

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN ARCHITECTURE

SECOND SEMESTER(W.E.F. JANUARY 2014)

SUBJECT NAME –DESIGN STUDIO II

SUBJECT CODE – 3326201

FOCUS:

Learning and applying fundamentals of space, form and design methodology. To develop the ability to translate abstract principles of design into architectural solutions for simple problems. Understanding the relation between form and function. Understanding and applying the learning of anthropometry by making a model with furniture layout.

CONTENTS:

- Basic human functions and their implications for space requirements. Minimum and optimum areas for various functions. User's data, movement and circulation diagrams. Spatial interpretations – various activities and their relationship with spaces. Design methodology.
- Case study analysis of small volume buildings, analysis of form, function, clarity.
- Design of a Single volume building should be given from the following: Telephone booth, Food Kiosk, Milk booth, Watch man's cabin with compound gate, Bus Stop, Public Toilets, etc.
- 1 major and 1 minor exercise, along with time problem should be aimed for the semester. Any one project from the above to be given as Time Problem
- Site plans, design developments, final presentation drawings, models to be expected.

SUGGESTED BOOKS

- Architecture –Form, Space & Order by Francis D.K.Ching
- Time Saver Standards for Architectural Design Data by John Hanock,
- Architectural Graphic Standard by Ramsay and Sleeper.
- Neufert Data Standards Ernst Neufert Archon Books
- Building Drawing Shah, Kale, Patki Tata Mcgraw Hill Publishing

SUBJECT NAME – CONSTRUCTION TECHNOLOGY II

SUBJECT CODE – 3326203

FOCUS:

Introduction to types of building materials – natural and manmade and their choices in terms of properties, structural and non-structural. To acquaint the students with all building components.

CONTENTS:

- **MATERIALS**
 - Timber – Quality of timber used in building, defects, seasoning and preservation of timber, types – Natural, hard and softwood, uses of timber for aesthetic & structural purpose
 - Uses of commercial wood in building i.e., plywood, block boards, particleboards, veneers and laminates and other types. Manufacturing processes in brief, their properties and application.
 - Introduction to types, properties, uses and application of non – ferrous metals and glass.

- **CONSTRUCTION**
 - Types of footings and shallow foundations.
 - Walls:
 - Different types of walls and their Construction details
 - Various types of wall finishes, like plastering, painting, cladding, jointing, & pointing etc and their applications.
 - Staircases:
 - Types & construction details of staircases in different materials.
 - Openings:
 - Different types of doors, windows, ventilations and skylights in different materials. and their operational and fixing details.
 - Types & details of building elements like weather shed, balcony, canopy & pergolas.
 - Timber Floors – Single, double and framed floors with joints between joist with wall plate, joist with beam and sub beam with main beam, strutting of joists, use of templates, for support.
 - Timber Trusses – King post and queen post trusses with details of joints, alternative arrangements for tile and sheet roof covering, detail of eaves projection with soft boarding, Alternative detail of gutter at eaves, sprocket joint.

- **SERVICES**
 - **Water supply**
 - Introduction
 - Assessment of water requirements
 - Sources and collection - Sources of supply, Bore wells
 - Purification – Treatment, Water treatment in swimming pools
 - Distribution - Distribution systems, Pipes – laying and jointing, Water pipes – materials(GI, PVC, CPVC/ UPVC pipes, introduction to Copper plumbing), Pipe Accessories, Storage tanks, Pumps

- Water conservation - Rain water Harvesting, Recharging, Recycling and reuse application in planning water supply systems (Urban& rural)
- **Sanitation and Drainage**
- Introduction - Collection and conveyance of Refuse
- House drainage
- Sewers
- Traps
- Sanitary Fittings
- Sewer Accessories
- Disposal and Treatment for urban and rural context - Sewage Treatment, Septic Tanks, Waste and Storm Water Drainage System, Rural sanitation
- **Solid waste management- Types of Garbage,disposal & management – landfills& treatment**
- Site visits on Water treatment plant, sewage treatment plant, multistoried apartments for studying water supply and sanitary arrangements.

SUGGESTED BOOKS

- Construction Building by I , R. Barry
- Building Construction by II, W. B. Mckay
- Building Materials and Components by CBRI Roorkee
- Engineering Materials by Rangwala
- Building Construction by Arora S.P. & Bindra S.P.
- Handbook of Architectural Technology by Cowan Henry J
- Fundamentals of Building Construction by Allen Edward
- National Building Codes
- Sanitary Engineering – (Vol I and II) by RS Deshpande
- Water Supply and Sanitary Engineering by S Birdii
- Water Supply and Sanitary Engineering by Charanjit S Shah (Arch. Handbook series)
- Relevant IS Codes of India
- Water Supply and Sanitary Engineering by S.C. Rangwala

SUBJECT NAME – DESIGN FUNDAMENTALS II

SUBJECT CODE – 3326204

FOCUS:

Understanding and analyzing spatial configuration. To understand the character and component of elements of space/ void as spatial composition. Development of basic design abilities, and learning the Fundamentals of Visual perception and Expressional skills.

CONTENTS:

- Study of various textures and colors with its inherent expressions and effects.
- Study of natural forms like leaf, shell, tomato etc.,
- Application of various materials like Clay, Paper Mache, Timber, Steel etc.
- Application of various graphic techniques and development of abstract reasoning.
- Understanding Principles of visual compositions i.e., Unity, Harmony, Rhythm, Balances etc., scales and proportions
- Introduction to volume, understanding the character if solids and void, 3 dimensional compositions

SUGGESTED BOOKS

- Meaning of Art: Herbert Read by Faber & Faber
- Art in everyday life by Hetta Gol'stir
- Art & Visual Perception by Rudocy Arhhim
- Free Hand Drawing & Self Taught by Arthur Guptill
- Pencil Sketching by Thomas Waug.
- Drawing & Painting Course by Hashmi A.H.
- Form, Space and Order by Ching, Francis D. K. –
- Ways of Seeing by Berger, John
- Rendering with pen and ink by Gill, Robert

SUBJECT NAME – STRUCTURE I

SUBJECT CODE – 3326205

FOCUS:

To give an introduction to the basic principles governing structural systems. Concept of direct force mechanism in structures, concept of resultant force, tension and compression. Equilibrium of forces, concept of structure and tie.

CONTENT:

- Introduction:
 - Introduction Fundamental principles of Engineering Mechanics, Newton's laws of motion, law of parallelogram of forces, principle of transmissibility, concept of rigid body, particle.
- Natural forms :
 - Understanding Nature- a creative base for understanding structure, correlation between natural & manmade structure.
- Forces :
 - Introduction to types of forces, Static loading, Time dependent loading, Impact loading, Cause & effect of various forces like Dead load, Imposed load, Wind load, Earthquake load, Hydrostatic load, erection force etc on building. Effect of physical form on load transfer i.e. Forces acting through point, distributed forces on line, & area.
- Force systems :
 - Free body diagram, Resolution of forces into components, Types of force systems, concurrent, coplanar, non concurrent etc. forces in plane & space.
 - Calculation of resultant for coplanar parallel & coplanar concurrent force system, calculation of moment.
- Equilibrium:
 - Introduction to Equilibrium, Conditions of equilibrium for the coplanar parallel & coplanar concurrent force system, Types of supports, Determinacy, &
 - Stability, Basic behavior of elements in load transfer i.e. bending, torsion, shear, tension, compression etc.
- Tension and Compression
 - Introduction as a flexural element, simply supported, overhanging & cantilever beams, determinacy, calculation of Reaction at supports for beam, Application.
 - Introduction, Types of truss, Analysis of a plane truss. Use of graphical method.
 - Introduction to space truss, Application.
- Simple Stresses and Strains – Concept of Deformable Bodies, Types of Stress (compressive, tensile, bending, shear) and strain (axial, shear, volumetric). Simple problems.
- Bending Moment and Shear Force Diagrams – Concept of Shear force and bending moment. BMD and SFD for statically determinate beams subjected to combinations of concentrated and uniformly distributed load.
- Relationship among Load, Shear force and Bending Moment.

SUGGESTED BOOKS

- Vector mechanics for engineers- statics by Bear & Johnston
- Engineering Mechanics, statics & Dynamics by Desai & Mistry
- Applied Mechanics by Junarkar & H.J. Shah
- Seeking structure from nature by Jeffery Cook
- Strength of Material – RK Bansal, Laxmi Publications, New Delhi, Third Edition
- Application Mechanics and Strength of Materials by IB Prasad

SUBJECT NAME – HISTORY OF INDIAN ARCH

SUBJECT CODE – 3326206

FOCUS:

Acquiring knowledge regarding various architectural styles of ancient India and their historic evolution with respect to factors influencing them e.g. climate, geographical location, culture, construction technology, etc. 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.
- Detail study of one example

CONTENTS:

- Ancient Indian Architecture
- Architecture of Buddhist period
- Rock Cut Architecture
- Temple Architecture
- Islamic Architecture (Indo-Sarcanic Architecture)

SUGGESTED BOOKS

- Indian Architecture, Hindu & Buddhist by Percy Brown Taraporewala Publications
- Indian Architecture – Islamic by Percy Brown Taraporewala Publications
- Indian Architecture – Islamic by Grover Satish Vikas Publishing House
- History of Architecture by Sir Banister Fletcher
- Prehistory to post modernism by Marvin & Isabel

SUBJECT NAME – CAD I

SUBJECT CODE – 3326202

FOCUS:

To develop skills required for preparation of two-dimensional drawings with the use of computer as a digital media for architectural design drawings.

CONTENTS:

- Introduction to computers
- Introduction to filing, MS Word, Excel etc
- Power point presentation
- 2D drawing in Auto-CAD.
 - Management of line weight, Layers, etc.
 - File management
 - Preparation of Professional drawings & printouts

SUGGESTED BOOKS

- A primer on computer aided engineering drawing by VTU