ANNA UNIVERSITY, CHENNAI 600 025
UNIVERSITY DEPARTMENT
REGULATIONS - 2012
B.ARCH DEGREE PROGRAMME
I TO X SEMESTERS CURRICULA AND SYLLABI

SEMESTER I

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#### SEMESTER IX AND X

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**Note:** L – Lecture period T- Tutorial Period P- Practical period / S – Studio period C – Credits

### B.Arch. Degree Programme – Regulations R 2012
**Consolidated statement of Total Credits in each Semester**

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OBJECTIVES
- Identifying practical problems to obtain solutions involving trigonometric and exponential functions.
- Studying the properties of lines and planes in space, along with sphere and providing a tool to understand 3D material.
- Understand functions of more than one variable, along with differentiation under integral sign.
- Solving differential equation of certain type.
- Analysing data collection and interpretation of results using statistical tools.

UNIT I TRIGONOMETRY AND MENSURATION
- Trigonometric (sine, cosine and tan functions) and exponential functions, De-Moiver’s theorem.
- Area of plane figures, computation of volume of solid figures.

UNIT II THREE DIMENSIONAL ANALYTICAL GEOMETRY
- Direction cosines and ratio’s – Angle between two lines – Equations of a plane – Equations of a straight line – Coplanar lines – Shortest distance between skew lines – Sphere – Tangent plane – Plane section of a sphere.

UNIT III INTEGRATION AND FUNCTIONS OF TWO VARIABLES
- Integration of rational, trigonometric and irrational functions, properties of definite integrals, Reductions formulae for trigonometric functions, Taylor’s Theorem - Maxima and Minima (Simple Problems).

UNIT IV ORDINARY DIFFERENTIAL EQUATIONS
- Linear equations of second order with constant coefficients – Simultaneous first order linear equations with constant coefficients – Homogeneous equation of Euler type – Equations reducible to homogeneous form.

UNIT V BASIC STATISTICS AND PROBABILITY
- The arithmetic mean, median, mode, standard deviation and variance - Regression and correlation - Elementary probability - Laws of addition and multiplication of probabilities - Conditional probability – Independent events.

TOTAL: 45 PERIODS

OUTCOMES
The aim of the course is to develop the skills of the students in architectural drawing. The students will be trained on the basis of the topics of Mathematics necessary for effective understanding of architecture subjects. At the end of the course, the students would have an understanding of the appropriate role of the mathematical concepts learnt.

TEXT BOOK:

REFERENCES:
OBJECTIVES:

- To inform about the development of architecture in the Ancient Western World and the cultural and contextual determinants that produced that architecture.
- To understand architecture as evolving within specific cultural contexts including aspects of politics, society, religion and climate.
- To gain knowledge of the development of architectural form with reference to Technology, Style and Character in the prehistoric world and in Ancient Egypt, West Asia, Greece and Rome.

UNIT I  
PREHISTORIC AGE

UNIT II  
ANCIENT RIVER VALLEY CIVILIZATIONS: EGYPT
Landscape and culture of Ancient Egypt – history – religious and funerary beliefs and practices – monumentality – tomb architecture: evolution of the pyramid from the mastaba – temple architecture: mortuary temples and cult temples

Great Pyramid of Cheops, Gizeh – Temple of Ammon Ra, Karnak – Temple of Abu Simbel (Rock Cut)

UNIT III  
ANCIENT RIVER VALLEY CIVILIZATIONS: MESOPOTAMIA

Ziggurat of Ur, Urnamu – Palace of Sargon, Khorsabad – Palace at Persepolis

UNIT IV  
CLASSICAL PERIOD: GREECE

UNIT V  
CLASSICAL PERIOD: ROME


TOTAL: 45 PERIODS

OUTCOMES:

- A detailed understanding of Western (Christian) architecture.
- An understanding about the spatial and stylistic qualities associated with church architecture
- An idea about Chennai Christian Architecture with the help of assignments.
- An Understanding of the architecture as an outcome of various social, political and economic upheaveals, and as a response to the cultural and climate conditions.
REQUIRED READINGS:
3. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994.

REFERENCES:

AR8103 THEORY OF ARCHITECTURE - I L T P/S C 3 0 0 3

OBJECTIVES:
- To introduce the various facets of architecture and its influencing factors.
- To introduce the formal vocabulary of architecture as one of the ways to experience the built environment.
- To understand and appreciate the universals of architectural form and space in terms of elements and principles within particular historical, cultural and geographic contexts.

UNIT I INTRODUCTION TO ARCHITECTURE 8

UNIT II ELEMENTS OF ARCHITECTURE 7
Understanding fundamental elements such as point, line, plane, form and space, shape, pattern, light, colour, surface and texture with reference to the evolution of architectural form and space.

UNIT III ELEMENTS OF ARCHITECTURE – FORM 9
Understanding perceptual effects of specific geometric forms such as sphere, cube, pyramid, cylinder and cone and its sections as well as their derivatives with respect to the evolution of architectural form and space.

UNIT IV ELEMENTS OF ARCHITECTURE – SPACE 9

UNIT V PRINCIPLES OF ARCHITECTURE 12
Understanding fundamental principles such as proportion, scale, balance, symmetry/asymmetry, rhythm, axis, hierarchy, datum, unity, harmony, dominance, climax – Movement with reference to the architectural form and space – detailed study of relationship between architectural form and circulation – Types of circulation – Building approach and entrance, path configuration and form, path space relationship, orientation.

TOTAL : 45 PERIODS
OUTCOMES
• A thorough understanding on the definition of architecture; elements of architectures of form and space.
• An exposure to the principles of architecture and applications of the same in buildings.

REQUIRED READINGS:

REFERENCES:
2. Peter von Meiss – Elements of architecture – from form to place, Spon Press 1977

AR8104 BUILDING MATERIALS I L T P/S C
3 0 0 3

OBJECTIVES:
• To have an understanding of the properties, characteristics, strength, manufacture, processing and application of materials such as soil, lime, rocks and stones.
• To inform the properties, characteristics and use of bamboo, palm, straw, etc. and methods of preservation and treatment.
• To sensitize the students to the use of these naturally occurring materials in the context of creating a green architecture.

UNIT I SOILS 9
Fundamentals of Soil Science, Types of soils, Principles of Soil Stabilization, Characterstics of core, Types of Stabilizers, Requirements and Types of mudwall building and surface protection.

UNIT II LIME 8
Types of lime, Classification of lime, comparison between fat lime and hydraulic lime, Manufacturing process slaking, Hardening – Testing and Storage, Lime putty, Precautions in handling and uses of lime.

UNIT III BAMBOO AND OTHER MATERIALS 10
Bamboo – Bamboo as plant classification, species, geographical distribution, Anatomy of Bamboo, Properties, strength, processing, harvesting, working of Bamboo tools – Treatment and preservation of Bamboo and uses of Bamboo. Cane, gate, coir, coconut - Growth, Form, Shape, Leaves, Flowering, Propagation Roofing materials – Thatch, grass, Bamboo, reeds – Basics – Case studies and applications.

UNIT IV STRAW BALES 6
Straw as a building material-physical aspects - Basics, Fire, moisture, insects and pests proof. Plastering straw bale walls, straw bale roof.
UNIT V
ROCKS AND STONES

OUTCOMES:
Students get sensitized about the need for using ecological materials to create apeen architecture which will adapt itself to the surrounding environment. In this process students learn about materials, properties characteristics, methods of preservation, treatment and methods of construction and uses of materials.

REQUIRED READINGS:

REFERENCES:
UNIT V  MEASURED DRAWING
Introduction to fundamentals of measured drawing, line value, lettering, drawing representation, format for presentation methods and technique of measuring buildings and their details. Measured drawing of simple objects like furniture, detailing in terms of construction, ornamentation, measured drawing of building components like column, door, window, cornice, etc.

TOTAL : 75 PERIODS

OUTCOMES
• An understanding on the concepts of architectural drawing as well as representation skills are imparted.
• An understanding on the building representation in 2D and 3D among students in addition to preparation of measured drawing.

REQUIRED READINGS
3. Fraser Reekie, Reekie’s Architectural Drawing, Edward Arnold, 1995

REFERENCES:

AR8112  ART STUDIO  L  T  P/S  C
0  0  5  3

OBJECTIVES:
• To develop presentation skills, visual expression and representation, imaginative thinking and creativity through a hands on working with various mediums and materials.
• To familiarize the students with the various mediums and techniques of art through which artistic expression can be achieved.
• To familiarize students with the grammar of art by involving them in a series of free hand exercises both indoor and outdoor to understand form, proportion, scale, etc.
• Involving them in a series of exercises which will help them experiment with form and volume.
• To involve students in a series of exercises which will look at graphic and abstract representations of art.

UNIT I  DRAWING
Introduction to art – Elements and principles of drawing – Types of drawing – Visual effects of drawing – Scale drawing – Composition – Approach to sketching – Study of light, shade and shadow.


UNIT II  PAINTING I

UNIT III  PAINTING II
UNIT IV  SCULPTURE
Introduction of sculpture – Sculpture using various materials such as clay, plaster of Paris, paper mache, and wire.

UNIT V  APPLIED ART
Graphic representations – Visual composition and Abstraction- Exercises involving Logo design, collage, calligraphy and printing.

OUTCOMES
- The students are exposed to various mediums and techniques.
- Bold enough to handle to the colours for the presentation sheets.
- The students are mastery in sketching and expression through forms.
- The skill and knowledge gained through the subject is most useful to their profession

REQUIRED READINGS

REFERENCES:

AR8113  BASIC DESIGN  L T P/S C
0 0 12 6

OBJECTIVES:
- To understand the elements and principles of Basic Design as the building blocks of creative design through exercises that will develop the originality, expression, skill and creative thinking.
- To involve students in a number of exercises to understand the grammar of design and visual composition.
- To enable the understanding of 3 D Composition by involving students in a number of exercises which will help generation of a form from a two dimensional / abstract idea.
- To enable the understanding of the relationship between the grammar of design and architecture by involving the students in seminars/ workshops and simple exercises which will look at building form analytically.

CONTENT:

The course shall be conducted by giving a number of exercises in the form of design studios, seminars and creative workshops that are aimed at teaching the following:

i) Elements and Principles of Visual Composition using point, line, shape.
ii) Exploring colour schemes and their application in a visual composition and in Architectural forms and spaces.
iii) Study of texture and schemes of texture both applied and stimulated and their application.
iv) Study of linear and Planar forms using simple material like Mount Board, metal foil, box boards, wire string, thermocol etc.
v) Study of Solids and voids to evolve sculptural forms and spaces and explore the play of light and shade and application of color.
vi) Study of fluid and plastic forms using easily mouldable materials like clay, plaster of paris etc.
vii) Analytical appraisal of building form in terms of visual character, play of light and shade, solids and voids etc.

OUTCOMES
- An understanding of the qualities of different elements as well as their composite fusions.
- An ability to engage and combine the elements of design in spontaneous as well as intentional ways in order to create desired qualities and effects.

REQUIRED READINGS:

REFERENCES:

AR8201 MECHANICS OF STRUCTURES I

OBJECTIVES:
- To enable a student to understand the effect of action of forces on a body and the concept of equilibrium of the body through exercises.
- To determine the internal forces induced in truss members due to external loads by working out problems.
- To calculate the sectional properties (centroid, moment of inertia, section modulus and radius of gyration) for various sections by working out problems.
- To study the stress – strain behaviors of steel and concrete due to axial loads and to determine the stresses and strains developed in solids due to external action through select problems.
- To derive the relationship between elastic constants and solving problems.

UNIT I FORCES AND STRUCTURAL SYSTEMS
Types of force systems - Resultant of forces-Lami’s theorem- principle of moments varignon’s theorem - principle of equilibrium (no reaction problems) - simple problems

UNIT II ANALYSIS OF PLANE TRUSSES
Introduction to Determinate and Indeterminate plane trusses - Analysis of simply supported and cantilevered trusses by method of joints.
UNIT III PROPERTIES OF SECTION

UNIT IV ELASTIC PROPERTIES OF SOLIDS
Stress strain diagram for mild steel, High tensile steel and concrete - Concept of axial and volumetric stresses and strains. (excluding composite bar)

UNIT V ELASTIC CONSTANTS
Elastic constants - Relation between elastic constants - Application to problems.

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
- Apply the concepts of action of forces on a body and should be able to apply the equilibrium concepts.
- Analyze any type of determinate trusses with different end conditions.
- To solve the sectional properties for any geometrical shapes.
- The concepts of elastic constants and its applications for various types of problems with a thorough understanding of stresses and strain.

REQUIRED READINGS

REFERENCES:

AR8202 HISTORY OF ARCHITECTURE AND CULTURE - II

OBJECTIVES:
- To understand Indian architecture as evolving within specific cultural contexts including aspects of society, religion, politics and climate
- To gain knowledge of the development of architectural form with reference to technology, style and character in the Indus valley Civilization, Vedic period and manifestation of Buddhist and Hindu architecture in various parts of the country.

UNIT I ANCIENT INDIA

UNIT II BUDDHIST ARCHITECTURE
UNIT III EVOLUTION OF HINDU TEMPLE ARCHITECTURE
Hindu forms of worship – evolution of temple form - meaning, symbolism, ritual and social importance of temple - categories of temple - elements of temple architecture - early shrines of the Gupta and Chalukyan periods

UNIT IV TEMPLE ARCHITECTURE - SOUTHERN INDIA

UNIT V TEMPLE ARCHITECTURE - NORTHERN INDIA
Temple architecture of Gujarat, Orissa, Madhyapradesh and Rajasthan - their salient features Lingaraja Temple, Bhuvaneswar - Sun temple, Konarak. - Somnatha temple, Gujarat, Surya kund, Modhera Khajuraho, Madhyapradhes - Dilwara temple, Mt. Abu

OUTCOMES
• The students understood Indian architecture as a response to the political and socio cultural conditions present in India at different points of time.
• The architectural responses were understood with respect to technology style and character

REQUIRED READINGS:
1. Percy Brown, Indian Architecture (Buddhist and Hindu Period), Taraporevala and Sons, Bombay, 1983.

REFERENCES:
3. V.R. Parameswaranpillai, Temple culture of south India, Inter India Publications, 1985
5. D.Raphael, Temples of Tamil Nadu; Works of Art, Fast Print Service Pvt Ltd., 1996.

AR8203 THEORY OF ARCHITECTURE - II

OBJECTIVES:
• To introduce factors that lending meaning to architecture, expression, communication.
• To understand architecture as a product of historical context through introduction to aspects of style, character and architectural movements
• To understand the generation of individual meaning in architecture through study of philosophies/theories and exemplary works of architects
• To introduce thorough case studies, tools for representing, analyzing and interpreting architecture.
• To actually learn to represent, analyze and interpret the architectural experience holistically through live case studies

TOTAL: 45 PERIODS
UNIT I MEANING IN ARCHITECTURE
Architecture as a vehicle of expressing, symbolism and communication- Illustrative examples

UNIT II ARCHITECTURAL CHARACTER
Ideas of character, style, architectural movement: Illustrative examples across various periods in history.

UNIT III WORKS OF ARCHITECTS
Role of individual architects in the generation of architectural form, through study of exemplary works, architectural inspirations, philosophies, ideologies and theories of architects.

UNIT IV ANALYZING ARCHITECTURE
Introduction to modes of understanding architecture in totality in terms of the various aspects studied before in the subject – understanding how case studies have used representational, analytic and interpretational tools

UNIT V EXPERIENCING ARCHITECTURE
Understanding architecture in totality in terms of the various aspects studied in this course firsth and experience, analysis and interpretation of building

TOTAL: 45 PERIODS

OUTCOMES
• An understanding the meaning of character and style of buildings with examples
• An exposure to students on ideologies and philosophies of architectures of contemporary architects through examples.
• An exposure to analysis and experience of architecture through case studies

REQUIRED READING
1. Yatin Pandya, Elements of Space making, Mapin 2007
5. HazeJ Conway, Rowan Roenisch, Understanding Architecture, Routledge 2005

REFERENCES
1. Anthony Antoniades, Poetics of architecture - Theory of design, Wiley 2008
2. Steen Eiler Rasmussen - Experiencing architecture, MIT Press 1964
3. Peter von Meiss -Elements of architecture - From Form to Place, Span Press 1992

AR8204 BUILDING MATERIALS II L T P/S C
3 0 0 3

OBJECTIVES:
• To have an understanding of the properties, characteristics, strength, manufacture, processing and application of materials such as brick and other clay products.
• To inform the properties and characteristics of timber, its conversion, preservation and uses.
• To inform of the various market forms of timber, their production, properties and application in the building industry.
UNIT I  BRICKS  10
Classification of bricks including bricks substitutes like fly ash bricks, characteristics, ingredients of bricks – Manufacture of bricks – Forms of bricks – Testing of bricks – Storing – Light weight bricks – Case studies and application. Light weight bricks.

UNIT II  CLAY PRODUCTS  12
Manufacture of burnt clay bricks, paving bricks, hollow bricks – terracotta, porcelain, stoneware, earthenware Glazing and their uses – Glazed ceramic tiles, Fully vitrified tiles, Ceramic sanitary appliances, Stoneware pipes and fittings.

Roofing materials - Manufacture of Mangalore tiles, pot tiles, pan tiles – Case studies and application.

UNIT III  TIMBER  8
Classification of trees, structure of trees, Defects in timber, Storage of timber, Uses of timber, characteristics, seasoning of timber, Defects and diseases, Decay of timber, Preservation, Fire resistance, Conservation of timber,

UNIT IV  TIMBER PRODUCTS  8
Market forms of timber, Industrial timber, - Veneers and Veneer Plywoods, Particle board, Hard board, Fibre board, Block board and Lamin boards, Laminates, advantages and Blockboard uses.

UNIT V  PAINTING AND VARNISHING IN TIMBER  7
Composition, characteristics, preparation, Primer, Painting different surfaces. Enamels, Paint, Varnishing – types of varnishing Miscellaneous paints, defects, uses and cost of materials.

TOTAL: 45 PERIODS

OUTCOMES
• Students get sensitized about the use of Brick, Timber, Timber products, painting and application in building industry students learn about making and manufacturing process of brick, properties, methods of preservation and treatment, methods of construction and uses of brick, timber, timber products and constituents of paints, preparation and surface application of paints.

REQUIRED READINGS

REFERENCES:

AR8211  BUILDING CONSTRUCTION I  L T P/S C  0 0 5 3

OBJECTIVES
• To involve students in a number of drawing exercises that will analyze the various building components in a simple load bearing structure.
• To involve students in a number of drawing exercises that will look at the design and detail of simple structures using naturally occurring materials such as mud, bamboo, straw, etc.
• To involve students in a number of drawing exercises that will look at the design and detail of various building components in a simple load bearing structure using stone.
UNIT I  INTRODUCTION
Functional requirements of building and its components, introduction to concept of load bearing and framed structures. Exercises – involving the same.

UNIT II  SOILS
Detailing of walls, roofs, flooring and foundations using soils (rammed earth, compressed blocks). Design exercises using soil for building components in small scale buildings like laborer’s house, art centre, snack bar including detailing of arches, walls, door and window openings and understanding of the same through case studies.

UNIT III  BAMBOO
Design and Construction Techniques using bamboo for building components for small scale buildings like snack bar, tree house including detailing of doors and windows, arches, barrel walls, weave structures and understanding of the same through case studies.

UNIT IV  STRAW BALES
Design Exercises : using straw bales for building components for Load bearing, Post and Beam systems, Foundations systems, Roofing options, plastering, door and window detailing for small scale buildings and understanding of the same through case studies

UNIT V  STONE
Design Exercises – Using stone (Ashlar, rubble etc.,) for building components including detailing of arches, corbels, coping, sills, lintels, corbels, arches, cladding in small scale buildings like classrooms, library and community hall and understanding the same through case studies

TOTAL: 75 PERIODS

OUTCOMES
Students learn about making of the building using mind, Bamboo, Straw bale, stone through drawing as well as doing a literature or live case study. It is required that students submit a case study example to understand materials used in the building, method of construction etc. After this stage students are requested to submit drawing plates constructing of plan, Elevation and section along with sketches and details showing method of construction.

REQUIRED READINGS:

REFERENCES:

AR8212  ARCHITECTURAL DRAWING II

OBJECTIVES:
- To involve students in a number of exercises that will help them develop the skill of representation in advance drawing techniques involving perspective and sciography.
- To involve students in a number of exercises that will help to understand the measured drawing method to document buildings of architectural interest using simple and advance techniques of representation.
UNIT I  SCIOGRAPHY  10

UNIT II  PERSPECTIVE: SCIENTIFIC METHOD  25
Characteristic of perspective drawing. Concepts and methods of perspective drawing. One point and two point perspective of simple geometrical shapes like cube, prism, combination of shapes, simple one, two and three-point perspective of building interiors and exteriors. Adding of figures, trees furniture etc., shade and shadows and applying rendering techniques.

UNIT III  PERSPECTIVE: SHORT CUT METHOD  15
Introduction to short cut perspective method. Adding of figures, trees furniture etc., shade and shadows and applying rendering techniques.

UNIT IV  MEASURED DRAWING: HISTORIC DOCUMENT STUDY  10
Combined study of historic document along with small building by using simple measuring tools like tapes, photograph etc.

UNIT V  MEASURED DRAWING: DOCUMENTATION  15
Documentation of a complete building of a special interest in terms of history, building construction, architectural excellence or technology.

TOTAL: 75 PERIODS

OUTCOMES
• The techniques and skills gained learned through this subject Architectural drawing II is very useful to their profession
• Able to construct the perspective drawings of the buildings and 3d views as well the documentation of buildings through drawings.

REQUIRED READINGS:

REFERENCES:
I. MEASURED DRAWING

II. PERSPECTIVE

III. SCIOGRAPHY
OBJECTIVES:
- To enable the conceptualization of form, space and structure through creative thinking and to initiate architectural design process deriving from first principles.
- To involve students in a design project(s) that will involve simple space planning and the understanding of the functional aspects of good design.
- To involve students in a small scale building project(s) which will sensitize them to intelligent planning that is responsive to the environmental context.
- To involve students in building case study by choosing appropriate examples to enable them to formulate and concretize their concepts and architectural program.
- To engage in discussion and analytical thinking by the conduct of seminars/ workshops.
- To enable the presentation of concepts through various modes and techniques that will move constantly between 2D representation and 3D modeling.

CONTENT:
Scale and Complexity: projects involving small span, single space, single use spaces with simple movement, predominantly horizontal, as well as simple function public buildings of small scale; passive energy

Areas of focus/ concern:
- architectural form and space
- aesthetic and psychological experience of form and space in terms of scale, colour, light, texture, etc.,
- function and need: user requirements, anthropometrics, space standards, circulation
- image and symbolism

Typology/ project: bedroom, bathroom, kitchen, shop, exhibition pavilion, children’s environment, snack bar, residence, petrol bunk, fire station.

OUTCOMES
- The students shall understand the basic functional aspect of designing simple building type and its relevant spatial organization
- The students shall be learn to reciprocate and sensitize the design/concept to the environment and the design skill of the project.

TOTAL: 180 PERIODS

REQUIRED READING:

REFERENCES:
OBJECTIVES:
To enable a student to understand the basic concepts of shear force and bending moment acting on beams subjected to various loading conditions through exercises.
• To determine the stresses in beams and strength of sections by working out problems.
• To calculate deflection of beams using methods.
• To study the theory of columns by working out problems.
• To understand the concept of inter determine structure and its analysis.
• Case studies and Models wherever feasible.

UNIT I SHEAR FORCE AND BENDING MOMENT 10
Basic concepts – shear force and bending moment diagrams for cantilever and simply supported beams subjected to various types of loadings (Point loads, uniformly distributed loads) – Over hanging simply supported beams – Point of contra flexure

UNIT II STRESSES IN BEAMS 10
Theory of simple bending – Bending stress distribution – Strength of sections – Beams of composite sections (Flitched beams) – Shearing stress distribution in beam sections

UNIT III DEFLECTION OF BEAMS 10
Slope and deflection at a point–Double Integration method and Macaulay’s method for simply supported and cantilever beams

UNIT IV COLUMNS 10
Short and long columns – Concept of Elastic stability – Euler’s theory – Assumptions and Load carrying capacity of Columns with different end conditions – Concept of Effective length – Slenderness ratio – Limitations of Euler’s theory – Rankine’s formula.

UNIT V STATICALLY INDETERMINATE BEAMS 5
Introduction – Determination of degree of statically indeterminacy for beams and frames – Concept of Analysis (No Problems)

TOTAL: 45 PERIODS

OUTCOMES
At the end of the course, the student should be able to:
• Apply the concepts of determining the techniques of finding the stresses.
• Use the theory of simple bending theory to find the deflection in beams.
• Analyze and solve the different types of columns.
• Analyze the different types of indeterminate beams.

REQUIRED READING:

REFERENCES:
OBJECTIVES:

- To understand Church architecture as evolving within specific cultural contexts including aspects of society, religion, politics and climate.
- To gain knowledge of the development of architectural form with reference to technology, style and character in the Western World through the evolution of the church from early Christian times up to the Renaissance period.

CONTENT:

UNIT I  EARLY CHRISTIAN  6
Birth and spread of Christianity – transformation of the Roman Empire – early Christian worship and burial.

Church planning – basilican concept: St. Clement, Rome; St. Peters Rome, - Centralized plan concept: S. Vitale, Ravenna; S. Hagia Sophia, Constantinople; St. Marks, Venice.

UNIT II  EARLY MEDIEVAL PERIOD  9


UNIT III  LATE MEDIEVAL PERIOD  9

UNIT IV  RENAISSANCE AND MANNERIST  12

UNIT V  BAROQUE AND ROCOCO  9
Protestantism – Counter Reformation – French Revolution – Monarchy and growth of nations.


TOTAL: 45 PERIODS

OUTCOMES:

- A detailed understanding of Western (Christian) architecture.
- An understanding about the spatial and stylistic qualities associated with church architecture
- An idea about Chennai Christian Architecture with the help of assignments.
- An Understanding of the architecture as an outcome of various social, political and economic upheaveals, and as a response to the cultural and climate conditions.

REQUIRED READINGS:
REFERENCES:
4. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994

AR8303 CLIMATE AND BUILT ENVIRONMENT

OBJECTIVES:
• To study human heat balance and comfort.
• To familiarize students with the design and settings for buildings for daylight and factors that influence temperature
• To inform about the air pattern around buildings and the effect of wind on design and siting of buildings
• To expose the students to the various design strategies for building in different types of climatic zones.

UNIT I CLIMATE AND HUMAN COMFORT

UNIT II DESIGN OF SOLAR SHADING DEVICES

UNIT III HEAT FLOW THROUGH BUILDING ENVELOPE CONCEPTS
The transfer of heat through solids – Definitions – Conductivity, Resistivity, Specific heat, Conductance, Resistance and Thermal capacity – Surface resistance and air cavities – Air to air transmittance (U value) – Time lag and decrement – Types of envelopes with focus on glass.

UNIT IV AIR MOVEMENT DUE TO NATURAL AND BUILT FORMS
The wind – The effects of topography on wind patterns – Air currents around the building – Air movement through the buildings – The use of fans – Thermally induced air currents – Stack effect, Venturi effect – Use of court yard.

UNIT V CLIMATE AND DESIGN OF BUILDINGS
Design strategies in warm humid climates, hot humid climates, hot and dry climates and cold climates – Climate responsive design exercises

OUTCOMES
• Understanding of Thermal balance in Human beings
• Designing Climate responsive structure
• Conceptual understanding of Air flow in Buildings

REQUIRED READINGS:
REFERENCES:

AR8304 BUILDING MATERIALS III L T P/S C 3 0 0 3

OBJECTIVES:
- To have an understanding of the properties, characteristics, strength, manufacture, processing and application of materials such as cement, glass, paints and other finishing materials.
- To inform about the properties, characteristics and use of concrete in construction including its manufacture
- To inform about the properties, characteristics and manufacture of various type of concrete using aggregates.

UNIT I REQUIREMENTS OF INGREDIENTS FOR MORTAR/ CONCRETE 6
Cement: definition, composition, strength, properties, manufacture, test for cement, types of cement

Sand : sources, impurities, classification, tests for bulking of sand, quality of sand Coarse aggregate : Sources, shape, size, grading, sampling and analysis, impurities Water: sources, requirements, water quality, tests

UNIT II CEMENT CONCRETE AND ITS MANUFACTURE 6
Definition, properties, specification, proportioning, water-cement ratio, workability, curing, water-proofing, guniting, special concretes.
Manufacture, construction of formwork, placing, quality assurance testing, fabrication, incorporation of steel in concrete.

UNIT III TYPES OF CONCRETE AGGREGATES AND CONCRETE 9
Lightweight aggregates, aerated concrete, no-fines concrete, polymer concrete, RCC, pre-stressed concrete, fibre-reinforced concrete, ready-mixed concrete

UNIT IV SURFACE FINISHING, FLOORING AND DAMP-PROOFING 12
Surface finishing: Smooth finishes, textured finishes, ribbed, etched, exposed aggregate finish-weathering of finishes- external renderings- roughcast, dry dash, textured, stucco, gypsum and POP applications, protective and decorative coatings.
Paints- properties and defects in paints, enamels, distemper, plastic emulsion, special paints-fire retardant, luminous and bituminous paints.

Materials for damp-proofing and water-proofing concrete structures: Hot and cold applications, emulsified asphalt, vinyl, epoxy resins, chemical admixtures, bentonite clay etc.- properties, uses and cost of materials.

Types of flooring- laying methods for marble, mosaic, and terrazzo, plain cement flooring, flooring stones & tiles.
UNIT V  GLASS
Composition of glass, brief study on manufacture, treatment, properties and uses of glass. Types of glass - float glass, cast glass, glass blocks, foamed glass. Decorative glass, solar control, toughened glass, wired glass, laminated glass, fire-resistant glass, glass blocks, structural glass - properties and application in building industry, glazing and energy conservation measures.

TOTAL: 45 PERIODS

OUTCOMES:
This subject helps the students to understand the properties characteristics. Strength, manufacturing process of various construction materials. Which in turn help them to choose the suitable materials according to the contact – In response to the surroundings.

REQUIRED READING:
1. M.S.Shetty, Concrete Technology, S.Chand & Co.ltd, New Delhi, 1986.

REFERENCES:

AR8305  COMPUTER AIDED VISUALISATION

OBJECTIVES:
- To introduce Computer operation principles and explore image editing through a visual composition using graphics.
- To impart training in Computer aided 2D drafting and 3D Modeling through projects
- To enable the rendering of a building so as to create a photo realistic image.

UNIT I  INTRODUCTION TO COMPUTER AND IMAGE EDITING
Technology of small computer system, computer terminology operation principles of P.C., introduction to application software, and graphic system, and use of printers, scanner, plotter, File management, etc. Understanding Bitmap images and Vector Graphics, Image size and Resolution. Basic Tools for Editing and Creating Graphics.

UNIT II  THE BASICS OF BUILDING MODELLING
Creating a basic floor plan, About Temporary Dimensions, Adding and Modifying Walls, Working with Compound Walls, Using Editing Tools, Adding and Modifying Doors, Adding and Modifying Windows

UNIT II  VIEWING THE BUILDING MODEL
Understanding the drawing unit’s settings, scales, limits, drawing tools, drawing objects, object editing, and text, dimensioning. Transparent overlays, hatching utilities, line type, line weight and colour. Multiline, Polylines, etc. Styles, blocks and symbol library.

UNIT IV  INTRODUCTION TO 3D MODELLING
Project: Create 3D sculpture using 3D primitives (cubes, spheres etc.)
Tools: Slide facilities script attributes, V-port, editing session. Introduction to 3D-modelling technique and construction planes, drawing objects, 3D surfaces setting up elevation thickness and use of dynamic projections. Solid modeling with primitive command and Boolean operation.
UNIT V  3D RENDERING AND SETTING

Project: Visualize a building. Explore the potential of lights and camera and use the same in the model created for the final submission.

Tools: Rendering and scene setting to create a photo realistic picture, understanding material mapping, environment setting and image filling. Exercise to identify and visualize a building using the above said utilities.

TOTAL: 75 PERIODS

OUTCOMES:

• The students benefit by learning software which helps them to better visualize complicated forms and also helps in producing photo realistic images of those 3D forms.

REQUIRED READING:


REFERENCES:

1. The Illustrated AutoCAD 2002 Quick Reference, Ralph Grabowski.

AR8311  BUILDING CONSTRUCTION II  L T P/S C
0 0 5 3

OBJECTIVES

• To understand both in general and in detail the methods of construction by using basic materials such as brick; clay products and natural timber for both structural and non-structural components.

• To understand both in general and in detail the methods of construction by using man-made timber products such as ply wood.

• To understand the quality assurance measures and testing procedures related to material, workmanship and performance for the topics discussed.

UNIT I  BRICKS & CLAY PRODUCTS

BRICKS

Basics of brick bonding principles, exercises involving different types of brick bonding. Design and construction of various structural components using bricks in single or (Ground+1) buildings – small house, community hall, snack bar etc. and understanding the same through case studies including methods of construction of various non-structural building components such as partition walls, screens, compound walls, parapets, coping - understanding the same through exercises and case studies.

CLAY PRODUCTS

Design exercises using clay blocks for flooring, roofing and walling in single or (Ground+1) buildings including detailing of Mangalore tiles, pot tiles, pan tiles roofing - understanding the same through exercises and case studies.

UNIT II  TIMBER JOINERY

Methods of construction using natural timber in joinery works including methods of fixing and options for finishing - Windows (panelled, louvered, glazed and sliding windows) - Doors (panelled, glazed, sliding, sliding/folding, louvered and pivoted) – Ventilators (top hung, bottom hung, pivoted, louvered, and glazed) – Hardware for doors, windows and ventilators - Exercises involving the above through drawings and application of the above for a single or (G+1) building with schedule of joinery.
UNIT III  TIMBER WALLS, FLOORS, TRUSSES AND STAIRCASES 10
Methods of construction using natural timber in various structural components of the building such as walls, floors, roof trusses - Exercises involving the above through case studies - Types of timber staircases. Methods of construction of timber staircases- basic principles and design details including detailing of handrail and baluster- Exercises involving the above through drawings.

UNIT IV  TIMBER PARTITIONS, PANELLING, FLASE CEILING 20
Methods of construction using man-made timber products such as ply woods, block boards, etc., in fixed partitions, sliding/folding partitions, wall panelling, false ceiling - Exercises of the above through drawings and case studies.

UNIT V  GLASS 10
Construction methods using glass for single storey glass structures like pavilions, green houses, staircases. Construction methods using glass for single/multi-storey buildings including curtain walling details – Exercises of the above through case studies and drawings.

TOTAL: 75 PERIODS

OUTCOMES:
• An Understanding of Brick and clay products and timber in methods of construction and in detailing.
• An Understanding of Testing Procedures, Quality assurance and workmen ship is imparted,

REQUIRED READING

REFERENCES
3. Wills H Wagner, Howard Bud, Modern Carpentry, Good Heart – Wilcox publishers, Portland, 2003

AR8312  ARCHITECTURAL DESIGN II  L T P/S C 0 0 14 7

OBJECTIVES:
To create an understanding of the inter relationships amongst various elements of architecture – form, function, space planning, user perception and behaviour.
• To understand the characteristics of site and the importance of site planning which includes built form and open space.
• To understand the relationship between form and spaces and the importance of aesthetics.
• To ascertain the response of user group through case studies.
• To enable the presentation of concepts through 2D drawings, sketches and model.

CONTENT:
Scale and Complexity :Project involving organization of multiples of single unit space with predominantly horizontal movement as well as single use public buildings of small scale; passive energy
Areas of concern/ focus:
• form-space relationships
• spatial organization
• behavioral aspects especially those relating to children
• site planning aspects
• appropriate materials and construction

Suggestive Typologies/ projects: residential buildings, institutional buildings: nursery or primary schools, schools for children with specific disabilities, primary health center, banks, neighbourhood market, neighbourhood library, Gate complexes including security Kiosk and entry / exit gates.

OUTCOMES:
The characteristics of site, importance of site planning and built form/open space relationship as been understood. User group responses were ascertained through case-studies. Presentation of concepts was enabled through 2D drawings, sketches of model.

TOTAL: 210 PERIODS

REQUIRED READING
4. Ernst Neuferts Architects Data, Blackwell 2002

REFERENCES
1. Richard P. Dober, Campus Planning - Reinhold Book Corporation, 1963
2. Kanvinde, Campus design in India, American year Book, 1969

AR8401   DESIGN OF STRUCTURES I

OBJECTIVES:
- To introduce the design of various timber components in a building.
- To enable the understanding of the types, efficiency and strength, advantages and disadvantages of Rivet and welded joints in steel.
- To enable the design of Tension (beams) and compression (columns) steel members in a building under various conditions.
- Case studies and models wherever applicable.

UNIT I   TIMBER STRUCTURES - DESIGN OF BEAMS AND COLUMNS

UNIT II   STEEL STRUCTURES - BOLTED AND WELDED JOINTS
UNIT III  TENSION MEMBERS  

UNIT IV  COMPRESSION MEMBERS  
Introduction – various sections – built up section – Design of columns (excluding Lacing, Battening and other connections.)

UNIT V  STEEL BEAMS  
Introduction – laterally supported and unsupported beams – Design of laterally supported beams.

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:

• Design the timber beams and columns by applying the codal provisions.
• Able to design the steel joints for maximum efficiency and strength.
• Tension members and compression members are designed for various conditions by applying the codal provisions.
• Different types of laterally unsupported & supported beams to be designed for various conditions.

REQUIRED READING

REFERENCES:
5. IS 883 – Code of Practice for Design of Structural Timber in Buildings
6. IS 800 - 2007 – Code of Practice for use of Structural Steel in General Building Construction

OBJECTIVES:

• To understand Islamic architecture as evolving within specific cultural contexts including aspects of society, religion, politics and climate
• To gain knowledge of the development of architectural form with reference to technology, style and character in the Indian context through the evolution of the mosque and tomb in the various phases of Islamic rule in the country.
• To gain knowledge of the expertise of the Mughal rulers in city building and garden design.

UNIT I  INTRODUCTION TO ISLAMIC ARCHITECTURE  
History of Islam: birth, spread and principles - Islamic architecture as rising from Islam as a sociocultural and political phenomenon- evolution of building types in terms of forms and functions: mosque, tomb, minaret, madarasa, palace, caravanserai, market - character of Islamic architecture: principles, structure, materials and methods of construction, elements of decoration, colour, geometry, light
UNIT II  ISLAMIC ARCHITECTURE IN INDIA & ARCHITECTURE OF THE DELHI SULTANATE

Advent of Islam into the Indian subcontinent and its impact including the change in the architectural scene- overview of development based on political history and the corresponding classification of architecture - Islamic architecture in India: sources and influences

Establishment of the Delhi Sultanate- evolution of architecture under the Slave, Khalji, Tughlaq, Sayyid and Lodhi Dynasties – tombs in Punjab- important examples for each period

UNIT III  ISLAMIC ARCHITECTURE IN THE PROVINCES

Shift of power to the provinces and evolution of regional architecture with their own unique influences: geographic, cultural, political, etc., - Bengal, Gujarat, Jaunpur, Malwa, Kashmir, Deccan (Gulbarga, Bidar, Golconda and Bijapur) - important examples for each region

UNIT IV  MUGHAL ARCHITECTURE

Mughals in India- political and cultural history- synthesis of Hindu-Muslim culture, Sufi movement - evolution of architecture and outline of Mughal cities and gardens under the Mughal rulers: Babur, Humayun, Akbar, Jahangir, Shahjahan, Aurangzeb- important examples- decline of the Mughal empire.

UNIT V  CROSS-CULTURAL INFLUENCES

Cross cultural influences across India and secular architecture of the princely states: Oudh, Rajput, Sikh, Vijayanagara, Mysore, Madurai- important examples

TOTAL: 45 PERIODS

OUTCOMES:
- Various criticisms against modernism
- The conditions associated with post modernity in terms of cultural, political conditions etc.
- An understanding of various postmodern directions in architecture
- Architectural responses as reactions to changing cultural paradigms
- An understanding of post independent Indian architecture

REQUIRED READINGS:

REFERENCES:
OBJECTIVES:
At the end of this course the student is expected to understand what constitutes the environment, what are precious resources in the environment, how to conserve these resources, what is the role of a human being in maintaining a clean environment and useful environment for the future generations and how to maintain ecological balance and preserve bio-diversity. The role of government and non-government organization in environment managements.

UNIT I INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES

10
Definition, scope and importance of environment – need for public awareness - Forest resources:
Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems
– Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.
Field study of local area to document environmental assets – river / forest / grassland / hill /mountain.

UNIT II ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY

14
Concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.

Field study of common plants, insects, birds; Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT III ENVIRONMENTAL POLLUTION

8
Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – soil waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides.
Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT

7
(Prevention and Control of Pollution) act – Water (Prevention and control of Pollution) act –
Wildlife protection act – Forest conservation act – enforcement machinery involved in
environmental legislation- central and state pollution control boards- Public awareness.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT
6
Population growth, variation among nations – population explosion – family welfare programme –
environment and human health – human rights – value education – HIV / AIDS – women and
child welfare – role of information technology in environment and human health – Case studies.

TOTAL: 45 PERIODS

OUTCOMES:
1. Students are sensitized on the need for natural resource management, and sustainable
   lifestyles
2. Students appreciate the value of ecosystem and the need and methods for conserving the
   same.
3. Students understand the how pollution and hazards can be mitigated.

TEXT BOOKS:
1. Gilbert M.Masters, “Introduction to Environmental Engineering and Science”, 2nd edition,
2. Erach Bharucha, “Text book of Environmental Studies”, University Press, Hyderabad,
   2006.
3. Anubha Kaushik and Kaushik C.P., “ Perspectives in Environmental Studies” New age
   International (P) Ltd., New Delhi, 2005
   India Pvt. Ltd., New Delhi, 2006.

REFERENCES:

AR8404 BUILDING MATERIALS IV

OBJECTIVES:
- To study ferrous and non ferrous materials in construction.
- To have an understanding of the properties, characteristics, strength, manufacture,
  processing and application of materials such steel and steel alloys, aluminum and
  aluminum alloys.
- To inform the innovations in the steel industry and the standards and accepted industrial
  practices involved.
- To inform the properties, characteristics and application of plastics in the construction
  industry as well as other light weight roofing materials.

UNIT I FERROUS METALS: STEEL
9
Iron ore: definition, introduction, manufacture of iron ore, types- pig iron, wrought iron and cast
iron- their properties and uses.

Steel- definition, properties, Manufacture, casting, heat treatment, mechanical treatment process
of steel, market forms of steel, fire protection of steel - Corrosion of ferrous metals (Causes
factors of corrosion and prevention).
UNIT II  STEEL ALLOYS AND INNOVATIONS IN STEEL INDUSTRIES  
Steel alloys- properties and uses. Structural steel-definition and protection. Steel sheeting- types of sheeting. Stainless steel in building Industry as a structural entity by studying codes. Study of innovations in steel industry. Design and construction parameters developed by INSDAG.

UNIT III  NON-FERROUS METALS  
Aluminium and Aluminums Alloys (Manufacture, properties, durability, and uses) - Aluminium products (extrusions, foils, castings, sheets etc.) - Other non-ferrous metals copper, lead, zinc (Manufacture, grades, forms, sizes) - Study of protection to non-ferrous metals and products such as anodizing, powder coating, painting, stove enamelling, chromium plating, varnishing, melamine treatments.

UNIT IV  PLASTICS  
Polymerisation, thermoplastics, thermosetting plastics, elastomers, properties of plastics, strength, plastic forming process, uses of plastics and decorative laminates - Plastics in construction (polythene, poly propylene, PVC, ethylene, polycarbonate, acrylic flooring, PVC tiles)

UNIT V  OTHER MATERIALS  
Light-roofing materials (Recent trends in roofing materials like Corrugated GI Sheets, Pre- coated metal sheets, Polycarbonate sheeting, Teflon coated sheets, PTFE Steel alloys properties and uses) - Adhesives, Sealants and joint fillers (Relative movement within buildings, types of sealants- elasto-plastic, elastic sealants- joint design- fire resistant sealants- gaskets- adhesives, epoxy, wall paper, bitumen, plastic pipe) - Materials for flooring finishes such as epoxy, oxy-chloride, hardeners, PVC, carpets.

TOTAL: 45 PERIODS

OUTCOMES:
• An Understanding of ferrous and Non-ferrous metals in terms of its properties, manufacture and their applications in architectural construction.
• The students are made to be aware of plastics and its applications in building industry as well as light roofing materials adhesives, Sealants and fillers apart from flooring finishes.

REQUIRED READING:

REFERENCES:
OBJECTIVES:

- To Study Water supply, treatments, distribution and plumbing system for all type of buildings.
- To Study Waste water treatments, Sewer lines for all types of buildings.
- To Study Drainage system for a Small Campus and a Residential neighbourhood.
- To understand Refuse collections, disposal, composting, Landfill, Bio gas for a Town and City.
- Applications of all the above systems to a Buildings, Small Campus and a Residential neighbourhood.

CONTENT:

UNIT I WATER QUALITY, TREATMENTS AND DISTRIBUTION 12

UNIT II WASTE WATER, TREATMENTS AND DISPOSAL 12
Waste water – Sewage disposal, primary treatment. Secondary treatment, Biological treatment and Modern types of Sewage Treatment Plants - Sewer line fixtures and traps, Manholes, Septic tank.

UNIT III STORM WATER DRAINAGE AND RAIN WATER HARVESTING 10
Basic principles of storm water drainage – drain pipes and type of pipe – storm water gutter – rain water harvesting principles – storage sumps

UNIT IV SOLID WASTE, COLLECTIONS, TREATMENTS, DISPOSAL, MODERN DRAINAGE SYSTEMS 12
Refuse collection, disposal, Incinerator, Composting, Vermicomposting, Sanitary Land filling, Bio gas system and Modern renewable energy system. Modern plumbing system, drainage collection system, disposal for a housing colony, small towns – Selection of pumps and Construction of pump rooms.

UNIT V APPLICATION OF THE ABOVE UNITS 14
Layout design and details of water supply distribution system in a Campus or Small residential neighbourhood - Layout design and details of sewage and drainage system for different types of buildings - water supply pipe lines, storm water drainage pipe lines and Rain water Harvesting for small residential neighbourhood.

TOTAL: 60 PERIODS

OUTCOMES

1. Students have through understanding of how water and waste water are managed, in residential unit, small campus and for a large city.
2. Students are aware of the principles and best practices for Solid waste management in residential unit, small campus and for a large city.

REQUIRED READINGS:

REFERENCES:
2. Manual on sewerage and sewerage treatment, CPHEEO – Ministry of works and housing, New Delhi, 1980
4. Renewable energy, basics and technology, supplement volume on integrated energy systems) Auroville, 1998 Sri Aurobindo Ashram, Pondicherry 605002 India

OBJECTIVES:
- To introduce construction of building components in Reinforced Cement Concrete.
- To introduce various water proofing, insulation & protection systems and their methods of construction.
- To expose the students to the advanced construction systems developed by research institutes in the country and the detailing of the same.
- To understand the quality assurance measures and testing procedures related to material, workmanship and performance for the above topics.

UNIT I CONCRETE CONSTRUCTION
Detailing of walls, roofs and flooring, foundations using RCC in simple framed buildings including detailing of RCC beams, columns, slabs (one way slabs, 2-way slab, continuous, flat slab etc.), detailing of apertures (lintels, sunshades, arches etc.), Exercises of the above through case studies and drawings of selected building types.

UNIT II WATER-PROOFING AND DAMP-PROOFING OF CONCRETE STRUCTURES
Construction methods for water-proofing and damp proofing for walls, roofs, basements, retaining walls, swimming pools etc. -Exercises of the above through case studies and drawings.

UNIT III DESIGN AND CONSTRUCTION METHODS FOR CONCRETE STAIRCASES
Staircases - basic principles, for different types of staircase for support conditions for stairs and details of handrail, baluster etc. and finishes for stairs - Exercises of the above through case studies and drawings.

UNIT IV ADVANCED CONSTRUCTION SYSTEMS DEVELOPED BY RESEARCH ORGANISATIONS IN INDIA
Design and detailing of building materials and components developed by research organizations like CBRI, SERC, NBO, and BMTPC – Exercises of the above through case studies and drawings.

UNIT V PLASTICS AND OTHER MATERIALS

TOTAL: 75 PERIODS
OUTCOMES:
The students understood how Reinforced Cement Concrete could be used for the various components of a building as well as in waterproofing and insulation and protection systems. The role of advanced construction systems that have been developed by research institutes throughout the country were also explored. Quality assurance and testing methods, after looking at the basics and research explorations associated with the materials were looked at.

REQUIRED READING
1. M.S.Shetty, Concrete Technology, S.Chand & Co.ltd,New Delhi,1986.

REFERENCES:
1. Alan Blanc, Stairs, Steps and Ramps, Butterworth, Heinemann Ltd., 1999
2. Francis D.K Ching Building Construction illustrated, John Willey & Sons, 2000
5. Pamphlet and Manuals supplied or published by SERC, BMPTC, HUDCO and Other research organization
6. Standard and Specification for cost effective innovation, Building Materials and Sequence, BMPTC Publication, New Delhi

AR8412 ARCHITECTURAL DESIGN III

OBJECTIVES:
• To create a holistic understanding of the socio-cultural, geographic and economic aspects that shape the built environment as well as to expose the students towards the design of simple community oriented buildings.
• To make a comprehensive study of a rural settlement that is an exemplar of collective design evolved organically over a period of time.
• To expose the students on the methodology of conducting various surveys covering, physical, visual characteristics and demographic aspects.
• To understand the vernacular / traditional architecture involving local materials and construction techniques.
• To emphasis on the importance of designing built form and open spaces that meet the aspirations of the community.
• To enable the presentation of concepts through 2D and 3D presentation including sketches and model.

CONTENT:
Scale and Complexity: Projects involving public and community oriented buildings - multi room, single use, small span, multiple storied, horizontal and vertical movement; active cum passive energy; comprehensive analysis of rural settlement in a hierarchical manner.

Area of concern/ focus :
• rural settlements and architecture
• community oriented design
• simple public buildings (not more than Ground+ 2 floors)
Suggestive Typologies/ projects : Rural projects that involve studies and design at settlement and building level- noon meal centre, market, primary health centre; department store, higher secondary school, campus students centre

TOTAL: 210 PERIODS

OUTCOMES

• Students ability to understand the concept of community and settlement evolution and the built environment as influenced by Socio-economic, Cultural, Environmental and Technical factors.
• Ability to provide a sensitive approach to the design of the built environment taking into account the above mentioned factors.

REQUIRED READING

4. Ernst Neuferts Architects Data, Blackwell 2002

REFERENCES:

1. Richard P. Dober, Campus Planning - Reinhold Book Corporation, 1963
2. Kanvinde, Campus design in India - American year Book, 1969

AR8501 DESIGN OF STRUCTURES II

OBJECTIVES:

• To inform about the methods of design through working stress and limit state methods.
• To use the above two methods for the design of Concrete beams and slabs under various conditions.
• To use the limit state method for design of a concrete staircase.
• Case studies and models wherever applicable.

UNIT I DESIGN OF CONCRETE MEMBERS AND WORKING STRESS DESIGN OF BEAMS


UNIT II LIMIT STATE DESIGN OF BEAMS

Analysis and design of singly and doubly reinforced rectangular and flanged beams for Bending – Design of Continuous beams using IS code co-efficient.

UNIT III LIMIT STATE DESIGN OF SLABS

Behavior of one way and two way slabs – Design of one way and two way slabs for various edge conditions - Corner effects.

UNIT IV DESIGN OF CIRCULAR SLABS

Design of Simply supported and fixed Circular slabs subjected to uniformly distributed loads.
UNIT V  DESIGN OF STAIRCASE BY LIMIT STATE METHOD
Types of Staircases – Design of Dog Legged Staircase.

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
• Understand the different concepts of WSM and LSD methods using the codal provisions.
• RC beams and slabs to be designed by applying the above concepts.
• Dog legged staircase design using LSD.

REQUIRED READING

REFERENCES:

AR8502  HISTORY OF ARCHITECTURE AND CULTURE - V

OBJECTIVES:
• To introduce the condition of modernity and bring out its impact in the realm of architecture
• To study modern architecture as evolving from specific aspects of modernity-industrialisation, urbanisation, material development, modern art as well as society’s reaction to them.
• To study the further trajectories of modern architecture in the post WWII period.
• To create an overall understanding of the architectural developments in India influenced by colonial rule.

UNIT I  LEADING TO A NEW ARCHITECTURE
Beginnings of modernity – Origin and development of Neo Classicism- Structural Neo classicists: Laugier, Soufflot, Schinkel, Labrouste - Romantic Neo classicists: Ledoux, Boulle, Durand, Jefferson- Industrialization and its impact- Urbanization in Europe and America- split of design education into architecture and engineering streams- Emergent new building / space types- Growing need for mass housing- Development of Industrial material and construction technologies- concrete, glass and steel- structural engineering, standardization-Industrial exhibitions- Chicago School and skyscraper development.

UNIT II  REVIEWING INDUSTRIALISATION
Opposition to industrial arts and production- Arts and Crafts in Europe and America : Morris, Webb- Art Nouveau: Horta, Van De Velde, Gaudi, Guimard, Mackintosh - Vienna secession: Hoffmann, Olbrich- Wright’s early works

UNIT III  MODERN ARCHITECTURE: DEVELOPMENT AND INSTITUTIONALISATION
Adolf Loos and critique of ornamentation- Raumplan: Peter Behrens- Werkbund – Modern architecture and art - Expressionism: Mendelsohn, Taut, Polzeig- Futurism- Constructivism, Cubism-Suprematism- De-Stijl Bauhaus- Gropius, Meyer and Mies - CIAM I to X and its role in canonizing architecture- growth of International Style Ideas and works of Gropius, Le Corbusier, Aalto, Mies, later works of Wright
UNIT IV MODERN ARCHITECTURE : LATER DIRECTIONS
Post WW II developments and spread of international style – Later works of Corbusier: Brasilia, Unite- Works of later modernists: Louis Kahn, Paul Rudolph, Eero Saarinen, Philip Johnson

UNIT V COLONIAL ARCHITECTURE IN INDIA
Colonialism and its impact- early colonial architecture :forts, bungalows, cantonments – Stylistic transformations: Neo- classicism, Gothic Revival and Indo Saracenic - PWD and institutionalization of architecture - Building of New Delhi showcasing imperial power.

OUTCOMES:
The condition of modernity and its impact on architecture has been introduced. The evolution of modern architecture from specific aspects of modernity like Industrialisation, Urbanisation etc and its post-world was II trajectories were studied. An overall understanding of the architectural developments of colonial India was obtained.

REQUIRED READING:

REFERENCES:

AR8503 BUILDING SERVICES- II L T P/S C
2 0 2 3

OBJECTIVES:
• To inform the students of the laws and basics of electricity and wiring systems within domestic and commercial buildings
• To expose the students to the fundamentals of lighting and lighting design
• To familiarize the students to the basic design principle systems of vertical distributions systems within a building
• To expose the student with the NBC Code for all of the above building services

UNIT I ELECTRICAL AND ELECTRONIC SYSTEMS: ELECTRICAL WIRING SYSTEMS
UNIT II  FUNDAMENTALS OF LIGHTING  12

UNIT III  ILLUMINATION AND LIGHTING  8
Electric light sources: brief description, characteristics and application of different types of lamps, methods of mounting and lighting control Luminaries classification/ Lumen method for design – Room reflectance/ Glare – manufacturer’s data on luminaries / luminaries cost

UNIT IV LIGHTING DESIGN: INSTALLATION AND APPLICATION IN BUILDINGS  18
Artificial light sources, spectral energy distribution, Luminous efficiency- color temperature – color rendering, Additive, subtractive color and their application areas and out door lighting Lighting for Office, Schools, Libraries, Residential, Hospital, Parking, Outdoor. Elementary ideas of special features required and minimum level of illumination for the physically handicapped and elderly in building types Solar energy systems for lighting – Photovoltaic systems for Residential/Commercial buildings. Reducing electric loads, installation and maintenance – LEED certification & energy efficient lighting, Lighting controls, Solar systems – Case studies and exercises involving in the above

UNIT V CONVEYING SYSTEMS  12
Basic design Principles, criteria for planning sizing, selection and layout of vertical distribution systems – (lifts, Escalators and moving walkways) along with mechanical, dimensional details Elevators- types of elevators - design criteria, capacity, frequency, car size, speed, number and size of elevators, layout of banks of elevators, planning and locating service cores in buildings, types of elevators – pit, machine room details – NBC code Escalators and Conveyors parallel and criss cross escalators, horizontal belt conveyors, horizontal moving walkways – design criteria, speed size, capacity, number Detailing for comfort, convenience of users- special features for physically handicapped and elderly - Case studies and exercises involving in the above

OUTCOMES:
- The students understand the basics of Electricity and wiring system
- The students are exposed to Fundamentals of Lighting and Lighting design
- An Understanding of Vertical transportation system in a building

REQUIRED READINGS:
5. National Building Code, 2005

REFERENCES:
Electrical Systems:
1. Handbook of building Engineers in metric systems, New Delhi 1968
2. National Building Code, 2005

AR8504  SITE ANALYSIS AND PLANNING  L T P/S C
2 0 2 3

OBJECTIVES:
- To teach the importance of site and its content in architectural creations
- To orient the students towards several influencing factors which govern the siting of a building or group of buildings in a given site.
- To teach various techniques of site analysis through exercises and case studies.
- To teach the students the methodology of preparing a site analysis diagram. This will serve as a prelude to any architectural creation through exercises.
UNIT I INTRODUCTION
Definition of plot, site, land and region, units of measurements. Introduction to survey, methods of surveying, where they are used, Surveying Instruments and their application. Need for surveying. Measuring and drawing out a site plan from the measurements.

UNIT II SITE DRAWINGS
Computation of area by geometrical figures and other methods. Drawing marking out plan, layout plan and centerline plan – Importance, procedure for making these drawings and dimensioning. Setting out the building plan on site – Procedure and Precautions. Exercises on the above.

UNIT III SITE ANALYSIS
Importance of site analysis; On site and off site factors; Analysis of natural, cultural and aesthetic factors – topography, hydrology, soils, vegetation, climate, surface drainage, accessibility, size and shape, infrastructures available - sources of water supply and means of disposal system, visual aspects; Preparation of site analysis diagram. Study of microclimate:- vegetation, landforms and water as modifers of microclimate. Study of land form:- contours, slope analysis, grading process, grading criteria, functional and aesthetic considerations – Case studies and exercises on the above.

UNIT IV SITE CONTEXT
Context of the site. Introduction to existing master plans land use for cities, development control Rules. Preparation of maps of matrix analysis & composite analysis. Site selection criteria for housing development, commercial and institutional projects - Case studies.

UNIT V SITE PLANNING AND SITE LAYOUT PRINCIPLES
Organization of vehicular and pedestrian circulation, types of roads, hierarchy of roads, networks, road widths and parking, regulations. Turning radii & street intersections

TOTAL: 60 PERIODS

OUTCOMES
• The contextual importance on site analysis can be understood based on the various site factor with respect to the study area.
• A first hand understanding of site drawings for Landscape Architecture and Urban design is studied.
• Various scientific and analytic site analysis techniques is understood.
• A methodological approach for preparation of master plans for small scale and large scale projects can be understood.

REQUIRED READING:

REFERENCES:

AR8511 BUILDING CONSTRUCTION - IV L T P/S C 0 0 5 3

OBJECTIVES:
• To understand both in detail the methods of construction using steel for structural purposes such as roof trusses and roof covering.
• To understand both in detail the methods of construction of building components using steel such as staircases, rolling shutters, doors and windows.
• To understand both in detail the methods of construction of building components using aluminum such as doors and windows, partitions and curtain walling.
• To understand both in detail the methods of construction of building components using plastics such as doors and windows, partitions, roofs and curtain walling.
• To understand quality assurance measures and testing procedures related to material, workmanship and performance for the above topics.

UNIT I  STEEL CONSTRUCTION INCLUDING STAIRCASES  25
Design exercises using structural steel sections for walls, foundations, column-beam connections and design and detailing of steel roof trusses (north-light, butterfly truss, space frames etc.) including construction methods for roof covering using steel, aluminium, asbestos, etc., for long span structures like furniture, apparel factory etc., -

Steel staircases basic principles for different types of staircases - Support conditions for stairs and details of handrail, baluster etc. - finishes for stairs - Exercises of the above through case studies and drawings.

UNIT II  STEEL DOORS, WINDOWS AND ROLLING SHUTTERS  10
Different Types of doors and windows (openable, sliding etc., methods of construction using steel) - Design and detailing of steel rolling shutter, collapsible gate etc.- Exercises of the above through case studies and drawings.

UNIT III  ALUMINIUM DOORS, WINDOWS AND VENTILATORS  10
Brief study of aluminium products- market forms of aluminium, aluminium extrusions- sketches of the above - Aluminium doors and windows - design details for doors (openable, sliding, pivoted and fixed) - Design details for windows (openable, sliding, fixed, louvered) – Design details for Ventilators (top hung, pivoted and louvered) - Exercises of the above through case studies and drawings.

UNIT IV  ALUMINIUM ROOFING, PARTITIONS, STAIRS  15
Aluminium roofing (Northlighting, glazing bar, roofing sheets, construction details including gutter details) - Aluminium partitions (fixed partitions, false ceiling, shop front construction methods and details) - Aluminium staircase - design and construction details- including detailing of handrail and baluster - Exercises of the above through case studies and drawings.

UNIT V  ALUMINIUM CURTAIN WALLING  15
Aluminium Curtain walling (design and construction details using aluminium for curtain walls)

TOTAL: 75 PERIODS

OUTCOMES:
• The students are able to understand in detail the method of construction of various building components using steel, aluminum and plastic.
• This also helps the student to understand the different construction practices adapted for the various components specific to the material in which its made.

REQUIRED READING

REFERENCES
2. Alan Blanc, Stairs, Steps and Ramps, Butterworth, Heinemann Ltd., 1999
OBJECTIVES:

- To explore the design of buildings addressing the socio-cultural & economic needs of contemporary urban society.
- To enable the students to understand the importance of spatial planning within the constraints of Development Regulations in force for urban areas.
- To enable the students to design for large groups of people in a socially and culturally sensitive manner, taking into account aspects such as user perception, crowd behaviour, large scale movement of people and identity of buildings.
- To emphasis on the importance of understanding the relationship between open space and built form, built form to built form and site planning principles involving landscaping circulation network and parking.
- To explore computer aided presentation techniques involving 2D and 3D drawings and models as required.

CONTENT:

Scale and Complexity: Buildings and small complexes that address the social and cultural needs of contemporary urban life (residential, Commercial, institutional) with a thrust on experiential qualities; multi bayed, multiple storied and circulation intensive; passive and active energy Areas of concern/ focus

- behavioral aspects and user satisfaction
- socio-cultural aspects
- designing for the differently abled
- Building byelaws and rules
- Appropriate materials and construction techniques
- Climatic design

Typology/ project: Housing Projects- detached, semi-detached, row housing, cluster housing, apartment; housing and facilities for other user groups- Old age Home, orphanage, working women's hostel, home for physically and mentally challenged; Museum/ Art centre, Educational campus, R & D centre, shopping complex

OUTCOMES

- Understanding DCR and its applications
- Understanding Campus Planning
- Sensitive to Socio-Economic aspects
- An orientation to Computer Aided Drafting

REQUIRED READING

4. Ernst Neuferts Architects Data, Blackwell 2002

REFERENCES

1. Richard P. Dober, Campus Planning - Reinhold Book Corporation, 1963
2. Kanvinde, Campus design in India - American year Book, 1969
OBJECTIVES:
• To use limit state design for the analysis and design of columns.
• To enable the learning of design of structural elements like footings, retaining walls and masonry walls.
• To understand the principle, methods, advantages and disadvantages of pre stressed concrete.
• Case studies and models applicable.

UNIT I  LIMIT STATE DESIGN OF COLUMNS  10
Types of columns – Analysis and Design of Short Columns for Axial, Uniaxial and biaxial bending – Use of Design aids.

UNIT II  DESIGN OF FOOTINGS  10
Types of footings – Design of wall footings – Design of Axially loaded rectangular footing (Pad and sloped footing). Design of Combined Rectangular footings.

UNIT III  DESIGN OF RETAINING WALLS  10
Types of Retaining walls – Design of RCC cantilever Retaining walls.

UNIT IV  DESIGN OF MASONRY WALLS  8
Analysis and Design of masonry walls – use of Nomograms - code requirements.

UNIT V  INTRODUCTION TO PRESTRESSED CONCRETE  7
Principle of Prestressing – Methods of Prestressing, advantages and disadvantages.

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
• Understand the different concepts in designing footings and columns and Masonry walls using LSD methods.
• Concepts of Prestressed concrete and applying them in real case.

REQUIRED READING:
3. SP – 16, Design Aids for Reinforced Concrete to IS 456 National Building Code of India, 1983
4. IS 1905, Code of Practice for Structural Safety of Buildings

REFERENCES:
OBJECTIVES:

- To introduce the context for the critiques of modern architecture and the evolution of new approaches.
- To study in detail the different post modern directions in architecture.
- To understand the trajectory of architecture in India from the end of colonial rule to the contemporary period- architectural debates associated with nation, establishment of modern architecture and subsequent quest for Indianess.

UNIT I CRITIQUING MODERNISM

UNIT II AFTER MODERNISM – I

UNIT III AFTER MODERNISM – II

UNIT IV ALTERNATIVE PRACTICES AND IDEAS
Critical Regionalism- Ideas and works of Baker, Fathy, Ralph Erskine, Lucien Kroll, Ando, Bawa, Barragan, Siza

UNIT V POST INDEPENDENT ARCHITECTURE IN INDIA

OUTCOMES
The context for the critique of modern architecture and the evolution of new approaches were introduced. The different post modern directions in architecture were studied in detail. The trajectory of Architecture in post-colonial India was understood.

REQUIRED READING:

REFERENCES:
### OBJECTIVES:
- To expose the students to the science behind an air-conditioning and refrigeration system.
- To familiarize them with the various air-conditioning systems and their applications.
- To study the design issues for the selection of various systems and their installation.
- To inform of the various ways by which fire safety design can be achieved in buildings through passive design.
- To familiarize the students with the various fire fighting equipment and their installation.
- To familiarize the students with the fundamentals of acoustics and principles in designing various built environment.

### UNIT I  AIR CONDITIONING: BASIC REFRIGERATION PRINCIPLES

### UNIT II  AIR CONDITIONING: SYSTEMS AND APPLICATIONS
- Air conditioning system for small buildings – window types, evaporative cooler, packaged terminal units and through the wall units split system.

### UNIT III  AIR CONDITIONING: DESIGN ISSUES AND HORIZONTAL DISTRIBUTION OF SYSTEMS
- Design criteria for selecting the Air conditioning system for large building and energy conservation measures - Typical choices for cooling systems for small and large buildings - Horizontal distribution of services for large buildings - Grouped horizontal distribution over central corridors, Above ceiling, In floor, Raised access floor, Horizontal distribution of mechanical services – case studies.

### UNIT IV  FIRE SAFETY: DESIGN AND GENERAL GUIDELINES OF EGRESS
- Design - Fire detection and Fire fighting and Installation

### UNIT V  ACOUSTICS
- Fundamentals – Sound waves, frequency, intensity, wave length, measure of sound, decibel scale, speech and music frequencies, Reverberation time.

Acoustics and building design-site selection, shape volume, treatment for interior surfaces, basic principles in designing open air theatres, cinemas, broadcasting studios, concert halls, class rooms, lecture halls, schools, residences, office buildings including constructional measures and sound reinforcement systems for building types – case studies.

**TOTAL: 60 PERIODS**
OUTCOMES:
- The students are exposed to various air conditioning systems and their applications. They are also exposed to various design issues in the distribution system.
- An understanding of fire safety, fire fighting, fire prevention and installations in buildings including codal requirements.
- The students are exposed to fundamentals of acoustics and its applications in buildings.

REQUIRED READINGS:

REFERENCES:
2. Design for fire safety (Andrew H Buchanan, John Wiley & Sons Ltd., New York).

AR8611 ARCHITECTURAL DESIGN DEVELOPMENT

OBJECTIVES:
- To enable students to appreciate the various stages in which architectural drawings are prepared such as Concept Stage, Schematic / Preliminary Stage, Approval Stage, Design Development Stage, Tender Drawings & Documentation Stage and Construction Drawing Stage.
- To enable students to appreciate the challenges in detailing for both the newly designed buildings as well as while carrying out additions and alterations to existing buildings.
- To enable students to understand the various Furniture, Fittings & Equipment (FFE) that are needed in buildings and their installation methods.
- To train students towards adopting an integrated approach while dealing with complex buildings incorporating various allied requirements.

UNIT I INTRODUCTION TO CURRENT DEVELOPMENTS IN BUILDING INDUSTRY 10
Smart Materials: Characteristics, classification, properties, energy behaviour, intelligent environments. Recycled and ecological materials and energy saving materials: Straw-bale, cardboard, earth-sheltered structures, recycled plastics, recycled tyres, paper-crete, sandbags, photovoltaic, solar collectors, light-pipes, wind catchers - Exercises of the above through case studies and drawings.

UNIT II DETAILING OF WALLS, ROOFS AND FLOORING FOR INSTITUTIONAL BUILDINGS 20
a) Detailing of a residence - selected spaces.
b) Detailing of classrooms, library (in school, college)
c) Detailing of lecture hall, auditorium, exhibition spaces
d) Detailing relevant to a small industrial structure showing wall cladding, insulated roofing, gantry support, floor trenches and industrial doors - Exercises of the above through case studies and drawings.
UNIT III DETAILING OF WALLS, ROOF, FLOORING FOR COMMERCIAL BUILDINGS 20
a) Detailing of shop-fronts, office spaces for commercial buildings including detailing of crucial elements such as entrance porches, main doors, staircases, show-windows, enclosed and air-conditioned atrium spaces.
b) Detailing of façade and selected spaces for apartment buildings, hotels and hostels.
c) Detailing of wall cladding (both internal and external), Computer Room Flooring and profiled our ceiling - Exercises of the above through case studies and drawings.

UNIT IV DETAILING OF BUILT-IN FURNITURE AND FITTINGS 20
Detailing of built-in elements like kitchen counters, cupboards, cabinets, toilets, toilet fitting - Exercises of the above through case studies and drawings.

UNIT V DETAILING OF EXTERIOR AND INTERIOR ARCHITECTURAL ELEMENTS 20
Detailing of architectural elements like indoor fountains, water walls, transparent floors, street furniture, hard and soft landscape, swimming pools, water bodies and courtyard spaces. Detailing of interior architectural elements in existing buildings (e.g. Staircase in bookshops, restaurants, playpen in restaurants, reception areas in hotel lobbies etc.) - Exercises of the above through case studies and drawings.

TOTAL: 90 PERIODS

OUTCOMES
- An understanding of the principles of detailing as applicable to various situation in Indian context.
- The student are also exposed to various materials, furniture’s, fittings and the equipments that are needed in buildings.
- The student are also exposed to detailing both newly designed buildings and also as well as in additions and alternations to existing buildings.

REQUIRED READING:
2. Richardson Dietruck, Big Idea and Small Building, Thames and Hudson, 2002

REFERENCES:
1. Susan Dawson, Architect’s Working Details(Volume 1-10), 2004
2. Swimming Pools, Lane Book Company, Menlo Park, California, 1962
4. Landscape Construction, Delmar Publisher, 2000

ARCHITECTURAL DESIGN - V

OBJECTIVES:
- To understand the design and form of building typologies that are the result of pressure on urban lands with a thrust on issues like urban land economics, technology and ecology
- To create an awareness with regard to the design of green buildings and sustainable architecture.
- To inculcate the importance of services integration and construction in spatial planning in the context of design of High-rise buildings and service intensive buildings.
- To highlight on the importance of High rise buildings as elements of identity in urban areas and urban design principles that govern their design.
- To explore computer aided presentation techniques involving 2D and 3D drawings, walk through and models as required.
CONTENT:
Scale and Complexity: Advanced and complex problems involving large scale Multi-storeyed buildings and complexes for Residential/ Commercial/ Institutional/ Mixed-Use in an urban context with focus on visual characteristics, service integration and sustainable practices.

Areas of focus/ issues:
• sustainable building practices, green issues, alternative energy
• intelligent building techniques and service integration
• Architectural Detailing
• Advanced building practices

Typology/ project: office building, multi-use centre, convention center, multiplex, corporate complex, health care and hospitality building

TOTAL: 210 PERIODS

OUTCOMES:
An ability to understand issues in buildings with respect to density, services and energy consumption as well as make the right choices in design situations involving these issues.
• Understand Green Building concepts and basic principles of sustainable built environment
• Incorporate services Integration
• Understand context based programme & design

REQUIRED READING:
2. Ernst Newforts Architects Data, Blackwell 2002.

REFERENCES:
3. SPACE Shopping mall, Diane Tsang, 2011

TOTAL: 210 PERIODS

AR8911 PRACTICAL TRAINING - I

OBJECTIVES:
• To expose students to the daily realities of an architectural practice through Practical Training
• To facilitate an understanding of the evolution of an architectural project from design to execution.
• To enable an orientation that would include the process of development of conceptual ideas, presentation skills, involvement in office discussions, client meetings, development of the concepts into working drawings, tendering procedure, site supervision during execution and coordination with the agencies involved in the construction process.

The Practical Training -I would be done in offices / firms in India empanelled by the Institution in which the principal architect is registered under the Council of Architecture.
The progress of practical training shall be assessed internally through submission of log books supported by visual documents maintained by students every month along with the progress report from the employer/s of trainees. The students would be evaluated based on the following criteria:

1. Adherence to time schedule, Discipline.
2. Ability to carry out the instructions on preparation of schematic drawings, presentation drawings, working drawings.
3. Ability to work as part of a team in an office.
4. Ability to participate in client meetings and discussions.
5. Involvement in supervision at project site.

At the end of the Practical Training -I, a portfolio of work done during the period of Practical Training along with certification from the offices are to be submitted for evaluation by a viva voce examination. This will evaluate the understanding of the students about the drawings, detailing, materials, construction method and service integration and the knowledge gained during client meetings, consultant meetings and site visits.

TOTAL: 15 WEEKS

OUTCOMES
- Students undertake their practical training in India
- Students learn to work on multiple projects in an office and learn all aspects relating to making of a building starting from Concept Development, Scheme Development, Presentation, Working Drawings, Specifications, Estimation etc. and through site visits students get exposed to practical aspects of making a building and other aspects like client meetings, project planning, project management time management which they are not exposed to in the college.

AR8081 DISSERTATION L T P S C
X X X 3

Design studio emphasize on explaining and understanding Architecture primarily through the mode of making. Dissertation offers an opportunity to look at architecture, history and design primarily through textual. However, like design, dissertation involves process of observation, reflection and abstraction. Students are encouraged to choose any topic of their interest during the Practical Training -I undertaken by the student in IX semester and obtain approval from the Department before commencement of the Practical Training-II at the X semester.

The dissertation proposal in about 1500 words stating the topic, issues to be explored and the scope must be submitted before the commencement of Practical Training II for the approval of the department. The topic chosen may range from analyzing the works of an architect, history, typological changes, writing, design process and many more. After approval the work would be reviewed at least twice during the semester by the department. Students are advised to seek the guidance of the architects under whom they go through the Practical Training II.

The final dissertation report shall contain objectives, followed by exhaustive documentation and arguments. The emphasis however, could vary according to the topic. A well written report of a minimum 15,000 words must be submitted in the prescribed format, if any provided by the University. The student would subsequently make a presentation of his/her work and appear for the Viva voce examination to be conducted at the end of Practical Training II.

TOTAL: 15 WEEKS

REFERENCES
2. Linda Grant and David Wang, Architectural Research Methods, John Wiley Sons, 2002
OBJECTIVES:
- To strengthen further the understanding of students to the nuances of architectural practice through Practical Training
- To facilitate an understanding of the evolution of an architectural project from design to execution.
- To enable an orientation that would include the process of development of conceptual ideas, presentation skills, involvement in office discussions, client meetings, development of the concepts into working drawings, tendering procedure, site supervision during execution and coordination with the agencies involved in the construction process.

The Practical Training -II would be done in offices / firms in India empanelled by the Institution in which the principal architect is registered with the Council of Architecture if the firm is in India or in an internationally reputed firm established abroad.

The progress of practical training shall be assessed internally through submission of log books supported by visual documents maintained by students every month along with the progress report from the employer/s of trainees.

The students would be evaluated based on the following criteria:
1. Adherence to time schedule, Discipline.
2. Ability to carry out the instructions on preparation of schematic drawings, presentation drawings, working drawings.
3. Ability to work as part of a team in an office.
4. Ability to participate in client meetings and discussions
5. Involvement in supervision at project site.

At the end of the Practical Training -II a portfolio of work done during the period of internship along with certification from the offices are to be submitted for evaluation by a viva voce examination. This will evaluate the understanding of the students about the drawings, detailing, materials, construction method and service integration and the knowledge gained during client meetings, consultant meetings and site visits.

TOTAL: 15 WEEKS

OUTCOMES
Students take up internship in any from India or abroad and learn all aspects of making a building as specified in AR8032. In addition to this, students also learn on modern methods of construction using the latest technology and how to handle large scale projects incorporating project planning, project management, etc.

AR8701 SPECIFICATIONS AND ESTIMATION

OBJECTIVES:
1. To inform to students the need and importance of specification, how to write specification – important aspects of the design of a specification.
2. To inform to students the need for estimation the concept of abstract and detailed estimates based on measurement of materials and works.
3. To inform to students about cost control and about valuation and depreciation
4. To inform students on writing feasibility report of a project.

UNIT I SPECIFICATION
UNIT II SPECIFICATION WRITING

Brief Specification for 1st class, 2nd class, 3rd class building. Detailed specification for earthwork excavation, plain cement concrete, Reinforced concrete, first class and second class brickwork, Damp proof course, ceramic tiles/marble flooring and dadoo, woodwork for doors, windows frames and shutters, cement plastering, painting & weathering course in terrace.

UNIT III ESTIMATION

Types & purpose, Approximate estimate of buildings – Bill of quality, factors to be considered, - principles of measurement and billing, contingencies, measurement of basic materials like brick, wood, concrete and unit of measurement for various items of work – abstract of an estimate.

UNIT IV DETAILED ESTIMATE

Deriving detailed quantity estimates for various items of work of a building. Like earthwork excavation, brick work, plain cement concrete, Reinforced cement concrete works, wood work, iron works, plastering, painting, flooring, weathering course for a single storied building.

UNIT V CURRENT TRENDS


TOTAL: 45 PERIODS

OUTCOMES

Students learn the art of building construction through specification writing. Students learn to work out the approximate estimate, detailed estimate for small scale building projects and low cost housing.

REQUIRED BOOKS:

• Estimating, Costing and Valuation(Professional practice) By Rangwala – S.C, 1984
• CHAROTAR PUBLISHING HOUSE, INDIA.

REFERENCES

2. Estimating Costing and Specification. – By M. Chakraborti, 1984

OBJECTIVES:

• To have an overview on the vocabulary of Human settlements To understand the various elements of Human Settlements and the classification of Human Settlements
• To familiarize the students with Planning concepts and process in Urban and Regional Planning.

CONTENTS:

UNIT I INTRODUCTION

UNIT II FORMS OF HUMAN SETTLEMENTS
Structure and form of Human settlements – Linear, non-linear and circular – Combinations – reasons for development – advantages and disadvantages – case studies – factors influencing the growth and decay of human settlements.

UNIT III PLANNING CONCEPTS

UNIT IV URBAN PLANNING AND URBAN RENEWAL

UNIT V ISSUES IN CONTEMPORARY URBAN PLANNING IN INDIA

TOTAL: 45 PERIODS

OUTCOMES:
1. To explore the students about the dynamics of Urban Form and various Human Settlements pattern
2. To understand the interrelationship between Human Settlements structure and Social Dynamics

REQUIRED READING:

REFERENCES:

AR8703 PROFESSIONAL PRACTICE AND ETHICS

OBJECTIVES:
• To give an introduction to the students about the architectural profession and the role of professional bodies and statutory bodies.
• To teach the students about the importance of code of conduct and ethics in professional practice and the mandatory provisions as per Architects Act 1972.
• To expose the students some of the important legal aspects and legislations which have a bearing on the practice of architectural profession.
• To enable the students to grasp the advanced issues concerning professional practice such as tendering, contracting including alternative practices in project execution and project management.
• To expose the students to the implications of globalisation on professional practice with particular reference to WTO and GATS and equip them for international practice.
UNIT I INTRODUCTION TO ARCHITECTURAL PROFESSION CODE OF
CONDUCT AND ETHICS 9
Importance of Architectural Profession – Role of Architects in Society – Registration of
Architects – Architect’s office and its management – Location, organisational structure -
Infrastructure requirement, skills required, elementary accounts – Tax liabilities.
Role of Indian Institute of Architects – Architects Act 1972 (intent, objectives, provisions with
regard to architectural practice) – Council of Architecture (role and functions) – Importance of
ethics in professional practice – Code of conduct for architects, punitive action for professional
misconduct of an architect.

UNIT II ARCHITECT’S SERVICES, SCALE OF FEES & COMPETITIONS 9
Mode of engaging an architect – Comprehensive services, partial services and specialised
services – Scope of work of an architect – Schedule of services – Scale of fees (Council of
Architecture norms) – Mode of payment – Terms and conditions of engagement – Letter of
appointment.
Importance of Architectural competitions – Types of competitions (open, limited, ideas
competition) – Single and two stage competitions – Council of Architecture guidelines for
conducting Architectural competitions – National and International Competitions - Case
studies.

UNIT III TENDER & CONTRACT 12
Tender -Definition - Types of Tenders - Open and closed tenders - Conditions of tender
- Tender Notice - Tender documents - Concept of EMD - Submission of tender -
Tender scrutiny - Tender analysis – Recommendations – Work order - E-tendering
(advantages, procedure, conditions).
Contract – Definition - Contract agreement - its necessity – Contents (Articles of Agreement,
Terms and Conditions, Bills of Quantities and specifications, Appendix) – Certification of
Contractors Bills at various stages.
New trends in project formulation and different types of execution (BOT, DBOT, BOLT, BOO, etc.)
- Execution of projects – The process (Expression of interest, Request for Proposal, Mode of
Evaluation of Bids, Award of work)

UNIT IV LEGAL ASPECTS 6
Arbitration (Definition, Advantages of arbitration, Sole and joint arbitrators, Role of umpires,
Award, Conduct of arbitration proceedings) – Arbitration clause in contract agreement (role of
architect, excepted matters)
Easement – (meaning, types of easements, acquisition, extinction and protection)
Copy rights and patenting – (provisions of copy right acts in India and abroad, copy right in
architectural profession)
Consumer Protection Act (Intent, Architects responsibility towards his clients)

UNIT V IMPORTANT LEGISLATIONS AND CURRENT TRENDS 9
Development Regulations in Second Master Plan for CMA, Chennai Corporation Building Rules
1972 - Factories Act – Persons with Disabilities Act – Barrier Free Environment - Costal
Regulation Zone – Heritage Act.
Globalisation and its impact on architectural profession – Preparedness for International practice
– Entry of Foreign architects in India – Information Technology and its impact on architectural
practice.
Emerging specialisations in the field of Architecture – Architect as construction / Project
manager – Architectural journalism – Architectural photography.

TOTAL: 45 PERIODS
OUTCOMES:
- Understand the role of professional and statutory bodies
- Understand the provisions in Architects Act 1972
- Understand code of conduct
- Understand the process and role of an architect in project execution.

REQUIRED READING:

REFERENCES:
2. Development Regulations of Second Master Plan for Chennai Metropolitan Area -2026.
5. Consumer Protection Act, 1986
6. Arbitration Act, 1996
7. Maharashtra Regional and Town Planning and Development (Amendment) Act, 1994
8. Factories Act, 1948

AR8704 URBAN DESIGN L T P/S C
2 0 2 3

OBJECTIVES:
- To understand the scope and nature of urban design as a discipline
- To introduce the components of a city and their interdependent roles.
- To understand the evolution of historic urban form
- To learn to interpret the city in different ways and layers.
- To create awareness of contemporary urban issues as well as learn about possible ways to address them

UNIT I INTRODUCTION TO URBAN DESIGN 8
Components of urban space and their interdependencies- outline of issues/ aspects of urban space and articulation of need for urban design- scope and objectives of urban design as a discipline

UNIT II HISTORIC URBAN FORM 12
Western: morphology of early cities- Greek agora- Roman forum- Medieval towns- Renaissance place making- ideal cities – Industrialization and city growth- the eighteenth century city builders Garnier’s industrial city- the American grid planning- anti urbanism and the picturesque- cite industrielle- citte nuovo-radiant city .


UNIT III THEORISING AND READING URBAN SPACE 8
Ideas of Imageability and townscape: Cullen, Lynch- place and genius loci- collective memory- historic reading of the city and its artefacts: Rossi- social aspects of urban space: life on streets and between buildings, gender and class, Jane Jacobs, William Whyte
UNIT IV  ISSUES OF URBAN SPACE
Understanding and interpreting of urban problems/ issues- place-making and identity, morphology: sprawl, generic form, incoherence, privatized public realm- effects/ role of real estate, transportation, zoning, globalisation - ideas of sustainability, heritage, conservation and renewal- contemporary approaches : idea of urban catalyst, transit metropolis, community participation – studio exercise involving the above.

UNIT V  BEST PRACTICE IN URBAN DESIGN
Contemporary case studies from developing and developed economies that offer design guidelines and solutions to address various issues/ aspects of urban space – case studies.

OUTCOMES
The students understood the role of Urban design as a discipline, and its role in understanding and interpreting a city. Various reading methods were explored, to understand the historical as well as present urban form. They also looked at addressing urban design issues in terms of awareness creation as well as with possible ways to address them.

REQUIRED READING:
2. Edmund Bacon , Design of Cities , Penguin, 1976
4. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999

REFERENCES:
4. Urban Design Futures, Molcolm Moor, Routledge, 2006
5. Geoffrey Broadbent, Emerging Concepts in Urban Space Design

OBJECTIVES:
• To understand the continuity and dynamics of urban form with a thrust on the interrelationships between the disciplines of architecture, urban design and town planning
• To understand the various components and aspects of the urban environment as well as their interrelationships
• To understand in specific components/issues such as public spaces, physical infrastructure, socio - cultural aspects- heritage, gender, class, dynamics of urban growth
• To understand people as users of the urban environment in various scales.
• To explore techniques of mapping and diagramming to understand the dynamic urban environment.
• To take design decisions in a comprehensive manner understanding their implications in the larger context.

CONTENT:
Scale and Complexity: projects involving the urban context and architecture in the urban context with a thrust on understanding interdependencies and formulating appropriate design directions.

Areas of focus/ issues:
• exploration of relationship between building and larger context
• contemporary processes in design
• appropriate architecture
• addressing issues in urban areas – transportation, sustainability, heritage, sprawl, place making, identity, collective memory
• Mixed use programming

Typology/project: those involving large scale urban interventions as well as large scale projects which have impact on the urban context- revitalization and renewal of urban fragments, evolving guidelines for heritage areas, adaptive reuse, urban waterfront development, transportation nodes, new communities, multi-use urban complexes.

TOTAL: 240 PERIODS

OUTCOMES
The students looked at various components and aspects associated with the urban environment in terms of physical infrastructure, socio cultural aspects, gender issues etc. and looked at ways to address them through their designs. Mapping and diagramming techniques were explored in the design process to help explore the design process better.

REQUIRED READING:

REFERENCES:

AR8811
THESIS
L T P/S C
0 0 34 17

OBJECTIVES:
All the architectural design courses offered since semester II culminate in the thesis Project to motivate students to involve in individual research and methodology. This is to train them in handling projects independently.

TOPICS OF STUDY
The main areas of study and research can include advanced architectural design, including contemporary design processes, urban design including urban-infill, environmental design, conservation and heritage precincts, housing etc. However, the specific thrust should be architectural design of built environment. Preparation of presentation drawings, working drawings, detailed drawings and study model are part of the requirements for submission.

METHOD OF SUBMISSION
The Thesis Project shall be submitted in the form of drawings, project report, models, slides, CDs and reports.

TOTAL: 510 PERIODS

OUTCOMES
A comprehensive understanding in handling a major Architectural independently

REQUIRED READING:
• Linda Grant and David Wang, Architectural Research Methods, John Wiley Sons, 2002
REFERENCES:
2. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999

AR8001 ART APPRECIATION L T P/S C
3 0 0 3

OBJECTIVES:
• To introduce the vocabulary of art and the principles.
• To inform students about the various art forms through the ages within the cultural contexts.
• To study Modern Art and the new directions that evolved in the 19th and 20th centuries.
• To inform the production of art in the Indian context through history and the contemporary manifestations.

UNIT I INTRODUCTION TO ART
Definition of art - need for art – role of art – art reality, perception, representation- categories of art in terms of media and technique - appreciating art: form, content and context

UNIT II VOCABULARY OF ART
Introducing the vocabulary of art constituted by elements (line, shape, form, space, colour, light, value, texture) and principles (unity, variety, harmony, rhythm, balance, proportion, emphasis, contrast, movement)

UNIT III APPRECIATING ART – BEGINNINGS TO MODERN ART
Appreciating art through the study of art production in the West from the beginnings to the birth of modern art. Important works from the following art traditions will be studied and analysed in terms of their form, content and context Prehistoric Art - Egyptian and Mesopotamian art Greek and Roman art– Medieval art - Renaissance and Baroque art - Neoclassicism - Romanticism – Realism

UNIT IV APPRECIATING ART- MODERN ART AND AFTER
Appreciating art through the study of art production in the West over history from modern art till the present. Important works from the following art traditions will be studied and analysed in terms of their form, content and context : Context for new directions in art in the late 19th and early 20th century - Impressionism - post Impressionism – Fauvism- Expressionism- Cubism – Dadaism – Surrealism - abstract art – Futurism - Constructivism – Suprematism — De Stijl - Abstract Expressionism - Pop art - Op art- new forms and media of art

UNIT V APPRECIATING ART- INDIAN ART
Appreciating art through the study of art production in India over history. Important works from the following art traditions will be studied and analysed in terms of their form, content and context Indus Valley Art - Hindu Buddhist and Jain art - Mughal and Rajput miniatures - art during the colonial period - modern Indian Art.

TOTAL :45 PERIODS
OUTCOMES:
- Students are able to appreciate the art forms and analyse the same and resizing the concept in their architecture profession.
- Gathered information across the world art and the use of art in architecture and its use
- Gathered, sound knowledge on how to art can be effectively used in to architecture and Interior Design.

REQUIRED READING
1. Fred, S. Kleiner, Gardener’s Art through Ages, Harcourt College Publishers, 2001
3. Edith Thomory- a History of Fine Arts in India and the West, Orient Longman Publisher’s Pvt. Ltd, New Delhi

REFERENCES:
3. E.H.Gombrich, Art and Illsuion, Phaidon, 2002
4. Indian Art since the early 1940s- A Search for Identity- Artists Handicrafts Association of Cholamandal Artists Village, Madras,1974
5. A.K.Coomaraswamy, Fundamentals of Indian Art, Historical Research Documentation Programme, Jaipur, 1985

AR8002 EARTHQUAKE RESISTANT ARCHITECTURE L T P/S C
3 0 0 3

OBJECTIVES:
- To understand the fundamentals of Earthquake and the basic terminology
- To provide basic knowledge of earthquake resistant design concepts
- To inform the performance of ground and buildings.
- To familiarise the students with design codes and building configuration
- To understand the various types of construction details to be adopted in a seismic prone area.
- To apply the knowledge gained in an architectural design assignment

UNIT I
Fundamentals of earthquakes
a) Earths structure, seismic waves, plate tectonics theory, origin of continents, seismic zones in India.
b) Predictability, intensity and measurement of earthquake c) Basic terms- fault line, focus, epicentre, focal depth etc.

UNIT II
Site planning, performance of ground and buildings
a) Historical experience, site selection and development
b) Earthquake effects on ground, soil rupture, liquefaction, landslides.
c) Behaviour of various types of building structures, equipments, lifelines, collapse patterns
d) Behaviour of non-structural elements like services, fixtures in earthquake-prone zones

UNIT III
Seismic design codes and building configuration
a) Seismic design code provisions – Introduction to Indian codes
b) Building configuration- scale of building, size and horizontal and vertical plane, building proportions, symmetry of building- torsion, re-entrant corners, irregularities in buildings- like short stories, short columns etc.
UNIT IV
Various types of construction details
a) Seismic design and detailing of non-engineered construction- masonry structures, wood
structures, earthen structures.
b) Seismic design and detailing of RC and steel buildings
c) Design of non-structural elements- Architectural elements, water supply, drainage, electrical and
mechanical components

UNIT V
Urban planning and design
a) Vulnerability of existing buildings, facilities planning, fires after earthquake, socio-economic
impact after earthquakes.
b) Architectural design assignment- Institutional masonry building with horizontal spread and
height restriction, multi-storeyed RC framed apartment or commercial building

TOTAL: 45 PERIODS

OUTCOMES
Students ability to understand the formation and causes of Earthquakes and factors to be
considered in the Design of buildings and services to resist Earthquakes.

REQUIRED READING:
1. Guidelines for earthquake resistant non-engineered construction, National Information
centre of earthquake engineering (NICEE, IIT Kanpur, India)
2. C.V.R Murthy, Andrew Charlson. “Earthquake design concepts”, NICEE, IIT Kanpur India.

REFERENCES
1. Ian Davis (1987) Safe shelter within unsafe cities” Disaster vulnerability and rapid
urbanisation, Open House International, UK
2. Socio-economic developmental record- Vol.12, No.1, Jan-Feb 2005
3. Learning from Practice- A review of Architectural design and construction experience after
recent earthquakes- Joint USA-Italy workshop, Oct.18-23, 1992, Orvieto, Italy.

AR8003 ENERGY EFFICIENT ARCHITECTURE

OBJECTIVES:
• To inform the need to use alternative sources of energy in view of the depleting resources
and climate change.
• To familiarise the students with simple and passive design considerations
• To inform about the importance of day lighting and natural ventilation in building design
• To make the students aware of the future trends in creating sustainable built environment.

UNIT I PASSIVE DESIGN
Significance of Energy Efficiency in the contemporary context, Simple passive design
considerations involving Site Conditions, Building Orientation, Plan form and Building Envelope -
Heat transfer and Thermal Performance of Walls and Roofs

UNIT II ADVANCED PASSIVE ARCHITECTURE-PASSIVE HEATING
Direct Gain Thermal Storage of Wall and Roof - Roof Radiation Trap - Solarium - Isolated Gain

UNIT III PASSIVE COOLING
Evaporative Cooling - Nocturnal Radiation cooling - Passive Desiccant Cooling - Induced
Ventilation - Earth Sheltering - Wind Tower - Earth Air Tunnels
UNIT IV  DAY LIGHTING AND NATURAL VENTILATION  5
Daylight Factor - Daylight Analysis - Daylight and Shading Devices - Types of Ventilation - Ventilation and Building Design.

UNIT V  CONTEMPORARY AND FUTURE TRENDS  12
Areas for innovation in improving energy efficiency such as Photo Voltaic Cells, Battery Technology, Thermal Energy Storage, Recycled and Reusable Building materials, Nanotechnology, smart materials and the future of built environment, Energy Conservation Building code.

TOTAL: 45 PERIODS

OUTCOMES:
- The students are exposed to alternative sources of energy and are exposed to passive design considerations
- An understanding on day lighting and natural ventilation in design in addition to the future trends in creating sustainable built environment

REQUIRED READING:

REFERENCES:
4. The energy efficient home: a complete guide by Patrick Waterfield, Crowood press ltd.

AR8004  EVOLUTION OF HUMAN SETTLEMENTS  L T P/S C  3 0 0 3

OBJECTIVES:
- To outline the origins of human settlements and its determinants and their evolution through the course of history.
- To study the characteristics of Human settlements and the manifestation of settlements as expression of political aspirations.
- To understand the changing scenario in the context of globalization.

UNIT I  IMPORTANCE OF EVOLUTION OF HUMAN SETTLEMENTS  9
Origin of civilization, effects of civilization on Human settlements, determinants of Human settlements, ancients towns in India.

UNIT II  HISTORICAL PERIODS AND GROWTH OF HUMAN SETTLEMENTS  9
Ancient, medieval, renaissance, industrial and post industrial age

UNIT III  HUMAN SETTLEMENTS AND THEIR CHARACTERISTICS  9
Importance of shelter and its form and scale in city, concepts of land marks, axis and orientation, city as living commercial, cultural and functional entities.
UNIT IV  HUMAN SETTLEMENTS AS POLITICAL EXPRESSION 9

UNIT V  HUMAN SETTLEMENTS IN A CHANGING WORLD 9
Global city and city origin and Global economy and Trade, information and communication technology and its impact on cities, city of the future and future of cities, Sustainable cities.

OUTCOMES:
- The students were able to understand the factors which determinants formation of settlements from prehistoric to the contemporary era.
- The students understood the expressions of settlements in terms of cultural, social, economic and political context of a region.
- An understanding how globalization transformed the contemporary settlements.
- The students were able to understand how sustainability is important in the future of any settlement.

REQUIRED READING:

REFERENCES:

AR8005  INTERIOR DESIGN  L T P/S C
3 0 0 3

OBJECTIVES:
- To introduce the vocabulary of interior design.
- To familiarize the students with an overview of interior and furniture design and design movements through history.
- To inform the various components of interior space and treatment and finishes for the same.
- To familiarize the students with the various components of interior design like lighting, landscaping and furniture.

UNIT I  INTRODUCTION TO INTERIOR DESIGN 8
Definition and process of interior design - vocabulary of interior design in terms of principles and elements - introduction to the design of interior spaces as related to typology and function, themes and concepts

UNIT II  HISTORY OF INTERIOR AND FURNITURE DESIGN 8
Overview of interior and furniture design in the Western context through the ages relating to historical context, design movements and ideas - overview of folk arts and crafts of India with reference to their role in interior decoration.

UNIT III  COMPONENTS OF INTERIOR SPACE- INTERIOR TREATMENT AND FINISHES 10
Treatment of components such as floors, ceilings, walls, partitions, window treatments, accessories, etc., in terms of their choice and design related to materials, methods of construction, colour, texture, etc., based on functional, aesthetic and psychological criteria
UNIT IV  COMPONENTS OF INTERIOR SPACE- LIGHTING AND LANDSCAPING  10
Interior lighting - different types of lighting - types of lighting fixtures- their effects and suitability in different contexts Interior landscaping elements: rocks, plants, water, flowers, fountains, paving, artifacts, etc., their physical properties and effects on spaces

UNIT V  COMPONENTS OF INTERIOR SPACE- - FURNITURE  9
Furniture design as related to human comfort and function, materials and methods of construction, changing trends and lifestyles, innovations and design ideas - furniture for specific types of interiors: office furniture, children’s furniture, residential furniture, display systems, etc.

OUTCOMES:
An understanding of interior design as an interdisciplinary as well as allied field related to architecture.

REQUIRED READING:
4. Dr. Saranya Doshi, Editor, The Impulse to adorn - Studies in traditional Indian Architecture, Marg Publications 1982

REFERENCES:
1. Helen Marie Evans, An Invitation to design, Macmillan Pub Co 1982
4. Kathryn B.Hiesinger and George H.Marcus, Landmarks of twentieth Century Design; Abbey Ville Press 1993
5. Susanne Slesin and Stafford Cliff, Indian Style, Clarkson N.Potter, Newyork 1990

AR8006  STRUCTURE AND ARCHITECTURE  L T P/S C  3 0 0 3

OBJECTIVES:
• To study evolution of structural systems through history.
• To familiarise the students with concepts of structural design through works of architects/engineers.
• To study architectural expression through relevant case studied.
• To evaluate the understanding of the relationship between form & structure through a seminar.

UNIT I  HISTORY OF STRUCTURAL DESIGN IN THE PRE INDUSTRIAL ERA  8
Development of monolithic and rock cut structures- trabeated construction-arcuate construction-vaults and flying buttresses- tents and masted structures and bridges through ancient and medieval history.

UNIT II  HISTORY OF STRUCTURAL DESIGN IN THE POST INDUSTRIAL PERIOD  8
Post Industrial modular construction of large span and suspension structures in steel and concrete- projects of Pier Nuigi Nervi, Maillart, Candella, Buckminster Fuller and Eero Saarinen.
UNIT III  CONTEMPORARY STRUCTURAL EXPRESSION THROUGH
CASE STUDY – I  13
The select case studies could include KCR Terminal at Hung Hom, Hong Kong, B3 Offices in Stockley Park, Sainsbury Centre for Visual Art, Renault Centre and Swindon UK by Normal Foster and Standsted Airport Terminal, London, UK by Fosters/Arup British Pavilion Expo 1992, Seville, Spain and Waterloo International Terminal by Nicholas Grimshaw

UNIT IV  CONTEMPORARY STRUCTURAL EXPRESSION
THROUGH CASE STUDY – II  10
The select case studies could include Inmos Microchip Factory, Centre Commercial St. Herbtain, PA Technology, Princeton and Fleetguard, Quimper UK by Richard Rogers Athens Olympic Stadium and Village, Bridges and Public Bus Stop in St. Gallen, Railway Station, Lyon, France and Stadelhofen Railway station, Zurich Schweiz by Santiago Calatrava Kansai International Airport, UNESCO Workshop, the Jean-Marie Tjibaou Cultural Center, Menil Museum, Thomson Optronics Factory, IBM Traveling Exhibition Pavilion, Columbus International Exposition, Genoa Italy and Lowara Officers, Montecchio Maggiore Italia by Reno Piano Building Workshop

UNIT V  SEMINAR  6
Seminar to present a study of architectural form and structural expression through select cases which will aid understanding of structural philosophy and analysis, building envelope and services and construction sequence.

TOTAL: 45 PERIODS

OUTCOMES
1. The student will understand and familiarize the concepts of structural design and its impact/functional dimension in the architectural design of the historic and contemporary buildings.
2. The student will be acquainted with the architectural expression, its relation between form and structure through relevant case studies.

REFERENCES
1. “Paper Arch” and Japan Pavilion at Expo 2000 in Hannover by Shigeru Ban
2. Greene King Draught Beer Dept and Schlumberger Cambridge Research Centre, UK by Michael Hopkins
3. Design Center, Linz, Austria and Two Family House in Pullach Thomas Herzog
4. King Abdul Aziz International Airport, Haj Terminal by SOM
5. Pavilion of the Future, Expo 92, Seville by Martorell, Bohigas & Mackay (MBM)
6. Daring Harbour Expo Center, Sydney Australia by P. COX
7. Olympic Archery Building by Enric Miralle & Carme Pinos
8. Eagle Rock House by Ian Ritchie
9. Le Grande Arche de La Defense by J O Spreckelsen

AR8007    THEORY OF DESIGN    L T P/S C
3 0 0 3

OBJECTIVES:
- To understand design and the role of the designer in changing society.
- To familiarize the students with methodologies, theories and models of the design process.
- To inform students about the term creativity and introduce techniques which will enable creative thinking.
- To inform the approaches that generate ideas for architectural design and the importance of the participatory approach to design.
UNIT I  INTRODUCTION TO DESIGN  
Definition and understanding of design- design in history -changing role of designer on society- different classifications of design according to scale, process, mode of production, etc.,

UNIT II  DESIGN METHODOLOGY MOVEMENT  
Context for the rise of the design methodology movement- theories of the first generation and the second generation design methodologists- various models of the design process- focus on the design problem: ideas of escalation/regression and wicked problem.

UNIT III  CREATIVE THINKING  
Understanding the term creativity- theories on thinking: left brain/ right brain, convergent and divergent thinking, lateral and vertical thinking- design spectrum from the logical to chance -blocks in creative thinking- various techniques to generate creativity

UNIT IV  ARCHITECTURAL CREATIVITY  
Design puzzles and traps - approaches to generate ideas for architectural design - types of concepts- personal philosophies and strategies of individual designers - channels to creativity in architecture

UNIT V  DESIGN AND PEOPLE  
Concept of pattern language- participatory approach to design - design as process

OUTCOMES:
An ability to think about architecture as one of the many fields under the broader ambit of design as a fundamental human activity.

REQUIRED READINGS:
3. Anthony Antoniades, Poetics of architecture- Theory of design
5. Christopher Alexander, Pattern Language, Oxford University Press, 1977

REFERENCES
1. Victor Papanek, Design for the real world

AR8008  VERNACULAR ARCHITECTURE  
L T P/S C  
3 0 0 3

OBJECTIVES:
- To introduce the study of vernacular architecture as a process and not a product.
- To provide an overview of the various approaches and concepts to the study of vernacular architecture.
- To study the various vernacular architecture forms in the various regions of the country.
- To look at the impact of Colonial rule on the vernacular architecture of India.
UNIT I INTRODUCTION  
Definition and classification of Vernacular architecture – Vernacular architecture as a process – Survey and study of vernacular architecture: methodology- Cultural and contextual responsiveness of vernacular architecture: an overview

UNIT II APPROACHES AND CONCEPTS  
Different approaches and concepts to the study of vernacular architecture: an over view – Aesthetic, Architectural and anthropological studies in detail

UNIT III VERNACULAR ARCHITECTURE OF THE WESTERN AND NORTHERN REGIONS OF INDIA  
Forms spatial planning, cultural aspects, symbolism, colour, art, materials of construction and construction technique of the vernacular architecture of the following:  
- Deserts of Kutch and Rajasthan; Havelis of Rajasthan  
- Rural and urban Gujarat; wooden mansions (havelis); Havelis of the Bohra Muslims  
- Geographical regions of Kashmir; house boats

UNIT IV VERNACULAR ARCHITECTURE OF SOUTH INDIA  
Forms, spatial planning, cultural aspects, symbolism, art, colour, materials of construction and construction technique, proportioning systems, religious beliefs and practices in the vernacular architecture of the following:  
- Kerala: Houses of the Nair & Namboothri community; Koothambalam, Padmanabhapuram palace.  
- Tamil Nadu: Houses and palaces of the Chettinad region; Agraharams.

UNIT V WESTERN INFLUENCES ON VERNACULAR ARCHITECTURE OF INDIA  

TOTAL: 45 PERIODS

OUTCOMES:  
- An Understanding on the study of Indian vernacular architecture as a process and also to provide and overview of various approaches and concepts.  
- An exposure to various vernacular architectural forms in various regions  
- An understanding on the impact of colonial rule on vernacular architecture in India.

REQUIRED READINGS:  

REFERENCES:  
5. S. Muthiah and others: The Chettiar Heritage; Chettiar Heritage 2000
OBJECTIVES:
- To provide students an exposure to disasters, their significance and types.
- To ensure that students begin to understand the relationship between vulnerability, disaster, disaster prevention and risk reduction.
- To gain a preliminary understanding of approaches of Disaster Risk Reduction (DRR).
- To enhance awareness of institutional processes in the country and
- To develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity.

UNIT I INTRODUCTION TO DISASTERS
Definition: Disaster, Hazard, Vulnerability, Resilience, Risks – Disasters: Types of disasters – Earthquake, Landslide, Flood, Drought, Fire etc - Classification, Causes, Impacts including social, economic, political, environmental, health, psychosocial, etc.- Differential impacts- in terms of caste, class, gender, age, location, disability - Global trends in disasters: urban disasters, pandemics, complex emergencies, Climate change- Dos and Don’ts during various types of Disasters.

UNIT II APPROACHES TO DISASTER RISK REDUCTION (DRR)
Disaster cycle - Phases, Culture of safety, prevention, mitigation and preparedness community based DRR, Structural- nonstructural measures, Roles and responsibilities of- community, Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), States, Centre, and other stakeholders- Institutional Processes and Framework at State and Central Level- State Disaster Management Authority(SDMA) – Early Warning System – Advisories from Appropriate Agencies.

UNIT III INTER-RELATIONSHIP BETWEEN DISASTERS AND DEVELOPMENT
Factors affecting Vulnerabilities, differential impacts, impact of Development projects such as dams, embankments, changes in Land-use etc.- Climate Change Adaptation- IPCC Scenario and Scenarios in the context of India - Relevance of indigenous knowledge, appropriate technology and local resources.

UNIT IV DISASTER RISK MANAGEMENT IN INDIA
Hazard and Vulnerability profile of India, Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management, Institutional arrangements (Mitigation, Response and Preparedness, Disaster Management Act and Policy - Other related policies, plans, programmes and legislation – Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster – Disaster Damage Assessment.

UNIT V DISASTER MANAGEMENT: APPLICATIONS AND CASE STUDIES AND FIELD WORKS
Landslide Hazard Zonation: Case Studies, Earthquake Vulnerability Assessment of Buildings and Infrastructure: Case Studies, Drought Assessment: Case Studies, Coastal Flooding: Storm Surge Assessment, Floods: Fluvial and Pluvial Flooding: Case Studies; Forest Fire: Case Studies, Man Made disasters: Case Studies, Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.

TOTAL: 45 PERIODS

OUTCOMES:
The students will be able to
- Differentiate the types of disasters, causes and their impact on environment and society
- Assess vulnerability and various methods of risk reduction measures as well as mitigation.
- Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management.
TEXT BOOKS:

REFERENCES
1. Govt. of India: Disaster Management Act, Government of India, New Delhi, 2005

GE8073 HUMAN RIGHTS L T P C
3 0 0 3

OBJECTIVES:
• To sensitize the Engineering students to various aspects of Human Rights.

UNIT I

UNIT II

UNIT III
Theories and perspectives of UN Laws – UN Agencies to monitor and compliance.

UNIT IV
Human Rights in India – Constitutional Provisions / Guarantees.

UNIT V

TOTAL: 45 PERIODS

OUTCOME:
• Engineering students will acquire the basic knowledge of human rights.

REFERENCES:
   Upendra Baxi, The Future of Human Rights, Oxford University Press, New
OBJECTIVES:
• To study loss of pre-stress and design requirements for determinate beams.
• To study the design of flat slabs and High Rise structures.
• To study the concepts of tensile structures, grids, domes, shells and folded plates.

UNIT I PRESTRESSED CONCRETE 10
Losses of Prestress – Design requirements – Design of determinate beams.

UNIT II FLAT SLABS 8

UNIT III HIGH – RISE BUILDINGS 10
Introduction – Load action in high rise buildings – Various structural systems – Approximate analysis and Design of frames for gravity and horizontal loadings.

UNIT IV TENSILE STRUCTURES 10
Concept, Development, Laws of formation, Merits and Demerits of Pneumatic structures – Basic principles, Various forms, Merits and Demerits of cable structures.

UNIT V GRIDS, DOMES AND FOLDED PLATES 7

OUTCOMES:
At the end of the course, the student should be able to:
• Concepts of Prestressed concrete and applying them in real case.
• Concepts of flat slab design and sky scrapers with application in real case.
• Theory of tensile structures, grids, domes, shells and folded plates application in design.

REQUIRED READING:

REFERENCES:
1. P. Dayarathnam, prestressed concrete structures, Oxford and IBM publishing Co., New Delhi, 1982
OBJECTIVES:
• To introduce the various issues and practices of Conservation.
• To familiarise the students with the status of conservation in India and the various agencies involved in the field of conservation worldwide and their policies.
• To outline the status of conservation practice in the country and the various guidelines for the preservation, conservation and restoration of buildings.
• To inform the students about the character and issues in our heritage towns through case studies.

UNIT I INTRODUCTION TO CONSERVATION

UNIT II CONSERVATION IN INDIA
Museum conservation – monument conservation and the role of Archeological Survey of India – role of INTACH – Central and state government policies and legislations – inventories and projects- select case studies of sites such as Hampi, Golconda, Mahabalipuram -craft Issues of conservation

UNIT III CONSERVATION PRACTICE
Listing of monuments- documentation of historic structures- assessing architectural character – historic structure report- guidelines for preservation, rehabilitation and adaptive re-use of historic structures- Case studies of Palaces in Rajasthan, Chettinad and Swamimalai dwellings, seismic retrofit and disabled access/ services additions to historic buildings-heritage site management

UNIT IV URBAN CONSERVATION
Over view of urban history of India and Tamil Nadu- understanding the character and issues of historic cities – select case studies of towns like Srirangaram, Kumbakonam and Kanchipuram - historic districts and heritage precincts.

UNIT V CONSERVATION PLANNING
Conservation as a planning tool.- financial incentives and planning tools such as Transferable Development Right(TDR)-urban conservation and heritage tourism-case studies of sites like for Cochin, Pondichery French town.- conservation project management.

TOTAL: 45 PERIODS

OUTCOMES
1. The student understands importance of heritage, issues and practices of conservation through case studies.
2. The student will gain understanding on historic materials and their properties various technologies for investigating masonry, foundation and also traditional and modern repair methods.

REQUIRED READING:

REFERENCES:
1. B.K. Singh, State and Culture, Oxford, New Delhi
3. Seminar Issue on Urban Conservation
OBJECTIVES:
- To provide basic introduction to the skills relevant to the practice of professional journalism. It introduces students to the fundamentals of writing, explaining of various strategies and their criticism.
- Introduction to Photojournalism and the contributions of photography to the professional practice of architecture and develop proficiency in this art using modern photography techniques.

UNIT I    INTRODUCTION
Introduction to journalism, key concepts and objectives of Journalism – Specialized journalism: with emphasis on architectural journalism - Journalism skills: research, reporting, writing, editing, photography, columnists, public relationships, criticism.

Issues such as copyright, public art policy, the arts and urban redevelopment. Introduction to local culture scene.

UNIT II    TECHNOLOGIES IN JOURNALS
Environment, Social Change, Persuasion- Interviewing techniques, Argument and debate as a technique in the investigation of social problems; evidence, proof, refutation, persuasion; training in argumentative speaking.

Introduction to software needed in journalism and photography, video coverage, walk-through of buildings, production of contemporary architectural journalism. Understanding the individual demands in the context of newspapers, radio, film, and television.

UNIT III   CONTEMPORARY ARCHITECTURAL JOURNALISM
Role of the Editor - Editing of Articles, Features and other stories - Editing for online newspaper and magazines - Text preparation, Mode of presentation, Standards and Guidelines for documentation, Code of ethics, Basic knowledge on Press laws, Press Council of India, Multimedia/online journalism and digital developments.

UNIT IV    DISCUSSIONS AND ISSUES
Regional, National and International discussion forums, Changes in contemporary and historical design practices. Discussions on topics needed in an architectural journal and current issues - types of journals, works of key architectural journalists, Public Discourse on the Internet, Mass Media and Public Opinion – critique on selected pieces of journalism.

UNIT V    ARCHITECTURAL PHOTOGRAPHY
Introduction to architectural photography and role of the photographic image in the global world – basic instruction in Photojournalism

Equipment: cameras and lenses – techniques: film speed, exposure measurement, gray scale—photo- finishing and editing digital images.

Perspectives: Single Point, Two- Point, Three- Point and methods of correcting distortions – Lighting: External and Interior

TOTAL: 45 PERIODS

OUTCOMES:
An ability to critically think and analyse about the effects of architecture on society as well as the tools to enable recording of the same.

TEXT BOOKS:
REFERENCES:
3. Basics Architectural photography – Heinrich

AR8012 CONSTRUCTION AND PROJECT MANAGEMENT

OBJECTIVES:
• The understand different management techniques suitable for planning and constructional projects.
• To understand the management system for accomplishing the task efficiently in terms of both time and cost.

CONTENT:
UNIT I INTRODUCTION TO PROJECT MANAGEMENT
Project management concepts-objectives, planning, scheduling Controlling and role of decision in project management. Traditional management system, Gantt’s approach, Load chart. Progress Chart, Development of bar chat, Merits and Demerits.

UNIT II PROJECT PROGRAMMING AND CRITICAL PATH METHOD

UNIT III ANALYSIS
Cost model-Project cost, direct cost, indirect cost, slope curve, Total project cost, optimum duration contracting the network for cost optimization. Steps in cost optimization, updating, resource allocation-resource smoothing, resource leveling.

UNIT IV PROGRAMMING EVALUATION REVIEW TECHNIQUE
PERT network, introduction to the theory of probability and statistics. Probabilistic time estimation for the activities for the activities of PERT Network.

UNIT V COMPUTERIZED PROJECT MANAGEMENT

TOTAL: 45 PERIODS
OUTCOMES:
At the end of the course, the student should be able to:

- Apply the project management techniques in solving the constructional problems efficiently.
- Different PMT to be applied in respective areas.
- The course of a work from the start to the finish to analysed before the commencement of the project.

REQUIRED READING:

REFERENCES:

AR8013 CONSTRUCTION TECHNOLOGY L T P/S C 3 0 0 3

OBJECTIVES:
- To study the advancements in construction with concrete for large span structures.
- To familiarize the students with the manufacture, storage and transportation of concrete.
- To inform the various equipment used in the construction industry and the criteria for choice of equipment.
- To familiarize the students with an overview of construction management, planning and scheduling

CONTENT:
UNIT I CONSTRUCTION SYSTEMS 10
Structural systems and design: Planning - pre-stressed, concrete constructions pre-cast concrete and pre-fabrication system - Modular coordination.

UNIT II CONSTRUCTION PRACTICE 10
Modern Construction Materials - Manufacture, storage, transportation and erection of pre-cast component forms, moulds and scaffoldings in construction - safety in erection and dismantling of constructions.

UNIT III CONSTRUCTION METHODS AND EQUIPMENT 10
Uses of the following: Tractors, bulldozers, shovels draglings, cableways and belt conveyors, batching plants - Transit mixers and agitator trucks used for ready mix concrete pumps Guniting equipments - Air compressors - welding equipment - cranes and other lifting devices Choice of construction equipment for different types of works.

UNIT IV CONSTRUCTION TECHNOLOGY FOR HIGHLRISE BUILDINGS 6
Planning and scheduling for high rise building: Scheduling- Simulation – Typical Floor Construction Cycle – Appropriate working schedule.

UNIT V CONSTRUCTION MANAGEMENT 9
Overview of construction management topics including estimating, cost control, quality control, safety, productivity, value engineering, claims, and legal issues.

TOTAL : 45 PERIODS
OUTCOMES:
At the end of the course, the student should be able to:

- Apply the concepts for large span structures.
- Concepts of construction management, planning and scheduling: apply them with examples.
- Materials storage and equipments for construction to be known before beginning of the work.

REQUIRED READINGS:

REFERENCES:
1. National Building Code of India, 2005

OBJECTIVES:
- To investigate various theories of media and its influence on the perception of space.
- To study the various aspects of Digital Architecture and its exploration through emerging phenomena that relies on abstraction of ideas.
- To study the works of contemporary architects who have illustrated the influence of the digital media in evolving architecture. This is to be presented as Seminars.

CONTENT:

UNIT I INTRODUCTION

UNIT II ASPECT OF DIGITAL ARCHITECTURE

UNIT III CONTEMPORARY PROCESS
Emerging phenomena such as increasing formal and functional abstractions – Diagrams – Diagrammatic Reasoning – Diagrams and Design Process – Animation and Design – Digital Hybrid

UNIT IV GEOMETRIES AND SURFACES
UNIT V  SEMINAR

Students would make presentation on the ideas and works of the following architects. The proposal must be discussed with course faculty prior to presentation. Greg Lynn, Reiser + Umemoto, Lars Spuybroek / NOX Architects, UN studio, Diller Scofidio, Dominique Perrault, Decoi, Marcos Novak, Foreign Office Architects, Asymptote, Herzog and de Meuron, Neil Denari.

TOTAL: 45 PERIODS

OUTCOMES

• Students would be able understand the effect of contemporary theories of media on contemporary architectural design.
• Student shall gain insight to the various contemporary design process/theories and their relation to computation.
• Students would be able to identify and go in depth into specific and appropriate aspects relating to the discipline of architecture and reflect this in the realm of design

REQUIRED READING

2. Ignasi de Sola Morales, High Tech: Functionalism of Rhetoric
8. Peter Eisenmann, Diagram: An Original Scene of Writing, Diagram Diaries

REFERENCES:

1. Gillian Hunt, Architecture in the Cybernetic Age, Architectural Design Profile no. 136
2. Sarah Chaplin, Cyber Space Lingering on the Threshold, Architecture, postmodernism and difference, Architectural Design Profile 118

AR8015 LANDSCAPE & ECOLOGY

OBJECTIVES:

• To familiarize students with the various elements of landscape architecture and the principle of landscape design.
• To provide an overview of ecological balance and impacts of human activities and stress the need for environmental protection and landscape conservation.
• To develop and strengthen the competence in dealing with the analytic, artistic and technical aspects of designing open spaces at different scales.

CONTENT:

UNIT I  INTRODUCTION

Introduction to landscape architecture, ecology, ecological balance, landscape conservation, reclamation and landscaping of derelict lands, environmental impact assessment.
## UNIT II  ELEMENTS IN LANDSCAPE DESIGN  
10
Hard and soft landscape elements; Plant materials - classification, characteristics, use and application in landscape design; Water and Landform,

## UNIT III  GARDEN DESIGN  
10
Landscape and garden design in history - Japanese, Italian Renaissance and Moghul gardens in India. Study of notable examples, Spatial development in landscape design.

## UNIT IV  SITE PLANNING  
10
Organisation of spaces - circulation, built form and open spaces, site planning and micro climate, site planning for neighbourhood parks, children’s play area and campus development.

## UNIT V  LANDSCAPING OF FUNCTIONAL AREAS  
8
Urban open spaces and principle of urban landscape; Street landscaping, landscape design for waterfront areas and functional areas in urban centers; green roofs and walls.

### TOTAL: 45 PERIODS

### OUTCOMES
i) Understanding of the scope of landscape architecture in the subject  
ii) Basic understanding of elements of landscape  
iii) Understanding of impact of human activities on the environment and the role of architect in mitigating it

### REQUIRED READING:

### REFERENCES:

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## AR8016  SUSTAINABLE PLANNING AND ARCHITECTURE  
L T P/S C  
3 0 0 3

### OBJECTIVES:
- To understand the concept of sustainability and sustainable development  
- To inform the various issues like climate change, ecological footprint, etc.  
- To understand low impact construction practices, life cycle costs and alternative energy resources.  
- To familiarize the students with the various rating systems for building practices with case studies.  
- Through case studies to understand the concept of sustainable communities and the economic and social dimensions.

## UNIT I  
7
Concept of Sustainability – Carrying capacity, sustainable development – Bruntland report – Ethics and Visions of sustainability.

## UNIT II  
Eco system and food chain, natural cycles – Ecological foot print – Climate change and Sustainability.
UNIT III

UNIT IV
Green building design – Rating system – LEED, GRIHA, BREEAM etc., case studies.

UNIT IV
Urban ecology, social and economic dimensions of sustainability, urban heat Island effects, sustainable communities – Case studies.

OUTCOMES:
1. The students are oriented about the concepts of ecosystem carrying capacity, ecological footprint, sustainability and sustainable development.
2. The students are aware of the emerging vulnerabilities of global warming and climate change and understand the contribution of building industry to the same.
3. The students are familiar with the various approaches to achieving sustainable buildings and communities
4. The students understand the various incentives and evaluation systems for green buildings

REFERENCES:

REQUIRED READINGS:
2. HOK guide book to sustainable design by Mendler (S) & Odell (W) – John willey and sons 2000.

AR8017 URBAN HOUSING

OBJECTIVES:
• To outline the Issues concerning housing in the Indian Context and the various agencies involved in the production of housing.
• To outline factors that influence housing affordability and to familiarize students with various schemes and policies of the government in the housing sector.
• To inform about the standards and guidelines for housing
• To inform about the various housing design typologies and the processes involves in housing project development.

CONTENT:
UNIT I INTRODUCTION TO HOUSING AND HOUSING ISSUES – INDIAN CONTEXT
Housing and its importance in Architecture and its relationship with neighbourhood and city planning.

Housing demand and supply – National Housing Policy – Housing agencies and their role in housing development – impact of traditional life style – Rural Housing, Public, private sector housing.
UNIT II   SOCIO-ECONOMIC ASPECTS  10
Social economic factors influencing housing affordability – equity in housing development sites and services/-slum upgradation community participation – Indira Awas Yojana Crime prevention, Health principles in Housing.

UNIT III   HOUSING STANDARDS  7

UNIT IV   SITE PLANNING AND HOUSING DESIGN  10
Site Planning : Selection of site for housing, consideration of physical characteristics of site, locational factors, orientation, climate, topography - Landscaping- Housing design - Traditional housing, row housing, cluster housing – apartments and highrise housing relating to Indian situations – case studies in India – integration all types of services, parking, incorporation of green sustainable practices –prefabrication in housing.

UNIT V   HOUSING PROCESS  8
Various stages and tasks in project development –community participation and housing management – Environmental aspects and national calamities and disaster mitigation.

TOTAL: 45 PERIODS

OUTCOMES
Ability to understand issues relating to Housing policy and its impact on housing development in Indian context. Students also learn about Evolution of settlement pattern, Design for diversity, Costing etc for a cross section of income groups and design of Disaster resistant structures.

REFERENCES:
2. Leuris (S), Front to back: A Design Agenda for Urban Housing, Architectural Press, 2006.

REQUIRED READINGS:
4. HUDCO publications – Housing for low income, sector model.