of simple Architecture design projects.

- 6) **Working on Graphics/Vector/Image editing software:** To present Architecture design studio projects –Introduction to publishing tools for creating presentations and portfolios.

Project 1 – Classroom exercise to convert architecture design project 2D drawings (of semester 3 / 4 OR any simple one to three-storeyed building) into 3D model using relevant software. Project to be rendered using an appropriate 3D visualisation software.

Project 2 – Classroom demonstration/exercise of image rendering/collage using Graphics/Image editing software (for e.g., adding context to visualisations), foreground, backgrounds etc.

Project to include presentation of final outcomes in the form of drawing panels, booklets, posters.

REFERENCES:

1. Internet resources, blogs, and learning resources on the web of popular 3D modelling software and NURBS modelling,
2. Vector/Graphics/Image editing software

18ARC48- ELECTIVE II

CONTACT PERIODS: 3 (Lecture/Studio/Practical)per week

PROGRESSIVE MARKS : 50

a. ENVIRONMENT RESPONSIVE ARCHITECTURE

OBJECTIVE: *To develop awareness and familiarity with green design and its integration with Architectural design.*

OUTLINE:

- 1) **Introduction to Green Buildings:** Why make Buildings Green? Concept and necessity.
- 2) **Green Building Rating System:** The seven categories in the rating system : Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, Indoor Environmental Quality, Innovation in Design and Regional Priority.
- 3) **Introduction to a design exercise (Project application):** Design of a small building with an objective to integrate categories of green building rating.
- 4) **Sustainable Sites:** Site Specific Design; Development Density and Community Connectivity, Alternative Transportation, Site Development, Storm water Design and Heat Island Effect.
- 5) **Water Efficiency:** Innovative Wastewater Treatment and Reuse and Water Use Reduction and Re-use factors.
- 6) **Energy and Atmosphere:** Optimization of Energy Performance, On-site Renewable Energy, Enhanced Commissioning and Green Power. To apply the principles of Solar Passive Architecture to design of buildings.
- 7) **Materials and Resources:** Building Reuse: Maintain Existing Walls, Floors, and Roof, Construction Waste Management, Materials Reuse, Recycled Content, Regional Materials and Certified Wood.
- 8) **Indoor Environmental Quality:** Construction Indoor Air Quality Management Plan and Daylight and Views. Rating Systems: GRIHA and LEED Systems.
- 9) **Regional Priority:** To provide incentive for project teams to address geographically significant environmental local issues. Introduction to passive techniques of cooling such as evaporative cooling, earth tubing, wind scoops, roof ponds, shaded courtyards etc.
- 10) Review of a design project considering various factors listed above.

REFERENCES:

1. Steemers, Koen and Steane, Mary Ann. Environmental Diversity in Architecture, Spon Press, 2004.
2. McGlynn, Sue et al., Responsive Environments, Architectural Press, 2008.

b. PRODUCT DESIGN

OBJECTIVES:

- 1) *To introduce the students to the discipline of Product Design*
- 2) *To develop basic skills required in handling simple product design projects*

OUTLINE:

Preamble:

We live in a world of objects. Objects can have meanings, carry associations or be symbols of more abstract ideas. These objects are predominantly functional in nature, some are purely symbolic / decorative in nature and there are a few which combine both the functional with the symbolic and decorative.

Great Architecture has demonstrated this fusion of the functional with the symbolic through the ages. Product design, on a smaller scale, seeks to blend the technical with the aesthetic, the utilitarian with the emotional delight; the dialogue between what people need / want vs what people will buy / discard.

1. **Product design as a noun:** the set of properties of an artifact, consisting of the discrete properties of the form (i.e., the aesthetics of the tangible good and/or service) and the function (i.e., its capabilities) together with the holistic properties of the integrated form and function.
2. **Product design as a verb:** the process of creating a new product to be sold by a business to its customers. A very broad concept, it is essentially the efficient and effective generation and development of ideas through a process that leads to new products.
3. **Product design process:** from idea generation to commercialization; concept, development, detail; materiality, technicality, imageability.
4. Relationship between Design, Technology and Product.
5. History of product design as a discipline, the various theories of design via study of design practices.
6. Mode and method of Design Process as applicable to product ideation and development.
7. Materials and manufacturing process and its influence on product ideation and development.
8. influence of ergonomics on product ideation and development.
9. Impact of culture i.e. the aesthetics on product ideation and development, the dialogue between people's aspirations and people's needs.
10. Relationship and difference between craft based and mass manufactured products.
11. Market as a tool for product promotion.

12. Indian aesthetic sense and its influence on product ideation and development.
13. Influence of product design on other disciplines like automobile styling, furniture, jewellery, toys, systems design, computer interfaces, etc.

Class assignments / exercises:

Short projects along with a time problem will be tackled in the class exploring the influences of design process, and ergonomics on the product ideation and development.

The student will also study the product changes that will occur through the choices made of materials, manufacturing process, and marketing techniques.

Discussions, video presentations, seminars and case studies will cover all the other topics.

REFERENCES:

1. Alexander, Christopher ,Notes on the Synthesis of Form, Harvard University Press, 1964
2. Morris, R, The fundamentals of product design, AVA Publishing 2009.

c. HERITAGE DOCUMENTATION

OBJECTIVE: *To understand the character of a settlement, street, building, spaces, materials through a process of measured drawings and photographic documentation.*

OUTLINE:

1. Introduction to Documentation

- Need for Documentation undertaken? Tools for Documentation available, Methodology, Importance of Archival research, Old Photographs, Maps etc

2. Site work

- Secondary information on the /street/heritage
- Reconnaissance survey of the /street/heritage building;
- Mapping of the street
- Identification of selected typology of structures for detailed measured drawing
- Recording of measurements- horizontal, vertical, measuring angles, marking center lines, datum, notations, building orientation
- Legend of materials used; Structural details and joineries
- Details of various elements – openings, ornamental details
- Mapping activities in various locations
- Supporting sketches
- Information on people, surroundings, climate, Access to site

3. Preparation of Drawings

- Developing drawings from the field data – Plans at various levels, Building floor plans, Reflected ceiling plans, roof plans, all elevations, relevant sections.
- Drawings of details such as openings, ornamental details, joineries

4. Analysis:

- Analysis as tools for understanding and interpreting the measured drawings

REFERENCES:

- 1) RSP Program Monographs –CEPT University
- 2) Building Craft Lab- DICRC, CEPT University

OPEN ELECTIVE:

The college has the discretion to offer an open elective in the areas/subject/field other than already covered under the syllabus . The college can decide to offer need based electives depending on the availability of the expertise. However, the college will require to submit the title of such electives with the course outline stating learning objectives and mode of delivering the content to the Registrar/ Registrar (evaluation) within the 15 days of the commencement of the semester.