

# GUJARAT TECHNOLOGICAL UNIVERSITY

## DIPLOMA IN ARCHITECTURE

### THIRD SEMESTER SYLLABUS(W.E.F. July 2014)

#### **SUBJECT NAME –DESIGN STUDIO III**

**SUBJECT CODE – 3336201**

#### **FOCUS:**

Evolving an appropriate design for specific users and context. Appropriate choice and use of the material based on the context, with all explorations of the material – in terms of construction and details.

#### **CONTENTS:**

- Program formulation on the basis of functional needs and users' requirements, understating site context, environmental conditions, social life and cultural values as determinants of architectural design, developing conceptual positions based on the interpretations of the program.
- Developing systems of construction and material details relevant to the conceptual positions, development of functional and aesthetical construction details and fenestration design.
- Individually students can select a material suitable to the context and explore all construction possibilities and technical details.
- Design of a dwelling unit based in a specific context, relevant case studies and their analysis, area volume diagrams, literature review, exercises and time problem to develop innovative thinking, exercises related to relevant or appropriate construction details and materials.
- Proper presentation drawings along with model to be aimed at the end of the studio.
- The studio includes 1 major and 2 minor exercise, and 1 time problem.

#### **SUGGESTED BOOKS**

- Site, Space and Structure by Todd, Kim
- Elements of Architecture from form to place by Miers , Pierr Von

## **SUBJECT NAME – CONSTRUCTION TECHNOLOGY III**

**SUBJECT CODE – 3336202**

### **FOCUS:**

To acquaint the students with construction practices pertaining to RCC & steel elements, construction practices pertaining to RCC floors, roofs and flooring with different materials and plastering. To introduce students to electrical services and illumination and to sensitize them with respect to their integration into Architectural Design.

### **CONTENTS:**

- Study of steel foundations and columns, types of foundations – isolated, combined, Raft, Base slab, Grillage, pile foundations.
- Study of principles and methods of construction of RCC, one way, two way slabs – cantilever slabs, sloping RCC roof, retaining walls, vaults, domes.
- Hollow clay blocks roofing techniques (filler slab)
- Shoring & underpinning, form-work techniques and reinforcement details for RCC Construction.
- Expansion joints – Necessity, location and detailing
  
- Insulation materials – Thermal and sound insulation materials: mineral wool, unbounded rock and slag wool, polyurethane forms (PUF) etc.,
- Introduction to the study of acoustics – nature of sound. Understanding of basic terminology like – frequency, pitch tone, sound pressure, sound intensity, loudness, threshold of audibility and pain, masking, sound distance.
- Behavior of sound in enclosed spaces – reflection of sound, nature of reflection from plane, convex and concave surfaces, sound diffraction, absorption of sound, sound absorption coefficient, reverberation, sound absorbents, porous materials, panel or membrane absorbers and cavity or Humboldt resonators, role of functional absorbers.

### **SUGGESTED BOOKS**

- Construction Technology by Chudley
- Construction of Buildings by Barry
- Building construction by Frank Ching
- Building construction by McKay

## **SUBJECT NAME – SURVEING AND LEVELLING**

**SUBJECT CODE – 3336203**

### **FOCUS:**

To develop the knowledge and skill relative to surveying and leveling principles and practice

### **CONTENTS:**

- Introduction of subject, basic terms, definition and terminologies. Classification and Division of survey, units of measurements.
- Chain Surveying: Linear measurement, principle of chain surveying, frame work, instruments used, field work.
- Compass Survey: Introduction to traversing, principle used, types of meridian, WCB & RB system.
- Methods of Area and Volume Measurements: Introduction to various methods of measuring area between chain line & boundary, calculation of area using trapezoidal & Simpson's formula, use of planimeter to calculate area, other approximate methods.
- Introduction to Leveling & Contour: Introduction to leveling & RL, How to get the RL. Understanding of contours, basic characteristics & uses of contour, study of contour map- identification of ridge line, valley line, etc. Calculation of volume for cutting & filling using contour map.
- Setting out of Building: Setting out of building on the ground- Methods for setting out buildings by horizontal and vertical control.
- Introduction to Remote sensing and GIS: Introduction to various terminology & reading of map.

### **SUGGESTED BOOKS**

- Surveying Vol -1 by Dr. B. C Punmia
- Surveying and Leveling (Vol -1) by Kanetkar TP and Kulkarni SV
- Surveying and Leveling by S C Rangwala

## **SUBJECT NAME – STRUCTURE II**

**SUBJECT CODE – 3336204**

### **FOCUS:**

To give an insight into the structural behavior of columns and beams. To provide an introduction to design of reinforced concrete structures. Role of Structures in architecture should be taught.

### **CONTENTS:**

- Concrete: Composition, Basics of mix design, water cement ration, strength, durability workability requirements.
- Relevance of RCC in Architectural practice Advantages of RCC over other conventional structural practices. Steel for RCC – Plain & Twisted bars, IS 456 code provisions.
- Working Stress method of design – Basic concept, types of loads, assumptions, calculation of MR for singly RC beam (only).
- Basic concepts of pre-stressed concrete, pre-stressing systems, materials, behavior of pre-stressed concrete beams and losses in pre-stress.
- Introduction to special structural form and basic structural concepts about: shells, folded plates domes, grid structures, flat slabs (RCC), space frames tensile structures and pneumatic structures (no problems to be solved).

### **SUGGESTED BOOKS**

- RCC by H. J. Shah
- RCC by Bhavikatti
- RCC by Jain and Jaikrishna
- RCC by Ramamrutham
- RCC – design and practice by N Krishna Raju and RN Pranesh

## **SUBJECT NAME – CONTEMPORARY ARCH**

### **SUBJECT CODE – 3336205**

#### **FOCUS:**

To develop the appropriate skills of reading, discussion and writing as well as understanding the physical experience of buildings in order to appreciate the complexity of the influences bearing on architecture, as reflected in the major historical periods. Critical appreciation characterized by technology, ornamentation, planning practices & influences in general. To provide an understanding and appreciation of contemporary trends in architecture in India and other part of the world. Detail study of one example.

#### **CONTENTS:**

- Byzantine, Romanesque, Gothic – understanding the architectural features of each through 1 example.
- Renaissance Period – Ex - Villa Rotunda by Palladio,
  - - St Peter's Rome by Michael Angelo & others
  - - St. Paul's London by Sir Christopher Wren
  - - St. Peter's Piazza by Bernini
- Impact of Industrial Revolution on Architecture- The social, Economic and political changes, affected, requirements of the society, new materials and technological development.
- Birth of various styles and movements such as Beaux art, Chicago school, Bauhaus, De Stijl movement, Art Nouveau.
- Impact of various thoughts and globalization on architecture in India and abroad in terms of ideas and directions through the works of outstanding architects with one example of each.
  - Post modernism
  - De constructivism
  - Contemporary vernacular
  - New expressionists.

#### **SUGGESTED BOOKS**

- History of Architecture by Sir Banister Fletcher
- Prehistory to post modernism by Marvin & Isabel
- Meaning in Western Architecture by Christian Norberg-Schulz
- Architecture Through the Ages by Talbot Hamlin
- Architecture : From Prehistory to Post-Modernity by Trachtenberg and Hyman
- Space, Time and Architecture by Sigfried Gideon
- Rethinking Architecture: a reader in cultural theory, Leach, Neil (Ed.)
- When was modernism in Indian art? by Geeta Kapur

## **SUBJECT NAME – BUILDING SERVICES**

**SUBJECT CODE – 3336206**

### **FOCUS:**

To introduce students to various services and to sensitize them with respect to their integration into Architectural Design.

### **CONTENTS:**

- **SERVICES**

- **PART 1 - ELECTRICITY**

- Importance of electrical services in building, introduction to commonly used terminology.
- Basic understanding of supply and distribution of electricity to buildings – transformer alternator (introductory part), low tension panels, generators and overhead versus underground distribution systems, panel boards etc.,
- Internal supply and distribution – brief description of various types of wiring, conduit, PVC casing and capping wiring systems; House wiring- wire thickness, color codes usages, Distribution of power to various appliances
- UPS & Inverters: Necessity & precautions, Online and & Offline uninterrupted power supplies, Types of batteries used.
- Earthing, Protective devices – fuses, MCB, ELCB, lightning arrestor
- Indian Electricity Rules – Relevant codes of Practice

- **PART 2 - LIGHTING**

- Quality and quantity of light;
- Methods and types of lighting ambient, task and accent lighting.
- Systems of luminaries: direct, indirect etc.,
- Various types of electrical lamps – incandescent, fluorescent / CFL, HID's, neon lamps and their lighting characteristics.
- Design considerations for different types of occupancies and task lighting.

- **PART 3 - AIR-CONDITIONING**

- Definitions, advantages and disadvantages, types of air conditioning systems summer. Air distribution system, ducts, air outlets, vents.
- Residential and commercial air conditioning, installation of air conditioning, energy conservation techniques to avoid load on air conditions.
- Basic understanding on its capacity and requirement, and loads working on it.

- **Part – 4 ELEVATORS (LIFTS) AND ESCALATORS**

- Brief History – types of elevators like counter weight and hydraulic elevators.
- Study of Passenger lift, hospital lift, goods lift, service lift or dumb waiters. Civil dimensions of hospital lift, goods lift, passenger lift, and service lift, definitions and components, lift location in building i.e. grouping of lift in building.
- Service requirement, passengers handling capacity. Architects role for installations of elevators or information to be provided by Architect to lift company.

- Escalators: Definition and components, types of Escalators, arrangements in building, Escalator V/s Elevators, capacity size and speed of escalators.
- Relationship of staircases and lifts and their location in plan.
- **PART 5 - FIRE**
- Types of fire, Causes of fire, fire safety in buildings planning stage, classification of building classification of fire zones, brief description of combustible and non-combustible materials in case of fire, fire rating, and fire escape routes and staircase design (NBC Code), active fire control using portable extinguishers, basic concepts in fixed firefighting installations, automatic fire detection and smoke alarm systems, wet risers.
- Rules for fire protection and firefighting requirements for high-rise buildings in India.

- Electrical Technology by H Cotton,
- Light right – TERI Manual
- Basic Electrical Engg. By Anwari
- Building Construction – Sushil Kumar
- Building construction by McKay
- Building construction by Frank Ching