PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):
Bachelor of Architecture curriculum is designed to prepare the graduates having aptitude and knowledge

1. To facilitate a successful professional career.
2. To imbibe a strong foundation in Humanities and Sciences, Engineering Sciences and Architectural Design Skills.
3. To appreciate the theories and practices in the field of Architecture and design.
4. To update themselves abreast of new developments in the field of architecture through life-long learning.
5. To emulate and inspire high ethical values in professional practice.

PROGRAMME OUTCOME (PO):
1) Ability to gain knowledge of Humanities, Sciences, Engineering Sciences and Architecture.
2) Ability to understand elements of Architecture and apply basic principles in Architectural Design.
3) Ability to identify social, economical environmental and cultural issues that have bearing on the Architectural Design Process.
4) Ability to analyze and apply theoretical knowledge to achieve Architectural Design solutions.
5) Ability to understand ethical and professional responsibilities.
6) Ability to review, comprehend and report technological developments in the profession of architecture and construction.
7) Ability to understand real life situation of Architectural Practice.
8) Ability to communicate effectively and work in interdisciplinary groups.
# MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES WITH PROGRAMME OUTCOME:

A broad relation between the programme objectives and the outcome is given in the following table.

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* Except Dissertation - Requirements for Dissertation as given in Elective List.
**2 weeks Educational Tour to be conducted during VI - VII Semester vacation or VII - VIII Semester vacation
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Non-Credit Mandatory: NCC/NSS/YRC/Rotaract Rural study tour.
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, Ancient Egypt, West Asia, Greece, Rome, Medieval times and Renaissance period.

UNIT I WISDOM OF THE ANCIENTS THRO RIVER VALLEY CIVILIZATION 07
Response to culture and context in building shelter in the Neolithic period - R. Nile and the architecture of Egypt with relevant examples – Urban form in the Indus Valley and the Tigris and Euphrates basin and relevant examples of architecture.

UNIT II CLASSICAL WORLD 10
Roman history: Republic and Empire – Religion, culture, lifestyle - Roman character – Roman urban planning – architecture as imperial propaganda: forums and basilicas – structural forms: materials and techniques of construction spanning large spaces with relevant examples - domestic architecture.

UNIT III EARLY CHRISTIANITY AND CHRISTIAN KINGDOMS 10
Birth and spread of Christianity – transformation of the Roman Empire – early Christian worship and burial. Church planning – Basilica concept and Centralized plan concept with relevant examples in the West and in the Byzantine.

UNIT IV THE AGE OF CHURCH BUILDING 08
Development of Gothic architecture Church plan, structural developments in France and England with using relevant examples of church architecture in Europe – wooden roofed churches.

UNIT V IDEA OF RE-BIRTH AND RENAISSANCE IN EUROPE 10

TOTAL: 45 PERIODS

OUTCOMES:

- An understanding about the spatial and stylistic qualities associated with architecture.
- An Understanding of architecture as an outcome of various social, political and economic upheavals, and as a response to the cultural and context.
TEXTBOOKS:

REFERENCES:

MA8102 MATHEMATICS

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 too.
- Understand 3D material.
- Understand functions of more than one variable, along with differentiation under integral sign.
- Solving differential equation of certain type.
- Analyzing 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 12
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: 60 PERIODS

OUTCOMES:
• The aim of the course is to develop the skills of the students in architecture. 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.

TEXTBOOKS:

REFERENCES:

AR8121 ARCHITECTURAL DRAWING I L T P/S C 1 0 4 3

OBJECTIVES:
• To understand drawing as a medium to visualize and communicate design ideas.
• To understand the concepts of Architectural Drawing with the introduction of drafting fundamentals.
• To understand the language of Architectural representations through Architectural Drawing systems.
• To introduce the basics of measured drawing.

UNIT I GEOMETRICAL DRAWING: INTRODUCTION TO DRAFTING 10
Introduction to fundamentals of drawing/ drafting: Construction of lines, line value, line types, lettering, dimensioning, representation, format for presentation, use of scales etc. Construction of lines and angles, construction of triangles, circles, tangents, curves and conic sections.

UNIT II PLANE GEOMETRY AND SOLID GEOMETRY 20
Construction and development of planar surface – square, rectangle, polygon etc. Introduction of multi-view projection – projection of points, lines and planes. Multi-view projection of solids – cube, prism, pyramids, cones, cylinders etc. Sections of solids, true shape of solids.
UNIT III ARCHITECTURAL DRAWING SYSTEMS

Communicating Architectural Design Ideas from Concept to Construction - Case studies of Architect’s Sketches translated as Drawing systems – Types of Projection systems and Pictorial systems – Types of Pictorial systems such as Multi view, Para line and Perspective drawings.

UNIT IV MULTIVIEW AND PARALINE DRAWINGS


UNIT V MEASURED DRAWING

Introduction to fundamentals of measured drawing, format for presentation methods - Techniques of measuring buildings and their details – Measured drawing of simple objects like furniture, ornamentation, measured drawing of building components like column, door, window, cornice, etc. isometric projections of simple construction details of the building components.

TOTAL: 75 PERIODS

OUTCOMES:

- Understanding on the concepts of architectural drawing as well as representation skills is imparted.
- Understanding on the building representation in 2D and 3D among students in addition to preparation of measured drawing.

TEXTBOOKS:


REFERENCES:

3. Scidler & Korte; Hand drawings for Designers - Communications ideas through area graphics; Four child books NY; 2012.

OBJECTIVES: The English Language Course for students of architecture would,

- Enhance their communication skills in English by developing their listening, speaking, reading and writing skills.
- Develop their speaking skills with specific reference to prospective/actual clients, suppliers, business partners and colleagues.
- Enhance their reading particularly, rules and regulations, catalogues, architecture journals and textbooks.
- Develop their writing skills especially writing emails, proposals and reports.
UNIT I INTRODUCTION 10
Listening- short talks, interviews and discussions from various media Speaking-negotiating meaning, convincing people- describing places Reading- texts on architecture-Writing-process descriptions -Vocabulary Development-Abbreviations and Acronyms. Grammar-Suitable tenses to write descriptions and describe.

UNIT II SPEAKING, READING AND WRITING 10
Listening –listen to talks for specific information- Speaking- preparing a presentation using the computer, participating in small group discussion- Reading- lengthy articles related to architecture and construction Writing- writing formal emails, vocabulary-appropriate words to describe topics in architecture, Grammar- suitable grammar for writing a report.

UNIT III DESCRIPTIVE PRESENTATION 10
Listening- Descriptions of place, conversations and answering questions, Speaking- making a power point presentation on a given topic, Reading- architecture manuals, Writing- writing a report, writing essays-descriptive essays, Vocabulary- adjectives of comparison, Grammar-collocations.

UNIT IV ANALYTICAL PRESENTATION 15
Listening- TED talks, Speaking- participating in group discussions, Reading- reading and interpreting visual information, Writing- writing analytical essays and argumentative, Vocabulary- suitable words to be used in analytical and argumentative essays, Grammar-subject-verb agreement.

UNIT V PROJECT PROPOSAL PRESENTATION 15
Listening- ink talks and longer talks, Speaking- talking about one’s project proposal, Reading- reading essays on construction, buildings, different schools of architecture, Writing-writing proposals, Vocabulary- related vocabulary, Grammar- Cohesive devices.

TOTAL: 60 PERIODS

OUTCOMES:
- Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, and argue using appropriate communicative strategies.
- Read different genres of texts, infer implied meanings and critically analyze and evaluate them for ideas as well as for method of presentation.
- Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings.
- Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.

TEXTBOOKS:
2. www.cambridgescholars.com
4. arkenghlish.

REFERENCES:
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 involve students in a series of exercises which will look at graphic and abstract representations of art.
- To sensitize students to the grammar of visual perception by involving them in a series of free hand exercises to understand form, proportion, scale, figure ground etc.,

UNIT I  BASICS OF DRAWING  15
Introduction to Drawing through various period of History - Seeing (Observation / Proposition / Scale / Texture through study of still life and natural objects), Visualizing (Memory Drawing / Exploratory Drawing), Expressing (Qualities of Lines / Drawing tools and Quality of Expressions – Pen, Pencil, Charcoal, Marker) – Abstraction and communication (Sketching and Free hand perspective Drawing)

UNIT II  DRAWING FROM OBSERVATION  15
The processes of seeing, Imagining and Representing - Observations on Line and Shape - Observation on Tone and Texture - Observations on Form and Structure - Observations on Space and Depth - Sketching Exercises related to the contents specified above.

UNIT III  GRAPHIC DESIGN  15
Introduction to history of Graphic Design – Visual perception theory (Gestalts) – Principle of Compositions – Colour Theory – Type Design and Typography (Layouts / Format / Calligraphy) – Environmental Graphics (Signage / Logo / enhancing the built environment) – Exercises in environmental graphic design, color and composition

UNIT IV  PAINTING  15
Introduction to Art / Artists’ / Movements and Styles before and after industrial revolution and its implication on design and architecture – Mediums, Techniques and Tools (Water colours / Posters / Acrylic / Inks / Brushes / Knives / Mixed Media) - Exercises using various techniques and mediums

UNIT V  CULTURE - CRAFT - TECHNOLOGY  30
Understanding Culture and Craft – Understanding Craft and Technology – Material exploration (Wood / Metal / Clay / Printing) - to be Explored as Workshop Modules - Print Making / Wood Carving / Clay Sculpting / Casting / Sheet Metal etc.,

TOTAL: 90 PERIODS

OUTCOMES

- The students are exposed to various mediums, techniques and tools.
- The students gain mastery in sketching, visualizing and expression through manual drawing.
- Sensitized to culture, craft and context.
- Skill Development in Handling Materials and in Making Products.

REQUIRED READINGS
REFERENCES

AR8112 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 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 3D Composition by involving students in a number of exercises which will help generation of a form from a two dimensional / abstract idea.
• To understand architecture as a craft, of making and of putting together.
• To sensitize students to materials both planar and plastics and Processes involved in working with them.
• To draw inspiration and clues from nature.
• To introduce Drawing as an analytical tool.
• To introduce students to History of Design and craft.

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:
• Elements and Principles of Visual Composition and Pattern making.
• Exploring Colour theories and their application in a Visual composition.
• Study of texture and schemes of texture both applied and stimulated and their application.
• Material and Form / Structures – Nature based enquiry into form both Linear and Planar, fluid and plastic forms using simple material like Mount Board, metal foil, box boards, wire string, thermocol, clay, plaster of Paris etc.
• Study of Solids and voids to evolve sculptural forms and spaces using specific process oriented methods like casting, mouldings etc.,
• Analytical appraisal of an iconic Design like a rietvelt chair, Eames chair etc., for form, function, visual characteristics, ergonomics etc. /evolution of a craft.
• Analytical appraisal of building form in terms of visual character, form and function, play of light and shade, solids and voids, colors and texture.

TOTAL: 180 PERIODS
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.
- Development of required skills – observation / analysis / abstractions / interpretation / representations / expressions through models and drawings.
- Understanding by making.

TEXTBOOKS:

REFERENCES:

AR8201 THE THEORY OF ARCHITECTURE L T P/S C
3 0 0 3

OBJECTIVES:
- To understand that architecture is a dynamic interface between man and his environment: through its constituent aspects and elements.
- To understand the various principles of architectural design, with which the above objective is attained.
- To understand that architecture is communicative medium involving aspects of expression and experience.
- To understand the various possibilities of approaching architectural design, through examples from historical and contemporary examples.

UNIT I ARCHITECTURE - ITS ELEMENTS
Defining Architecture; an overview of the complexities of various layers and factors involved in Architecture. - Architecture as an organic entity and its components - function, form, structure, skin, material, circulation, character etc. - Architecture as a building entity and its elements - floor, walls, columns, roof, openings, stairs, etc; - their definition, evolution, attributes and spatial roles - Form/space making and its elements - points, lines, planes and volume; Various configuration of these elements in space making.
UNIT II  
NATURE AND MAN - ARCHITECTURE AS AN INTERFACE  9
Nature - its five basic elements - earth (material, site, vegetation etc), water (rain, humidity etc), fire (light, temperature, radiation), wind (ventilation), sky (space); The dynamic interactions between elements of nature and elements of architecture - Human being - the five basic senses - their role in perception of built environment - vision (light, color, views etc), hearing (sound, noise, silence), tactility (texture, thermal and physical feeling), smell, spiritual. --- The Functional, psychological and aesthetic relevance in architecture - The demonstration of architecture as an experiential interface between human senses and his environment --- explained with relevant Architectural examples. Case studies of relevant architectural examples and exercises.

UNIT III  
ARCHITECTURAL DESIGN - ITS PRINCIPLES  9
Introduction to Design; A brief overview of design and its principles in other fields. (Arts, crafts, nature etc); Architectural design - its tools (elements), objectives (experience and expression) and means (principles) - Principles of Design - proportion, scale, order, repetition, rhythm, harmony, balance, emphasis, hierarchy, symmetry, axis, datum etc; Application of design principles at various levels - site level, building level and detail level - Evolution of architectural form - Basic 3d forms, Transformation of form, principles involved - space, spatial relationships and spatial organization, principles involved. --- Relevant examples from modern and traditional architecture. Case studies of relevant modern and traditional architectural examples and exercises.

UNIT IV  
EXPRESSION AND EXPERIENCE IN ARCHITECTURE  9
Architecture as an expressive medium, semiotics involved in various elements, aspects, and principles of architecture; Examples of spatial narratives - Experiencing architecture - Aspects influencing the experience and expression - place, people, society, culture, history, tradition, time etc. Case studies through works of architects.

UNIT V  
CONCEPTS IN ARCHITECTURE  9
Conceptualizing architecture, various approaches - Understanding Concepts behind the various architectural manifestations in relevant traditional, historical, vernacular examples - Understanding Concepts, ideas, philosophy behind the works of few architects choosing from the modern, post modern and contemporary periods in the context of the West and India.

TOTAL: 45 PERIODS

OUTCOMES:
- A thorough understanding on the definition of architecture; elements of architectures of form.
- An exposure to the principles of architecture and applications of the same in buildings and spaces.
- An understanding the meaning of character and style of buildings with examples.
- An exposure to students on ideologies and philosophies of architectures of contemporary.
- An exposure to analysis and experience of architecture through case studies and architects through examples.

TEXTBOOKS:
REFERENCES:
1. Eri J. Jenkins; Drawn to Design - Analyzing Architecture through Free Hand Drawing; BV GMbH Basel; 2013. (available in an EPVB ebook edition)

AR8202 MECHANICS OF STRUCTURES I
L T P/S C
2 2 0 3

OBJECTIVES:
• To make students aware of how structural resolutions are important in realization of architectural design concept. At this stage, students shall be exposed to forces, moments, and resolution of forces.
• To make the students understand basic properties of solids and sections which influence their behavior under the effect of various types of forces.

UNIT I FORCES AND STRUCTURAL SYSTEMS 16

UNIT II ANALYSIS OF PLANE TRUSSES 12
Analysis of plane trusses - Introduction to Determinate and Indeterminate plane trusses - Analysis of simply supported and cantilevered trusses by method of joints and method of sections.

UNIT III PROPERTIES OF SECTION 12

UNIT IV ELASTIC PROPERTIES OF SOLIDS 10
Elastic properties of solids –concept of stress and strain –deformation of axially loaded simple bars-types of stresses- Concept of axial and volumetric stresses and strains. (excluding composite bar).

UNIT V ELASTIC CONSTANTS 10
Elastic constants –Elastic Modulus-Shear Modulus- Bulk Modulus-Poisson’s ratio - Relation between elastic constants - Application to problems.

TOTAL: 60 PERIODS

OUTCOMES:
• Apply the concepts of action of forces on a body and should be able to apply the equilibrium concepts.
• Students are taught basic geometric properties and the behavior of materials under effect of forces.
TEXTBOOKS:

REFERENCES:

AR8221 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 PERSPECTIVE METHODS
Introduction to the concept of perspective drawing. One point and two point perspective of simple geometrical shapes like cube, prism, combination of shapes using picture plane method and measuring point method. Introduction to three point perspective.

UNIT II PERSPECTIVE: BUILDING INTERIOR
Construction of one, two and three-point perspective grids - Construction of one and two point perspective of building interiors. Understanding the basic human proportion and scale. Adding of human figures, planters, furniture etc. in an interior perspective scene. Basic applications of shade and shadows and rendering techniques.

UNIT III PERSPECTIVE: BUILDING EXTERIOR

UNIT IV MEASURED DRAWING: HISTORIC DOCUMENT STUDY
Documentation and drawing of a simple historic building along with the relevant study of the building based on its history, morphology and context. Measured drawing using pen and ink rendering technique.

UNIT V MEASURED DRAWING: BUILDING DOCUMENTATION
Complete documentation of a building of special interest in terms of building construction, architectural excellence or technology using photographs, tapes etc. Measured drawing of plans, elevations, sections, isometric projections of building details etc. using pen and ink rendering technique.

TOTAL: 75 PERIODS
OUTCOMES:
- Ability to construct the 3d views and perspective drawings of the buildings.
- Understanding of advanced documentation and measured drawing techniques.

TEXTBOOKS:
1. Francis D. K. Ching; Design Drawing; John Wiley & Sons; 2010
2. Rerdow Yee; Architecture Drawing - A Visual Compendium of Types & Methods; John Wiley & Sons; 2012

REFERENCES:
2. Mo Zell; The Architecture Drawing Course - Understand the principles & master the practices; Thames & Hudson; 2014

AR8222 BUILDING MATERIALS AND CONSTRUCTION I

OBJECTIVES:
- To have an understanding of the properties, characteristics, strength and application of naturally occurring building materials such as Stone, Bamboo, Lime and Mud.
- To study the principles of designing components of load bearing structures – foundation, plinth, wall, openings etc. with naturally occurring building materials.

UNIT I BUILDING MATERIALS
Introduction to Building materials – Naturally occurring building materials such as Stone, Bamboo, Lime and Mud – Characteristics and Applications

UNIT II BUILDING COMPONENTS – 01 – FOUNDATIONS

UNIT III BUILDING COMPONENTS – 02 - WALLS

UNIT IV BUILDING COMPONENTS – 03 – OPENINGS / FENESTRATIONS
Introduction to Building Components – Openings – Openings/Fenestrations suitable for construction with stone, bamboo, lime and mud – Exercises on Openings / Fenestrations in History and Today’s context.

UNIT V FINISHES
Introduction to Finishes – Paints, Plastering, Glazes and Varnishes – Exercises on different finishes in History and Today’s context for building components with stone, bamboo, lime and mud – Market survey of Paints, Plastering materials, Glazes and Varnishes.

TOTAL: 75 PERIODS
OUTCOMES:
- Students learn construction details using naturally occurring building materials such as stone, bamboo, mud and lime through drawing as well as doing a literature or live case study. Students are to submit drawing plates comprising of technical plan, elevation and section along with sketches and details showing method of construction.

TEXTBOOKS:

REFERENCES:

AR8211 MODEL MAKING AND ARCHITECTURAL DELINEATION

OBJECTIVES:
- To introduce students to analytical and illustrative drawing techniques as tools in the materialization and expression of thoughts.
- To introduce model making as a generative process, a tool in Design generation.
- To inculcate the dynamic act of constructing in thinking process.
- To understand the challenges of proper craftsmanship.

UNIT I LINE, RENDER AND MIXED MEDIA 16
Free hand sketching in architectural representation- pen, charcoal, ink, water colour, paints, mixed media, collages, lino cutting, print making as tools.

UNIT II DIAGRAMMING 18
Conceptual sketches - Plan, section, elevation, perspectives, isometric / oblique projections, axonometric /parallel projection, photography and montage as techniques in Architectural delineation from study till presentation.
Unit I & II can be explored by way of assignments that require study, analysis, documentation with weightage given to representational expression and techniques.

UNIT III DESIGN PROCESSES AND MODEL MAKING TECHNIQUES 18
Generative / geometry, fractals, parametrics / material explorations (both in traditional materials like mount, foam, thermacoel, clay, plaster of Paris, paper Mache, wood and new age materials like polystyrene, Aerocon blocks, plastics, meshes, and processes like carpentry, casting, moulding, welding, laser cutting etc.
Unit III can be explored with exercises that involve research through a process for example nature to structure and the evolution of a structural system that can be fabricated to scale.
UNIT IV PRESENTATION MODELS 18
Exploration in varying scales of models through instruction in techniques- Residential to urban - Historic / Contemporary buildings - Exercises involving topography, textures, landscapes, human elements etc.

UNIT V STUDY MODELS AS A TOOL IN ARCHITECTURAL DESIGN PROCESS 20
Exploration of the physical model as a tool through all phases of architectural design process, ranging from conceptual to specific design solutions- This Unit will integrate with the Architectural Design course in this semester.

TOTAL: 90 PERIODS

OUTCOMES:
- Exploration of conventional and less conventional techniques of representation in an attempt to creative visualization and to understand drawings as vehicles of thinking.
- Versatility in making models ranging from study to presentation and in varying scales and materials.

TEXTBOOKS:

REFERENCES:
3. Rendow Yee, Architectural Drawing A visual Compendium of Types and Methods, Wiley, 2013

AR8212 ARCHITECTURAL DESIGN I L T P/S C 0 0 12 6

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 sensitizem 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.

TOTAL: 180 PERIODS
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.

TEXTBOOKS:
3. Ernst Neufert’s Architects Data, Blackwell 2012.

REFERENCES:
1. Will Jones; Architects Sketch books; Thames & Hudson; 2011.

AR8301 HISTORY OF ARCHITECTURE AND CULTURE II L T P/S C
3 0 0 3

OBJECTIVES
• To give an overall understanding of the architecture in India up to the colonial period as parallel and sequential productions rising from the cumulative effect of forces operating and intersecting in the Indian subcontinent.
• To inform about specific and prominent modes of architecture in terms of evolution, function, morphology and character.
• To give exposure to works that are architecturally exemplary and/or representative.
• To appreciate architecture as giver of particular and universal meaning.
UNITI 
EARLY INDIA AND ITS CULTURAL PRODUCTIONS

UNIT II 
ARCHITECTURE OF SOUTHERN INDIA
Outline history of South India with particular emphasis on Bhakthi movement and evolution of temple town urbanism and architecture. Art and architecture under the Pallavas, Cholas, Pandyas, Nayaks and Vijayanagara kingdom with specific focus on Hindu temple architecture. Influence of social and political history on them. Hoysala architecture. Study of important monuments for all the above.

UNIT III 
ARCHITECTURE OF NORTHERN INDIA
Architecture of Gujarat, Orissa, Madhya Pradesh and Rajasthan with specific focus on Hindu temple architecture. Study of important monuments. Architecture of step wells in Northern India and their socio-cultural importance.

UNIT IV 
INTRODUCTION TO ISLAMIC ARCHITECTURE AND EARLY ISLAMIC ARCHITECTURE IN INDIA
Brief history of Islam. Islamic architecture of the world as rising from Islam as a socio-cultural and political phenomenon. Evolution of building types in terms of forms and functions. Principles and characteristics of Islamic architecture - to include aspects of religion, geometry, structure, materials, decoration, light. Early political history of Islam in India. Evolution of Islamic architecture under the Delhi Sultanate - Slave, Khaji, Tughlaq, Sayyid and Lodi dynasties. Study of important monuments. Early Islamic architecture of Punjab.

UNIT V 
REGIONAL ISLAMIC ARCHITECTURE, MUGHAL ARCHITECTURE AND AFTER

TOTAL:45 PERIODS

OUTCOME
- An understanding of the diversity of architecture in India and sensitivity towards its syncretic aspects.
- Ability to appreciate particular cultural, symbolic, spatial and material qualities in architecture and cities as givers of meaning and continuity.
- Ability to appreciate universal qualities of architecture and their effects.

TEXTBOOKS

REFERENCES

AR8302 MECHANICS OF STRUCTURES II

OBJECTIVES
- To enable understanding of the basic concepts of shear force and bending moment acting on beams subjected to different loading conditions.
- To give knowledge about how to determine stresses in beams and strength of sections.
- To give knowledge about how to calculate deflection of beams.
- To enable study of theory of columns.
- To give an understanding of the concept of indeterminate structure and its analysis.

UNIT I SHEAR FORCE AND BENDING MOMENT
Basic concepts. Shear force and bending moment diagrams for cantilever and simply supported beams subjected to different types of loadings - Point loads, uniformly distributed loads. Overhanging simply supported beams. Point of contra flexure.

UNIT II STRESSES IN BEAMS

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

UNIT IV COLUMNS
UNIT V  STATICALLY INDETERMINATE BEAMS

TOTAL: 60 PERIODS

OUTCOME
- Ability to apply the concepts/techniques of finding stresses.
- Ability to use simple bending theory to find deflection in beams.
- Ability to analyse and solve different types of columns.
- Ability to analyse the different types of indeterminate beams.

TEXTBOOKS

REFERENCES

AR8321 BUILDING MATERIALS AND CONSTRUCTION II

OBJECTIVES
- To give an introduction to brick, clay and timber products in building construction.
- To enable an understanding of the principles, methods of construction and applications of the above for structural and non-structural building components.
- To enable design and detail using all these materials in simple buildings.

UNIT I  INTRODUCTION TO BRICK AND CLAY PRODUCTS
Brick and clay as basic building materials and brief history of their use through examples. Types of brick and clay products. Outline of their manufacture, characteristics and applications in building construction. Products to include different types of bricks for masonry, roofing products such as pot/pan tiles and Mangalore tiles, flooring tiles such as clay, ceramic and vitrified tiles, Hourdi tiles, current innovations. Understanding of product literature. Site visits with documentation in the form of sketches/drawings/photos.

UNIT II  BRICK AND CLAY IN BUILDING CONSTRUCTION
Basic principles of brick bonding and its types. Mortar, plastering, pointing, finishes for brick. Construction principles and procedures for building components using brick and clay products. Components to include foundation, load bearing walls, partition walls, compound walls, parapet walls, roofs, arches, lintels, coping, steps, flooring, paving of different types. Principles for innovative and composite construction using brick and clay products. Products to include prefabricated brick panels,
precast curved brick arch panels, reinforced brick/ reinforced brick concrete slabs, prefabricated floor/ roof using structural clay units, Hourdi block roofing, current innovations. Drawings/ models of the principles. Understanding of detailed drawings/ published work. Site visits with documentation in the form of sketches/ photos.

UNIT III  INTRODUCTION TO TIMBER AND TIMBER PRODUCTS  10
Timber as basic building material and brief history of its use with examples. Timber sources, classification, characteristics, defects, conversion, seasoning, storage, uses, preservation, finishes (including paint, varnish, enamel, special paints and coatings). Market forms of timber. Types of industrial timber products. Outline of their manufacture, characteristics and applications in building construction. Products to include plywood, particle board, block board, fibre board, cement bonded particle board, sustainable products, current innovations. Understanding of product literature. Site visits with documentation in the form of sketches/ drawings/ photos.

UNIT IV  TIMBER IN BUILDING CONSTRUCTION  20
Joints in timber. Construction principles and procedures for timber wall, floor, roof trusses (to include lean to, couple, collar, king post, queen post and roof covering material), staircase. Construction principles and procedures for different types of timber doors, windows and ventilators. The types, whichever is applicable for each, will include materials (panelled, flush, glazed), swing, mechanisms of operation (fixed, openable, sliding, folding, sliding and folding, pivoted, revolving, top hung, bottom hung, louvered), nature - (french, corner, bay). Construction principles and procedures using timber/ industrial timber/ gypsum products for partitions (fixed, sliding, sliding and folding), panelling, false ceiling, flooring. Hardware and fixing for all the above as applicable. Drawings/ models of the principles. Understanding of detailed drawings/ published work. Site visits with documentation in the form of sketches/ drawings/ photos.

UNIT V  DESIGN USING BRICK, CLAY, TIMBER AND TIMBER PRODUCTS  15
A design exercise involving use of brick, clay and timber products in appropriate structural and non structural components in a simple, small project of any basic typology. The project will integrate knowledge from all the previous units. Design and construction details in the form of drawings and models.

OUTCOME
- Knowledge of properties and construction methods of brick, clay products and timber products.
- Ability to design and detail structural and non structural components of simple buildings using the above materials.
- Ability to integrate knowledge of properties and construction methods of basic building materials in the design of simple projects.

TEXTBOOKS
REFERENCES

AR8322 SITE SURVEYING AND PLANNING

OBJECTIVES
- To inform about the ways in which the characteristics of sites can be understood.
- To enable an understanding of the macro and micro impact of buildings on it.
- To give understanding of the potential/limitations site offers to the design of buildings.
- To give exposure to different terminologies and techniques associated with site, site surveying, site analysis and site planning.
- To explore all the above through a project.

UNIT I INTRODUCTION TO SITE AND SITE SURVEYING
Definition of plot, site, land and region, units of measurements. Introduction to survey and need for surveying. Methods of surveying and context of use. Chain survey and Triangulation - instruments used, method of survey and plotting into survey drawing. Plain table, Compass and theodolite surveys - method, instruments used and application. Modern surveying Instruments such as EDMs and Total Stations and their application. Understanding of administrative maps and site drawings, including FMB. Introduction to measuring a site, drawing out a site plan from measurements and computing area by geometrical figures and other methods. Introduction to marking plans, layout plans and centerline plans. Importance and procedure for making these drawings and dimensioning. Procedure and precautions of setting out a plan on site. Understanding the above through site visits to real projects.

UNIT II SITE ANALYSIS
Site as offering potential/limitations to architectural design. Importance of site analysis. On site and off site factors. Analysis of natural, cultural and aesthetic factors. Factors to include topography, hydrology, soils, vegetation, climate and microclimate, surface drainage, accessibility, size and shape, infrastructure, sources of water supply and means of disposal system, visual aspects, context of built environment. Introduction to detailed analysis involving aspects like contours, slope analysis, grading process, grading criteria, functional and aesthetic considerations. Maps of matrix analysis & composite analysis methods. Understanding the above through real projects/ case studies.

UNIT III SITE CONTEXT AND REGULATIONS
Detailed understanding of context of the site. Introduction to master plans, land use for cities, development control rules. Site selection criteria for different building typologies. Impact of building developments on the surroundings including aspects such as traffic, noise, pollution, microclimate, etc., especially in the context of large scale projects. Understanding the above through real projects/ case studies.
UNIT IV PRINCIPLES OF SITE LAYOUT AND DEVELOPMENT

Organisation of pedestrian and vehicular circulation. Geometric calculation for movement. Types of roads, hierarchy of roads, networks, road widths and parking regulations. Principles of positive drainage and grading for drainage. Location and design of sewage treatment plants. Methods to control soil erosion. Location of utility lines to simplify maintenance. Planning for rain water harvesting. Incorporation of services such as drinking water pipelines, fire hydrants, communication and networking facilities at site. Vegetation, landforms and water as modifiers of microclimate. Understanding the above through real projects/ case studies.

UNIT V EXERCISE IN SITE SURVEYING AND PLANNING

Application of all the knowledge gained in previous units through a real/ hypothetical project involving a real site. The process would involve choosing site for a building typology or vice versa, field exercise in measuring and drawing the site, detailed site analysis, schematic site layout and development. The project will be explored through analysis/ models/ sketches/ drawings.

TOTAL: 60 PERIODS

OUTCOME

- Sensitivity towards aspects of site at macro and micro contexts.
- Ability to exploit potential of site to design the built environment.
- Ability to measure, draw, analyse and plan a particular site for a specific purpose.

TEXTBOOKS


REFERENCES


AR8323 CLIMATE AND BUILT ENVIRONMENT

OBJECTIVES

- To introduce the concepts of human heat balance and comfort.
- To inform about the movement of sun and understand its impact on building design.
- To inform about the effects of wind and air with respect to siting and design of buildings.
- To give exposure to design strategies for building in different types of climatic zones.

UNIT I CLIMATE AND HUMAN COMFORT

UNIT II DESIGN OF SOLAR SHADING DEVICES 14
Shadow angles.
Exercise in the design of shading devices through models/ calculations/ drawings/ software.

UNIT III HEAT FLOW THROUGH BUILDING ENVELOPE- CONCEPTS 10
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. Material qualities of envelopes.
Exercise involving calculation/ software for design analysis.

UNIT IV AIR MOVEMENT DUE TO NATURAL AND BUILT FORMS 12
The wind. The effects of topography on wind patterns. Air currents around building. Air movement
through buildings. The use of fans. Thermally induced air currents – Stack effect, Venturi effect, use of
court yard.
Exercise exploring air movement in architecture with physical models/ simulation through software.

UNIT V CLIMATE AND DESIGN OF BUILDINGS 14
Design strategies in warm humid climates, hot humid climates, hot and dry climates and cold climates.
Climate responsive design exercise for different contexts through sketches/ drawings/ analysis/
detailing/ calculation.

TOTAL: 60 PERIODS

OUTCOME
- An understanding of heat balance in human beings.
- An understanding of the effect of sun and wind on buildings.
- An understanding of material effects in buildings.
- Ability to design buildings with respect to climate.

TEXTBOOKS
1. O.H. Koenigsberger and Others, 'Manual of Tropical Housing and Building- Climatic Design',

REFERENCES
5. Arvind Krishnan, Szokolay et.al, 'Climate Responsive Architecture- A Design Handbook for
OBJECTIVES

- To create understanding of human built environment as a holistic, living entity from macro to micro scales, and shaped by geographic and socio-cultural forces as well as by historic, political and economic factors, through study of and design within the context of rural settlements.
- To enable a comprehensive study of rural settlement and architecture in order to understand them as exemplar of collective design that evolved through various parameters.
- To observe changes in the above, analyse their nature and causes for them.
- If required, to explore possible policy and physical interventions towards positive changes within the context studied.
- To enable design process that engages context and community.

CONTENT

Rural settlements offer an opportunity to understand basic aspects of human built environment and what goes into its making/ influences it. The interrelationship between built form and society will be studied, understood and established, starting from either end as required. Study of specific modes of rural/vernacular/traditional architecture including their morphology, local materials and construction techniques, details, meaning, etc., will be done to give an insight into the particulars and universals of architecture.

Appropriate tools and processes can be used to aid the understanding. These include different methods of historical and socio-cultural study, oral history, discussions, information collection, surveys, maps, perceptual sketches, documentation through drawings, demographic study, assimilation and analysis.

Transformations across time need to be traced to understand constants and dynamics in human society. They will also be critically evaluated through discussions with experts. Rising from this, future changes can be projected/ envisaged and if found required, policy and physical interventions can be suggested/ explored. The physical interventions found necessary will be taken up as design situations. This could range from individual to community level and involve any aspect of the physical environment (including building projects) as the situation/viewpoint warrants.

If the context does not warrant a building need, a small community oriented building design will be given as a separate project in addition to the rural project. For building projects, the scale and complexity of planning and construction usually involved will be simple - small or medium span, ground plus two storeyed maximum, simple horizontal and vertical movement, simple/ local materials and construction, passive energy.

TOTAL: 210 PERIODS

OUTCOME

- Ability to collect, assimilate and integrate knowledge in a holistic manner.
- Sensitivity towards the nature and values of unselfconscious and collective design as well as the interconnectedness of human society and environment.
- Ability to observe and analyse changes in the above.
- Ability to project future transformations and give possible/ appropriate ways to address issues, if any.
- Sensitivity in design approach in community oriented projects with respect to context, collective values and needs.

TEXTBOOKS

REFERENCES

AR8401 DESIGN OF STRUCTURES I

OBJECTIVES
• To get introduced to basic structural members in timber and steel.
• To give knowledge to design different timber components in a building.
• To enable an 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 different conditions.

UNIT I TIMBER STRUCTURES - DESIGN OF BEAMS AND COLUMNS

UNIT II STEEL STRUCTURES - BOLTED AND WELDED JOINTS

UNIT III STEEL TENSION MEMBERS

UNIT IV STEEL COMPRESSION MEMBERS
Introduction. Different 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: 60 PERIODS

OUTCOME
• Ability to design timber beams and columns by applying the code provisions.
• Ability to design steel joints for maximum efficiency and strength.
• Ability to design tension and compression members for different conditions by applying the code provisions.
• Ability to design different types of laterally unsupported & supported beams for different conditions.

TEXTBOOKS
REFERENCES

AR8402
ENVIRONMENTAL SCIENCE FOR THE BUILT ENVIRONMENT

OBJECTIVES
- To enable understanding of the environment, and its interrelationship with living organisms.
- To help understand the importance of environment by assessing its impact on humans and to envision the surrounding environment, its functions and its value.
- To give understanding of dynamic processes and features of the earth’s interior and surface.
- To give awareness about integrated themes and biodiversity, natural resources, pollution control and waste management.
- To inform about scientific, technological, economic and political solutions to environmental problems.

UNIT I
ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY


UNIT II
ENVIRONMENTAL POLLUTION

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 III
NATURAL RESOURCES

Forest resources - Use and over-exploitation, deforestation, timber extraction, case studies. Mining, dams and their effects on forests and tribal people. Water resources - Use and overutilization of surface and ground water. Floods, drought, conflicts over water. Dams-benefits and problem. 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 IV SOCIAL ISSUES AND THE ENVIRONMENT


UNIT V HUMAN POPULATION AND THE ENVIRONMENT


OUTCOME

1. Sensitivity towards the environment as a totality and knowledge about its importance.
2. An understanding of the role of public awareness and participation with respect to environmental issues, apart from laws.

TEXTBOOKS


REFERENCES


AR8421 BUILDING MATERIALS AND CONSTRUCTION III

OBJECTIVES

- To give an introduction to metals as material for building construction.
- To give knowledge about the principles, methods of construction and applications of metals for structural and non-structural building components.
- To provide familiarity with market forms of metals and finishes for them.
- To enable design and detail using metals in buildings.
UNIT I FERROUS METALS IN BUILDING CONSTRUCTION

UNIT II STEEL IN NON STRUCTURAL BUILDING COMPONENTS
Construction principles and procedures for non structural building components using steel. Components to include doors, windows, ventilators, rolling shutters of different types as applicable - openable, sliding, pivoted, fixed, louvred. Glazing, hardware and fixing for components. Sketching/ drawing/ models of the principles. Understanding of product literature/ shop drawings. Site visits with documentation in the form of sketches/ drawings/ photos.

UNIT III STEEL IN STRUCTURAL BUILDING COMPONENTS
Construction principles and procedures for structural building components using steel. Components to include foundations, columns, beams, staircases, roofs (different types of trusses, space frames, etc), total structures such as geodesic dome. Connections between the different components and fixing. Materials for glazing, cladding, roof covering, etc., as required for particular components, and their fixing. Prefabrication in steel. Drawings/ models of the principles. Understanding of product literature/ shop drawings. Site visits with documentation in the form of sketches/ drawings/ photos.

UNIT IV NON FERROUS METALS IN BUILDING CONSTRUCTION
Aluminium and aluminium alloys in building construction. Brief history of their use through examples. Their manufacture, properties, durability, finishes and uses. Aluminium products such as extrusions, foils, castings, sheets, current innovations. Construction principles and procedures for non structural building components using aluminium. Components to include door, window, ventilator of different types - openable, sliding, pivoted, fixed, louvred, etc., as applicable. Aluminium for interior components such as panelling, partitions and false ceiling. Glazing, hardware and fixing for components. Introduction to Aluminium curtain wall glazing. Sketching/ drawing/ models of the principles. Understanding of product literature/ shop drawings. Site visits with documentation in the form of sketches/drawings/photos. Introduction to other non-ferrous metals such as copper, lead, zinc. Their manufacture, properties, uses and finishes.

UNIT V DESIGN AND DETAILING USING METALS
A design and detailing exercise involving metals, predominantly steel, as primary construction material in an appropriate typology involving a simple scale project. The project will integrate knowledge from all the previous units. Design and construction details in the form of sketches, drawings, models.

TOTAL: 75 PERIODS

OUTCOME
- Knowledge of properties of ferrous and non ferrous metals as materials for buildings.
- An understanding of possibilities of steel as an important building construction material.
- Ability to design and detail structural and non structural components of simple buildings using metals.
- Ability to use metal innovatively in building projects.

TEXTBOOKS
REFERENCES

AR8422 BUILDING SERVICES I

OBJECTIVES
- To give information about water supply source, treatment and distribution.
- To give information about waste water disposal and sewerage systems.
- To give information about drainage system, refuse collection and disposal.
- To give exposure to sustainable practices in all the above contexts.
- To give an overall understanding of how to plan for all the above in small buildings, campuses and neighbourhoods.

UNIT I WATER QUALITY, TREATMENT AND DISTRIBUTION
Understanding of service drawings. Site visits with documentation in the form of sketches/ drawings/ photos.

UNIT II SULLAGE AND SEWAGE DISPOSAL
Understanding of service drawings. Site visits with documentation in the form of sketches/ drawings/ photos.

UNIT III STORM WATER DRAINAGE AND RAIN WATER HARVESTING
Understanding of service drawings. Site visits with documentation in the form of sketches/ drawings/ photos.
UNIT IV  SOLID WASTE MANAGEMENT  10
Understanding of service drawings. Site visits with documentation in the form of sketches/ drawings/photos.

UNIT V  DESIGN OF SERVICES  12
Schematic design of water supply, sewage, drainage and solid waste services in the context of a small building/ campus/ neighbourhood. The project will integrate knowledge from all the previous units. Design in the form of choice, details of system and layout/ drawings.

TOTAL: 60 PERIODS

OUTCOME
- Understanding of water supply, sewage, drainage and waste systems in buildings.
- Ability to conceptually plan/ design the above for a given simple context.
- Awareness of sustainable principles and best practices.

TEXTBOOKS

REFERENCES
2. S.C. Rangwala, 'Water Supply and Sanitary Engineering', Charotar publishing house,

AR8423       COMPUTER-AIDED VISUALIZATION
L T P/S C
1 0 4 3

OBJECTIVES
- To introduce computer operation principles and explore image editing through a graphical composition.
- To impart training in computer aided 2D drafting and 3D modelling through projects.
- To enable the use of computer applications to develop a design from the initial stages to the final outcome.
- To enable the rendering of a building so as to create a photo realistic image.

UNIT I  INTRODUCTION TO COMPUTER AND IMAGE EDITING  12
Technology of small computer system. Computer terminology. Operation principles of P.C. Introduction to application software, graphic system, 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.
Exercise in creating visual compositions using digital graphics (pixels/vector).
UNIT II  THE BASICS OF BUILDING MODELLING  15
2D Drafting exercise of a simple building.

UNIT III  VIEWING THE BUILDING MODEL  15
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, polyline, etc. Styles, blocks and symbol library.
Drafting exercise on the above.

UNIT IV  INTRODUCTION TO 3D MODELLING  15
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 modelling with primitive command and Boolean operation.
3D sculpture exercise using 3D primitives (cubes, spheres etc.)

UNIT V  3D RENDERING AND SETTING  18
Rendering and scene setting to create a photo realistic picture, understanding material mapping, environment setting and image filling.
Exercise on visualising a building and exploring the potential of lights and camera.

TOTAL: 75 PERIODS

OUTCOME
• Ability to express using digital tools in the realm of visual composition, drafting, 3D visualisation and rendering.

TEXTBOOKS

REFERENCES

AR8411  ARCHITECTURAL DESIGN III  L T P/S C
0 0 14 7

OBJECTIVES
• To enable an understanding of the fundamental possibilities of architectural form and space in relation to human experience and use within the context of the immediate living environment.
• To get the above understanding through personal, first hand exploration as well as through theoretical and literature studies.
• To use this understanding to create meaningful built environment in the context of small scale projects that involve simple function and experience.
CONTENT
Designing a built environment requires the development of individual capacity for thought with respect to subjective and objective aspects. Studying and designing projects of small scale that involve a more immediate and basic experience is important in this context. The study and project exploration will involve the following aspects from first principles as well as through live studies and theory – human behaviour, activities and needs for various purposes, role of specific form/space in creating particular experiences and effects, built form-open space relationships, spatial organisation, environment behaviour aspects (especially those relating to children), site as a positive tool in all scales, potential of materials and construction. Through this, both the qualitative and quantitative attributes of design can be understood and engaged. This would give training in the ingenious use of architecture to fulfil goals towards a responsive and stimulating environment.

The techniques used for study and presentation can align themselves towards the above, such as cognitive maps, sketches, manual drawings, physical models with simple materials.

The scale and complexity of projects will be commensurate with this - small to medium size projects involving buildings/ small campuses with simple circulation, passive energy, multiples of single unit space, single use buildings. Some suggestive projects are small buildings or small campuses involving civic/ cultural use, uses related to children such as schools, facilities for people with special requirements. The number of projects is left to the discretion of the faculty based on scale and complexity.

TOTAL: 210 PERIODS

OUTCOME
• Ability to perceive, understand and represent fundamental attributes of form-space with respect to human experience and use.
• Ability to ideate, innovate and create meaningful built environment in basic human situations.

TEXTBOOKS

REFERENCES

AR8501 DESIGN OF STRUCTURES II

OBJECTIVES
• To inform about structural design through working stress and limit state methods.
• To enable use of the above two methods for the design of concrete beams and slabs under different conditions.
• To enable use of limit state method for design of a concrete staircase.
UNIT I DESIGN OF CONCRETE MEMBERS AND WORKING STRESS DESIGN OF CONCRETE BEAMS 14

UNIT II LIMIT STATE DESIGN OF CONCRETE BEAMS 14
Analysis and design of singly and doubly reinforced rectangular and flanged beams for bending.

UNIT III LIMIT STATE DESIGN OF CONCRETE SLABS 12
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 CONCRETE CIRCULAR SLABS 10
Design of simply supported and fixed circular slabs subjected to uniformly distributed loads.

UNIT V DESIGN OF CONCRETE STAIRCASE BY LIMIT STATE METHOD 10
Types of staircases. Design of dog legged staircase.

TOTAL: 60 PERIODS

OUTCOME
- Ability to understand the different concepts of WSM and LSD methods using the code provisions.
- Ability to design RCC beams and slabs by applying the above concepts.
- Ability to design RCC dog legged staircase design using LSD.

TEXTBOOKS

REFERENCES

AR8502 HISTORY OF ARCHITECTURE AND CULTURE III L T P/S C 3 0 0 3

OBJECTIVES
- To introduce the condition of modernity and outline its impact on society, cities and architecture.
- To give a detailed understanding of modern architecture as new expression with different strands rising from various aspects and effects of modernity.
- To create an overall understanding of the architectural developments in India rising out of colonial modernity and nationalism.
UNIT I MODERNITY AND ARCHITECTURE

UNIT II REACTIONS TO INDUSTRIALISATION

UNIT III EVOLUTION OF MODERN ARCHITECTURE - IDEOLOGIES, MOVEMENTS AND STYLES

UNIT IV MODERNIST ARCHITECTS AND THEIR WORKS
Ideas, works and evolution of Gropius, Corbusier, Aalto, Wright, Mies, Neutra.

UNIT V ARCHITECTURE OF COLONIALISM, MODERNITY AND NATIONALISM IN INDIA

TOTAL: 45 PERIODS

OUTCOME
- An understanding of modernity as a fundamental transformation in Western society that spread across the world and the resultant architectural production.
- An insight into the development of modern architecture.
- An understanding of architecture in India under influence of colonialism and colonial modernity.

TEXTBOOKS
REFERENCES

AR8521 BUILDING MATERIALS AND CONSTRUCTION IV

OBJECTIVES
- To give an introduction to cement and concrete as materials for building construction.
- To help understand the principles, types, methods of construction and applications of concrete for structural and non-structural building components.
- To enable design and detail using concrete in buildings.

UNIT I INTRODUCTION TO CEMENT AND CONCRETE

UNIT II CAST IN-SITU CEMENT CONCRETE IN BUILDING CONSTRUCTION
Construction principles and procedures for building components using cast in situ cement concrete (plain and reinforced). Components to include different types of foundations, columns, beams, slabs, walls, lintels and sun shades, staircases, sump, water tank, flooring. Drawings/models of the principles. Understanding of detailed drawings/published work. Site visits with documentation in the form of sketches/photos.

UNIT III PRECAST CONCRETE PRODUCTS IN BUILDING CONSTRUCTION

UNIT IV SPECIAL CONCRETES AND INNOVATIONS IN CONCRETE
Types of special concretes, to include lightweight concrete, aerated concrete, no-fines concrete, polymer concrete, pre-stressed concrete, fibre-reinforced concrete, ready-mixed concrete, ferrocement. Building materials and components developed by research organisations like CBRI, SERC, NBO, and BMTPC. Techniques for renovation and retrofitting. Basic principles for seismic design in concrete. Understanding of product literature/published work. Site visits with documentation in the form of sketches/photos.
UNIT V  DESIGN AND DETAILING USING CONCRETE

Design and detailing exercise involving concrete as primary construction material in an appropriate typology involving a simple scale project. The project will integrate knowledge from all the previous units. Design and construction details in the form of drawings, sketches and models.

OUTCOME

- Ability to use concrete as a versatile material in different contexts.
- An understanding of the concepts of concrete as a building construction material.
- Ability to design and detail specific components in concrete where there is scope for architectural design.
- Ability to use concrete innovatively in simple projects.

TEXTBOOKS


REFERENCES

5. Alan Blanc, 'Stairs, Steps and Ramps', Butterworth, Heinemann Ltd., 1999
8. Pamphlet and Manuals of SERC, BMPTC, HUDCO and other research organisations.

AR8522  BUILDING SERVICES II  L  T  P/S  C

OBJECTIVES

- To inform about the principles and laws of electricity and wiring systems in buildings.
- To inform about the principles and laws of lighting systems in buildings.
- To inform about the principles and laws of acoustics in buildings.
- To give exposure to the design of electrical, lighting and acoustic systems in buildings of small scale.

UNIT I  GENERATION OF ELECTRICITY AND DISTRIBUTION IN BUILDINGS

Understanding of service drawings. Site visits with documentation in the form of sketches/ drawings/ photos. Design of electrical layout for buildings of small scale through drawings.

UNIT II  INTRODUCTION TO LIGHTING  10

UNIT III  LIGHTING DESIGN FOR BUILDINGS  12
Lighting level for different uses in outdoor and indoor environment. Lighting calculations. Lighting simulation and performance analysis using software. Design exercise involving lighting design for appropriate projects of simple scale through choice, calculations, layout, drawings, simulations, physical models.

UNIT IV  FUNDAMENTALS OF ACOUSTICS  9
Understanding acoustic properties of materials/ products through study of product literature/ site visits.

UNIT V  ENVIRONMENTAL ACOUSTICS  17
Environmental noise and its control. Structure borne and air borne noise control. Site selection. Sound in enclosed space: Reverberation time, optimum reverberation time, echo, early decay time. Architectural acoustics. Importance of shape volume, treatment for interior surfaces, etc. Basic principles in designing classroom, lecture and conference hall, offices, open air theatre, auditorium, concert hall, theatre, cinema, recording studio.
Understanding of drawings/ details related to real acoustic design projects. Site visits with documentation in the form of sketches/ drawings/ photos. Simple problems based on reverberation time and absorption coefficients. Acoustic design for simple and small projects including planning, constructional measures and sound reinforcement systems through calculations, conceptual sketches, drawings, models.  

TOTAL: 60 PERIODS

OUTCOME
- Knowledge of basics of electrical, lighting and acoustic systems in buildings.
- Ability to design buildings satisfying electrical, lighting and acoustic principles.
- Ability to design basic electrical, lighting and acoustic systems for buildings.

TEXTBOOKS
REFERENCES

AR8511 ARCHITECTURAL DESIGN IV L T P/S C
0 0 14 7

OBJECTIVES
- To introduce the challenges involved in the design of projects related to diverse needs and ways of contemporary urban life.
- To enable exploration of the above projects with perception, socio-cultural awareness and innovation.

CONTENT
Urban environment is synonymous with heterogeneity of populace and their diverse needs and lifestyles. Private and public spaces for varied programmes such as living, working and socio-cultural needs bring individuals and groups in intersection or proximity to each other. Further, current transformations in urban society have led to many changes in buildings. The challenge within the discipline of architecture is not only to create conducive spaces for contemporary ways of life within particular contexts, but also to identify issues and programmes and address them in innovative ways. These would include urban living, urban working, socio-cultural life, urban recreation, etc., Achieving comfort without sacrificing on density would also be a concern, along with exposure to building byelaws and barrier free environment. The approach and projects will be directed towards one or more of these aspects.

The tools and techniques engaged for study and design can be those which are best suited to study the above, including mapping of urban patterns/ways of life and needs, demographics, socio-cultural aspects, densities, land use, etc.,

Projects will address specific situations/scenarios characteristic of urban life and context, either single or mixed use. They will be of medium to large scale, involving repetitive or unique spaces, low or mid rise buildings with passive/active energy. The number of projects is left to the discretion of the faculty based on scale and complexity.

TOTAL: 210 PERIODS

OUTCOME
- Ability to understand the nature, needs and ways of contemporary urban society as well as relate the existing built environment as a reflection of this.
- Ability to draw from this understanding and identify issues/challenges involving contemporary urban life and the built environment.
- Ability to give appropriate/innovative design solutions in the above context.

TEXTBOOKS
REFERENCES

AR8601 DESIGN OF STRUCTURES III L T P/S C
2 2 0 3

OBJECTIVES
- To enable use of 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 give understanding of the principle, methods, advantages and disadvantages of pre stressed concrete.

UNIT I LIMIT STATE DESIGN OF COLUMNS
Types of columns. Analysis and design of short columns for axial, uniaxial and biaxial bending. Use of design aids.

UNIT II DESIGN OF FOOTINGS
Types of footings. Design of wall footings. Design of axially loaded square & rectangular footings (pad and sloped).

UNIT III FLAT SLABS

UNIT IV DESIGN OF MASONRY WALLS
Analysis and design of masonry walls. Use of nomograms. Code requirements.

UNIT V INTRODUCTION TO PRESTRESSED CONCRETE

TOTAL: 60 PERIODS

OUTCOME
- An understanding of the different concepts in designing footings and columns and masonry walls using LSD methods.
- An understanding of the concepts and applications of prestressed concrete.
TEXTBOOKS
3. 'SP – 16, Design Aids for Reinforced Concrete to IS 456 National Building Code of India‘, 1983

REFERENCES

AR8602 HISTORY OF CONTEMPORARY ARCHITECTURE

OBJECTIVES
- To introduce the large scale changes from 1960s as context for new thought in architecture.
- To give exposure to the critiques of modern architecture.
- To study in detail the different post modern directions in architecture.
- To give an outline of architectural approaches across the world from late 20th century.
- To give an understanding of the trajectory of post independence architecture of India till the present.

UNIT I MODERN ARCHITECTURE – SPREAD AND LATER DIRECTIONS

UNIT II AFTER MODERNISM I

UNIT II AFTER MODERNISM II

UNIT III AFTER MODERNISM III
UNIT V  CONTEMPORARY ARCHITECTURE
Overview of larger changes in society from late 20th century and their influence on architecture. Outline of architecture related to parametric design and digital processes, sustainability, globalisation, phenomenology, complexity. Ideas and works of ZHA, contemporary Dutch architecture, Bjarke Engels and BIG, OMA and Rem Koolhaas, Steven Holl, Mcdonough, Yeong, Zumthor, Pallasma, Murcutt. Outline of contemporary architecture in the non Western world. Large scale changes in India from the 90s. Outline of post 1990s architecture of India.

TOTAL: 45 PERIODS

OUTCOME
- An awareness of the spread and varied later directions of modern architecture across the world.
- An understanding of architectural production from the 1960s as driven by large scale changes across the world.
- Familiarity with contemporary forces and directions in architecture across the world.
- An understanding of postindependence architecture in India contemporaneous with the rest of the world, along with its own particular influences.

TEXTBOOKS

REFERENCES

AR8621 BUILDING MATERIALS AND CONSTRUCTION V

OBJECTIVES
- To give an introduction to paints and special finishes in buildings.
- To give an introduction to glass, plastic and related materials in building construction.
- To provide familiarity with advanced building construction techniques and materials as well as design with them.
UNIT I  GLASS  15
Understanding of product literature/ shop drawings. Site visits with documentation in the form of sketches/ photos.

UNIT II  PLASTICS  15
Plastic as a building material. Brief history of their use through examples. Manufacture, properties, types, uses and application of plastics in building industry. Different types of adhesives and sealants. Plastic joints. Specific materials such as polycarbonate sheet and teflon. Introduction to plastic based products in building construction such as such as doors, windows, ventilators, partitions, floors, walls, roofs, handrails. Current innovations.
Understanding of product literature/ shop drawings. Site visits with documentation in the form of sketches/ photos.

UNIT III  FINISHES  12
Paints and finishes in buildings. Their different types, composition, characteristics and uses. Types to include enamels, distemper, plastic emulsion, polyurethane, special paints such as fire retardant, luminous and bituminous paints. Preparation of surface and application for different paints/ finishes.
Gypsum and POP finishes. Current innovations.
Understanding of product literature. Site visits with documentation in the form of sketches/ photos.

UNIT IV  ADVANCED CONSTRUCTION TECHNIQUES AND MATERIALS  18
Drawings/ sketches/ models of the principles. Understanding of detailed drawings/ published work. Site visits with documentation in the form of sketches/ drawings/ photos.

UNIT V  DESIGN USING ADVANCED CONSTRUCTION TECHNIQUES AND MATERIALS  15
Design and detailing exercise involving advanced construction techniques and materials outlined in the previous unit. The emphasis would be on innovative ways to use their principles in an appropriate typology involving a simple scale project. Design and construction details in the form of sketches and models.

TOTAL: 75 PERIODS

OUTCOME
- Knowledge of glass, plastics, paints and finishes in building construction.
- Familiarity with advanced materials and construction techniques.
- Ability to use advanced materials and construction techniques in innovative ways.

TEXTBOOKS
6. Pamphlet and Manuals supplied or published by SERC, BMPTC, HUDCO and other research organisations.

REFERENCES

AR8622  BUILDING SERVICES III  L T P/S C
2 0 2 3

OBJECTIVES
- To give exposure to the science behind air-conditioning systems, the different types and applications.
- To enable understanding of architectural aspects related to air-conditioning systems and take appropriate design decisions.
- To inform about fire protection, fire safety and fire fighting in buildings and how to plan for the same.
- To inform about mechanical transportation systems for buildings and how to plan for the same.

UNIT I  AIR CONDITIONING – PRINCIPLES AND SYSTEMS  14
Thermodynamics. Transfer of heat. Refrigeration cycle components. Vapor compression cycle. Refrigerant, Compressor, condenser, evaporator, refrigerant control devices, electric motors, air handling units, cooling towers. Air conditioning systems for buildings of different scales and their requirements- window type, split system, package unit, direct expansion system, chilled water system, fan coil unit, district cooling systems. Energy efficient systems, environmental aspects and latest innovations. Understanding all the above through product literature/ field visits.

UNIT II  DESIGN ASPECTS OF AIRCONDITIONING SYSTEMS  10
Design criteria for selection of air conditioning. Configuring/ sizing of mechanical equipment, equipment and spaces for them. Horizontal and vertical distribution of services for large buildings. Exercise on the above through choice, calculations, layout, drawings.

UNIT III  FIRE AND SAFETY  12
UNIT IV  MECHANICAL TRANSPORTATION SYSTEMS IN BUILDINGS  12

UNIT V  INTEGRATION OF SERVICES INTO ARCHITECTURAL DESIGN  12
Principles of grouping and integrating of horizontal and vertical distribution of all services in a multi-storeyed building/ large building. Services to include vertical transportation, electrical, communication, air conditioning and fire safety. Integrating service requirements into architectural design in an appropriate typology involving a simple scale project through sketches/ drawings.

OUTCOME
- Familiarity with different air conditioning systems, their context of use and basics of planning involved.
- An understanding of fire safety, fire fighting, fire prevention and installations in buildings.
- An understanding of mechanical transportation systems in a building.
- Ability to integrate services in buildings.

TOTAL: 60 PERIODS

TEXTBOOKS

REFERENCES
4. ISHRAE, 'All about AHUs- Air Handling Units'.
OBJECTIVES

- To introduce buildings as consumers of resources for human needs and to enable responsible, creative addressing of this fact through design choices.
- To enable an understanding of architectural design as integrating diverse functional concerns in a building through analysis and innovation.
- To impart training in the resolving of spatial considerations with other physical aspects such as structures, services and climate.

CONTENT

Architecture is a man made addition to the world and is resource intensive. The questions in this regard are how to simplify needs and means. Further, architecture today is also required to integrate several physical concerns in a building as human needs in built environment have become more complex with respect to intensity, distribution and interdependency of activities/programmes. Here the challenge is to address complex needs in an efficient manner so as to conserve/optimise resources without compromising on quality of life. The approach and projects will be directed towards one or more of these concerns.

Appropriate tools and techniques related to the above can be used in study and design, especially in terms of technical aspects.

The nature of projects can be either or both of these- 1) simple scale, ordinary or special use projects examining design through resources of different types 2) large, complex projects (multi storeyed buildings, office complexes, buildings for healthcare, performing art centre, etc.,) that need technical resolution and/or balance of various aspects. Aspects to be addressed can be urban land as resource, planning integration and detailing, sustainable building practices, green issues, alternative energy, intelligent building techniques and service integration, advanced building practices, appropriate materials and construction, sensitive and optimal use of resources. The number of projects are left to the discretion of the faculty based on scale and complexity.

TOTAL: 210 PERIODS

OUTCOME

- Ability to critically understand and address issue of resources.
- Ability to balance diverse aspects/concerns of buildings by making informed choices and innovative design in the context of buildings with intense or complex programmes.
- Ability to apply knowledge intensively in realms such as sustainable built environment, services.

TEXTBOOKS

5. Stephen A. Kliment, Editor 'Building Type Basics' Series, Wiley.

REFERENCES

OBJECTIVES

- To introduce the various aspects of outdoor design and site planning in enhancing and improving the quality of built environment, functionally and aesthetically.
- To stress on the role of landscape design in sustainability, to provide an overview of ecological balance and impacts of human activities and the need for environmental protection and landscape conservation.
- To provide familiarity with the various elements of landscape architecture and the principle of landscape design.
- To give an outline of the evolution of landscape and garden design across history.
- To help develop and strengthen competence in dealing with the analytic, artistic and technical aspects of designing open spaces at different scales.

UNIT I INTRODUCTION

UNIT II ELEMENTS IN LANDSCAPE DESIGN
Introduction to hard and soft landscape elements. Different types of hard landscape elements. Plant materials, water and landform - classification, characteristics, use and application in landscape design.

UNIT III GARDEN DESIGN IN HISTORY

UNIT IV SITE PLANNING
Organisation of spaces in the outdoor environment. Role of circulation and built form in shaping the environment. Role of landscape design in design of neighbourhood parks, children’s play area and campus development.

UNIT V LANDSCAPING OF FUNCTIONAL AREAS
Urban open spaces and principle of urban landscape. Street landscaping, landscape design for waterfront areas and functional areas in urban centres. Green infrastructure including green roofs and walls.

TOTAL: 45 PERIODS

OUTCOME

- Awareness of the role of landscape design with respect to macro scale of sustainability and ecology as well as in the micro scale of shaping of outdoor environments.
- Knowledge about the elements of landscape design and their scope.
- Sensitivity towards evolution of different garden and landscape design across time and context.
- An understanding of landscape design with respect to site planning and different functional typologies of spaces.

TEXTBOOKS
REFERENCES

AR8702 URBAN DESIGN L T P/S C
3 0 0 3

OBJECTIVES
• To create an understanding of urbanism and urban morphology as rising from various forces through history.
• To introduce the components of the modern city and their interdependencies.
• To introduce the scope and nature of urban design as a discipline
• To introduce key theories associated with urbanism and cities.
• To create awareness of contemporary urban issues and how they are addressed.
• To give exposure to ways of perceiving, documenting and analysing cities.

UNIT I URBANISM IN HISTORY

UNIT II MODERN URBANISM
Industrialisation and impact on urbanism. American grid iron planning. Theories, ideas and practice of good urban planning/cities/urbanism in early 20th century. Outline of modernist cities and urbanism across the world. Morphology of Indian modernist cities of Chandigarh, Bhubaneswar and Gandhi Nagar. Components of modern urbanism such as blocks, density, neighbourhood, streets etc., and their interdependencies. Evolution of urban design as a discipline, its scope and objectives.

UNIT III CITIES AND URBANISM THROUGH TEXTS AND THEORIES
Introduction to and discussion of key texts and theories of cities and urbanism - Imageability and Lynch, Townscape and Cullen, Genius Loci and Schulz, historic city and Rossi, social aspects of urbanism and the works of Jane Jacobs, William Whyte and Jan Gehl, Collage City and Colin Rowe, current theories and texts.

UNIT IV CONTEMPORARY URBANISM AND URBAN INTERVENTIONS
Understanding aspects, issues and solutions related to urbanism today through study of literature and best practices/case studies in urban design. Topics to include urban decay, change and renewal, place making, heritage, conservation, identity, suburban sprawl, gated communities, generic form, privatisation of public realm, role of real estate, transportation, zoning, globalisation, technology, digital age, sustainability, community participation, gender, class, power.
UNIT V URBAN STUDIES

Introduction to study and interpretation of cities (especially Indian) through understanding published studies/analysis. The focus will be on components/aspects as well as tools/methods. Tools and methods to include different types of maps/mapping, drawings, sketches, photo documentations, reading, data collection, analysis. Aspects to include topography, geology, hydrology, micro climate, vegetation, urban density, growth, city limits/boundaries, history, urban architecture, typologies, infrastructure, land parcels, public space, demographics, patterns of usage, land use.

TOTAL: 45 PERIODS

OUTCOME
- Awareness of the evolution and characteristics of urban forms, their components and interdependencies.
- Understanding of urbanism through theories, aspects, issues and solutions.
- Knowledge of ways to look at and interpret urbanism today.

TEXTBOOKS

REFERENCES

AR8703 SPECIFICATION, ESTIMATION AND VALUATION

OBJECTIVES
- To enable understanding with respect to quality and quantity of materials, quantity and classes of skilled and unskilled labours, and tools and plants required for projects.
- To give an understanding of how to draw up specifications for the different items of a building project and also to prepare the schedule of programming of the project.
- To give knowledge on how to prepare approximate as well as detailed estimates and to have a clear picture of the project expenditure.
- To help calculate the exact quantities of items of work done for effecting payment especially when direct measurements are difficult and also to determine the quantities of different materials required for various items of work.
- To give understanding of how to prepare valuation report of real and landed property.
- To give exposure to budgeting in projects.
UNIT I  SPECIFICATION AND SPECIFICATION WRITING  9

UNIT II  ESTIMATION  9

UNIT III  DETAILED ESTIMATE  11
Deriving detailed quantity estimates for various items of work for a single storied building. To include earthwork excavation, brick work, plain cement concrete, reinforced cement concrete works, wood work, iron works, plastering, painting, flooring, weathering course.

UNIT IV  VALUATION  8

UNIT V  BUDGETING  8

TOTAL: 45 PERIODS

OUTCOME
- An understanding of the art of building construction through specification writing.
- Ability to work out the approximate estimate and detailed estimate for small scale building projects and low cost housing.
- An understanding of valuation and budgeting.

TEXTBOOKS

REFERENCES
1. 'I.S.1200-1968 Methods of Measurements of Buildings and Civil Engineering works'.
2. Latest schedule of rates of P.W.D.
3. Latest Data book of P.W.D.
OBJECTIVES

- To introduce various aspects involved in the construction of buildings through the understanding of different types of architectural and technical drawings.
- To enable the understanding of architectural design as integrating spatial and technical concerns.
- To enable development of an architectural design project into schematic drawings through integrating concerns of structure, construction and services.
- To create architectural drawings for construction and as a base for structures and services drawings.
- To design, incorporate and detail architectural and interior components of the architectural design project.

UNIT I
UNDERSTANDING ARCHITECTURE THROUGH BUILDING DRAWINGS 12
Understanding architecture as a physical, workable product through study of comprehensive set of drawings for any live building project, interpreting them and presenting their characteristics through seminars/assignments. The drawings to be studied should include architectural working drawings from macro to micro scale - site plan, building plans, staircase details, kitchen and toilet detail of joinery, etc., structural drawings and service drawings to include electrical, plumbing, mechanical and HVAC details.

UNIT II
SCHEMATIC DESIGN INTEGRATING ARCHITECTURAL DESIGN WITH STRUCTURAL AND SERVICE CONSIDERATIONS 18
Evolving a conceptual design project into schematic design, balancing different technical considerations. Considerations to include appropriate structural, plumbing, electrical, mechanical and HVAC systems. Working out schemes to decide and finalise on the best possible design that integrates everything together. Scale of the project could be small to medium and include any typography, involving a newly created, quick, simple design or an older design from previous academic years.

UNIT II
ARCHITECTURAL WORKING DRAWINGS 18
Preparation of architectural working drawings for the resolved schematic design. Drawings to include site plan, centre line drawings, building drawings, detailed drawings of specific areas like staircases and wall sections, dimensions explaining the various components, joinery schedule.

UNIT IV
DETAILED DRAWINGS OF ROOMS AND ARCHITECTURAL COMPONENTS 15
Design and preparation of detailed drawings of joinery including doors, windows and ventilators. Design and preparation of layouts of service intensive rooms like kitchens and toilets. Design and detailing out of floor, wall and ceiling finishes/construction/laying.

UNIT V
DETAILED DRAWINGS OF BUILT IN COMPONENTS 12
Design and preparation of detailed drawings of built in furniture and components based on the room/typology to include counters, cabinets, wardrobes, storage, fittings and fixtures, display units, workstation.

TOTAL: 75 PERIODS

OUTCOME

- An understanding of all the aspects that go into the making of a building through study of drawings related to construction.
- Ability to resolve spatial concerns with technical aspects of a building.
- Ability to design and detail components within a building.
TEXTBOOKS

REFERENCES

AR8711  ARCHITECTURAL DESIGN VI  L T P/S C
0 0 16 8

OBJECTIVES
• To enable an understanding of architecture as having the capacity to critically interpret and transform status quo in the built environment and society through the act of design.
• To guide in the taking of critical/philosophical/ideological positions relating to specific design situations in the current world and to explore architectural morphology as an expression of those positions.

CONTENT
Architecture as a discipline balances many concerns in the creation of buildings. However, it also represents ideas and production reacting to/ reinforcing/ anticipating/ transforming specific aspects of the existing world towards a more desirable future. This could spring from individual perspectives as well as through concerted efforts which then become movements. Architecture can thus seek to understand, reflect, strengthen, question, change status quo. The process of design can thus offer a possible, intended future.

Projects/design situations will be given in this regard which address issues/programmes of current society with a larger impact in terms of scale or importance. Different realms/aspects of contemporary life can be explored. Some possible projects/area of inquiry are institutional campuses of significance, mixed use projects involving diverse user groups, culturally and socially important buildings, urban life, technological developments, culture, globalisation, place, meaning, identity, appropriate architecture, etc.

Suitable processes can be engaged for critical and creative thinking which could include wide and interdisciplinary reading to take critical positions, contemporary processes such as mapping and diagramming, methods related to social, technical or empirical aspects, etc.

The particular line of thought will be taken through to completion through the processes. It is preferable to have one major project with small exercises under it if required.

TOTAL: 240 PERIODS

OUTCOME
• Ability to understand the wider implication of design decisions and their interdependency with larger processes of society.
• Ability to take creative, critical and informed decisions in the context of significant projects that could shape society in positive ways.
TEXTBOOKS

REFERENCES

AR8801 HUMAN SETTLEMENTS PLANNING

OBJECTIVES
- To introduce the vocabulary, elements and classification of human settlements.
- To give exposure to planning concepts at different scales of settlements.
- To give an understanding of planning addressing current issues.

UNIT I INTRODUCTION TO HUMAN SETTLEMENTS 9

UNIT II FORMS OF HUMAN SETTLEMENTS 9

UNIT III RURAL AND REGIONAL DEVELOPMENT IN INDIA 9
Rural development plans, programmes and policies from case studies. Regional Plan. Area delineation, land utilisation plan, hierarchical system of settlements, their sizes and functions.

UNIT IV URBAN PLANNING AND URBAN RENEWAL 9

UNIT V ASPECTS IN CONTEMPORARY URBAN PLANNING IN INDIA 9
Globalisation and its impact on cities. Sustainable planning concepts. New forms of developments, to include self sustained communities, SEZ, transit oriented development (TOD), integrated townships, smart cities. Case studies.

TOTAL: 45 PERIODS
OUTCOME
- Ability to understand morphology of settlements and their generating forces and characteristics.
- An understanding of the role of planning processes in making positive changes to settlements.
- Awareness of planning interventions with respect to the current world.

TEXTBOOKS

REFERENCES

AR8802 PROFESSIONAL PRACTICE AND ETHICS

OBJECTIVES
- To give an introduction to the architectural profession and the role of professional bodies and statutory bodies as well as ethics of the profession.
- To give familiarity with basic aspects of running an architectural practice.
- To give exposure to the processes involved in taking up and completing an architectural project.
- To inform about legal aspects and legislations associated with the profession.
- To give exposure to the larger implications of professional practice in the globalised world today.

UNIT I INTRODUCTION TO ARCHITECTURAL PROFESSION CODE OF CONDUCT AND ETHICS

UNIT II ARCHITECT’S SERVICES, SCALE OF FEES & COMPETITIONS
UNIT III  PROJECT MANAGEMENT - TENDER & CONTRACT

UNIT IV  LEGAL ASPECTS

UNIT V  IMPORTANT LEGISLATIONS AND CURRENT TRENDS

TOTAL: 45 PERIODS

OUTCOME
• Knowledge of the role of professional and statutory bodies.
• An understanding of the provisions in Architects Act 1972.
• An understanding of code of conduct.
• Familiarity with the process and role of an architect in project execution.

TEXTBOOKS
2. Publications of Council of Architecture

REFERENCES
2. Development Regulations of Second Master Plan for Chennai Metropolitan Area-2026. (Second Master plan of CMA).
OBJECTIVES

- To introduce housing in the Indian context and the various agencies involved in the production of housing.
- To outline factors, aspects and standards related to housing.
- To inform about the various housing design typologies and the processes involved in housing project development.
- To inform about current issues and aspects in housing.

UNIT I INTRODUCTION TO HOUSING AND HOUSING ISSUES IN INDIA


UNIT II SOCIO-ECONOMIC ASPECTS


UNIT III HOUSING STANDARDS

UDPFI guide lines, standard and regulations. DCR. Performance standards for housing.

UNIT IV SITE PLANNING AND HOUSING DESIGN

Site Planning for housing. Selection of site for housing, consideration of physical characteristics of site, location factors, orientation, climate, topography, landscaping. Integration of services and parking. Housing design relating to Indian situations – traditional housing, row housing, cluster housing, apartments, high-rise housing. Case studies in India of the various types.

UNIT V CURRENT ASPECTS AND ISSUES IN HOUSING

Green building and sustainable practices. Disaster resistance and mitigation. Prefabrication Community participation.

TOTAL: 45 PERIODS

OUTCOME

- Knowledge of various issues concerning housing & housing development in Indian & global context covering a cross section of income groups.
- Ability to appreciate socio-economic aspects in housing.
- An understanding of housing standards, site planning principles, housing concepts and types.
- An understanding of key issues in housing today.

TEXTBOOKS


REFERENCES

4. HUDCO Publications, 'Housing for Low Income, Sector Model'.

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**OBJECTIVES**

- To enable an understanding of urbanism as a continuous experience involving the interrelated disciplines of architecture, urban design and town planning.
- To understand architecture as influenced by and influencing the dynamics of cities.
- To facilitate the taking of architectural design decisions in the context of the urban environment.

**CONTENT**

Urbanism is a dynamic phenomenon involving many aspects - urban growth, landuse distribution and change, urban form, demographics including gender and class, cultural aspects such as place and heritage, physical infrastructure such as roads and transportation nodes, public spaces, etc., Architecture is an integral and large part of urbanism, shaping and being shaped by it. It can serve to include/ gather society and enrich the urban environment in a seamless manner.

Understanding of this aspect of architecture will be achieved by architectural projects involving interdependencies between architecture and the city. Some of the issues and areas that could be addressed are- transportation nodes, heritage areas, adaptive reuse, suburban sprawl, place making, identity, collective memory, mixed use programming, large scale urban interventions, revitalisation and renewal of urban fragments, urban waterfront development, urban nodes, multi-use urban complexes.

The tools and techniques can include contemporary ways/ tools of perceiving, gathering and analysing data, inclusive, collaborative and participatory approaches, etc., It is preferable to have one major project with small exercises under it if required.

**TOTAL: 240 PERIODS**

**OUTCOME**

- Ability to perceive and design buildings as contributing to/ transforming the urban fabric.
- Ability to bring inclusivity into the architectural design process.

**TEXTBOOKS**

REFERENCES

AR8911 PRACTICAL TRAINING L T P/S C
- - - 12

OBJECTIVES
- To introduce the challenges of architectural practice.
- To enable overall understanding of different stages in real life architectural projects in practice.
- To create involvement in these stages as much as possible within the scope of a specific architectural practice - initiation of project, development of concepts into schematic drawings, approval process, presentations and working drawings, involvement in office discussions and client meetings, integrating structural and service concerns, estimation and tendering processes, site supervision and coordination in the construction process.

CONTENT
Practical Training will be done in offices/ firms in India, empanelled by the institution, in which the principal architect is registered with the Council of Architecture. The student will attempt to learn as much of aspects outlined in the objectives, either first hand or indirectly.

The progress of practical training will be assessed periodically internally through submission of log books along with work done by the students in terms of drawings, reports, etc., along with the regular progress report from the employers.

The students will be evaluated based on the criteria related to their contribution in the office some of which are given below.
- Understanding and involvement in the process of architectural practice as mentioned in the objectives within the scope of the specific office in which training is undertaken.
- Adherence to time schedule, overall responsibility and professional conduct.
- Ability to carry out the instructions on preparation of schematic drawings, presentation drawings, working drawings and skill in this regard.
- Ability to work as part of a team in an office and contribute to related activities.
- Ability to participate in client meetings and discussions.
- Involvement in supervision at project site.
- Involvement/initiative/participation in any other aspects during the course of the training.

At the end of the Practical Training, a portfolio of work done during the period of internship along with certification from the office should be submitted for evaluation through a viva voce examination.

OUTCOME
- An overall idea of the nuances of architectural practice.
- An understanding about the total process that goes into the making of a building.
- Maturity in using the experience gained from internship in the thesis project.
OBJECTIVES

- To ensure consolidation and application of the knowledge gained in preceding years of the programme in the context of a design project of the student’s choice.
- To enable addressing of specific projects through key, identified issues inherent in the project or to enable development of thought processes in specific areas/aspects into a project.
- To facilitate development of ability to complete and handle projects independently as a precursor to professional life.

CONTENT

Students should choose a topic of their choice in terms of design potential and/or idea exploration to be taken up for completion. The topic could be project based with specific areas of study/approach or study/approach based leading to a project. If the latter, care should be taken to choose topics that can lead to sufficient architectural design component.

Students should submit the topic for approval with a rough outline of the nature of the project, area of interest, study and design scope, challenges, possible case studies, methodology and outcome. The areas of study/research/design can include any of the broad areas of the discipline - contemporary needs of society, history, theory, sustainability, structural or service oriented design, projects that involve complex planning and integration of several aspects, appropriate architecture, urban design, contemporary processes, social housing, urban oriented architectural design, conservation oriented architectural design, etc.

The progress of work will be reviewed periodically throughout the semester. At the end of the semester, students should submit the final thesis project for the viva voce exam. The final submission will comprise of study sheets, optional study models, design approach sheets, optional design process models, design presentation sheets, final model, detailed drawings of an important part of the project, project report summarising the entire thesis work and soft copy of all the work.

OUTCOME

- Skill, knowledge and expertise in the domain of architectural design.
- Ability to handle a major architectural project independently through all stages.

TEXTBOOKS


REFERENCES

OBJECTIVES

- To give understanding of design as a broader field and the changing role of designer in society.
- To give exposure to methodologies, theories and models of the design process.
- To give deeper understanding of the process of creativity as well as to introduce techniques which will enable creative thinking.
- To help understand creativity with respect to the discipline of architecture.
- To introduce participatory approach to design.

UNIT I INTRODUCTION TO DESIGN

Definition and understanding of design. History of design process from earliest times through Renaissance, Beaux Arts, Bauhaus. Different classifications of design according to scale, process, mode of production, etc., - selfconscious/ unselfconscious, design through drawing/ design through craft, pragmatic/ iconic/ analogic/ canonic or syntactic, hand made/ machine made, product design to city design, functional/ aesthetic, nature vernacular/ technological.

UNIT II DESIGN METHODOLOGY MOVEMENT

Context for the rise of the design methodology movement from the 1950s with the critique of modernism. Theories of the first generation and the second generation design methodologists. Design as wicked problem. Escalation and regression in design. Summary by Johnson of various models of the design process - parametric or analysis/ synthesis/ evaluation, conjecture-refutation, paradigmatic, hermeneutical.

UNIT III CREATIVE THINKING

Understanding the term creativity. Theories on thinking - left brain/ right brain, convergent/ divergent thinking, lateral/ vertical thinking. Broadbent's idea of the design spectrum - from the logical to chance. Blocks in creative thinking. Techniques to generate creativity as put forth by Broadbent, Bono.

UNIT IV ARCHITECTURAL CREATIVITY

Types of architectural concepts - programmatic, analogic, metaphor, essence, etc., Channels to creativity in architecture as put forth by Antoniades. Personal philosophies and strategies of individual designers.

UNIT V PROCESS AND DESIGN

People and design process- concept of pattern language by Christopher Alexander, participatory approach to design, design as process involving time and people. Introduction to contemporary processes in design including diagramming, mapping, parametric exploration, etc.,

TOTAL: 45 PERIODS

OUTCOME

- Ability to think about architecture as one of the many fields under the broader ambit of design as a fundamental human activity.
- Self awareness with respect to the creative process.
- Ability to engage different processes to give creative output.

TEXTBOOKS


REFERENCES

AR8002 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 different approaches and concepts to the study of vernacular architecture.
- To study the various vernacular architecture forms in the different 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. Methodology for survey and study of vernacular architecture. Overview of cultural and contextual responsiveness of vernacular architecture.

UNIT II APPROACHES AND CONCEPTS
Overview of different approaches and concepts to the study of vernacular architecture. 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 deserts of Kutch and Rajasthan (including havelis of Rajasthan), rural and urban Gujarat (including wooden mansions/ havelis in general and that of the Bohra Muslims) and geographical regions of Kashmir (including 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 Kerala (including houses of the Nair & Namboothri community, Koothambalam and Padmanabhapuram palace) and Tamil Nadu (including houses and palaces of the Chettinad region, aghramarams).
UNIT V  WESTERN INFLUENCES ON VERNACULAR ARCHITECTURE OF INDIA  
Colonial influences on the traditional Goan house. Evolution of the bungalow from the traditional bangla, Victorian villas. Planning principles and materials and methods of construction of the bungalow. Settlement pattern and house typologies of Pondicherry and Cochin.

TOTAL: 45 PERIODS

OUTCOME
- An understanding of Indian vernacular architecture as a process and to also provide an overview of various approaches and concepts towards its study.
- Knowledge of vernacular architectural forms in different regions.
- An understanding of the impact of colonial rule on vernacular architecture in India.

TEXTBOOKS

REFERENCES

AR8003  ART APPRECIATION  L T P/S C  3 0 0 3

OBJECTIVES
- To introduce art as a fundamental human activity, its characteristics and ways in which it can be understood.
- To introduce the vocabulary of art and to enable the appreciation of art.
- To understand different productions of art as manifestations within particular contexts.

UNIT I  INTRODUCTION TO ART  7
Definition of art, need for art, role of art. Art, reality, perception, representation. Categories of art in terms of media and technique. How to appreciate art in terms of form, content and context.

UNIT II  VOCABULARY OF ART  7
Introduction to 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). Appreciation of art with respect to all the above through examples.
UNIT III  
BEGINNINGS OF WESTERN ART TO MODERN ART

Outline of art in the West from the beginnings to the birth of modern art. Important works from the following art traditions will be understood and appreciated 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  
MODERN ART AND AFTER

Outline of the context for the major changes in art from late 19th century and the birth of modern art. Important works from the following movements will be understood and appreciated in terms of their form, content and context: Impressionism, Post Impressionism, Fauvism, Expressionism, Modern art, Abstract/ Non Objective art, Cubism, Dadaism, Surrealism, Futurism, Constructivism, Suprematism, De Stijl, Abstract Expressionism, Pop art, Op art. Outline of new forms and media in art from mid 20th century.

UNIT V  
INDIAN ART

Outline of art in India over history. Important works from the following art traditions and movements will be understood and appreciated in terms of their form, content and context: Indus Valley art, Hindu, Buddhist and Jain art, Mughal and Rajput miniature art, art during the colonial period, modern Indian art, contemporary directions.

TOTAL: 45 PERIODS

OUTCOME

- An understanding and appreciation of art as basic and varied human creation related to cognition and experience.
- Awareness of important art productions in the West and India.
- Sensitivity towards collective and individual cultural productions as unique expressions of historical and geographic context.

TEXTBOOKS


REFERENCES

4. 'Indian Art since the early 1940s- A Search for Identity', Artists Handicrafts Association of Cholamandal Artists Village, Madras, 1974.

AR8004  
INTERIOR DESIGN

L T P/S C
3 0 0 3

OBJECTIVES

- To provide familiarity with the characteristics of interior spaces and furniture across history.
- To introduce the profession of interior design and bring out its role.
- To inform about the various components of interior space and give an understanding of the design aspects involved in each.
UNIT I  INTERIOR SPACES AND FURNITURE ACROSS HISTORY
Outline of the characteristics of representative/exemplary interior spaces, interior decoration and furniture in the Western world from the beginnings to twentieth century. Outline of characteristics of representative/exemplary interior spaces, interior decoration and furniture in India across the ages, including living folk traditions.

UNIT II  INTRODUCTION TO INTERIOR DESIGN
Introduction to the professions of interior decoration, interior design and furniture design, bringing out their origin, evolution and current scope of work. Definition and process of interior design. Introduction to the design of interior spaces as related to typology, function and themes. Vocabulary of design in terms of elements (point, line, shape, form, space, colour, light, pattern, texture) and principles (balance, proportion, scale, rhythm, hierarchy, unity, contrast, harmony, emphasis, movement) with specific reference to examples from interior design.

UNIT III  COMPONENTS OF INTERIOR SPACE - I
Role of interior treatment and finishes in the experience of interior spaces. Outline of the design of components such as floors, ceilings, walls, partitions, window treatments and accessories based on parameters such as context, function, ambience, materials, properties, methods of construction, colour, texture. Study of representative examples.

UNIT III  COMPONENTS OF INTERIOR SPACE - II
Role of lighting in the experience of interior spaces. Outline of different types of interior lighting systems and fixtures based on their effects and suitability in different contexts. Study of representative examples.
Role of landscaping in the experience of interior space. Outline of interior landscaping elements such as rocks, plants, water, flowers, fountains, paving, artefacts. Their physical properties and effects on spaces. Study of representative examples.

UNIT V  COMPONENTS OF INTERIOR SPACE - III
Introduction to furniture design as related to parameters such as human comfort and function (including anthropometrics and ergonomics), built in or freestanding, materials and methods of construction, cultural particularities, changing trends and lifestyles, innovations and design ideas. Study of representative examples.

OUTCOME
- An understanding of interior design as an integral part of architecture and as an interdisciplinary and allied field related to architecture.
- An overall exposure to the ways in which interior spaces can be enriched through the design of specific interior components.

TEXTBOOKS
REFERENCES

AR8005 STRUCTURE AND ARCHITECTURE

OBJECTIVES
- To outline the evolution of structural systems through history.
- To introduce concepts of structural design through works of architects/ engineers.
- To create understanding about the relationship between architectural expression/ form and structure.

UNIT I STRUCTURAL DESIGN IN THE PRE INDUSTRIAL ERA

UNIT II STRUCTURAL DESIGN IN THE POST INDUSTRIAL PERIOD

UNIT III CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDIES - I
The select case studies would include KCR Terminal at Hung Hom, Hong Kong, B3 Offices in Stockley Park, Sainsbury Centre for Visual Art, Renault Centre and Swindon UK by Norman Foster and Standsted Airport Terminal, London, UK by Fosters/Arup British Pavilion EXPO1992, Seville, Spain and Waterloo International Terminal by Nicholas Grimshaw.

UNIT IV CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDIES – II
The select case studies would 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 Renzo Piano Building Workshop. Contemporary examples with respect to parametric/ digital processes and innovative new materials.
UNIT V  SEMINAR
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

OUTCOME
- Familiarity with concepts of structural design and its influence on the functional and aesthetic domains of architectural design relating to historic and contemporary periods.
- Understanding of architectural expression and its relation to form, structure and changing technology.

TEXTBOOKS

REFERENCES
2. Christopher Beorkrem, 'Material Strategies in Digital Fabrication', Routledge, 2012

AR8006  EVOLUTION OF HUMAN SETTLEMENTS

OBJECTIVES
- To introduce the origins, determinants and elements of human settlements.
- To give an overview of the evolution of human settlements across history.
- To introduce planned cities as expressions of specific intent.
- To give exposure to changes in human settlements today.

UNIT I  ORIGIN OF HUMAN SETTLEMENTS AND EARLY SETTLEMENTS
Origins of civilizations. Elements and determinants of human settlements. Human settlements in the pre-historic period. Ancient river valley civilisations of Indus valley, Mesopotamia, Egypt and China with emphasis on the layout and patterns of the settlements and the influence of resources on them.

UNIT III  PRE INDUSTRIAL CITIES

UNIT IV  CITIES IN INDIA
Ancient town planning principles of India. Medieval Indian cities and factors that led to their development. Islamic and Mughal cities. Colonial urbanism including presidency towns, hill towns and cantonments. New Delhi as imperial power.
UNIT IV MODERN AND POSTMODERN CITIES

UNIT V HUMAN SETTLEMENTS IN A CHANGING WORLD
Changing nature of human settlements today through case studies. Topics to include impact of global economy, trade, information and communication technology, sustainability.

TOTAL: 45 PERIODS

OUTCOME
- Awareness of the nature and characteristics of human settlements.
- An understanding of the evolution of human settlements and their shaping forces.
- Familiarity with current aspects of settlements.

TEXTBOOKS

REFERENCES

AR8007 CONTEMPORARY BUILDING MATERIALS

OBJECTIVES
- To introduce current materials and products in architecture that are eco-friendly, composite, durable, advanced, smart.
- To inform about innovations in materials and practices in building industry.
- To focus on materials and systems, their properties and connections, intrinsic relationship with structural systems and environmental performance.

UNIT I INTRODUCTION
Introduction and need for ultra-performance materials in building design as a substitute to conventional materials. Newer application for special performance, thermal/ sound/ moisture protection, fitting, equipment and furnishing. Properties of contemporary materials – multidimensional, repurposed, recombinant, intelligent, interfacial, transformant, etc.
UNIT II ADVANCED CONCRETE AND COMPOSITE REINFORCEMENT    10

UNIT III COMPOSITE MATERIALS    10
Types, terminology and classification of composite materials based on particle reinforced, fiber reinforced, structural and composite benefit in building construction. Composite materials manufacturing process. Use of composite materials namely Polymer Matrix Composites (PMCs) and Fibre- Reinforced Polymers (FRPs) along with cement, steel, aluminium, wood, glass, etc., for thermal insulation, fire protection, coating, painting and structural monitoring, etc.

UNIT IV NANO-MATERIALS AND NANO-COMPOSITES    9
Definition, manufacture and types of nano materials. Properties, performance of nano materials in building construction, types and application of nano-materials like carbon, nanotubes etc., Nano composite used with cement, steel, aluminium, wood, glass for thermal insulation, fire protection, coating and painting and structural monitoring etc.. Nano technologies in building and construction.

UNIT V DIGITAL AND TENSILE MATERIALS    9

TOTAL: 45 PERIODS

OUTCOME
- Exposure to the need and use of various contemporary materials in creating innovation and ultra-performance in building design.
- An understanding of characteristics and performance of the newer materials in terms of detailing and application to the context.

TEXTBOOKS

REFERENCES
OBJECTIVES
To introduce latest advances in the field of glass in architecture.
To enable right selection and usage of right glass for appropriate purposes.
To give understanding of use of glass in contemporary architecture as well as its role in green design and improving building performance.

UNIT I   GLASS AS BUILDING MATERIAL

UNIT II   GLASS AND GREEN ARCHITECTURE

UNIT III   CASE STUDY

UNIT IV   DESIGN WORKSHOPS I
Analysing and creating building using interactive modelling. Analysing of sun path, solar exposure building orientation, daylight, acoustics, site shadow analysis.

UNIT V   DESIGN WORKSHOPS II
Analysis of thickness for safety, consideration of aesthetics, economy, optimisation and wastage, air-conditioning load calculations and payback analysis.

TOTAL: 60 PERIODS

OUTCOME
• An understanding of glass and its potential in contemporary usage
• An understanding of tools and software currently in practice with respect to the use of glass in buildings.

TEXTBOOKS

REFERENCES
5. Training Manuals & E- Learning, Glass Academy.

AR8009 STEEL ARCHITECTURE AND DESIGN

OBJECTIVES

- To introduce the design potential of steel as a material in building construction and its inherent structural benefits.
- To inform about the various components of steel as structural and aesthetic design through case studies.
- To provide familiarity with the best practices of steel as a construction material.

UNIT I INTRODUCTION TO STEEL AS BUILDING MATERIAL


UNIT II STEEL IN HIGH TECH MOVEMENT, CONTEMPORARY ARCHITECTURE


UNIT III STRUCTURAL EXPRESSION OF STEEL

Introduction to AESS (architecturally exposed structural steel), standard structural steel versus AESS. Factors that define AESS. Characteristics and categories of AESS. Connection types for AESS – bolted, welded and cast connections. Member types for AESS – Tubular and standard sections. Various steel frame design, basic connection strategies, basic understanding of steel floor systems, truss systems and braced systems.

UNIT IV SUSTAINABILITY, STEEL AND OTHER MATERIALS


UNIT V FABRICATIONS, ERECTION AND IMPLICATIONS ON DESIGN

Study on transformation of architectural design into fabricated elements. Study of process profile through case studies. Role of physical and digital models in fabrication. Steel in temporary/ exhibit buildings. Need for corrosion and fire protection. Various finishes and coating systems of steel. Detailed study on corrosion protection and fire protection systems. Transportation, site issues and erection on site. Erection of beams and columns. Effects of climate and weather on erections. Other issues relating to practical implication of design on site.

TOTAL: 45 PERIODS
OUTCOME

- An understanding of steel as a structural, functional and aesthetic material in design and construction practice.

TEXTBOOKS


REFERENCES

6. INSDAG Publications and Brochures.

AR8010 CONTEMPORARY PROCESS IN ARCHITECTURAL DESIGN

OBJECTIVES

- To introduce theories of media and its influence on the perception of space.
- To enable study of the various aspects of digital architecture and its exploration through emerging phenomena that relies on abstraction of ideas.
- To give understanding of the works of contemporary architects who have illustrated the influence of the digital media in architecture.

UNIT I INTRODUCTION

Investigation of contemporary theories of media and their influence on the perception of space and architecture. Technology and art. Technology and architecture. Digital technology and architecture.

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 CONTEMPORARY PROCESS AND ARCHITECTURAL WORKS

Ideas and works of architects related to contemporary processes. The architects to include Greg Lynn, Reiser + Umemotto, Lars Spuybroek / NOX Architects, UN studio, Diller Scofidio, Dominique Perrault, Decoi, Marcos Novak, Foreign Office Architects, Asymptote, Herzog and de Meuron, Neil Denari, Serie Architects, BIG Architects. Study to be undertaken in the form of assignments/discussions/seminars/presentations.

TOTAL: 45 PERIODS
OUTCOME

- An understanding of the effect of contemporary theories of media on contemporary architectural design.
- Insight into contemporary design process/theories and their relation to computation.
- Ability to understand specific aspects of contemporary processes appropriate to a design situation.
- Familiarity with architectural works derived from contemporary processes.

TEXTBOOKS


REFERENCES


AR8011 ENERGY EFFICIENT ARCHITECTURE

OBJECTIVES

- To inform about the need to use alternative sources of energy in view of the depleting resources and climate change.
- To provide familiarity with simple and passive design considerations.
- To inform about the importance of day lighting and natural ventilation in building design.
- To create awareness of future trends in the design of 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 PASSIVE HEATING

UNIT III PASSIVE COOLING

UNIT IV DAY LIGHTING AND NATURAL VENTILATION

UNIT V CONTEMPORARY AND FUTURE TRENDS
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, energy conservation building code.

TOTAL: 45 PERIODS

OUTCOME
- Knowledge of alternative sources of energy and passive design considerations.
- An understanding of day lighting and natural ventilation in design.
- Familiarity with future trends in creating sustainable built environment.

TEXTBOOKS

REFERENCES

AR8012 ARCHITECTURAL CONSERVATION

OBJECTIVES
- To introduce the various issues and practices of conservation in architecture.
- To provide familiarity 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 about the character and issues in Indian heritage towns through case studies.

UNIT I INTRODUCTION TO CONSERVATION
UNIT II CONSERVATION IN INDIA
Museum conservation. Monument conservation and the role of ASI, SDA, INTACH. Central and state government policies and legislations. Inventories and projects. Selected case studies of sites such as Hampi, Golconda, Mahabalipuram. Craft Issues of conservation.

UNIT III CONSERVATION METHODS AND MATERIALS

UNIT IV CONSERVATION PRACTICE

UNIT V URBAN CONSERVATION AND CONSERVATION PLANNING
Understanding the character and issues of historic towns. Selected case studies. Historic districts and heritage precincts. Conservation as a planning tool. Financial incentives and planning tools such as TDR. Urban conservation and heritage tourism. Case studies of sites like Cochin, Pondicherry French town. Conservation project management.

OUTCOME
- An understanding of the importance of heritage, issues and practices of conservation through case studies.
- Familiarity with historic materials and their properties, different technologies for investigating masonry, foundation and also traditional and modern repair methods.

TEXTBOOKS
6. Publications of INTACH

REFERENCES
3. B.P. Singh, 'India's Culture- The State, The Arts and Beyond', Oxford University Press, 2000
OBJECTIVES
- To give an understanding of the loss of pre-stress and design requirements for determinate beams.
- To provide familiarity with the concept of industrial structures and high rise structures.
- To enable the study of concepts of tensile structures, domes, shells and folded plates.

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

UNIT II INDUSTRIAL STRUCTURES
Classification, planning and layout requirements, functional requirements. Types of industrial structures- power plants, bunkers and silos, cooling towers, containment structures, chimneys. Merits.

UNIT III HIGH–RISE BUILDINGS

UNIT IV TENSILE STRUCTURES
Concept, development, laws of formation, merits and demerits of pneumatic structures. Basic principles, forms, merits and demerits of cable structures.

UNIT V SHELLS, DOMES AND FOLDED PLATES

TOTAL: 45 PERIODS

OUTCOME
- An understanding of concepts and applications of pre-stressed concrete.
- An understanding of concepts and application of industrial structures and sky scrapers.
- Familiarity with the theory and applications of tensile structures, grids, domes, shells and folded plates.

REQUIRED READING

REFERENCES
OBJECTIVES

- To give an understanding of the concept of sustainability and sustainable development.
- To inform about issues like climate change, ecological footprint, etc.
- To provide familiarity with low impact construction practices, life cycle costs and alternative energy resources.
- To give exposure to the different rating systems for building practices with case studies.
- To enable understanding of the concept of sustainable communities and associated socio-economic dimensions through case studies.

UNIT I  INTRODUCTION TO SUSTAINABILITY  7

UNIT II  CLIMATE CHANGE AND SUSTAINABILITY  10

UNIT III  SITE AND SUSTAINABILITY  8
Sustainable site selection and development. Introduction to Green building concepts. TERI, LEED, GIRHA and BREEAM. Ecology and sustainability. Different sources of energy, recyclable products and embodied energy.

UNIT IV  SUSTAINABLE MATERIALS  10
Selection of materials Eco building materials and construction. Low impact construction – bio mimicry, zero energy buildings, nano technology and smart materials.

UNIT V  SUSTAINABLE CITIES  10
Dimensions of sustainable community- social, cultural and economic factors. Urban ecology, urban heat island effects, smog etc. Case studies of eco city or communities.

TOTAL: 45 PERIODS

OUTCOME

- An understanding of the concepts of ecosystem, carrying capacity, ecological footprint, sustainability and sustainable development.
- Awareness of emerging vulnerabilities of global warming and climate change and an understanding of the contribution of building industry towards the same.
- Familiarity with approaches to achieving sustainable buildings and communities.
- Knowledge of incentives and evaluation systems for green buildings.

TEXTBOOKS
REFERENCES

OBJECTIVES
- To inculcate the spirit of research in architecture.
- To enable the acquisition of in-depth knowledge in a specific aspect/issue in the discipline of architecture as well as develop perspectives on the same through reading, study, analysis and thought.
- To facilitate the development of a coherent line of thinking and express it through clear writing.
- To serve as prelude to Thesis.

CONTENT
Design studio emphasises on explaining and understanding architecture primarily through the mode of making. However, architecture as a field itself is driven by explicitly stated or implicitly understood ideas/points of view of particular society and individuals. Dissertation offers an opportunity to look at architecture, history and design through ideas, texts and intent behind works. It involves process of observation, reflection and abstraction. Students are encouraged to choose any topic of their interest. Topics may range from analysing the works of an architect, history, typological changes, writing, design process and many more. They could involve research based on primary sources in terms of doing actual field studies and/or secondary sources through reading. The dissertation proposal in about 1500 words stating the topic, issues to be explored and the scope must be submitted for approval. Work on the approved topic should start from the beginning of the semester and would be periodically reviewed. At the end of the semester, a well written report of a minimum 10,000 words should be submitted in the prescribed format, if any, provided by the University. The suggested structure for the report can be - outline/background of the area of study, statement of objectives or research questions within the area of study, outline of methodology/way to achieve the objectives or answer the questions of research, core section with necessary content such as documentation, analysis, arguments, etc., final conclusion. The report will be presented in the viva-voce exam and defended.

OUTCOME
- A dissertation report which is based on accepted norms of technical writing.
- Ability to research deeply into a subject and develop a coherent line of thought based on point of view, observation, analysis and study.
- Ability to look at architecture from an informed, analysed and well thought out critical perspective which would help strengthen the thesis process.
TEXTBOOKS

REFERENCES

AR8016 ARCHITECTURAL JOURNALISM AND PHOTOGRAPHY

OBJECTIVES
- To introduce general skills necessary for the practice of professional journalism.
- To introduce the fundamentals of writing, explain different strategies and their criticism.
- To give particular exposure to architectural journalism.
- To introduce photojournalism, bring out importance/ contributions of photography in the architectural profession and to help develop proficiency in modern photography techniques.

UNIT I INTRODUCTION
Introduction to journalism, key concepts and objectives of journalism. Specialised 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

UNIT IV DISCUSSIONS AND ISSUES
UNIT V  ARCHITECTURAL PHOTOGRAPHY
Introduction to architectural photography and role of the photographic image in the global world. 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

OUTCOME
- 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.

TEXTBOOKS
5. M. Harris, 'Professional Interior Photography', Focal Press, 2002

REFERENCES

AR8017  CONSTRUCTION AND PROJECT MANAGEMENT

OBJECTIVES
- To introduce different management techniques suitable for planning and construction projects.
- To enable understanding of management systems for accomplishing the task efficiently in terms of quality, time and cost.

UNIT I  INTRODUCTION TO PROJECT MANAGEMENT

UNIT II  PROJECT PROGRAMMING AND CRITICAL PATH METHOD
UNIT III RESOURCE PLANNING
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 V COMPUTERIZED PROJECT MANAGEMENT
Creating a new project, building task. Creating resources and assessing costs, refining project. Project tracking, recording actual. Reporting on progress. Analysing financial progress. Introduction to BIM.

UNIT V CONCEPT TO COMMISSIONING

TOTAL: 45 PERIODS

OUTCOME
- Ability to understand a project from concept to commissioning, feasibility study & facility programme, design, construction to commissioning.
- Ability to apply project management techniques in achieving objectives of a project like client needs, quality, time & cost.
- An understanding of principles of management, construction scheduling, scope definition and team roles.

TEXTBOOKS

REFERENCES

AR8018 EARTHQUAKE RESISTANT ARCHITECTURE

OBJECTIVES
- To enable an understanding of the fundamentals of earthquake and the basic terminologies.
- To give basic knowledge of earthquake resistant design concepts.
- To provide familiarity with design codes and building configuration
- To enable understanding of the different types of construction details to be adopted in a seismic prone area.
- To give knowledge for applying earthquake resistant principles in an architectural design project.

UNIT I FUNDAMENTALS OF EARTHQUAKES
Earth's structure, seismic waves, plate tectonics theory, origin of continents, seismic zones in India. Predictability, intensity and measurement of earthquake. Basic terms- fault line, focus, epicentre, focal depth etc.
UNIT II SITE PLANNING, PERFORMANCE OF GROUND AND BUILDINGS 10
Historical experience, site selection and development. Earthquake effects on ground, soil rupture, liquefaction, landslides. Behaviour of different types of building structures, equipments, lifelines, collapse patterns. Behaviour of non-structural elements like services, fixtures in earthquake-prone zones.

UNIT III SEISMIC DESIGN CODES AND BUILDING CONFIGURATION 10
Seismic design code provisions. Introduction to Indian codes. Building configuration - scale of building, size, horizontal and vertical plane, building proportions, symmetry of building - torsion, re-entrant corners, irregularities in buildings like short storeys, short columns, etc.

UNIT IV DIFFERENT TYPES OF CONSTRUCTION DETAILS 11
Seismic design and detailing of masonry structures, wood structures, earthen structures. Seismic design and detailing of RC and steel buildings. Design of non-structural elements - architectural elements, water supply, drainage, electrical and mechanical components.

UNIT V URBAN PLANNING AND ARCHITECTURAL DESIGN 7

TOTAL: 45 PERIODS

OUTCOME
- Ability to understand the formation and causes of earthquakes
- An understanding of the factors to be considered in the design of buildings and services to resist earthquakes.

REQUIRED READING

REFERENCES
1. Ian Davis, 'Safe Shelter within Unsafe Cities: Disaster Vulnerability and Rapid Urbanization', Open House International, UK, 1987
2. 'Socio-economic developmental record' - Vol.12, No.1, 2005.