PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):
Bachelor of Architecture curriculum is designed to prepare the graduates having aptitude and knowledge
1. To enable a successful professional and technical career.
2. To enable a strong foundation in Humanities and Sciences, Engineering Sciences and Architectural Design Skills.
3. To impart knowledge of the theories and practices in the field of Architecture.
5. To put into practice and inspire high ethical values and technical standards.

PROGRAMME OUTCOME (PO):

a) Ability to gain knowledge of Humanities, Sciences and Architecture.
b) Ability to understand elements of Architecture and apply basic principles in Architectural Design.
c) Ability to identify social, economical and cultural issues in Architectural Design.
d) Ability to analyze and apply theoretical knowledge to achieve Architectural Design solutions.
e) Ability to understand ethical and professional responsibilities.
f) Ability to review, comprehend and report technological developments.
g) Ability to understand real life situation of Architectural Practice.
h) 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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*Course from the curriculum of other UG Programmes*
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Non-Credit/ Mandatory:
- NCC/NSS/YRC/Rotaract
- Rural study tour
- All India 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:
3. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994.
REFERENCES:

AR7102 MATHEMATICS L T P/S C
2 2 0 3

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 12
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 12
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 12
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 12
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.
AR7111 ARCHITECTURAL DRAWING I

OBJECTIVES:
- To introduce the concepts and fundamentals of architectural drawing, to develop representation skills and to nurture the understanding of the nature of geometrical forms and simple building forms and to teach the language of architectural and building representation in two- and three dimensions.
- To introduce the basics of measured drawing.

UNIT I GEOMETRICAL DRAWING: INTRODUCTION TO DRAFTING
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 GEOMETRICAL DRAWING: PLANE GEOMETRY
Construction and development of planar surface – square, rectangle, polygon etc. Introduction of multi-view projection – projection of points, lines and planes.

UNIT III GEOMETRICAL DRAWING: SOLID GEOMETRY
Multi-view projection of solids – cube, prism, pyramids, cones, cylinders etc. Sections of solids, true shape of solids.

UNIT IV GEOMETRICAL DRAWING: AXONOMETRIC PROJECTION
Isometric and axonometric projections, plan oblique and elevation oblique projection of planes, solids and combination of solid etc.

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

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:
AR7112          ART STUDIO          L    T    P/S    C
                         1    0    4    3

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

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

UNIT II   PAINTING I

UNIT III PAINTING II

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

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

TOTAL: 75 PERIODS

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

TEXTBOOKS:
REFERENCES:

AR7113 COMMUNICATION ENGLISH

L T P/S C
2 0 2 3

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
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
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
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
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
Listening- ink talks and longer talks, Speaking—talking about one’s project proposal
Reading—writing 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.
OBJECTIVES:

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

CONTENT:


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

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

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.
TEXTBOOKS:

REFERENCES:

AR7201 BUILDING MATERIALS I

OBJECTIVES:
- To have an understanding of the properties, characteristics, strength, manufacture, processing and application of conventional materials such as soil, lime, rocks, stones, Clay and products from Flora.

UNIT I SOIL

UNIT II BAMBOO
Bamboo anatomy, Properties, strength, processing, harvesting, and working of Bamboo tools. Treatments and preservation of Bamboo and uses of Bamboo. Straw as a building material-physical aspects - Basics, Fire, moisture, insects and pests proof.

UNIT III TIMBER

UNIT IV STONE
Classification of rocks, Sources, Seasoning, Dressing, Characteristics and testing and uses of stones. Stone veneering, preservation of stones Deterioration of stones, Durability, Preservation, Selection of stones, Artificial stones. Clay products Manufacture and uses in buildings, finishes, appliances, pipes and fittings.

UNIT V PAINTS
Composition, characteristics, preparation, Primer, Painting different surfaces. Enamels, Paint, Varnishing – types of varnishing Miscellaneous paints, defects, uses and cost of materials.

TOTAL: 45 PERIODS

OUTCOMES:
- Students are sensitize to the use of naturally occurring materials such as lime, timber, stones in the context of creating a green architecture and to know about the constituents of paints, preparation and surface application of paints.
REFERENCES:

AR7202 MECHANICS OF STRUCTURES I

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
Principles of statics - Forces and their effects - Types of force systems - Resultant of concurrent and parallel forces - Lami’s theorem - principle of moments - Varignon’s theorem - principle of equilibrium - Types of supports and loadings - Determination of reactions for simply supported beams - simple problems.

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.

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:
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 15
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 10
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 15

UNIT IV MEASURED DRAWING: HISTORIC DOCUMENT STUDY 20
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 15
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.

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

REFERENCES:

OBJECTIVES:
- To study the principles of designing components of load bearing structures – foundation, plinth, wall, roofing systems, flooring, spanning of openings, fins and projections.
- To understand the need for and study the principles and practices of monolithic and masonry construction, arches, lintels/ beams, corbelling, cantilever etc.
- To understand the details of construction using the stone and soil as well as products derived from them.
UNIT I  INTRODUCTION
Planning and design of simple load bearing structures- typical parts of the load bearing structure- types of foundations – methods of spanning openings (lintel, arches, corbelling, beams) - types of roofs.

UNIT II  MUD CONSTRUCTION
Cob, Rammed earth, Wattle and daub construction- Principles of Masonry construction using Adobe, Compressed Stabilized Earthen Blocks; Foundation and plinth for mud structures, Design of openings (arches, corbelled arches), Mud plaster, mud mortar, Damp and weather proofing of mud structures, Mud flooring ’ Construction of thatched roof.

UNIT III  CONSTRUCTION USING STONE
Principles of stone masonry construction- types of stone masonry- stone finishes- jointing-types of mortar for stone construction- Stone masonry for foundation, plinth and wall, retaining wall, arches and lintels in stone, coping, steps, Stone Flooring, Stone cladding, Application of Artificial stone.

UNIT IV  CONSTRUCTION USING BRICK AND OTHER CLAY PRODUCTS
Principles of brick masonry construction- types of brick masonry- joints, pointing and finishing- types of mortar & mortar mix for brick construction- Plastering - Brick masonry for foundation plinth and wall, arches and lintels in brick, coping, steps, Brick paving- Roof using pan/ pot tiles, Mangalore pattern tiles- Flooring using clay tiles, ceramic tiles and vitrified tiles.

UNIT V  COMPOSITE/ ALTERNATE CONSTRUCTION TECHNIQUES AND INNOVATIVE PRACTICES
Composite walls, Cavity walls in stone and brick, jack arch flooring, domes/ vaults, prefabricated brick panels, precast curved brick arch panels, reinforced brick/ reinforced brick concrete slabs, Prefabricated floor/ roof using structural clay units, Houri block roofing, Guna tile roofing.

OUTCOMES:
- Students learn construction details using traditional and conventional building materials such as mud, bamboo, straw bale, stone 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:

AR7213  THEORY OF ARCHITECTURE  L T P/S C
2 0 2 3

OBJECTIVES:
- To make the students learn the theoretical aspects of design and understand how it could be manifested in architectural design.
- To understand the ideologies from works of architects and planners.
• To learn the design communication skills to enable to put forth the design ideas in graphics and literature.

UNIT I ELEMENTS OF DESIGN IN NATURE 10
Points, lines and shapes found in nature. Role of elements to emphasize the location, as landmark, for direction and dominance, etc. Patterns in nature and building design. Chaos and Order. Study : examples of nature inspired man made design.

UNIT II PRINCIPLES OF ORGANIZATION FROM NATURE 15

UNIT III COMPOSITION OF SHAPES / FORMS 15
Composition. Two dimension to three dimension .Figure and ground, positive and negative spaces. Axis, Symmetry/Asymmetry, Massing. Form generating exercises to approach site planning in small scale and large scale projects. Examples and Analysis.

UNIT IV CONCEPTS IN ARCHITECTURAL DESIGN 10
Concept – types- Ideas and Intent in design - Intuitive, contextual, Iconic, Experiential, Environmental, Energy based, Symbolic, Modular, etc. Ideologies and philosophies of architects. Exercises.

UNIT V DESIGN COMMUNICATION AND GRAPHICS 10
Importance of graphics in architectural design. Study of site plans, city plans, conceptual drawings. Interpretation of architects’ conceptual sketches and the respective buildings. Exercises on writing articles on design projects.

TOTAL: 60 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. Leland M. Roth - Understanding Architecture, its experience history and meaning, Craftsman house, 1994.
OBJECTIVES:
- To enable the conceptualization of form, space and structure through creative thinking and to initiate architectural design process deriving from first principles.
- To involve students in a design project(s) that will involve simple space planning and the understanding of the functional aspects of good design.
- To involve students in a small scale building project(s) which will sensitize them to intelligent planning that is responsive to the environmental context.
- To involve students in building case study by choosing appropriate examples to enable them to formulate and concretize their concepts and architectural program.
- To engage in discussion and analytical thinking by the conduct of seminars/workshops.
- To enable the presentation of concepts through various modes and techniques that will move constantly between 2D representation and 3D modeling.

CONTENT:
Scale and Complexity: projects involving small span, single space, single use spaces with simple movement, predominantly horizontal, as well as simple function public buildings of small scale; passive energy.
Areas of focus/concern:
- Architectural form and space.
- Aesthetic and psychological experience of form and space in terms of scale, colour, light, texture, etc.
- Function and need: user requirements, anthropometrics, space standards, circulation.
- Image and symbolism.
Typology/project: bedroom, bathroom, kitchen, shop, exhibition pavilion, children’s environment, snack bar, residence, petrol bunk, fire station.

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

TEXTBOOKS:

REFERENCES:
OBJECTIVES:
- To understand the influence of social, political influences on the evolution of various styles of Architecture.
- To gain knowledge of the development of architectural form with reference to technology, style and character.

UNIT I  ANCIENT INDIA AND THE EVOLUTION OF BUDDHIST ARCHITECTURE  09

UNIT II  EVOLUTION OF HINDU TEMPLE ARCHITECTURE  09
Hindu forms of worship – Evolution of temple form - meaning, symbolism, ritual and social importance- Categories of early temple architecture- With relevant architectural examples from Gupta and Chalukya periods- South Indian history and the relation between Bakthi period and temple architecture.

UNIT III  TEMPLEARCHITECTURE – DRAVIDIAN AND INDO ARYAN  09

UNIT IV  ISLAMIC ARCHITECTURE AND THE INFLUENCE OF DELHI SULTANATE RULE IN INDIA  08
A short history of Islam- Islamic architecture as rising from Islam as a socio cultural and political phenomenon - evolution of building types in terms of forms and functions under Delhi Sultanate: mosque, tomb, minaret, madarasa - Character of Islamic architecture understood through relevant architectural examples.

UNIT V  ISLAMIC PROVINCIAL STYLE AND MUGHAL ARCHITECTURE  10
The development of the Islamic Provincial styles in various provinces of Gujarat, Punjab, Bengal and the Deccan with relevant architectural examples.
Contribution of the Mughals under Humayun, Akbar and Shajahan to the architecture (tombs, mosques and forts) and city planning with relevant architectural examples.

TOTAL: 45 PERIODS

OUTCOMES:
- An understanding of Indian architecture as a response to the political and socio cultural conditions present in India at different points of time.
- An understanding of the formations of a new religion and its influence on the architecture of its lands.
- Development of monuments, cities and landscape design and various technologies used for the construction of the same.

TEXTBOOKS:
REFERENCES:

AR7302 MECHANICS OF STRUCTURES II
L T P/S C
2 2 0 3

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

UNIT I BENDING OF BEAMS
Beams and supporting conditions - Types of supports – Shear force and bending moment for Simply supported, Cantilever and Over hanging beams - Theory of simple bending - Stress distribution at a cross section due to bending moment and shear for Rectangular, I and T sections - concept of Flitched beams (no mathematical calculation).

UNIT II DEFLECTION OF BEAMS
Relation between slope, deflection and curvature-Determination of deflection and slope for simply supported and Cantilever beams using Double Integration Method, Macaulay's method and Moment Area Method.

UNIT III THEORY OF COLUMNS
Columns- Concept of Axial and eccentric loads on columns- Combined bending and axial load – Euler's and Rankine formulae for columns - simple problems.

UNIT IV STATICALLY INDETERMINATE BEAMS
Introduction-Determination of degree of statical indeterminacy for beams and frames-advantages and disadvantages-method of consistent deformation-application to simple problems.

UNIT V CONCEPTS IN ANALYSIS OF STRUCTURES
Method of Moment distribution for continuous beams and Single portal frames - Concept of load distribution for structural systems and overall stability like a) One way b) Two way c) Arches e) portal frames f) Space Structures.

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

TEXTBOOKS:
REFERENCES:

GE7251 ENVIRONMENTAL SCIENCE AND ENGINEERING

L T P/S C
3 0 0 3

OBJECTIVES:
- To study the nature and facts about environment.
- To finding and implementing scientific, technological, economic and political solutions to environmental problems.
- To study the interrelationship between living organism and environment.
- To appreciate the importance of environment by assessing its impact on the human world; envision the surrounding environment, its functions and its value.
- To study the dynamic processes and understand the features of the earth’s interior and surface.
- To study the integrated themes and biodiversity, natural resources, pollution control and waste management.

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

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

UNIT 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, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting
and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.

Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT 07

UNIT V HUMAN POPULATION AND THE ENVIRONMENT 06

TOTAL: 45 PERIODS

OUTCOMES:
- Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.
- Public awareness of environmental is at infant stage.
- Ignorance and incomplete knowledge has lead to misconceptions.
- Development and improvement in std. of living has lead to serious environmental disasters.

TEXTBOOKS:

REFERENCES:
OBJECTIVES:
- To understand both in general and in detail the methods of construction by using basic materials such as bamboo, straw products and natural timber for both structural and non-structural components.
- To understand both in general and in detail the methods of construction by using man-made timber products such as ply wood.
- To understand the material’s workmanship and performance for the topics discussed and to understand how these materials come together to create a building as a whole.

UNIT I  
BAMBOO AND STRAW BALES  
BAMBOO : Design and Construction Techniques using bamboo for building components including detailing of doors and windows, arches, barrel walls, weave structures and understanding of the same through case studies.

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

UNIT II  
TIMBER JOINERY  
Design and construction techniques using natural timber in joinery works including methods of fixing and options for finishing – Windows, door, ventilators (hinged, pivoted, louvered, sliding, etc) – Hardware for doors, windows and ventilators - Exercises involving the above through drawings and application of the above for a single or (G+1) building with schedule of joinery.

UNIT III  
TIMBER WALLS, FLOORS, TRUSSES AND STAIRCASES  
Methods of construction using natural timber in various structural components of the building such as walls, floors, roof trusses - Exercises involving the above through case studies - Types of timber staircases. Methods of construction of timber staircases- basic principles and design details including detailing of handrail and baluster- Exercises involving the above through drawings.

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

UNIT V  
COMPOSITE CONSTRUCTION  
Design exercises combining bamboo, straw, timber as structural and non structural components for single storey constructions such as snack bar, tree house, etc. The study of the same through case studies.

TOTAL: 75 PERIODS

OUTCOMES:
- An understanding of natural building materials in methods of construction and in detailing.
- This also helps the student to understand the different construction practices adapted for the various components specific to the material in which its made.

TEXTBOOKS:


REFERENCES:

AR7312 CLIMATE AND BUILT ENVIRONMENT L T P/S C
2 0 2 3

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

UNIT I CLIMATE AND HUMAN COMFORT 10

UNIT II DESIGN OF SOLAR SHADING DEVICES 15
Movement of sun- Locating the position of sun- Sun path diagram- Overhead period- Solar shading- Shadow angles- Exercises in the design of appropriate shading devices.

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 – Types of envelops with focus on glass- Exercises involving software for design analysis.

UNIT IV AIR MOVEMENT DUE TO NATURAL AND BUILT FORMS 10
The wind – The effects of topography on wind patterns – Air currents around the building – Air movement through the buildings – The use of fans – Thermally induced air currents – Stack effect, Venturi effect – Use of court yard- Experiments as relevant.

UNIT V CLIMATE AND DESIGN OF BUILDINGS 15
Design strategies in warm humid climates, hot humid climates, hot and dry climates and cold climates – Climate responsive design exercises for various contexts.

TOTAL: 60 PERIODS

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

TEXTBOOKS:
REFERENCES:

OBJECTIVES:
- To enable a firsthand understanding of the basic aspects of architecture and interrelationships among them through personal exploration- experiential form/space, space planning and activities, user perception and behavior.
- To supplement this understanding through theoretical studies.
- To understand the characteristics of site and the importance of site planning.
- To understand the potential of materials and construction in architectural experience
- To enable the presentation of concepts through 2D drawings, sketches and model.

CONTENT:
Scale and Complexity: Projects involving organization of multiples of single unit space with predominantly horizontal movement as well as single use public buildings of small scale; passive energy

Areas of concern/ focus:
- Individual development of subjective and objective capacity for thought in study and design.
- Built form-open space relationships, spatial organization
- Environment behavior studies, especially those relating to children
- Site planning
- Appropriate materials and construction

Suggestive Typologies/ Projects: residential buildings, small institutional, civic and public buildings- nursery/ primary schools, schools for children with special needs, primary health center, banks, neighborhood market, neighborhood library, other projects- gate complexes including security kiosk and entry / exit gates.

OUTCOMES:
- The students would be able develop ideational skills towards creating desired user experiences through architectural form and space. They would be able to exploit the site as a positive element in architecture. They would be able to express their ideas in the form of simple expressive sketches, manual drawings and models.

TEXTBOOKS:

REFERENCES:
OBJECTIVES:
- To have an understanding of the properties, characteristics, strength, manufacture, processing and application of contemporary materials such as cement, glass, ferrous and nonferrous metals, plastics and other materials used for advanced construction.
- To sensitize the students by understanding the use of these materials innovatively and for advanced constructions.

UNIT I  CEMENT AND CONCRETE  09
The composition, strength, properties, manufacture, test for cement, types of cement - Sources, properties, uses and tests for sand, coarse aggregate and water for mortar and concrete. Definition, properties, specification, proportioning, water-cement ratio, workability, curing, water-proofing, guniting, special concretes.

UNIT II  MANUFACTURING AND TYPES OF CONCRETE  09
Manufacture, construction of formwork, placing, quality assurance testing, fabrication, incorporation of steel in concrete.

UNIT III  FERROUS AND NO-FERROUS METAL  09
Brief study on the properties, manufacturing process, treatments, market forms and application of ferrous & non-ferrous metals and their alloys.

UNIT IV  PLASTICS  09
The properties, types, uses and application of Plastics in building industry. The importance and application of Adhesives and sealants Polycarbonate sheeting, Teflon coated sheets, PTFE Steel alloys properties and uses - Adhesives, Sealants and joint fillers (Relative movement within buildings, types of sealants- elasto-plastic, elastic sealants - joint design - fire resistant sealants - gaskets adhesives, epoxy, wall paper, bitumen, plastic pipe) - Materials for flooring finishes such as epoxy, oxy-chloride, hardeners, PVC, carpets.

UNIT V  GLASS AND ADVANCED BUILDING MATERIALS  09
Composition of glass, brief study on manufacture, treatment, properties and uses of glass. Types of glass - float glass, cast glass, glass blocks, foamed glass. Decorative glass, solar control, toughened glass, wired glass, laminated glass, fire-resistant glass, glass blocks, structural glass - properties and application in building industry, glazing and energy conservation measures. Advanced Construction materials by BMTPC, SERC, etc. Light-roofing materials (Recent trends in roofing materials like Corrugated GI Sheets, Pre-coated metal sheets

OUTCOMES:
- The course helps to understand the materials of construction such as cement, concrete, metals, Plastics and advanced materials application in the building industry.

TEXTBOOKS:
2. M.S. Shetty, Concrete Technology, S.Chand & Co.ltd, New Delhi, 1986.

REFERENCES:
4. Pamphlet and Manuals supplied or published by SERC, BMPTC, HUDCO and Other research organization.
OBJECTIVES:
- To introduce the elements of human settlements and to outline the origins, determinants of human settlements and their evolution through the course of history.
- To study the characteristics of Human settlements and the manifestation of settlements as expression of political aspirations.

UNIT I ELEMENTS AND ORIGIN OF HUMAN SETTLEMENTS

UNIT II RIVER VALLEY CIVILIZATIONS
 Growth of human settlements in the ancient river valley civilizations of Indus valley, Mesopotamia, Egyptian and Chinese. Emphasis on the layout and patterns of the settlements and the influence of resources on them.

UNIT III THE CLASSIC PERIOD AND MEDIEVAL EUROPE
 Classic period- Greek and Roman civilizations with relevant examples- Medieval and Renaissance Periods with relevant examples- Sforzinda and Utopia- Origin of cities and theories on city planning. City plans of Vienna, Amsterdam, Paris- Role of defense, trade and other factors in the development of settlement planning.

UNIT IV EVOLUTION OF HUMAN SETTLEMENTS IN INDIA
 Medieval Indian cities, factors that led to their development. Influence of Islamic and Mughal in the evolution of settlements planning. Colonial period and its influence – Imperialism in city planning-New Delhi and Development of Cantonment cities such as Bangalore.

UNIT V EVOLUTION OF MODERN PLANNING CONCEPTS
 Transition to the Industrial city- Post industrial Age-Visionary/ Utopian city concepts by Le Corbusier, Frank Lloyd Wright, Archigram, Metabolism and Paolo Soleri.

TOTAL: 45 PERIODS

OUTCOMES:
- The course enables the understanding of the factors that led to the growth of settlements and the changing scenario in the contemporary world.

TEXTBOOKS:

REFERENCES:
OBJECTIVES:
- To introduce construction of building components in Reinforced Cement Concrete.
- To introduce various waterproofing, insulation & protection systems and their methods of construction.
- To expose the students to the advanced construction systems developed by research institutes in the country and the detailing of the same.

UNIT I INTRODUCTION: CONCRETE CONSTRUCTION
25
Detailing of walls, roofs and flooring, foundations using RCC in simple framed buildings including detailing of RCC beams, columns, slabs (one way slabs, 2-way slab, continuous, flat slab, post-tension slab etc.), detailing of apertures (lintels, sunshades, arches etc.), Exercises of the above through case studies and drawings of selected building types. Staircases - basic principles, for different types of staircase for support conditions for stairs and details of handrail, baluster etc. and finishes for stairs - Exercises of the above through case studies and drawings.

UNIT II WATER-PROOFING AND DAMP-PROOFING OF CONCRETE STRUCTURES
10
Construction methods for waterproofing and damp proofing for walls, roofs, basements, retaining walls, swimming pools etc. - Exercises of the above through case studies and drawings.

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

UNIT IV ADVANCED CONSTRUCTION TECHNIQUES AND INNOVATIVE PRACTICES
20
Design and detailing of concrete used in advanced construction – Precast concrete, prestressed concrete, Folded plates, Shell structures, vaults, domes, decorative concrete, insulated concrete forms (ICF), concrete for Seismic design.

UNIT V PLASTICS AND OTHER MATERIALS
10

TOTAL: 75 PERIODS

OUTCOMES:
- The students learn how Reinforced Cement Concrete, glass and plastics could be used for the various components of a building as well as in waterproofing and insulation and protection systems.
- The role of advanced construction techniques that have been developed are also explored.

TEXTBOOKS:

REFERENCES:
AR7412 BUILDING SERVICES I

**OBJECTIVES:**

- To study the water quality control and treatment and its distribution within a building.
- To understand the fundamentals of waste disposal from a building and the guidelines for planning a sewerage system.
- To expose the students to water and waste management concepts.
- To familiarize the students with equipment for management of usable water and waste water.

**UNIT I**

**WATER QUALITY CONTROL AND DISTRIBUTION SYSTEM**


**UNIT II**

**SANITARY WASTE AND SEWERAGE SYSTEM**

Sewage and sewerage – source, collection and disposal – types of pipes – sanitary fixtures, fittings, connectors / joints, traps and seals. Treatment plant – sizes and spatial requirements for installation in site.

**UNIT III**

**MECHANICAL SYSTEMS**

Pumps, motors- types and applications in water supply and sanitation- location in the site and the facility- Automation systems. Energy efficient systems.

**UNIT IV**

**CASE STUDIES**


**UNIT V**

**EXERCISES**

Design of water tank, plumbing systems and prepare drawings of plumbing layout-Plan, section-drawn to scale. Specification of pumps, pipes, motors, water tanks & treatment plants.

**TOTAL: 60 PERIODS**

**OUTCOMES:**

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

**TEXTBOOKS:**


REFERENCES:
4. Renewable energy, basics and technology, supplement volume on integrated energy systems) Solar Agni systems, Sri Aurobindo Ashram, Pondicherry 605002.

AR7413 COMPUTER-AIDED VIZUALIZATION 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 Modeling through projects.
- Students will study 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 10
Technology of small computer system, computer terminology operation principles of P.C, introduction to application software, and graphic system, and use of printers, scanner, plotter, File management, etc. Understanding Bitmap images and Vector Graphics, Image size and Resolution. Basic Tools for Editing and Creating Graphics.

UNIT II THE BASICS OF BUILDING MODELLING 15
Creating a basic floor plan, About Temporary Dimensions, Adding and Modifying Walls, Working with Compound Walls, Using Editing Tools, Adding and Modifying Doors, Adding and Modifying Windows

UNIT 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.

UNIT IV INTRODUCTION TO 3D MODELLING 15
Project: Create 3D sculpture using 3D primitives (cubes, spheres etc.) Tools: Slide facilities script attributes, V-port, editing session. Introduction to 3D-modelling technique and construction planes, drawing objects, 3D surfaces setting up elevation thickness and use of dynamic projections. Solid modeling with primitive command and Boolean operation.

UNIT V 3D RENDERING AND SETTING 20
Project: Visualize a building. Explore the potential of lights and camera and use the same in the model created for the final submission.
Tools: Rendering and scene setting to create a photo realistic picture, understanding material mapping, environment setting and image filling. Exercise to identify and visualize a building using the above said utilities.

TOTAL: 75 PERIODS

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

REFERENCES:

AR7414 ARCHITECTURAL DESIGN III

OBJECTIVES:
- To understand the built environment as a holistic, living, entity shaped by historic socio-cultural, geographic and economic aspects.
- To make a comprehensive study of rural settlement as exemplar of collective design that evolved organically over time.
- To understand vernacular/traditional architecture and their details, including local materials and construction techniques.
- To expose the students to various methods of recording/getting information, including surveys and documentation, covering physical, visual and demographic aspects.
- To expose the students to ways of analysing, organising, interpreting and presenting information and analysis.
- To emphasise on the importance of designing built form and open spaces that meet the aspirations of the community.

CONTENT:
Scale and Complexity: Study projects involving rural settlement; Design projects involving public and community oriented buildings within the context of human settlements - multi room, single use, small span, maximum G+2 storeyed, simple horizontal and vertical movement; active passive energy.

Area of concern/ focus:
- rural settlements and architecture
- community oriented design
- simple public buildings set within community

Suggestive Typologies/ projects: Rural projects that involve studies and design at settlement and building level - noon meal centre, market, community centre, local buildings for economic activities, primary health centre; small community/ need oriented urban projects such as department store, campus students centre.

TOTAL: 210 PERIODS

OUTCOMES:
- The understanding of human settlements at macro and micro scale as rising from various forces would sensitise the students towards the nature and values of unselfconscious design. They would also be able to bring sensitivity in design approach in community oriented projects with respect to collective values and needs.

TEXTBOOKS:
1. Amos Rapoport, House, Form and Culture; Prentice hall; 1969.
2. Bernard Rudovsky, Architecture without Architects; Cost reduction; Architectural Press; 1964.
OBJECTIVES:
- To enable the design of different types of masonry walls and retaining walls.
- Also to teach the students the design of different types of timber structures and steel members.

UNIT I DESIGN OF WALLS 14
Retaining walls - Types of retaining walls - design of R.C.C cantilever retaining walls Masonry walls- Analysis and design of masonry walls-use of nomograms for design.

UNIT II DESIGN OF TIMBER STRUCTURES-BEAMS AND COLUMNS 08
Grades of timber - design of timber beams and columns- madras terrace roof design.

UNIT III CONNECTIONS IN STEEL STRUCTURES 14
Assumptions-Failure of bolted joints-strength and efficiency of bolted joints-types-design of bolted joints for axially loaded members excluding eccentric connections- Types of welded joints-advantages and disadvantages-design of fillet welds (excluding eccentric connections).

UNIT IV STEEL TENSION MEMBERS 12
Introduction-net sectional area-permissible stresses- design of axially loaded tension member-lug angle-tension splice.

UNIT V COMPRESSION MEMBERS AND BEAMS 12
Introduction-various sections-built up sections-design of columns excluding lacing and battening and other connections-Introduction to steel beams-laterally supported and unsupported beams-design of laterally supported beams.

OUTCOMES:
- Understanding the design of masonry walls and cantilever type retaining walls.
- Enabling To understand the design of timber beams and columns of different grades.
- The understanding of the types, efficiency and strength of different types of connections in steel members is achieved.
- Knowledge in Design of tension members, beams and compression members(columns) in steel buildings under different conditions will help the students to visualize the structural behavior of steel buildings and also the stability aspects of such buildings.

TEXTBOOKS:
REFERENCES:
5. IS 883 – Code of Practice for Design of Structural Timber in Buildings.

AR7502 HISTORY OF ARCHITECTURE AND CULTURE - III

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

UNIT I LEADING TO A NEW ARCHITECTURE


UNIT II REVIEWING INDUSTRIALISATION


UNIT III MODERN ARCHITECTURE: DEVELOPMENT AND INSTITUTIONALISATION


UNIT IV MODERN ARCHITECTURE: LATER DIRECTIONS


UNIT V COLONIAL ARCHITECTURE IN INDIA

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

TOTAL: 45 PERIODS

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

REFERENCES:

AR7511 BUILDING CONSTRUCTION IV L T P/S C
1 0 4 3

OBJECTIVES:
- To understand both in detail and the methods of construction using steel for structural purposes and as building components.
- To understand both in detail and the methods of construction of building components using aluminum such as doors and windows, partitions and curtain walling.
- To understand the significance of Plastic, allied products use as the building component and building finishes in door and windows, partitions, roofs and curtain walling.

UNIT I STEEL CONSTRUCTION INCLUDING STAIRCASES 15
Design exercises using structural steel sections for walls, foundations, column-beam connections and design and detailing of steel roof trusses (north-light, butterfly truss, space frames etc..) and girders including construction methods for roof covering (using steel, aluminum, asbestos, etc.), for long span structures (like hangars, factory etc.), - Steel staircases basic principles for different types of staircases - Support conditions for stairs and details of handrail, baluster etc. - finishes for stairs - Exercises of the above through case studies and drawings.

UNIT II STEEL DOORS, WINDOWS AND ROLLING SHUTTERS 15
Different Types of doors and windows (openable, sliding etc., methods of construction using steel) - Design and detailing of steel rolling shutter, collapsible gate etc. - Exercises of the above through case studies and drawings.

UNIT III ALUMINIUM DOORS, WINDOWS AND VENTILATORS 15
Brief study of aluminum products- market forms of aluminum, aluminum extrusions- sketches of the above - Aluminum doors and windows - design details for doors (openable, sliding, pivoted and fixed) - Design details for windows (openable, sliding, fixed, louvered) – Design details for Ventilators (top hung, pivoted and louvered) - Exercises of the above through case studies and drawings.

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

UNIT V COMPOSITE / ALTERNATE CONSTRUCTION TECHNIQUES AND INNOVATIVE PRACTICES 15
Composite walls, pneumatic structures, application of tensile structures, Corrugated hypar shells, single layer reticulated shells, tension hybrid membranes, sustainable steel (preco beams, cellular beams, composite slim floor beam) - Detail and use of the same through case studies and drawings.

TOTAL: 75 PERIODS
OUTCOMES:
- The students are able to understand in detail the method of construction of various building components using steel, aluminum and plastic.
- This also helps the student to understand the different construction practices adapted for various building components specific to the material in which its made and its innovation in terms of function and aesthetics.

TEXTBOOKS:

REFERENCES:

AR7512 BUILDING SERVICES II L T P/S C
2 0 2 3

OBJECTIVES:
- To inform the students of the laws and basics of electricity and wiring systems within domestic and commercial buildings.
- To expose the students to the fundamentals of lighting and lighting design.
- To expose the student to the standards and byelaws related to electrical and lighting design.

UNIT I ELECTRICAL SYSTEMS: GENERATION
Generation of electricity- Ohms and Kichoffs Laws – units : watt, volt, amps - distribution from grid to facilities- Two phase and three phase systems -substation, transformers, generators- Types-wire, conduits- types –Applications. Lightning conductors and earthing.

UNIT II ELECTRICITY DISTRIBUTION IN BUILDINGS
Distribution boards, Meters, switch boards, earthing. Electrical layout drawings for low rise buildings. Energy efficient systems and renewable energy resources.

UNIT III INTRODUCTION TO LIGHTING

UNIT IV LIGHTING DESIGN BASICS

UNIT V LIGHTING DESIGN: EXERCISES
Analysis of lighting from case studies- architects works – Lighting design for a particular typology – layout - drawings. Physical models and lighting study. Lighting simulation and performance analysis using lighting software – Autodesk Ecotect Analysis, Dialux or Lite Pro 2.0.

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

TOTAL: 60 PERIODS
TEXTBOOKS:

REFERENCES:

AR7513 ARCHITECTURAL DESIGN IV L T P/S C
                                0 0 14 7

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

CONTENT:
Scale and Complexity: Buildings and small complexes that address the social and cultural needs of contemporary urban life (residential, commercial, institutional); multi bayed, multiple storeys, circulation intensive; passive and active energy.

Areas of concern/ focus
Socio-cultural and economic aspects
Designing for the differently abled
Building byelaws and rules
Appropriate materials and construction techniques, detailing
Climatic design

Typology/project: housing projects- detached, semi-detached, row housing, cluster housing, apartment; housing and facilities for other user groups- old age home, orphanage, working women’s hostel, home for physically and mentally challenged; museum/art centre, educational campus, R & D centre, shopping complex.

TOTAL: 210 PERIODS

OUTCOMES:
- The students would be able to explore innovative design solutions in projects involving practical needs of contemporary urban society. They would be able to convey their design through aid of computers/digital media.

TEXTBOOKS:
2. Ernst Neuferts Architects Data, Blackwell 2002.
REFERENCES:
2. MVRDV, FARMAX- Excursions on Density; 010 Publishers; 2006.

AR7601 DESIGN OF STRUCTURES II

OBJECTIVES:
- To study the basic concepts of load transfer mechanism in structures.
- To use limit state design for the analysis and design of slabs, beams, columns, footings and staircases.
- Case studies and models applicable.

UNIT I BASIC CONCEPTS

UNIT II LIMIT STATE DESIGN OF SLABS AND STAIRCASES
Behaviour of one way and two way slabs - Design of one way slabs and two way slabs for various edge conditions and corner effects, circular slabs subjected to uniformly distributed loads - Design of continuous slabs using codal coefficients - Detailing of slabs using SP34 - Design of doglegged staircase.

UNIT III LIMIT STATE DESIGN OF BEAMS
Analysis and Design of singly, doubly reinforced rectangular and flanged beams for bending and shear - Design of continuous beams using codal coefficients - Detailing of beams using SP34.

UNIT IV LIMIT STATE DESIGN OF COLUMNS
Long and short columns - axially loaded Rectangular and circular columns - Columns subjected to uniaxial and biaxial bending - Design of columns using column interaction diagrams - Use of SP16 - Detailing of columns using SP34.

UNIT V LIMIT STATE DESIGN OF FOUNDATION
Types of R.C.C. foundation - Design of wall footings, design of axially loaded rectangular pad footings and Sloped footings - Design of combined rectangular and trapezoidal footings.

TOTAL: 60 PERIODS

OUTCOMES:
- At the end of the course, the student should be able to understand the different concepts in designing the structural elements like slab, beams, columns and footings.

TEXTBOOKS:
5. SP – 16, Design Aids for Reinforced Concrete to IS 456 National Building Code of India, 1983.
REFERENCES:

AR7602 SITE PLANNING AND DEVELOPMENT L T P/S C
3 0 0 3

OBJECTIVES:
- To teach the importance of site and its content in architectural creations.
- To orient the students towards several influencing factors which governs the siting of a building or group of buildings in a given site.
- To teach various techniques of site analysis through exercises and case studies.
- To teach the students the methodology of preparing a site analysis diagram. This will serve as a prelude to any architectural creation.
- To teach planning of site utilities and infrastructure.

UNIT I INTRODUCTION
Definition of plot, site, land and region, units of measurements. Introduction to survey; methods of surveying and where they are used. Modern surveying Instruments and their application such as EDMs and Total Stations. Need for surveying. Measuring and drawing out a site plan from the measurements.

UNIT II SITE ANALYSIS
Importance of site analysis; On site and off site factors; Analysis of natural, cultural and aesthetic factors – topography, hydrology, soils, vegetation, climate, surface drainage, accessibility, size and shape, infrastructures available - sources of water supply and means of disposal system, visual aspects; Preparation of site analysis diagram.

UNIT III DETAILED ANALYSIS AND TECHNIQUES
Study of contours, slope analysis, grading process, grading criteria, functional and aesthetic considerations. Preparation of maps of matrix analysis & composite analysis methods. Site selection criteria for housing development, commercial and institutional projects- Case Studies.

UNIT IV SITE CONTEXT AND REGULATIONS
Context of the site. Introduction to existing master plans land use for cities, development control Rules. Impact of proposed developments on the surroundings especially with reference to large scale projects. Aspects such as increase in traffic, noise and pollution to surroundings - Study through notable examples.
UNIT V  SITE LAYOUT AND DEVELOPMENT

Organization of vehicular and pedestrian circulation and 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 – Improving climatological conditions on site through landscaping.

TOTAL: 45 PERIODS

OUTCOMES:
- It enables the students to effectively do site analysis and Planning towards better environments.
- Enables to plan utilities and other services for a sustainable site management.

TEXTBOOKS:

REFERENCES:

AR7603  SPECIFICATION, ESTIMATION AND BUDGETING

OBJECTIVES:
- To prepare detailed exact as well as approximate estimates to meet a number of requirements and also to have a clear picture of the project expenditure.
- To have a thorough idea regarding the quality and quantity of materials, quantity and classes of skilled and unskilled labours and tools and plants required for the project.
- To calculate the exact quantities of items of work done for affecting payment especially when direct measurements are difficult and also to determine the quantities of different materials required for various items of work.
- To draw up specifications for the different items of civil engineering project and also to prepare the schedule of programming of the project.
- To prepare valuation report of real and landed property.

UNIT I  SPECIFICATION AND SPECIFICATION WRITING

Necessity of specification, importance of specification, - How to write specification, - Types of Specification, -Principles of Specification writing, - Important aspects of the design of specification – sources of information – Classification of Specification - Brief Specification for 1 st class, 2 nd class , 3 rd class building-Detailed specification for earthwork excavation, plain cement concrete, Reinforced concrete, first class and second class brickwork, Damp proof course, ceramic tiles/marble flooring and dado, woodwork for doors, windows frames and shutters, cement plastering, painting & weathering course in terrace.

UNIT II  ESTIMATION

Types & purpose, Approximate estimate of buildings – Bill of quality, factors to be considered, - principles of measurement and billing, contingencies, measurement of basic materials like brick, wood, concrete and unit of measurement for various items of work – abstract of an estimate-Costs Associated with Constructed Facilities - Approaches to Cost Estimation - Type of Construction Cost Estimates - Cost Indices - Applications of Cost Indices to Estimating - Estimate Based on Engineer’s List of Quantities - Estimation of Operating Costs.

UNIT III  DETAILED ESTIMATE

Deriving detailed quantity estimates for various items of work of a building. Like earthwork excavation, brick work, plain cement concrete, Reinforced cement concrete works, wood work, iron works, plastering, painting, flooring, weathering course for a single storied building.
UNIT IV  VALUATION  06
Valuation - Explanation of terms-types of values, sinking fund, years of purchase-
Depreciation –types of depreciation- Valuation of real properties- types, methods and
purpose of valuation.

UNIT V  BUDGETING  08
Elements of cash flow- Time value of Money – Capital investment decision - Types of
business firms -Budget and Budgetary Control – Types of Budgets – Preparation of Financial
Budget.

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

TEXTBOOKS:
CHAROTAR PUBLISHING HOUSE, INDIA.
Distribution P.Ltd. India, 1983.

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.

AR7611  ARCHITECTURAL DESIGN DETAILING  L T P/S  C
1 0 4 3

OBJECTIVES:
• To enable students to design and develop a comprehensive set of drawings for
construction of building in a site containing architect’s drawings along with structural and
services engineer’s drawings etc.
• To focus the students on the development of a project design (a typology/ architectural
design project completed in their previous semesters) from concept through analysis to
create an architectural design with well develop engineering systems/ complete technical
drawings by the use of computer drafting software /tools.
• To enable students to understand and appreciate the challenges in construction detailing
and to train them in the aspects of detailing buildings with allied requirements namely
structure, building services, Furniture, Fittings & Equipment (FFE) etc along with the
installation methods.

UNIT I  INTEGRATION TO ARCHITECTURAL AND STRUCTURAL
DETAILING  15
Exercise involved in development and generation of architectural working drawing with
detailing of floor plan , technical drawing with working drawings for Structural System most
suitable for the project with integration of structural components into the design – application
of appropriate Building Materials ,development of assembly drawing regarding the installation
of materials.

UNIT II  INTEGRATION OF SERVICE COMPONENTS OF DESIGN  15
Exercise involved in development of technical drawing with understands the integration of
Electrical, Plumbing and HVAC systems into the Design.
UNIT III DETAILING OF ARCHITECTURE COMPONENTS
Exercise involved in detailing of, joinery scheduling, dimensions explaining the various components. Detailing of site layout with facilities; specific Areas like Staircase, Wall-Sections, explaining the interface of the building etc.

UNIT IV DETAILING OF BUILT-IN FURNITURE AND FITTINGS
Exercise involved in development of technical drawing and detailing of built-in elements like kitchen counters, cupboards, cabinets, toilets, toilet fitting, workstation, display unit etc. as per the project typology and design.

UNIT V DETAILING OF EXTERIOR AND INTERIOR ARCHITECTURAL ELEMENTS
Exercise involved in development of technical drawing and detailing of architectural elements like indoor fountains, water walls, transparent floors, street furniture, hard and soft landscape, swimming pools, water bodies and courtyard spaces etc. Detailing of interior architectural elements in existing buildings.

OUTCOMES:
- An understanding of the principles of design detailing as applicable to various situations in the Indian context.
- The students are also exposed to various materials, furniture’s, fittings and the equipments that are needed in buildings.
- The students are also exposed to integration of Structure and Services components and to deal with the project as a complex whole rather than just its parts.

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

REFERENCES:

AR7612 ARCHITECTURAL DESIGN V L T P/S C
0 0 16 8

OBJECTIVES:
- To understand the design and form of building typologies that are the result of pressure on urban lands with a thrust on issues like urban land economics, technology and ecology.
- To balance complex planning needs in buildings of large floor areas and diverse requirements.
- To critically question and creatively address aspects such as sustainable architecture and green buildings.
- To inculcate the importance of services integration and construction in spatial planning in the context of design of high-rise buildings and service intensive buildings.
- To explore advanced computer aided presentation techniques involving 2D and 3D drawings and virtual models, apart from physical models.
CONTENT:
Scale and Complexity: Advanced and complex problems involving large scale multi-storeyed buildings and complexes for residential/ commercial/ institutional/ mixed-use buildings in an urban context with focus on planning aspects, service integration and sustainable practices.

Areas of focus/ issues:
- Planning integration and detailing
- Sustainable building practices, green issues, alternative energy
- Intelligent building techniques and service integration
- Advanced building practices

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

TOTAL: 240 PERIODS

OUTCOMES:
- The student would be able to balance diverse aspects/ concerns of buildings by making right choices in design situations after studying various criteria. They would be able to apply knowledge in realms such as sustainable built environment, services.

TEXTBOOKS:

REFERENCES:

AR7701 PROFESSIONAL PRACTICE AND ETHICS

OBJECTIVES:
- To give an introduction to the students about the architectural profession and the role of professional bodies and statutory bodies.
- To sensitize the students about the importance of code of conduct and ethics in professional practice and the mandatory provisions as per Architects Act 1972.
- To expose the students some of the important legal aspects and legislations which have a bearing on the practice of architectural profession.
- To enable the students to grasp the advanced issues concerning professional practice such as tendering, contracting including alternative practices in project execution and project management.
- To expose the students to the implications of globalisation on professional practice with particular reference to WTO and GATS and equip them for international practice.
- To facilitate practical exposure to students about Approval Process, Team work with consultants, Project management, certifications etc.

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

Tender - Definition - Types of Tenders - Open and closed tenders - Conditions of tender – Tender Notice - Tender documents - Concept of EMD - Submission of tender - Tender scrutiny - Tender analysis – Recommendations – Work order - E-tendering (advantages, procedure, conditions).

Contract – Definition - Contract agreement - its necessity – Contents (Articles of Agreement, Terms and Conditions, Bills of Quantities and specifications, Appendix) – Certification of Contractors Bills at various stages. New trends in project formulation and different types of execution (BOT, DBOT, BOLT, BOO, etc.) - Role of Architect in Project execution stage (A visit to major project site and interaction with Project managers).

UNIT IV LEGAL ASPECTS

Arbitration (Definition, Advantages of arbitration, Sole and joint arbitrators, Role of umpires, Award – Arbitration clause in contract agreement (role of architect, excepted matters) Easement – (meaning, types of easements, Copy rights and patenting – (provisions of copy right acts in India, copy right in architectural profession) Consumer Protection Act (Intent, Architects responsibility towards his clients).

UNIT V IMPORTANT LEGISLATIONS AND CURRENT TRENDS


TOTAL: 45 PERIODS

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

TEXTBOOKS:

REFERENCES:
2. Development Regulations of Second Master Plan for Chennai Metropolitan Area - 2026. (Second Master plan of CMA).
OBJECTIVES:
- To understand the scope and nature of urban design as a discipline.
- To introduce the components of a city and their interdependent roles.
- To understand the evolution of historic urban form.
- To learn to interpret the city in different ways and layers.
- To create awareness of contemporary urban issues as well as learn about possible ways to address them.

UNIT I  INTRODUCTION TO URBAN DESIGN
Introduction to cities, Components of urban space such as blocks, density, neighborhood, streets etc and their interdependencies - outline of issues/ aspects of urban space and articulation of need for urban design- scope and objectives of urban design as a discipline.

UNIT II  HISTORIC URBAN FORM
Overview of rise and fall of various river civilizations. Detailed study of urban development throughout the globe.
**Western:** Morphology of early cities - Greek agora - Roman forum - Medieval towns - Renaissance place making - ideal cities – Industrialization and city growth - the eighteenth century city builders Garnier’s industrial city - the American grid planning - anti urbanism and the picturesque - cite industrielle- cite nuovo-radiant city.
**Indian:** Evolution of urbanism in India - Temple towns - Mughal city form - medieval cities - colonial urbanism - urban spaces in modernist cities: Chandigarh, Bhuvaneshwar and Gandhi Nagar subsequent directions – case studies.

UNIT III  THEORIES AND ILLUSTRATIONS OF URBAN DESIGN

UNIT IV  URBAN DESIGN AND URBAN ANALYSIS
Understanding various tools thru which an urban setting could be perceived - maps, sketches, photo documentations, reading, data collections, transects etc. Students to have a broad knowledge of various techniques to read a city. The various aspects of urban growth esp. in Asian cities, city limits/boundaries, urban structure, urban architecture, typologies as well as infrastructural planning, parcellation, public space and design guidelines will be introduced. The critical role that transportation plays in structuring the city will also be examined.

UNIT V  SUSTAINABLE URBAN DESIGN AND DEVELOPMENT
Overview of urban ecology. Contemporary issues of urban ecology in Asian context and its articulation towards urban design. Urban sustainability focuses on forms and flows of urban, industrial and natural systems. Two main categories of spatial typologies and ecological flows to be studied thru case studies from western as well as eastern parts of the globe. The sessions conclude with the discussion of urban and environmental design that is essential to the professional practices of ecologically sound urban and environmental design.

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

REFERENCES:

AR7711 BUILDING SERVICES III L T P/S C
2 0 2 3

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

UNIT I AIR CONDITIONING: BASIC REFRIERGATION PRINCIPLES 06

UNIT II AIR CONDITIONING: SYSTEMS AND APPLICATIONS 12
Air conditioning system for small buildings and large building – Chilled water plant – All Air system, variable air volume, All water system -Configuring/ sizing of mechanical equipment, equipment spaces and sizes for chiller plant, cooling tower, Fan room, circulation Pumps, Pipes, ducts.

UNIT III AIR CONDITIONING: DESIGN ISSUES AND HORIZONTAL DISTRIBUTION OF SYSTEMS 12
Selection- Energy efficient systems - choices for small and large buildings - Horizontal distribution of services for large buildings - Grouped horizontal distribution of mechanical services. NBC 2005 and BIS.

UNIT IV FIRE AND SAFETY: DESIGN AND GENERAL 15

UNIT V VERTICAL TRANSPORTATION SYSTEMS IN BUILDINGS 15
Elevators, escalators, conveyors, travelators, dumb waiters – types and applications-round trip time, design of lift lobby and vertical transportation core. Latest technologies in vertical transport systems. Integration of lifts and escalators with building automation systems. Case study visits to commercial complexes, hospitals, apartments and offices.

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

TEXTBOOKS:

REFERENCES:
2. Andrew H Buchanan; Design for fire safety, John Wiley & Sons Ltd., NY.
4. ISHRAE : All about AHUs – Air Handling Units.

AR7712
ARCHITECTURAL DESIGN VI

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OBJECTIVES:
- To develop a critical faculty/ position in architectural design with respect to various qualitative and quantitative aspects of architecture.
- To engage architectural form as an expression of philosophical/ critical ideas relating to the role of architecture in society.
- To explore techniques of mapping and diagramming to understand the built environment as well as design it.
- To create physical models and drawings that are expressive of studies and ideas.

CONTENT:
Scale and Complexity: Projects involving large campuses or groups of buildings, large scale buildings, mixed use projects involving diverse user groups.

Areas of concern/focus: exploration of relationship between building, space, landscape and movement in a context involving diverse user groups. appropriate architecture and exploration of architectural form towards a desired ideal for a given context of time and place. Meaning and identity contemporary processes in design.

Typology/ project- campus, culturally significant buildings, multiuse convention centres, multiplexes, large housing communities, corporate complexes, health care and hospitality buildings, multi use urban complexes.

TOTAL: 240 PERIODS

OUTCOMES:
- The students would be able to make creative and informed decisions in the context of large scale projects and those involving a diverse user group. They would be able to express studies and design ideas through innovative models and drawings.

TEXTBOOKS:
REFERENCES:

AR7811 PRACTICAL TRAINING L T P/S C 0 0 0 12

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

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

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

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

At the end of the Practical Training, a portfolio of work done during the period of internship along with certification from the offices is to be submitted for evaluation by a viva voce examination. TOTAL: 15 WEEKS

OUTCOMES:
- To strengthen the understanding of students to the nuances of architectural practice.
- This will enable the understanding of the students about the architectural drawings, detailing, material and construction techniques, integration of structure and services and gain knowledge during client-consultant meetings and site visits.

AR7901 HUMAN SETTLEMENTS PLANNING L T P/S C 3 0 0 3

OBJECTIVES:
- To understand the factors that determined the form and structure of human settlements in the modern age.
- To understand the various planning concepts in urban, rural and regional level development plans developed for India.
- To understand the changing scenario in human settlements in the context of Globalization.
UNIT I   INTRODUCTION  
Squalor of Industrial cities and responses to them. Contributions of Ebenezer Howard, Lewis Mumford, Patrick Geddes, C.A. Perry in human settlements planning. Introduction to planning as a discipline and brief evolution of the profession.

UNIT II   FACTORS AFFECTING SETTLEMENT PLANNING  

UNIT III   RURAL AND REGIONAL DEVELOPMENT IN INDIA  
Rural development plans, programs and policies from case studies. Regional Plan – Area delineation, Land utilization plan, hierarchical system of settlements, their sizes and functions.

UNIT IV   URBAN PLANNING AND URBAN RENEWAL  

UNIT V   ISSUES IN CONTEMPORARY URBAN PLANNING IN INDIA  

TOTAL: 45 PERIODS

OUTCOMES:
• The course provides the various factors affecting the form, structure and growth of human settlements. The student understands process in planning and implementation of various plans polices and programs in rural, urban and regional level in India through case studies.

TEXTBOOKS:

REFERENCES:
3. V. Nath, Regional Development And Planning In India, Neha Publishers & Distributors, 2009.

OBJECTIVES:
• To introduce the various aspects of outdoor design and site planning in enhancing and improving the quality of building environs, functionally and aesthetically.
• To familiarize students with the various elements of landscape architecture and the principle of landscape design.
To develop and strengthen the competence in dealing with the analytic, artistic and technical aspects of designing open spaces at different scales.

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.

UNIT I INTRODUCTION
Introduction to landscape architecture, Basic concepts of ecology and the impact of Human activities on them – Bio, Geo, chemical cycles including water cycle, carrying capacity of an ecosystem. Environmental impact assessment. Reclamation and restoration of derelict lands.

UNIT II ELEMENTS IN LANDSCAPE DESIGN
Hard and soft landscape elements; Hard landscape elements, Plant materials, Water and Landform - classification, characteristics, use and application in landscape design.

UNIT III GARDEN DESIGN
Landscape and garden design in Indian history – Gardens depicted in Sanskrit literature, Nandavanams and residential gardens of South India, Moghul gardens, public parks and residential gardens of the colonial period and contemporary public landscape projects. Study of notable examples, Spatial development in landscape design.

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 centers. Green infrastructure including green roofs and walls.

TOTAL: 45 PERIODS

OUTCOMES:
- Understanding of the role of landscape design in the shaping of outdoor environments.
- Knowledge about the elements of Landscape design and their scope.
- Exposure to various typologies of Landscape design.
- Knowledge about the evolution of Indian gardens.

TEXTBOOKS:

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

UNIT I INTRODUCTION TO HOUSING AND HOUSING ISSUES – INDIAN CONTEXT

UNIT II SOCIO-ECONOMIC ASPECTS AND LOW-INCOME HOUSING AND HOUSING DEVELOPMENT
Economics of housing; housing demand and supply; quantifying and estimating housing need; housing process and housing adjustment; formal and informal sector provision of housing; legislation for housing development, slum housing and re-development, sites and services, low-cost housing - case studies in India and developing countries. Housing affordability- Cost-effective materials and technologies for housing.

UNIT III HOUSING STANDARDS
URP – guidelines, CCA, EIA, stipulated by NIUA, model inclusive zoning, DCR, CRZ rules for Indian cities, housing density, street classification and standards; housing standards for EWS, LIG, MIG and HIG and facilities programming for housing and housing development.

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

UNIT V COMMUNITY ARCHITECTURE AND DISASTER RESISTANT HOUSING
Community architecture movement and housing developments, community participation and housing management – Environmental aspects and natural calamities; planning and design for cyclone, landslide, earthquake and disaster mitigation.

OUTCOMES:
- The course is devised to learn various issues concerning housing & housing development in Indian & International context covering a cross section of income groups.
- The students also will appreciate socio-economic aspects in housing, housing standards, site planning principles, various housing concepts, sustainable green building practices and measures to be taken for disaster mitigation.

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

REFERENCES:
OBJECTIVES:
- To understand the continuity and dynamics of urban form with a thrust on the interrelationships between the disciplines of architecture, urban design and town planning.
- To understand the various components and aspects of the urban environment as well as their interrelationships.
- To understand in particular aspects such as public spaces, physical infrastructure, socio-cultural aspects such as heritage, gender, class, dynamics of urban growth.
- To take design decisions in a comprehensive manner understanding their implications in the larger context.
- To value ideas and opinions of others in society by engaging in collaborative study and design projects in the urban context and making design more inclusive.

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

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

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

TOTAL: 240 PERIODS

OUTCOMES:
- The students will be able to perceive and design buildings as part of the urban fabric, which could either be contextual or contrasting. They will develop ability towards making architecture inclusive, both in ideation and in response from society.

TEXTBOOKS:

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

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

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

OUTCOMES:
- A comprehensive understanding of handling a major architectural project independently.

TEXTBOOKS:

REFERENCES:

OBJECTIVES:
- To understand the behavior of structural systems for tall buildings and to design them for different types of loadings.
- To study the different types of tensile structures and their applicability.
- To learn the different industrial structures and their merits.
- To study the different types of shells.
- To study the different types of domes, folded plates and grids and their applications.

UNIT I TALL BUILDINGS
Load action in high rise buildings- structural systems for tall buildings - Brief outline of their behaviour and their applicability for various heights of buildings - Approximate analysis and design of frames for gravity and lateral loadings.

UNIT II TENSILE STRUCTURES
Concepts, Development, Laws of formation, Merits and demerits of Pneumatic Structures, Basic principles, various forms, Merits and Demerits of cable structures.
UNIT III  INDUSTRIAL STRUCTURES
Classification - Planning and layout requirements, Functional requirements - Types of power plants - Bunkers and Silos, Cooling Towers, Containment structures - Transmission line towers - Chimneys - Merits.

UNIT IV  SHELLS

UNIT V  DOMES AND FOLDED PLATES

TOTAL: 45 PERIODS

OUTCOMES:
- Understanding of the types, nature and behaviour of more advanced and complicated structural systems which are gaining popularity in current scenario. After the completion of the course students will be able to visualize these systems and their applications in many modern day constructions and also try to include them in their design process.

TEXTBOOKS:

REFERENCES:
OBJECTIVES:
- To introduce the various issues and practices of Conservation.
- To familiarize the students with the status of conservation in India and the various agencies involved in the field of conservation worldwide and their policies.
- To outline the status of conservation practice in the country and the various guidelines for the preservation, conservation and restoration of buildings.
- To inform the students about the character and issues in our heritage towns through case studies.

UNIT I  INTRODUCTION TO CONSERVATION  12

UNIT II  CONSERVATION IN INDIA  07
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  10
Investigation techniques and tools- Behaviour of historic materials and structures- Problems with masonry, foundation- repair methods- traditional and modern methods- seismic retrofit and disabled access/ services additions to historic buildings- moisture and pollution problems.

UNIT IV  CONSERVATION PRACTICE  07
Listing of monuments- documentation of historic structures- assessing architectural character – historic structure report- guidelines for preservation, rehabilitation and adaptive re-use of historic structures- Case studies of Palaces in Rajasthan, Chettinad and Swamimalai dwellings, heritage site management.

UNIT V  URBAN CONSERVATION AND CONSERVATION PLANNING  09
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.

TOTAL: 45 PERIODS

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

TEXTBOOKS:
2. MS Mathews; Conservation Engineering, Universitat Karlsruhe; 1998.

REFERENCES:
OBJECTIVES:
- To provide basic introduction to the skills relevant to the practice of professional journalism. It introduces students to the fundamentals of writing, explaining of various strategies and their criticism.
- Introduction to Photojournalism and the contributions of photography to the professional practice of architecture and develop proficiency in this art using modern photography techniques.

UNIT I INTRODUCTION
Introduction to journalism, key concepts and objectives of Journalism – Specialized journalism: with emphasis on architectural journalism - Journalism skills: research, reporting, writing, editing, photography, columnists, public relationships, criticism. Issues such as copyright, public art policy, the arts and urban redevelopment. Introduction to local culture scene.

UNIT II TECHNOLOGIES IN JOURNALS
Environment, Social Change, Persuasion- Interviewing techniques, Argument and debate as a technique in the investigation of social problems; evidence, proof, refutation, persuasion; training in argumentative speaking. Introduction to software needed in journalism and photography, video coverage, walk-through of buildings, production of contemporary architectural journalism. Understanding the individual demands in the context of newspapers, radio, film, and television.

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

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

UNIT V ARCHITECTURAL PHOTOGRAPHY

TOTAL: 45 PERIODS

OUTCOMES:
- An ability to critically think and analyze 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:

AR7004 ART APPRECIATION

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

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

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

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

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

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

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

TEXTBOOKS:

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

AR7005 BUILDING INFORMATION MODELING L T P/S C 0 0 6 3

OBJECTIVES:
• To equip students with skills and information to build comprehensive Building Information Models (BIM) using appropriate Digital software and Media.

UNIT I INTRODUCTION TO THE FUNDAMENTALS 15
Key concepts of BIM - reading and manipulating the software Interface - navigating within views - selection methods - the importance of levels and grids- creating walls, doors, windows, and components - working with essential modification commands and load family. Creating floors, ceilings, and stairs - working with type and instance parameters - importing drawings - understanding the project browser and type properties palettes - adding sheets - inserting views onto sheets - adding dimensions and text to the mode and plotting.

UNIT II ADVANCED MODELING – FAMILY TYPES AND TOPO SURFACE MODELLING 20
Creating curtain walls, schedules, details, a custom family, and family types - “flex” a family with family types and work with reference planes - creating rooms and an area plan - tag components - customize existing wall styles. Create and edit a topo-surface, add site and parking components - draw label contours - work with phasing - understand groups and links - work with stacked walls - and learn the basics of rendering and create a project template.

UNIT III RENDERING AND MATERIAL APPLICATION 20
Choosing material for buildings– Creating custom walls, floors, and roofs - keynoting - working with mass elements - enhancing rendering with lighting - producing customized materials - Using sun and shadow settings - Walkthrough technique - adding decals - working with design options and worksets - and calculating energy analysis - managing revisions.

UNIT IV BIM FOR BUILDING ENERGY SIMULATION 30
Energy simulation for conceptual BIM models using massing- Detailed modeling using design elements- Rapid energy modeling and simulation with software. Conceptual Energy Analysis features to simulate performance. To produce energy consumption, carbon neutrality and renewable potential reports.

UNIT V BIM FOR COST ESTIMATING, PROJECT PHASING AND ADMINISTRATION 05
Introduction and theoretical information on the following topics- Model based Cost Estimating - Challenges in cost estimating with BIM- Cad geometrics vs BIM element description- Visual data models - Material substitutions and value engineering- detailed estimates and take off sheets- XML and automated cost estimate- project phasing and management- 4D modeling - BIM for project lifecycles.

TOTAL: 90 PERIODS
OUTCOMES:
- This is a project-based course where students gain knowledge on the implementation of BIM concepts throughout the lifecycle of a building, from planning and design, to construction and operations.
- The students will learn about how to use BIM for building energy performance simulation, construction administration.

REFERENCES:

OBJECTIVES:
- To understand different management techniques suitable for DESIGN and BUILD projects.
- To understand the management system for accomplishing SCOPE, QUALITY, TIME & COST.

UNIT I  INTRODUCTION TO PROJECT MANAGEMENT  06

UNIT II  PROJECT PROGRAMMING AND CRITICAL PATH METHOD  10

UNIT III  COMPUTERIZED PROJECT MANAGEMENT  15

UNIT IV  RESOURCE PLANNING  06
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  CONCEPT TO COMMISSIONING  08

TOTAL: 45 PERIODS

OUTCOMES:
- Ability to understand a project from concept to commissioning, feasibility study & facility program, design, construction to commissioning.
- Apply project management techniques in achieving objectives of a project like client needs, quality, time & cost.
- Understand principles of management, construction scheduling, scope definition and team roles.
OBJECTIVES:
- To study the advancements in construction with concrete for large span structures.
- To familiarize the students with the manufacture, storage and transportation of concrete.
- To inform the various equipment used in the construction industry and the criteria for choice of equipment.
- To familiarize the students with an overview of construction planning and scheduling.

UNIT I
GENERAL BUILDING REQUIREMENTS
07
NBC - Definitions – Development regulations - Classification of buildings - Requirements of parts of buildings.

UNIT II
CONSTRUCTION SYSTEMS
12
Structural systems and design - Planning - pre-stressed concrete constructions - pre-cast concrete and pre-fabrication system - Modular coordination.

UNIT III
CONSTRUCTION PRACTICE
12
Modern Construction Materials - Manufacture, storage, transportation and erection of pre-cast component forms - Types of moulds and scaffoldings in construction - safety in erection and dismantling of constructions.

UNIT IV
CONSTRUCTION METHODS AND EQUIPMENT
08
Use of equipments for construction and related activities - Ready mix concrete plant - Choice of construction equipment for different types of works.

UNIT V
CONSTRUCTION TECHNOLOGY FOR HIGHRISE BUILDINGS
06
Planning and scheduling for high rise building - Scheduling - Simulation – Typical Floor Construction Cycle – Appropriate working schedule.

TOTAL: 45 PERIODS

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

TEXTBOOKS:
REFERENCES:
5. http://www.cmdachennai.gov.in

AR7008 CONTEMPORARY BUILDING MATERIALS L T P/S C
3 0 0 3

OBJECTIVES:
- To introduce and to know the categories of new materials currently used in any building site and also the modern products used in architecture, building and finishing (eco-friendly, composite, durable, advanced, smart).
- To inform the innovations in the materials used in Building Industry and the accepted industrial practices involved.
- To inform the properties, characteristics and application of materials in the construction industry. The primary focus is on materials and systems, their properties and connections, and their intrinsic relationship to structural systems and environmental performance.

UNIT I INTRODUCTION
Introduction and the needs 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. The properties of the contemporary materials – multidimensional, repurposed, recombinant, intelligent, interfacial, transformant etc.

UNIT II ADVANCED CONCRETE AND COMPOSITE REINFORCEMENT

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

UNIT IV NANO-MATERIALS AND NANO-COMPOSITES

UNIT V DIGITAL AND TENSILE MATERIALS

TOTAL: 45 PERIODS
OUTCOMES:
- Students are sensitized to the need and use of various contemporary materials in the context of creating innovative and ultra-performance in building design using contemporary materials.
- The performance and characteristics of the newer material in terms of detaining and application to the context.

TEXTBOOKS:
1. Sauer, Christiane: Made of --: new materials sourcebook for architecture and design, Publisher: Gestalten, 2010.

REFERENCES:
1. Addington, Michelle; Schodek, Daniel L.: Smart materials and new technologies: for the architecture And design professions, Publisher: Architectural Press, 2005.

AR7009 CONTEMPORARY PROCESSES IN ARCHITECTURAL DESIGN L T P/S C
3 0 0 3

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

UNIT I INTRODUCTION 06

UNIT II ASPECT OF DIGITAL ARCHITECTURE 09

UNIT III CONTEMPORARY PROCESS 10
Emerging phenomena such as increasing formal and functional abstractions – Diagrams – Diagrammatic Reasoning – Diagrams and Design Process – Animation and Design – Digital Hybrid.
UNIT IV  GEOMETRIES AND SURFACES

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

TOTAL: 45 PERIODS

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

TEXTBOOKS:
6. Peter Eisenmann; Diagram Diaries ; Universe; 1999.

REFERENCES:

AR7010  DIGITAL ART  L  T  P/S  C  1  0  4  3

OBJECTIVES:
- Through a project the student is taught video, image and vector editing using editing software.
- To enable the creation of interactive patterns by introducing scripting.
- To enable synchronization of sound with patterns generated.
- To enable presentation using voice over and production of CD roms.

UNIT I  VIDEO EDITING, IMAGE EDITING & VECTOR EDITING
Tools: Importing avis and mpegs, sequencing, cutting trimming, decrease and increase the speed of the movie, filters, transitions, output settings, saving the output with the help of video editing software. Image editing (pixel image types) using tools, Vector characters, bizer and grip editing, transform, fill types, text formatting, colour overlays, etc.
UNIT II OVERLAPPING TECHNIQUE (2D ANIMATION WITH MOVIE) 20
Project: Import Movie file in the editing software and overlap the 2D Animation film creation. Synchronize the sound and create a perfect blend of AVI and 2D Animation film.

UNIT III PATTERNS THROUGH SCRIPTING 15
Project: Create 2d interactive patterns using basic scripting. Through this scripting tools will be taught.
Tools: Scripting in software could be explored.

UNIT IV DESIGN GENERATION USING SOUND 10
Project: Create forms/ patterns synchronized to sound file, through this relationship between sound and forms/ patterns will be explored.
Tools: related software could be explored.

UNIT V SPACE GENERATION 15
Project: Students would identify a metaphor (literature, movies, and music albums) and create spaces using the same. The proposal must be discussed with course faculty prior to presentation.
Tools: Importing files using standard and linking options. Using scripts and behaviors, understanding stage, cast and time line, using cast library, Tweening, using swf movie, presentation using voice over and presentation demos, creating auto run cd-roms.
TOTAL: 75 PERIODS

OUTCOMES:
- The student has sufficient knowledge to edit video and image using editing software.
- The student can synchronize sound with patterns generated.
- The student can make presentation using voice over.

TEXTBOOKS:

REFERENCES:
5. 3-D Human Modeling and Animation, Second Edition by Peter Ratner, April 18, 2003).
OBJECTIVES:
- To expose the students to the various thrust areas in architecture.
- To inculcate the spirit of research in architecture by providing opportunities to read on various issues.
- To expose the students to the finer details of technical writing.
- To provide a platform for a prelude to the ‘Design Thesis’.

CONTENT:
Design studio emphasize on explaining and understanding Architecture primarily through the mode of making. Dissertation offers an opportunity to look at architecture, history and design primarily through textual. However, like design, dissertation involves process of observation, reflection and abstraction. Students are encouraged to choose any topic of their interest. They may range from analyzing the works of an architect, history, typological changes, writing, design process and many more. The dissertation should state its objectives, followed by exhaustive documentation and arguments. The emphasis however, could vary according to the topic. The dissertation proposal in about 1500 words stating the topic issues to be explored and the scope must be submitted. After approval the work would be periodically reviewed. A well written report of a minimum 15,000 words must be submitted in the prescribed format, if any provided by the University. The student would subsequently make a presentation of his/her work and defend them.

OUTCOMES:
- A Dissertation book which is based on accepted norms of technical writing.
- An understanding leading to formation of thesis ideas.

TEXTBOOKS:

REFERENCES:
2. Ranjith Kumar; Research Methodology- A step by step guide for beginners; Sage Publications; 2005.

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

UNIT I  FUNDAMENTALS OF EARTHQUAKES
a) Earths structure, seismic waves, plate tectonics theory, origin of continents, seismic zones in India.
b) Predictability, intensity and measurement of earthquake.
c) Basic terms- fault line, focus, epi- centre, focal depth etc.
UNIT II  SITE PLANNING, PERFORMANCE OF GROUND AND BUILDINGS  08
a) Historical experience, site selection and development.
b) Earthquake effects on ground, soil rupture, liquefaction, landslides.
c) Behaviour of various types of building structures, equipments, lifelines, collapse patterns.
d) Behaviour of non-structural elements like services, fixtures in earthquake-prone zones.

UNIT III  SEISMIC DESIGN CODES AND BUILDING CONFIGURATION  08
a) Seismic design code provisions – Introduction to Indian codes.
b) Building configuration- scale of building, size and horizontal and vertical plane, building proportions, symmetry of building- torsion, re-entrant corners, irregularities in buildings like short stories, short columns etc.

UNIT IV  VARIOUS TYPES OF CONSTRUCTION DETAILS  10
a) Seismic design and detailing of non-engineered construction- masonry structures, wood structures, earthen structures.
b) Seismic design and detailing of RC and steel buildings.
c) Design of non-structural elements- Architectural elements, water supply, drainage, electrical and mechanical components.

UNIT V  URBAN PLANNING AND DESIGN  12
a) Vulnerability of existing buildings, facilities planning, fires after earthquake, socio-economic impact after earthquakes.
b) Architectural design assignment- Institutional masonry building with horizontal spread and height restriction, multi-storeyed RC framed apartment or commercial building.

TOTAL: 45 PERIODS

OUTCOMES:
• To provide basic knowledge of earthquake resistant design concepts to students of Architecture, as it has become evident in recent years that some of the seismically active areas of the world are located within Indian and lives lost during past earthquakes due to damage of homes and other buildings are enormous.

TEXTBOOKS:

REFERENCES:
1. Ian Davis; Safe shelter within unsafe cities” Disaster vulnerability and rapid urbanisation, Open House International, UK; (1987).
2. Socio-economic developmental record- Vol.12, No.1, Jan-Feb 2005.

AR7013  ENERGY EFFICIENT ARCHITECTURE  L T P/S C
3 0 0 3

OBJECTIVES:
• To inform the need to use alternative sources of energy in view of the depleting resources and climate change.
• To familiarise the students with simple and passive design considerations.
• To inform about the importance of day lighting and natural ventilation in building design.
• To make the students aware of the future trends in creating sustainable built environment.
UNIT I  PASSIVE DESIGN 10
Significance of Energy Efficiency in the contemporary context, Simple passive design considerations involving Site Conditions, Building Orientation, Plan form and Building Envelope - Heat transfer and Thermal Performance of Walls and Roofs.

UNIT II  ADVANCED PASSIVE ARCHITECTURE- PASSIVE HEATING 10
Direct Gain Thermal Storage of Wall and Roof - Roof Radiation Trap - Solarium - Isolated Gain.

UNIT III  PASSIVE COOLING 08

UNIT IV  DAY LIGHTING AND NATURAL VENTILATION 05
Daylight Factor - Daylight Analysis - Daylight and Shading Devices - Types of Ventilation - Ventilation and Building Design.

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

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

TEXTBOOKS:

REFERENCES:

AR7014  ENTREPRENEURSHIP SKILLS FOR ARCHITECTS  L T P/S C 3 0 0 3

OBJECTIVES:
- To learn how to start a business as an architect and to develop the creative and leadership skills for the same.
- To develop the confidence and skills in preparing business plans and to propose and sell ideas to potential clients and investors.
- To collaborate with students from other disciplines and mentors from both, University and Industry.
UNIT I  INTRODUCTION TO ENTREPRENEURSHIP  06
Leadership - Creativity - Self - Motivation - Administration-Time Management - Marketing –
Finance Management – People skills – Starting a business.

UNIT II  STRATEGIC DESIGN AND INNOVATION  09
Application of future-oriented design principles to increase the design organization’s
innovative and competitive qualities - Re-definition of problems – user experience - rapid
prototyping – multidisciplinary entrepreneurship skills – Case studies.

UNIT III  SUSTAINABILITY  10
Risk-taking – financial, social and environmental risks – Job Procurement – Cash flow –
Costing – Risk assessment - Employee management.

UNIT IV  MARKETING  10
Branding - Social media - Advertising – Public Speaking – People management.

UNIT V  SEMINAR  10
Talks and presentations by industry organizations – private, govt, ngo’s.
Students would design and make presentations on a strategic business model for a design
and innovation challenge in the context of the current design and social situation. Students
can take up a challenge in collaboration with the industry.

TOTAL: 45 PERIODS

OUTCOMES:
• The student get sufficient knowledge to start a business as an architect and establish his
  office.
• The student develops enough confidence and skills to prepare business plans and to
  propose ideas to potential clients and investors.

TEXTBOOKS:
1. Jagat Trivedi, IIM: Insights Into Managing: A Must Read for Leaders, Managers,
2. Eric Reinholdt, Architect and Entrepreneur: A Field Guide to Building, Branding, and
3. Dave Ramsey, Entre Leadership: 20 Years of Practical Business Wisdom from the

REFERENCES:
1. Small Business Service. Social Enterprise Unit. Online. URL:

AR7015  GLASS ARCHITECTURE AND DESIGN  L  T  P/S  C
2  2  0  3

OBJECTIVES:
• This is an Industry based elective course to provide the students with the latest & recent
trends in architecture.
• To understand the right selection and usage for right glass for appropriate purposes.
• To understand concepts on modern concepts on Glass Architecture, Role of Glass in
  Green design and concepts on considerations for improving the building performance
  using glass.

UNIT I  GLASS – THE BUILDING MATERIAL  10
Evolution & importance of Glass in Modern Architecture- Applications of Glass in Buildings
(façade/ interior applications)- Understanding the Production & properties of Glass- Value
additions- Coating Technology: Importance & necessity, Processing: Concepts on
Tempering, Heat Strengthening, DGU, Laminated, Ceramic Fritting; Different Types of Glass:
Mirror, Lacquered, Fire Resistant & Modern Glass with different applications - Glass for
segments- Hospitals, Green Homes, Airports, Offices, Other buildings - Understanding Glass
& Human safety Compliances - Role of Glass in Fire Safety Considerations: Class E, EI &
UNIT II  
GLASS AND GREEN ARCHITECTURE  

UNIT III 
CASE STUDY 

UNIT IV  
DESIGN STUDIO (WORKSHOPS)  
Software Analysis : CREATE your building: Interactive Modeling - Find when it’s HOT: Sun Path Analysis - Feel the WEATHER: Solar exposure Analysis - Know the ANGLES: Building Orientation Analysis - Simulate the NEIGHBORHOOD: Site Shadow Analysis - Accommodate COMFORT: Daylight Analysis and Acoustic analysis.

UNIT V  
DESIGN STUDIO (WORKSHOPS)  

TOTAL: 60 PERIODS

OUTCOMES:
- An understanding of current industry expectation with modern concepts of Architecture.
- Understanding the tools and software currently in practice in the field of architecture.

TEXTBOOKS / REFERENCES:

AR7016  
GRAPHIC AND PRODUCT DESIGN  
L T P/S C  
1 0 4 3

OBJECTIVES:
- To understand the scope and nature of Graphic design as a discipline.
- To introduce the principle of a Graphic and their design applications.
- To understand the evolution of Form and Space in product design.
- To learn to interpret the design concepts in different ways and layers.

UNIT I  
INTRODUCTION TO GRAPHIC DESIGN  
design. Stationery design: Visiting cards, Envelope design, Letterhead design. Label designs for product packaging on paper and cardboards mock-ups. Design for Print media. Introduction to Printing processes: Gravure, Screen, Offset and Digital printing. Introduction to software packages for graphic design applications.

UNIT II INTRODUCTION TO PRODUCT DESIGN

UNIT III PRODUCT DESIGN
Selection of the projects is based on the possibility of user interaction leading to innovation. Projects end with a comprehensive presentation through working/mockup models, design drawing and a report. The project is supported by detailed discussion on various stages in the design process emphasizing the complementary nature of systematic and creative thinking. This is achieved by short supporting assignment in following topics: Creativity techniques like brain storming & synectics to develop creative attitude and open mind, design opportunity, problem perception, Idea Sketching, clustering of ideas for concept development, exploratory mockup models for concept development, evaluation of concepts, final concept selection, concept development, refinement and detailing.

UNIT IV PRODUCT DETAILING

UNIT V PRODUCT DESIGN PROTOTYPING AND ADVANCED MANUFACTURING PROCESSES

TOTAL: 75 PERIODS

OUTCOMES:
- The students will understand the role of Graphic and product design as a discipline, and its role in understanding and interpreting a real life design. Various reading methods were explored, to understand the contemporary design process as well as manufacturing process of design.
REFERENCES:

Graphic design:

Product design:

AR7017 HISTORY OF CONTEMPORARY ARCHITECTURE L T P/S C
3 0 0 3

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

UNIT I CRITIQUING MODERNISM

UNIT II AFTER MODERNISM – I

UNIT III AFTER MODERNISM – II

UNIT IV ALTERNATIVE PRACTICES AND IDEAS
UNIT V POST INDEPENDENT ARCHITECTURE IN INDIA


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

TEXTBOOKS:

REFERENCES:

AR7018 INTERIOR DESIGN L T P/S C 3 0 0 3

OBJECTIVES:
- To introduce the vocabulary of interior design. To introduce the basics of measured drawing.
- To familiarize the students with an overview of interior and furniture design and design movements through history.
- To inform the various components of interior space and treatment and finishes for the same.
- To familiarize the students with the various components of interior design like lighting, Landscaping and furniture.
- To help students to understand way of analyzing furniture forms and designing furniture forms scientifically based on Ergonomics, materials design and working parameters.

UNIT I INTRODUCTION TO INTERIOR DESIGN 06
Definition and process of interior design - vocabulary of interior design in terms of principles and elements - introduction to the design of interior spaces as related to typology and function, themes and concepts.

UNIT II HISTORY OF INTERIOR AND FURNITURE DESIGN 09
Overview of interior and furniture design focusing from the time span of 17th century to current time span. Overview of folk arts and crafts of Indian sub-continent with reference to their role in interior decoration. Other geographical areas will include Europe and America, East and West Asia and Africa.

UNIT III MATERIALS AND FINISHES 10
Introduction to skills required, materials properties, bio-mechanical factors, agronomical considerations and aesthetic considerations. Treatment of components such as floors, ceilings, walls, partitions, window treatments, accessories, etc., in terms of their choice and design related to materials, methods of construction, colour, texture, etc., based on functional, aesthetic and psychological criteria.
Psychological aspects of lighting and creating a mood or an ambience. Study of new trends in interior lighting with reference to creation of required ambience within the space. It will include the study of various lighting systems, their fixing details in addition to other related environmental issues. Introduction to the interior landscape elements (landform, water, vegetation, architectural elements). Understanding the visual (color, form, texture) / non-visual (smell, touch, sound) attributes of these elements and their usage and application in design. Integration of indoor and outdoor spaces.

UNIT V   FURNITURE DESIGN
Introduction to anthropometry and ergonomics with reference to functionality. Furniture design as related to human comfort and function, materials and methods of construction, changing trends and lifestyles, innovations and design ideas various systems and approaches to design – use of grid, modules etc. - furniture for specific types of interiors: office furniture, children’s furniture, residential furniture, display systems, etc.

TOTAL: 45 PERIODS

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

TEXTBOOKS:
6. Aronson (J); The Encyclopedia of Furniture –Potter Style; 1965.

REFERENCES:

AR7019 REAL ESTATE DEVELOPMENT

OBJECTIVES:
- To understand land as a resource.
- To appreciate the role of team work to make a successful project.
- To provide adequate inputs so as to make to the whole development as a smooth activity and ultimately be aware of the tactical aspects of marketing the completed property.

UNIT I   REAL ESTATE FUNDAMENTALS: CONCEPTS AND TOOLS

UNIT II   EVENTS AND PRE PROJECT STUDIES
UNIT I
THE REAL ESTATE DEVELOPMENT PROCESS

UNIT IV
TRENDS AND ISSUES IN DEVELOPING DIFFERENT PROPERTY TYPES
Multi-Family/Student Housing/Affordable Housing/Senior Housing, Mixed Use/Transport Oriented Development/ Smart Growth, Environmental Remediation/Brownfield Development and Green Buildings and Green Infrastructure.

UNIT V
PROJECT MARKETING & HAND-OVER OF THE COMPLETED PROJECT
Communication tools required for presenting the project, In house sales promotion, franchisee system, joint venture and sharing issues, procedure and laws relating to transfer of completed project.

OUTCOMES:
- To understand the fundamentals of real estate development and the significance of team work to make a successful project.
- To be exposed to the contemporary trends and issues in real estate projects.

TEXTBOOKS:

REFERENCES:

UNIT III
INTRODUCTION TO STEEL MATERIAL
UNIT II  HIGH TECH AND CONTEMPORARY ARCHITECTURE  10

UNIT III  STRUCTURAL EXPRESSION OF STEEL  10
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  09
Introduction to steel as a sustainable material, Recycled, Reuse and adaptive reuse of steel. Steel and glazing systems, support systems for glazing. Technical aspects of combining steel with glass. Various steel and glass envelope systems - curtain wall system, wind braced support systems, cable net walls, spider steel connections with structural glass, simple and complex cable systems. Handling curves and lattice shell construction. Advanced framing system – Steel and Timber. Low carbon design strategies.

UNIT V  FABRICATIONS, ERECTION AND IMPLICATIONS ON DESIGN  08
Study on transformation of architectural design into fabricated elements. Study of process profile thru 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

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

REFERENCES:
2. Victoria Ballard & Bell; Materials for Architectural design; Lawrence King 2006.
5. Peter Silver etc.; Structural engineering for Architects, Handbook; Laurence King; 2013.
7. Leckie, John; Steel and other materials, Canadian Institute of steel construction, 2007.

AR7021  STRUCTURE AND ARCHITECTURE  L  T  P/S  C
3  0  0  3

OBJECTIVES:
• To study evolution of structural systems through history.
• To familiarise the students with concepts of structural design through works of architects/engineers.
• To study architectural expression through its structure.
• To analyze and understand the relationship between form & structure through seminars.
UNIT I HISTORY OF STRUCTURAL DESIGN IN THE PRE INDUSTRIAL ERA

08
Development of monolithic and rock cut structures - trabeated construction - arcuate construction vaults and flying buttresses - tents and masted structures and bridges through ancient and medieval history.

UNIT II HISTORY OF STRUCTURAL DESIGN IN THE POST INDUSTRIAL PERIOD

Post Industrial modular construction of large span and suspension structures in steel and Concrete - projects of Pier Niugi Nervi, Maillart, Candella, Buckminster Fuller and Eero Saarinen. Structure in Deconstructivism – Structure and aesthetics.

UNIT III CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDY - I

The select case studies could include KCR Terminal at Hung Hom, Hong Kong, B3 Offices in Stockley Park, Sainsbury Centre for Visual Art, Renault Centre and Swindon UK by Norman Foster and Standsted Airport Terminal, London, UK by Fosters/Arup British Pavilion EXPO 1992, Seville, Spain and Waterloo International Terminal by Nicholas Grimshaw.

UNIT IV CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDY - II

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

UNIT V SEMINAR

09
Seminar to present a study of architectural form and structural expression through select cases which will aid understanding of structural philosophy and analysis, building envelope and services and construction sequence.

TOTAL: 45 PERIODS

OUTCOMES:

- The student will understand and get acquainted with the concepts of structural design and its influence on the functional and aesthetic domains of architectural design relating to historic and contemporary periods.
- The student will be acquainted with the architectural expression, its relation between form and structure through relevant case studies.

TEXTBOOKS:


REFERENCES:

2. COX Architects Millennium; Images; 2000.
3. Enric Miralle & Carme Pinos, Olympic Archery Building, 857072 COH.
OBJECTIVES:
- To understand the concept of sustainability and sustainable development.
- To inform the various issues like climate change, ecological footprint, etc.
- To understand low impact construction practices, life cycle costs and alternative energy resources.
- Familiarize the students with the various rating systems for building practices with case.
- Through case studies to understand the concept of sustainable communities and the economic and social dimensions.

UNIT I  INTRODUCTION TO SUSTAINABILITY  07
Concept of Sustainability – Carrying capacity, sustainable development – Bruntland report – Ethics and Visions of sustainability. Circles of Sustainability. Sustainable economy and Use. Eco systems, food chain and natural cycles or cradle to cradle concept.

UNIT II  CLIMATE CHANGE AND SUSTAINABILITY  10

UNIT III  SITE AND SUSTAINABILITY  08
Sustainable site selection and development. Introduction to Green building concepts. Teri, LEED, GIRHA and BREEAM. Ecology and sustainability. Various sources of energy, recyclable products and embodied energy.

UNIT IV  SUSTAINABLE MATERIALS  10

UNIT V  SUSTAINABLE CITIES  10
Dimensions of sustainable, sustainable community, Social, cultural and economic factors, urban ecology, urban heat island effects, smog etc. Various case studies of eco city or communities.

TOTAL: 45 PERIODS

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

TEXTBOOKS:

REFERENCES:
OBJECTIVES:
- To understand design and the role of the designer in changing society.
- To familiarize the students with methodologies, theories and models of the design process.
- To inform students about the term creativity and introduce techniques which will enable creative thinking.
- To inform the approaches that generates ideas for architectural design and the importance of the participatory approach to design.

UNIT I INTRODUCTION TO DESIGN
Definition and understanding of design - design in history - changing role of designer on society - different classifications of design according to scale, process, mode of production, etc.,

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

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

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

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

TOTAL: 45 PERIODS

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

TEXTBOOKS:

REFERENCES:
OBJECTIVES:
- To understand Chennai city through history, cultural influence.
- To understand about the differences in planning & character of historic cores and new neighborhoods of Chennai city.
- To understand the ecosystems of Chennai area.
- To understand current issues due to population pressure & destruction of natural ecosystems in Chennai.

UNIT I COLONIAL HISTORY
Brief outline of pre-colonial period- fishing hamlets, Role of Trade, Ports, European settlers- Portuguese, Dutch, British periods- White & Black town- Political history & social life- Administrative, military and economic importance of the city.

UNIT II HISTORIC CORES & NEW DEVELOPMENT
Historic cores like George town, Mylapore, Triplicane- Residential development in post independence period like Besant Nagar, Anna Nagar, T. Nagar, KK Nagar- Growth of city & infrastructure development, Population & demographic changes, industrial zone, special economic zone.

UNIT III CULTURE
Understanding the traditions and festivals, religious & ethnic diversity, music, dance, theatre, literature, art, architecture, cinema & politics.

UNIT IV ECOLOGY
Understanding the natural ecosystems of the city- coastal ecosystems, sea, river, estuary, wetlands, indigenous forests, lakes, tanks, flora & fauna, navigational canals MRTS encroachment, destruction of navigation routes, encroachment of water bodies & marshlands.

UNIT V URBAN ISSUES
Impact of migration, globalization and mass transit system, urban poor and housing scenario, Growth of IT, automobile industry and medical tourism.

TOTAL: 45 PERIODS

OUTCOMES:
- The student understands the history & culture of Chennai city and the influence of European settlers on the city.
- The student will gain understanding on the ecology of Chennai area.
- The student will gain understanding of the current issues, growth of the city and the influence of the master plan.

TEXTBOOKS:

REFERENCES:
1. KV Raman, The Early History of Madras Region, Published by C.P. Ramaswami Aiyar Foundation, Chennai.
OBJECTIVES:
- To introduce the study of vernacular architecture as a process and not a product.
- To provide an overview of the various approaches and concepts to the study of vernacular architecture.
- To study the various vernacular architecture forms in the various regions of the country.
- To look at the impact of Colonial rule on the vernacular architecture of India.

UNIT I introduction 06
Definition and classification of Vernacular architecture – Vernacular architecture as a process – Survey and study of vernacular architecture: methodology - Cultural and contextual responsiveness of vernacular architecture: an overview.

UNIT II APPROACHES AND CONCEPTS 09
Different approaches and concepts to the study of vernacular architecture: an overview – Aesthetic, Architectural and anthropological studies in detail.

UNIT III VERNACULAR ARCHITECTURE OF THE WESTERN AND NORTHERN REGIONS OF INDIA 12
Forms spatial planning, cultural aspects, symbolism, colour, art, materials of construction and construction technique of the vernacular architecture of the following: - Deserts of Kutch and Rajasthan; Havelis of Rajasthan - Rural and urban Gujarat; wooden mansions (havelis); Havelis of the Bohra Muslims - Geographical regions of Kashmir; house boats.

UNIT IV VERNACULAR ARCHITECTURE OF SOUTH INDIA 08
Forms, spatial planning, cultural aspects, symbolism, art, colour, materials of construction and construction technique, proportioning systems, religious beliefs and practices in the vernacular architecture of the following: - Kerala: Houses of the Nair & Namboothri community; Koothambalam, Padmanabhapuram palace. - Tamil Nadu: Houses and palaces of the Chettinad region; Agraharams.

UNIT V WESTERN INFLUENCES ON VERNACULAR ARCHITECTURE OF INDIA 10

TOTAL: 45 PERIODS

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

TEXTBOOKS:

REFERENCES:
5. S. Muthiah and others: The Chettiar Heritage; Chettiar Heritage 2000.
6. Weber (W) & Yannas (S); Lessons from Vernacular Architecture; Routledge; 2014.
OBJECTIVES:
- To provide students an exposure to disasters, their significance and types.
- To ensure that students begin to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction.
- To gain a preliminary understanding of approaches of Disaster Risk Reduction (DRR).
- To enhance awareness of institutional processes in the country.
- To develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity.

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

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

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

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

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

TOTAL: 45 PERIODS

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

TEXTBOOKS:

REFERENCES:

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

UNIT I

UNIT II

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

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

UNIT V

OUTCOMES:
- Architecture students will acquire the basic knowledge of human rights.

REFERENCES: