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**TOTAL NO OF CREDITS FOR COMPLETION OF SEMESTER : 214**

**Note:**

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

- **L** – Lecture period
- **T** – Tutorial Period
- **P** – Practical period
- **S** – Studio period
- **C** – Credits
AIM
This course aims to develop the skills of the students in engineering mathematics. They will be trained on the basis of chosen topics of Mathematics necessary for effective understanding of engineering subjects. At the end of this course, the students would have an understanding of the appropriate role of the mathematical concepts learnt.

OBJECTIVES
- Identifying Eigenvalue problems, obtain solution and acquired the technique of diagonalizing a matrix.
- Studying the properties of lines and plans in space, along with sphere and providing a tool to understand 3D material.
- Understand geometrical aspects of curvature and elegant application of differential calculus.
- Understand function of more than one variable, along with differentiation under integral sign.
- Solving differential equation of certain type

CONTENT:

UNIT I MATRICES

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

UNIT III GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS
Curvature – Cartesian and polar co_ordinates – Centre and radius of curvature – Circle of curvature – Involutes and evolutes – Envelopes.

UNIT IV FUNCTIONS OF SEVERAL VARIABLES

UNIT V ORDINARY DIFFERENTIAL QUATIONS
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.

TOTAL: 45 PERIODS

REQUIRED READINGS
REFERENCES

AD9101 HISTORY OF ARCHITECTURE AND CULTURE I L S P/S C

AIM:
To inform about the development of architecture in the Ancient Western World and the cultural and contextual determinants that produced that architecture.

OBJECTIVES:
- To understand architecture as evolving within specific cultural contexts including aspects of politics, society, religion and climate
- To gain knowledge of the development of architectural form with reference to technology, style and character in the prehistoric world and in Ancient Egypt, West Asia, Greece and Rome.

CONTENT:

UNIT I PREHISTORIC AGE
Introducing concepts of culture and civilization - Paleolithic and Neolithic culture - art forms and evolution of shelter - megaliths - agricultural revolution and its impact on culture and civilization.

UNIT II ANCIENT RIVER VALLEY CIVILIZATIONS: EGYPT
Landscape and culture of Ancient Egypt - history - religious and funerary beliefs and practices - monumentality – tomb architecture: evolution of the pyramid from the mastaba - temple architecture: mortuary temples and cult temples
Great Pyramid of Cheops, Gizeh - temple of Ammon Ra, Karnak - temple of Abu Simbel (Rock Cut)

UNIT III ANCIENT RIVER VALLEY CIVILIZATIONS: MESOPOTAMIA
Urbanization in the Fertile Crescent - Sumerian, Babylonian, Assyrian and Persian culture - evolution of city-states and their character - law and writing - theocracy and architecture - evolution of the ziggurat - palaces
Ziggurat of Ur, Urnaku - Palace of Sargon, Khorsabad - Palace at Persepolis

UNIT IV CLASSICAL PERIOD: GREECE
Landscape and culture of Greece - Minoan and Mycenaean cultures - Hellenic and Hellenistic cultures – Greek character - Greek polis and democracy – Greek city planning - architecture in the archaic and classic periods – Domestic architecture; Public Buildings: Agora, stoas, theaters, bouletrion and stadias – Greek temple: evolution and classification - Parthenon and
Erecthion- orders in architecture: Doric, Ionic, Corinthian - optical illusions in architecture

UNIT V   CLASSICAL PERIOD: ROME

Roman history: Republic and Empire- Roman religion and the Roman temple- Roman character- lifestyle- Roman urban planning- art and architecture as imperial propaganda: forums and basilicas- domestic architecture – structural forms, materials and techniques of construction - orders in architecture: Tuscan and Composite


TOTAL: 30 PERIODS

REQUIRED READINGS

3. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994

REFERENCES

4. Webb and Schaeffer; Western Civilisation Volume I; VNR: NY: 1962

AD9102        BUILDING MATERIALS I          L S P/S C

2 0 0 2

AIM:
This course is devised to make students understand the basic materials of construction such as soil, lime, stone and rocks and other naturally occurring materials such as bamboo, palm, straw, etc.

OBJECTIVES:

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

CONTENT:

UNIT I   SOILS
Fundamentals of Soil Science, Types of soils, Principles of Soil Stabilization, Characteristics of core, Types of Stabilizers, Requirements and Types of mudwall building and surface protection.
UNIT II  LIME  4
Types of lime, Classification of lime, comparison between fat lime and hydraulic lime, Manufacturing process slaking, Hardening – Testing and Storage, Lime putty, Precautions in handling and uses of lime.

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

UNIT IV  STRAW BALES  6
Straw as a building material, - Basics, Fire, moisture, insects and pests proof.

UNIT V  ROCKS AND STONES  4
Classification of rocks, Classification, Sources, Seasoning, Quarrying of stones, Dressing, Characteristics of stones, Testing of stones, Common building stones and their uses. Preservation of stones Deterioration of stones, Durability, Preservation, Selection of stones, Artificial stones.

TOTAL: 30 PERIODS

REQUIRED READINGS
4. UNO, Use of Bamboo and reeds in construction – UNO publications

REFERENCES
3. Rural Construction NBO – New Delhi

AD9103  ENVIRONMENTAL SCIENCE  L S P/S C
3 0 0 3

AIM:
To sensitize the students to understand the diversities and complexities in natural environments and the need for intervention in the context of global warming and climate change.

OBJECTIVES:
• To provide an overview of natural resources, various ecosystems & its characteristics and conservation of biodiversity.
To create an awareness about impact of human activities such as pollution and its consequences.
To stress the importance of environmental protection and sustainable development.

CONTENT:

UNIT I THE MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES
Definition, Scope and importance;
Need for public awareness.

UNIT II RENEWABLE AND NON-RENEWABLE RESOURCES
Natural resources and associated problems
(a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal peoples.
(b) Water resources: Use and over-utilization of surface and ground water, dams-benefits and problems.
(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
(d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.
(f) Land resources: Land as a resource, land degradation, man included landslides, soil erosion and desertification.
  • Role of an individual in conservation of natural resources.
  • Equitable use of resources for sustainable lifestyles.

UNIT III ECOSYSTEMS
Concept of ecosystem.
  • Structure and function of an ecosystem.
  • Procedures, 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 following ecosystem:
    (a) Forest ecosystem
    (b) Grassland ecosystem
    (c) Desert ecosystem
    (d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT IV BIODIVERSITY AND ITS CONSERVATION
Introduction - Definition: Genetic, species and ecosystem diversity.
  • Biogeographical classification of India.
  • Value of biodiversity: Consumptive use, productive use, social, ethical, and 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.
UNIT V 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 pollution
- Soil waste Management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management: Floods, earthquake, cyclone and landslides.

UNIT VI SOCIAL ISSUES AND THE ENVIRONMENT
- From unsustainable to sustainable development.
- Urban problems related to energy.
- Water conservation, rain water harvesting, watershed management.
- Resettlement and re habitation of people; its problem and concerns. Case studies.
- Environmental ethics: Issues and possible solutions.
- Climate changes, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation.
- Consumerism and waste products.
- Environmental protection Act.
- Air (prevention and control of Pollution) Act.
- Water (prevention and control of Pollution) Act.
- Wildlife protection Act.
- Forest conservation Act.
- Issues involved in enforcement of environmental legislation.
- Public awareness.

UNIT VII HUMAN POPULATION AND THE ENVIRONMENT
- Population growth, variation among nations.
- Population explosion - Family Welfare Programme.
- Environment and human health.
- Human rights.
- Value education.
- HIV/AIDS
- Women and Child Welfare.
- Role of information Technology in Environment and human health.
- Case studies.

UNIT VIII FIELD WORK
- Visit to a local area to document environmental asserts-river/ forest/ grassland/ hill/ mountain.
- Visit to a local polluted site - Urban/ Rural/ Industrial/ Agricultural.
- Study of common plants, insects, birds.
• Study of simple ecosystem-pond, river, hill slopes, etc. (Field work Equal to 5 lecture hours).

TOTAL: 45 PERIODS

REQUIRED READINGS:
1. Miller T.G. Jr., Environmental Sciences, Wadsworth Publishing Co. (TB)

REFERENCES:

AD9104 ART STUDIO

AIM:
To develop presentation skills, visual expression and representation, imaginative thinking and creativity through a hands on working with various mediums and materials.

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

CONTENT:

UNIT I DRAWING 15
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 15
UNIT III  PAINTING II
Indoor and out door painting – Rendering techniques

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.

REQUIRED READINGS

REFERENCES

AD9105  ARCHITECTURAL DRAWING I
AIM:
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.

OBJECTIVES:
- To involve students in a number of exercises that will help them to understand the nature of geometrical forms in terms of drawing plane and solid projections.
- To involve students in a number of exercises that will help to understand the representation of 3 Dimensional forms through isometric and axonometric drawings.
- To introduce basic measured drawing of simple objects and building components.
CONTENT:

UNIT I GEOMETRICAL DRAWING: PLANE GEOMETRHY 12
Introduction to fundamentals of drawing/drafting - Construction of lines, angles - scales and area. Construction of plane - circles, tangent, curves and conic sections – construction and development of planar surface – square, rectangle, polygon etc.

UNIT II GEOMETRICAL DRAWING: ORTHOGRAPHIC PROJECTION OF PLANAR SURFACES 12
Isometric, axonometric and multi-view projection of geometric shapes namely square, circle, and polygon etc.

UNIT III GEOMETRICAL DRAWING: SOLID GEOMETRY 12
Introduction to simple projection – projection and development of solid surfaces – sections of solid, true shape of section and penetration of solids.

UNIT IV GEOMETRICAL DRAWING: ORTHOGRAPHIC PROJECTION OF SOLIDS 12
Isometric, axonometric and multi-view projection of solid – cube, prism combination of solid etc.

UNIT V MEASURED DRAWING 27
Introduction to fundamentals of measured drawing, line value, lettering, drawing representation, format for presentation methods and technique of measuring buildings and their details. Measured drawing of simple objects like furniture, detailing in terms of construction, ornamentation, measured drawing of building components like column, door, window, cornice, etc.

TOTAL: 75 PERIODS

REQUIRED READINGS

REFERENCES

AD9106 BASIC DESIGN LS P/S C
0 0 14 7

AIM:
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.

OBJECTIVES:
- To involve students in a number of exercises to understand the grammar of design and visual composition.
To enable the understanding of 3D Composition by involving students in a number of exercises which will help generation of a form from a two-dimensional / abstract idea.

To 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:

Introduction to Architectural Design through Basic Design – Elements of Design:
Properties, qualities and characteristics of point, line, direction shape, form, colour and texture
- Principles of Design: Scale, Proportion, Balance, Harmony, Rhythm and Contrast.

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

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

REQUIRED READINGS

REFERENCES
AIM:
To make students aware of how structural resolutions become important in realization of architecture design concept. At this stage, students shall be exposed to forces, moments, and resolution that are to be resolved. Concepts of structures, and enable students to solve basic, simple problems.

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

CONTENT:
UNIT I FORCES AND STRUCTURAL SYSTEMS 5
Types of force systems - Resultant of forces-lami’s theorem- principle of moments varignon’s theorem - principle of equilibrium (no reaction problems) - simple problems

UNIT II ANALYSIS OF PLANE TRUSSES 5
Introduction to Determinate and Indeterminate plane trusses - Analysis of simply supported and cantilevered trusses by method of joints.

UNIT III PROPERTIES OF SECTION 8

UNIT IV ELASTIC PROPERTIES OF SOLIDS 6
Stress strain diagram for mild steel, High tensile steel and concrete - Concept of axial and volumetric stresses and strains. (excluding composite bar)

UNIT V ELASTIC CONSTANTS 6
Elastic constants - Relation between elastic constants - Application to problems.

TOTAL: 30 PERIODS

REQUIRED READINGS

REFERENCES
5. A.P.Dongre – Structural Engineering for Architecture, Scitech Publications Ltd.
AIM:
To inform about the development of architecture in India from ancient times to its evolution through history under two religious movements- Buddhism and Hinduism- and the cultural and contextual determinants that produced that architecture.

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

CONTENT:

UNIT I   ANCIENT INDIA

UNIT II   BUDDHIST ARCHITECTURE

UNIT III   EVOLUTION OF HINDU TEMPLE ARCHITECTURE

UNIT IV   TEMPLE ARCHITECTURE - SOUTHERN INDIA

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

TOTAL: 30 PERIODS
REQUIRED READINGS
1. Percy Brown, Indian Architecture (Buddhist and Hindu Period), Taraporevala and Sons, Bombay, 1983.

REFERENCES
3. Stella Kramrisch The Hindu Temple
4. K.V. Soundarajan, Art and Architecture of South India
5. George Michell Ed, Temple Towns of Tamil Nadu
6. History of Indian Philosophy, Dasgupta

AD9153 BUILDING MATERIALS II

AIM:
This course is devised to make students understand some basic materials of construction such as brick, clay products and timber and its various market forms.

OBJECTIVES:
- To have an understanding of the properties, characteristics, strength, manufacture, processing and application of materials such as brick and other clay products.
- To inform the properties and characteristics of timber, its conversion, preservation and uses.
- To inform of the various market forms of timber, their production, properties and application in the building industry.

CONTENT:
UNIT I BRICKS

UNIT II CLAY PRODUCTS
Manufacture of burnt clay bricks, paving bricks, hollow bricks – terracotta, porcelain, stoneware, earthenware and glazing and their uses. Roofing materials - Manufacture and uses of Mangalore tiles, pot tiles, pan tiles

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

UNIT IV TIMBER PRODUCTS
Market forms of timber, Industrial timber, - Veneers, Plywoods, Laminates, advantages and Blockboard uses.
UNIT V  
PAINTING AND VARNISHING IN TIMBER  
Composition, characteristics, preparation, painting different surfaces Enamels, Varnishing, Miscellaneous paints, defects, uses and cost of materials.  
TOTAL: 30 PERIODS

REQUIRED READINGS
3. B. Reshpande, materials and construction oriental watchman publishing House Poona II

REFERENCES
3. To have an understanding of the various finishes that can be applied to timber.

AD9154  
BUILDING CONSTRUCTION I   L S P/S C  1 0 4 3

AIM
This course is devised to provide an understanding of the various components that go into the making of a building shell and to focus on the various technicalities of construction and construction detail using some of the basic building materials.

OBJECTIVES
• To involve students in a number of drawing exercises that will analyze the various building components in a simple load bearing structure.
• To involve students in a number of drawing exercises that will look at the design and detail of simple structures using naturally occurring materials such as mud, bamboo, straw, etc.
• To involve students in a number of drawing exercises that will look at the design and detail of various building components in a simple load bearing structure using stone.

CONTENT

UNIT I  
INTRODUCTION  8
Functional requirements of building and its components, introduction to concept of load bearing and framed structures. Exercises – involving the same.

UNIT II  
SOILS  16

UNIT III  
BAMBOO  16
UNIT IV STRAW BALES

UNIT V STONE

REQUIRED READINGS

REFERENCES

AD9155 THEORY OF ARCHITECTURE

AIM
The course is devised to introduce architecture as a discipline, to develop sensitivity towards the aesthetic and psychological experience of form and space and to make aware of how meaning is created in architecture.

OBJECTIVES
- To introduce architecture as a discipline and to sensitize the students to the various functional aspects of architecture while looking at factors that contribute to the meaning of architecture and its visual aesthetic.
- To introduce the students to the ordering elements and principles of architecture to understand the vocabulary of the architectural language through the analysis of selected buildings.
- To understand not only the organization of form and space but to understand the organizing elements in a building through the case of selected buildings.
- To inform students of how meaning is created in architecture by analyzing cases of buildings, architects work(s), architectural styles.
- To engage students in seminars, case study analysis, workshops, etc that will look analytically at architecture.
UNIT I  INTRODUCTION TO ARCHITECTURE AND MEANING IN ARCHITECTURE  

Definitions of Architecture- context for architecture as satisfying human needs- functional, aesthetic and psychological –architecture as a discipline- introducing the various functional aspects of architecture: site, structure, skin, services, use, circulation etc.

Introduction to the factors that lend meaning to architecture- architectural expression and symbolism- character and style- movements, philosophies, ideologies and theories- meaning and interpretation of architecture

UNIT II  ORDERING ELEMENTS AND PRINCIPLES OF ARCHITECTURE  
Point, line, plane, form, shape, pattern, light, colour, texture – understanding the elements with respect to architecture
Exercises involving the above

Detailed study of the visual and emotional effects of geometric forms and their derivatives: sphere, cube, pyramid, cylinder and cone – Transformation of forms, Articulation of forms – mass-space/solid-void effects, articulation of edges, corners, surfaces
Exercises involving the above

Proportion, scale, balance, rhythm, axis, symmetry, hierarchy, datum, unity, harmony, dominance with respect to architecture
Exercises involving the above

UNIT III  ORGANISATION OF FORM AND SPACE  
Spatial relationships: space within space, interlocking spaces, adjacent spaces, space linked by a common space - spatial organization: centralised, linear, radial, clustered, grid - form- space relationships-
Exercises involving the above

UNIT IV  CIRCULATION AND IN TOTALITY  
Circulation as organizing element: building approach, building entrance, configuration of the path, path space relationship, form of circulation space
Exercises involving the above

UNIT V  EXPERIENCING ARCHITECTURE  
Understanding architecture in totality in terms of the various aspects through first hand experience, analysis and interpretation using the case of a building, architectural style, work(s) of contemporary architects
Seminar in the above

TOTAL: 90 PERIODS

REQUIRED READINGS

REFERENCES:
1. Leland M.Roth - Understanding Architecture, its experience history and meaning, Craftsman house, 1994.

AD9156 ARCHITECTURAL DRAWING II  

AIM:  
To develop the skill of representation in advanced drawing techniques and building documentation.

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.

CONTENT:  

UNIT I  SCIOGRAPHY 
Principles of shade and shadow – construction of shadow of simple geometrical shapes – construction of sciography on building, shadows of architectural elements.

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

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

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

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

TOTAL: 75 PERIODS

REQUIRED READINGS:  
REFERENCES:

I. MEASURED DRAWING

II. PERSPECTIVE

III. SCIOGRAPHY

AIM:
To enable the conceptualization of form, space and structure through creative thinking and to initiate architectural design process deriving from first principles.

OBJECTIVES:
- 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.

TOTAL: 210 PERIODS

REQUIRED READING
4. Ernst Neuferts Architects Data, Blackwell 2002

REFERENCES

AD 9201               MECHANICS OF STRUCTURES II            L T P/S C
                              2 0 0 2

AIM:
To make students aware of how structural resolutions become important in realization of architecture design concept. At this stage, students shall be exposed to forces, moments, and resolution that are to be resolved. The focus is to study the concept of shear force and bending moment in beam section, deflection of beams and theory of columns and to know the concept of indeterminate structure.

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

CONTENT:
UNIT I       SHEAR FORCE AND BENDING MOMENT  5
Basic concepts – shear force and bending moment diagrams for cantilever and simply supported beams subjected to various types of loadings (Point loads, uniformly distributed loads, uniformly varying loads and concentrated moments/ couple) – Over hanging simply supported beams – Point of contra flexure
UNIT II  STRESSES IN BEAMS  5
Theory of simple bending – Bending stress distribution – Strength of sections – Beams of composite sections (Flitched beams) – Shearing stress distribution in beam sections

UNIT III  DEFLECTION OF BEAMS  8
Slope and deflection at a point – Double Integration method and Macaulay’s method for simply supported and cantilever beams

UNIT IV  COLUMNS  7
Short and long columns – Concept of Elastic stability – Euler’s theory – Assumptions and Load carrying capacity of Columns with different end conditions – Concept of Effective length – Slenderness ratio – Limitations of Euler’s theory – Rankine’s formula – Eccentric loading – Core of a column section

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

TOTAL: 30 PERIODS

REQUIRED READING:

REFERENCES :

AD9202  HISTORY OF ARCHITECTURE AND CULTURE III  L T P/S C  2 0 0 2

AIM:
To inform about the development of architecture in the Western World through the evolution of Christianity as a religion and the cultural and contextual determinants that produced that architecture.

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

UNIT I EARLY CHRISTIAN 4
Birth and spread of Christianity – transformation of the Roman Empire – early Christian worship and burial.

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

UNIT II EARLY MEDIEVAL PERIOD 6


UNIT III LATE MEDIEVAL PERIOD 6
Political and social changes: Re-emergence of the city – Crusades, - Scholasticism.

Development of Gothic architecture Church plan, structural developments in France and England – Notre Dame, Amiens; Notre Dame, Paris; Salisbury Cathedral; Westminster Abbey – wooden roofed churches – domestic architecture.

UNIT IV RENAISSANCE AND MANNERIST 8

UNIT V BAROQUE AND ROCOCO 6
Protestantism – Counter Reformation – French Revolution – Monarchy and growth of nations.

TOTAL: 30 PERIODS

REQUIRED READINGS:

REFERENCES:
4. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994
AIM:
The course is designed to familiarize the students with building services that support the functioning of a building in the area of water supply and sewerage

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

CONTENT:
I. WATER SUPPLY AND WATER DISTRIBUTION SYSTEM

UNIT I WATER QUALITY CONTROL AND DISTRIBUTION SYSTEM 10
Water quality, purification and treatment – surface and ground water sources, water/quality-nature of impurities, treatments - sedimentation, Rapid sand filters, pressure filters – sterilization and disinfection.

Water distribution systems
Distribution systems in small towns, layouts – cold water lines, hot water lines, Design criteria for daily water requirements based on occupancy, various kinds of meters, Tank capacity - Pumping plant capacity, Testing of water hardness - calculation of water consumption for Residential/Multistoried buildings
Piping systems/piping materials/plumbing fixtures/selection – Domestic hot water systems Solar water heating systems, application and installation

UNIT II WATER MANAGEMENT CONCEPTS 8
Different methods of Harvesting rain water from roofs and paved areas
Waste water treatment – conventional, modern systems
Mandatory provision with respect to plumbing arrangements in apartment buildings.

II. SANITARY WASTE AND SEWERAGE SYSTEM

UNIT III FUNDAMENTALS, SANITARY WASTE AND SEWERAGE SYSTEM 11
Basic Principles of sanitation and disposal of waste matter from buildings, various systems of sewerage disposal and their principles
Model bye-Laws in regard to sanitation of buildings specifications of various sanitary fittings for buildings.
Planning of bathrooms, Toilets in domestic and Multistoried buildings. Standard type of sanitary fittings, Caulking compounds, traps, joints.
Flushing cisterns, manholes, septic tanks in relation to buildings. Intercepting Chambers, inspection Chambers and their location and ventilation of sewers.
Layout of simple drainage system for small buildings, apartments, commercial buildings – gradient used in laying of drains and sewers, size of drain pipes and materials used

UNIT IV WASTE MANAGEMENT CONCEPT 8
Sewerage disposal :
Primary, secondary treatment, activated sludge, intermittent and trickling sand filters, sewage treatment plant – layout for residential/commercial buildings
Solid waste disposal:
Refuse disposal, collection, and conveyance disposal of town refuse. Sanitary land fills, incineration, vermiculture, aerobic digestion for compost, anaerobic digestion for energy and organic filler (Bio gas) and rural energy systems

UNIT V      EQUIPMENT’S USED FOR MANAGEMENT OF USABLE
WATER AND WASTE WATER
Space requirements, Configuration and Sizing of motors and deep well, centrifugal, +submersible, reciprocating pumps and their location in building types
TOTAL:45 PERIODS

REQUIRED READINGS:

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

AD9204     CLIMATE AND BUILT ENVIRONMENT
L T P/S C
3 0 0 3

AIM:
To enable the understanding of the technical basis of the environment which exists in or around a building and to integrate the requirements of climate in building and in relation to building functions.

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.

CONTENT:
UNIT I      CLIMATE AND HUMAN COMFORT
UNIT II DESIGN OF SOLAR SHADING DEVICES  8

UNIT III HEAT FLOW THROUGH BUILDING ENVELOPE CONCEPTS  9
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

UNIT IV IMPACT OF AIR MOVEMENT DUE TO NATURAL AND BUILT FORMS  9
The wind – The effects of topography on wind patterns – Air currents around the building – Air movement through the buildings – The use of fans – Thermally induced air currents – Stack effect, Venturi effect – Use of court yard.

UNIT V CLIMATE AND DESIGN OF BUILDINGS  9
Design strategies in warm humid climates, hot humid climates, hot and dry climates and cold climates – Climate responsive design exercises

TOTAL: 45 PERIODS

REQUIRED READINGS:
1. O.H. Koenigsberger and others (1993), Manual of Tropical Housing and Building – Part I - Climate design, Orient Longman, Madras, India.

REFERENCES:

AD9205 BUILDING CONSTRUCTION II  L T P/S C
1 0 4 3

AIM:
This course is devised to provide an understanding of brick and clay products and timber and industrial timber products that go into making of structural and non structural components of building.

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

UNIT I  BRICKS  10
Design and construction of various structural components using bricks – basics of brick bonding principles, types of bonding, foundations, load bearing walls, cavity walls, lintels, arches, corbels, piers, flooring etc.
Exercises of the above and application of the design details of brick construction in single or (Ground+1) buildings – small house, community hall, snack bar etc. and understanding the same through case studies.
Methods of construction of various non-structural building components such as partition walls, screens, compound walls, parapets, coping.

Exercises of the above through case studies and drawings.

UNIT II  CLAY PRODUCTS  5
Clay block partition walls, screen walls, clay blocks for flooring and roofing. Roofing methods using Mangalore tiles, pot tiles, pan tiles.

Exercises involving the above through drawing and case studies.

UNIT III  TIMBER JOINERY, PARTITIONS, PANELLING, FALSE CEILING  15
Methods of construction using natural timber in joinery works including methods of fixing and options for finishing.
Window types: panelled, pivoted, top hung, louvered, glazed, windows, French windows, corner windows, bay windows.
Door types: ledge-braced, panelled, glazed, sliding, sliding/folding, louvered
Ventilators: top hung, bottom hung, pivoted, louvered, glazed.
Hardware: For doors, windows and ventilators

Exercises involving the above through drawings and application of the above for a single or (G+1) building with schedule of joinery.

Timber Partitions, panelling, false ceiling. Methods of construction using man-made timber products such as ply woods, block boards, and laminated wood and gypsum products. in fixed partitions, sliding/folding partitions, wall panelling, false ceiling.

Exercises of the above through drawings and case studies.

UNIT IV  TIMBER STAIRCASES  15
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 V  TIMBER WALLS, FLOORS AND TRUSSES  15
Methods of construction using natural timber in various structural components of the building such as walls, floors, roof trusses (lean to couple roofs, collar roof, king post, queen post and other trusses)

Exercises involving the above through drawings.

Quality assurance measures and testing procedures related to material, workmanship and performance for the above topics.

TOTAL: 75 PERIODS
AD9206 COMPUTER AIDED DRAFTING

1. **AIM:**
The lecture program and practical engage students with understanding of the Software, Visual languages, Design fundamentals and Visual literacy which provide the fundamental understandings required for the Medium.

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

3. **CONTENT:**

   **UNIT I**  
   **INTRODUCTION TO COMPUTER AND IMAGE EDITING**
   
   **Project:** Visual Composition using Graphics (Pixels /Vector)
   **Tools:** 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 in ADOBE PHOTOSHOP.

   **UNIT II**  
   **INTRODUCTION TO VISUAL COMPOSITION USING COMPUTER TOOLS**
   
   **Project:** Visual Composition using various elements of Design (lines, shapes, colour, texture etc.)
   **Tools:** Understanding the drawing unit’s settings, scales, limits, drawing tools, drawing objects, object editing, and text, dimensioning in ACAD. Transparent overlays, hatching utilities, line type, line weight and colour. Multiline, Polyline, etc. Styles, blocks and symbol library in ACAD.

   **UNIT III**  
   **INTRODUCTION TO COMPUTER AIDED 2D DRAFTING**
   
   **Project:** 2D Drafting of a simple building
   **Tools:** Understanding the drawing unit’s settings, scales, limits, drawing tools, drawing objects, object editing, and text, dimensioning in ACAD. Transparent overlays, hatching utilities, line type, line weight and colour. Multiline, Polyline, etc. Styles, blocks and symbol library in ACAD.
UNIT IV INTRODUCTION TO 3D MODELLING

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

UNIT V 3D RENDERING AND SETTING

Project: Visualize a building. Explore the potential of lights and camera in 3DMAX 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 in ACAD/ 3DMAX. Exercise to identify and visualize a building using the above said utilities.

TOTAL: 75 PERIODS

REQUIRED READING:

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

AD 9207 ARCHITECTURAL DESIGN II

AIM:
To create an understanding of the inter relationships amongst various elements of architecture – form, function, space planning, user perception and behaviour.

OBJECTIVES:
- To understand the characteristics of site and the importance of site planning which includes built form and open space.
- To understand the relationship between form and spaces and the importance of aesthetics.
- To ascertain the response of user group through case studies.
- To enable the presentation of concepts through 2D drawings, sketches and model.

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

Areas of concern/ focus:
- form-space relationships
- spatial organization
- behavioral aspects especially those relating to children
- site planning aspects
- appropriate materials and construction
Suggestive Typologies/ projects: residential buildings, institutional buildings: nursery or primary schools, schools for children with specific disabilities, primary health center, banks, neighborhood market, library

TOTAL: 210 PERIODS

REQUIRED READING
4. Ernst Neuferts Architects Data, Blackwell 2002

REFERENCES
1. Richard P. Dober, Campus Planning
2. Kanvinde, Campus Planning in India

AD9251 DESIGN OF STRUCTURES I

AIM:
To enable the design of timber and steel structural members in a building.

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

CONTENT:

TIMBER STRUCTURES

UNIT I DESIGN OF BEAMS AND COLUMNS

STEEL STRUCTURES

UNIT II RIVETED AND WELDED JOINTS
UNIT III  TENSION MEMBERS  

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

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

TOTAL: 45 PERIODS

REQUIRED READING

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

AIM:
To inform about the development of architecture in Asia particularly India through the evolution of Islam as a religion and the cultural and contextual determinants that produced that architecture.

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

CONTENT:

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

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

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

UNIT III ISLAMIC ARCHITECTURE IN THE PROVINCES

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

UNIT IV MUGHAL ARCHITECTURE

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

UNIT V CROSS-CULTURAL INFLUENCES

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

TOTAL: 30 PERIODS

REQUIRED READINGS:


REFERENCES:

AIM:
This course is devised to make students understand the materials of construction such as cement, concrete, paints and other surface finishes and their applications in the building industry.

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

UNIT I REQUIREMENTS OF INGREDIENTS FOR MORTAR/ CONCRETE 4
Cement: definition, composition, strength, properties, manufacture, test for cement, types of cement
Sand: sources, impurities, classification, tests for bulking of sand, quality of sand
Coarse aggregate: Sources, shape, size, grading, sampling and analysis, impurities
Water: sources, requirements, water quality, tests

UNIT II CEMENT CONCRETE AND ITS MANUFACTURE 4
Definition, properties, specification, proportioning, water-cement ratio, workability, curing, waterproofing, guniting, special concretes.
Manufacture, construction of formwork, placing, quality assurance testing, fabrication, incorporation of steel in concrete.

UNIT III TYPES OF CONCRETE AGGREGATES AND CONCRETE 6
Lightweight aggregates, aerated concrete, no-fines concrete, polymer concrete, RCC, pre-stressed concrete, fibre-reinforced concrete, ready-mixed concrete

UNIT IV SURFACE FINISHING, FLOORING AND DAMP-PROOFING 8
Surface finishing: Smooth finishes, textured finishes, ribbed, etched, exposed aggregate finish- weathering of finishes- external renderings- roughcast, dry dash, textured, stucco, gypsum and POP applications, protective and decorative coatings.
Paints- properties and defects in paints, enamels, distemper, plastic emulsion, special paints- fire retardant, luminous and bituminous paints.
Materials for damp-proofing and water-proofing concrete structures: Hot and cold applications, emulsified asphalt, vinyl, epoxy resins, chemical admixtures, bentonite clay etc.- properties, uses and cost of materials.
Types of flooring- laying methods for marble, mosaic, and terrazzo, plain cement flooring, flooring stones & tiles.

UNIT V GLASS 8
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.
REQUIRED READING
1. M.S. Shetty, Concrete Technology, S.Chand & Co.ltd, New Delhi, 1986.

REFERENCES

AD9254 BUILDING SERVICES II

AIM:
To familiarize the students with building services that support the functioning of a building in the area of electrical wiring, lighting and conveying systems

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

CONTENT:

UNIT I ELECTRICAL AND ELECTRONIC SYSTEMS: ELECTRICAL WIRING SYSTEMS
Laws of electrical circuits: Ohms and Kichoffs Laws
Basics of electricity – Single/Three phase supply. Earthing for safety – types of earthing - ISI specifications
Electrical wiring systems in domestic and commercial buildings. Conduits, Types of wiring Diagram for connection.
Bus way, Bus Bars, lighting track and conduits (Aluminum metallic, non metallic) arrangements.
Power handling, equipment, switch board, panel boards.
Lighting conductors : Purpose, materials, fixing, earthing arrangements
Electronic and Communication systems
Communication and data systems- communication spaces, pathways, cabling systems, voice and data, communication, Electronic security systems, computer labs/server, Rooms etc.
Electrical Installations in Buildings. Main and distribution boards – transformers – switch gears – substations – space requirement and Layout of the same in building types

UNIT II FUNDAMENTALS OF LIGHTING
Principles of light – Electromagnetic radiation, waves, nature of vision, measurement of lighting.
UNIT III  ILLUMINATION AND LIGHTING
Electric light sources: brief description, characteristics and application of different types of lamps, methods of mounting and lighting control
Luminaries classification/ - Lumen method for design – Room reflectance/ Glare – manufacturer’s data on luminaries / luminaries cost

UNIT IV  LIGHTING DESIGN: INSTALLATION AND APPLICATION IN BUILDINGS
Artificial light sources, spectral energy distribution, Luminous efficiency- color temperature – color rendering, Additive, subtractive color and their application areas and out door lighting
Lighting for Office, Schools, Libraries, Residential, Hospital, Parking, Outdoor.
Elementary ideas of special features required and minimum level of illumination for the physically handicapped and elderly in building types


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

TOTAL: 45 PERIODS

REQUIRED READINGS:

Conveying systems
1. Elevators, Escalators , Moving Walkways – Manufactures catalogues

REFERENCES
Electrical Systems:
1. Handbook of building Engineers in metric systems, New Delhi 1968
AIM:
To enable the appreciation of site and its elements and to equip students with the various types of techniques of site surveying as well as to introduce them to aspects of site planning and site analysis

OBJECTIVES:
- To teach various techniques of site surveying
- 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 the students the methodology of preparing a site analysis diagram. This will serve as a prelude to any architectural creation.

CONTENT:

UNIT I INTRODUCTION
Definition of plot, site, land and region, units of measurements, reconnaissance and need for surveying.

UNIT II SITE SURVEYING
Chain survey and Triangulation – Instruments used, method of survey and plotting into survey drawing, plain table, Compass and Theodolite Surveys, method, instruments used and application.
Computation of area by geometrical figures and other methods. Marking plans, layout plans and centerline plans – Importance, procedure for making these drawings and dimensioning. Setting out the plan on site – Procedure and Precautions.

UNIT III SITE ANALYSIS
Importance of site analysis; On site and off site factors; Analysis of natural, cultural and aesthetic factors – topography, hydrology, soils, vegetation, climate, surface drainage, accessibility, size and shape, infrastructures available - sources of water supply and means of disposal system, visual aspects; Preparation of site analysis diagram.
Site selection criteria for housing development, commercial and institutional projects.

UNIT IV DETAILED ANALYSIS AND TECHNIQUES
Context of the site. Introduction to existing master plans landuse for cities, development control Rules. Preparation of maps of matrix analysis & composite analysis.
Study of contours, slope analysis, grading process, grading criteria, functional and aesthetic considerations.

UNIT V SITE PLANNING AND SITE LAYOUT PRINCIPLES
Organization of vehicular and pedestrian circulation, types of roads, hierarchy of roads, networks, road widths and parking, regulations. Turning radii & street intersections
Study of microclimate; vegetation, landforms and water as modifiers of microclimate.

TOTAL: 45 PERIODS

REQUIRED READING:

REFERENCES:
AIM:
To provide an understanding of construction using concrete as well as to expose students to the current research in concrete construction and detailing.

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

CONTENT:
UNIT I  CONCRETE CONSTRUCTION  25
Construction of simple framed buildings using RCC-
Types of foundations (strip foundation, raft, isolated, combined, and continuous) construction details.
Construction details of RCC frames- beams, columns, slabs, precast frames.
Construction details of apertures- concrete lintels, sunshades, arches, shading devices, screen walls, pergolas.
Construction principles and details for RCC slabs- one way slabs, 2-way slab, continuous, flat slab, waffle slab, coffer slab etc.
Construction details of concrete blocks- for walls, lintels, floors and roofs.
Exercises of the above through drawings and case studies.

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

UNIT III  DESIGN AND CONSTRUCTION METHODS FOR CONCRETE STAIRCASES  15
Staircases- basic principles, types of staircase- straight flight, dog-legged, quarter-turn, spiral, helical and other types. Support conditions for stairs and details of handrail, baluster etc. and finishes for stairs.
Exercises of the above through case studies and drawings

UNIT IV  ADVANCED CONSTRUCTION SYSTEMS DEVELOPED BY RESEARCH ORGANISATIONS IN INDIA  10
Design and detailing of building materials and components developed by research organisations like CBRI, SERC, NBO, BMTPC.
Special construction details for materials like brick, concrete, other materials developed by Building research organisation.

Exercises of the above through case studies and drawings.

UNIT V GLASS 15
Construction methods using glass for single storey all 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.

Quality assurance measures and testing procedures related to material, workmanship and performance for the above topics.

TOTAL: 75 PERIODS

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

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

AIM:
To create a holistic understanding of the socio-cultural, geographic and economic aspects that shape the built environment as well as to expose the students towards the design of simple community oriented buildings.

OBJECTIVES:
- To make a comprehensive study of a rural settlement that is an exemplar of collective design evolved organically over a period of time.
- To expose the students on the methodology of conducting various surveys covering, physical, visual characteristics and demographic aspects.
- To understand the vernacular / traditional architecture involving local materials and construction techniques.
- To emphasise on the importance of designing built form and open spaces that meet the aspirations of the community.
To enable the presentation of concepts through 2D and 3D presentation including sketches and model.

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

Area of concern/ focus:
- rural settlements and architecture
- community oriented design
- simple public buildings (not more than Ground+ 2 floors)

Suggestive Typologies/ projects: Rural projects that involve studies and design at settlement and building level - noon meal centre, market, primary health centre; department store, higher secondary school, campus students centre

TOTAL: 210 PERIODS

REQUIRED READING
4. Ernst Neuferts Architects Data, Blackwell 2002

REFERENCES
1. Richard P. Dober, Campus Planning
2. Kanvinde, Campus Planning in India

AD9301 DESIGN OF STRUCTURES II

AIM:
To facilitate the design of Reinforced concrete beams and slabs by working stress method and limit state method.

OBJECTIVES:
- To inform about the methods of design through working stress and limit state methods.
- To use the above two methods for the design of Concrete beams and slabs under various conditions.
- To use the limit state method for design of a concrete staircase.

UNIT I METHODS OF DESIGN FOR CONCRETE MEMBERS
Concept of Elastic method, Ultimate Load Method and Limit State Method – Advantages of Limit State Method over other methods.
WORKING STRESS DESIGN OF BEAMS
Analysis and Design of Singly and Doubly reinforced rectangular and flanged beams for bending – Design of Beams for shear

UNIT II LIMIT STATE DESIGN OF BEAMS 12
Analysis and design of singly and doubly reinforced rectangular and flanged beams for Bending - Design of beams for shear – Design of Continuous beams using IS code co-efficient.

UNIT III LIMIT STATE DESIGN OF SLABS 7
Behaviour of one way and two way slabs – Design of one way and two way slabs for various edge conditions - Corner effects.

UNIT IV DESIGN OF CIRCULAR SLABS 7
Design of Simply supported and fixed Circular slabs subjected to uniformly distributed loads.

UNIT V DESIGN OF STAIRCASE BY LIMIT STATE METHOD 7
Types of Staircases – Design of Dog Legged Staircase.

TOTAL: 45 PERIODS

REQUIRED READING

REFERENCES:
3. Dr. B.C. Punmia, Reinforced Concrete Structures, Vol, 1 & 2 Laxmi publication, Delhi, 1994.

AD9302 HISTORY OF ARCHITECTURE AND CULTURE V  L T P/S C  3 0 0 3

AIM:
To expose the students to the origin, development and spread of modern architecture in the Western world as well the architectural production of colonialism in India.

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

UNIT I  LEADING TO A NEW ARCHITECTURE  8
Beginnings of modernity – Origin and development of Neo Classicism - Structural Neo classicists: Laugier, Soufflot, Schinkel, Labrouste - Romantic Neo classicists: Ledoux, Boulle, Durand, Jefferson- Industrialization and its impact- Urbanization in Europe and America- split of design education into architecture and engineering streams- Emergent new building / space types- Growing need for mass housing- Development of Industrial material and construction technologies- concrete, glass and steel- structural engineering, standardization-Industrial exhibitions- Chicago School and skyscraper development.

UNIT II  REVIEWING INDUSTRIALISATION  8
Opposition to industrial arts and production - Arts and Crafts in Europe and America: Morris, Webb- Art Nouveau: Horta, Van De Velde, Gaudi, Guimard, Mackintosh - Vienna secession: Hoffman, Olbrich- Wright’s early works

UNIT III  MODERN ARCHITECTURE: DEVELOPMENT AND INSTITUTIONALISATION  13
Adolf Loos and critique of ornamentation- Raumplan: Peter Behrens- Werkbund – Modern architecture and art - Expressionism: Mendelsohn, Taut, Polzeig- Futurism- Constructivism, Cubism-Suprematism- De-Stijl
Bauhaus- Gropius, Meyer and Mies -CIAM I to X and its role in canonizing architecture- growth of International Style
Ideas and works of Gropius, Le Corbusier, Aalto, Mies, later works of Wright

UNIT IV  MODERN ARCHITECTURE : LATER DIRECTIONS  8
Post WW II developments and spread of international style – Later works of Corbusier: Brasilia, Unite- Works of later modernists: Louis Kahn, Paul Rudolph, Eero Saarinen

UNIT V  COLONIAL ARCHITECTURE IN INDIA  8
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

REQUIRED READING:

REFERENCES:
2. Christian Norburg Schulz., Meaning in Western Architecture, Studio Vista
AIM:
This course is devised to make students understand ferrous and non ferrous materials of construction as well as plastics and their applications in building industry.

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

UNIT I  FERROUS METALS: STEEL AND STEEL ALLOYS  6
Iron ore: definition, introduction, manufacture of iron ore, types- pig iron, wrought iron and cast iron- their properties and uses.
Steel- definition, properties, Manufacture, casting, heat treatment, mechanical treatment process of steel, market forms of steel, fire protection of steel. Steel alloys- properties and uses.
Structural steel-definition and protection. Steel sheeting- types of sheeting.
Corrosion of ferrous metals: Causes, factors of corrosion and prevention

UNIT II  INNOVATIONS IN STEEL AND STEEL INDUSTRY  6
Study of codes, standards, accepted industrial practices and procedures regarding the performance, expectations and acceptance criteria for steel, stainless steel in building Industry. Study of innovations in steel industry. Design and construction parameters developed by INSDAG.

UNIT III  NON-FERROUS METALS  6
Aluminium and Aluminium Alloys: Manufacture, properties, durability, and uses.
Aluminium products- extrusions, foils, castings, sheets etc.
Other non-ferrous metals- copper, lead, zinc: Manufacture, grades, forms, sizes.
Study of protection to non-ferrous metals and products such as anodizing, powder coating, painting, stove enamelling, chromium plating, varnishing, melamine treatments.

UNIT IV  PLASTICS  6
Polymerisation, thermoplastics, thermosetting plastics, elastomers, properties of plastics, strength, plastic forming process, uses of plastics and decorative laminates
Plastics in construction: polythene, poly propylene, PVC, ethylene, polycarbonate, acrylic flooring, PVC tiles.

UNIT V  OTHER MATERIALS  6
Light-roofing materials: Asbestos, corrugated GI Sheets, corrugated aluminium sheet, PVC and others.
Adhesives, Sealants and joint fillers. Relative movement within buildings, types of sealants-elasto-plastic, elastic sealants- joint design- fire resistant sealants- gaskets- adhesives, epoxy, wall paper, bitumen, plastic pipe.

Materials for flooring finishes such as epoxy, oxy-chloride, hardeners, PVC, carpets.

TOTAL: 30 PERIODS

REQUIRED READING
3. P.C Vargheese, Building Materials, Prentice Hall of India Pvt. Ltd., New Delhi, 110001

REFERENCES

AD9304  BUILDING SERVICES III  L T P/S C
3 0 0 3

AIM:
To familiarize the students with building services that support the functioning of a building in the area of internal environment control and fire and security systems.

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

CONTENT:

UNIT I  AIR CONDITIONING: BASIC REFRIGERATION PRINCIPLES  9

UNIT II  AIR CONDITIONING: SYSTEMS AND APPLICATIONS  12
Air conditioning system for small buildings – window types, evaporative cooler, packaged terminal units and through the wall units split system b) Systems for 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
Design criteria for selecting the Air conditioning system for large building and energy conservation measures - Typical choices for cooling systems for small and large buildings - Horizontal distribution of services for large buildings - Grouped horizontal distribution over central corridors, Above ceiling, In floor, Raised access floor, Horizontal distribution of mechanical services

UNIT IV  FIRE SAFETY: DESIGN AND GENERAL GUIDELINES OF EGRESS DESIGN
Principles of fire behavior, Fire safety design principles – NBC Planning considerations in buildings – Non- Combustible materials, egress systems, Exit Access – Distance between exits, exterior corridors – Maximum travel distance, Doors, Smoke proof enclosures
General guidelines for egress design for Auditoriums, concert halls, theatres, other building types, window egress, accessibility for disabled- NBC guidelines – lifts lobbies, stairways, ramp design, fire escapes and A/C, electrical systems.

UNIT V  FIRE SAFETY: FIRE DETECTION AND FIRE FIGHTING INSTALLATION
Heat smoke detectors – sprinkler systems
Fire fighting pump and water requirements, storage – wet risers, Dry rises
Fire extinguishers & cabinets
Fire protection system – CO2 & Halon system
Fire alarm system, snorkel ladder
Configuring, sizing and space requirements for fire fighting equipments

TOTAL: 45 PERIODS

REQUIRED READINGS:

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

AD9305  BUILDING CONSTRUCTION IV  L T P/S C
3 0 0 3

AIM:
To provide an understanding of the various construction practices and details using steel and aluminum in the structural and non structural components of a building.

OBJECTIVES:
• To understand both in detail the methods of construction using steel for structural purposes such as roof trusses and roof covering.
• To understand both in detail the methods of construction of building components using steel such as staircases, rolling shutters, doors and windows.
• To understand both in detail the methods of construction of building components using aluminum such as doors and windows, partitions and curtain walling.
• To understand both in detail the methods of construction of building components using plastics such as doors and windows, partitions, roofs and curtain walling.

CONTENT:
UNIT I STEEL CONSTRUCTION 15
Structural steel sections- construction methods, methods of connections, steel in foundations, column-beam connections.
Steel roof trusses: Design and detailing. Types of trusses- north-light, butterfly truss, bow-string truss, space frames, portal frames, spacer decks- construction details of the above and the context in which they are used.
Steel roof covering. Types of roof covering using steel, aluminium, asbestos, and other sheets.

Exercises of the above through drawings and case studies.

Steel staircases: basic principles, types of staircase- straight flight, dog-legged, spiral and other types. 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 STEEL DOORS, WINDOWS AND ROLLING SHUTTERS 10
Types of doors, windows – operable, sliding etc., methods of construction using steel.
Design and detailing of steel rolling shutter, collapsible gate, strong room, safe vault doors.

Exercises of the above through case studies and drawings.

UNIT III ALUMINIUM DOORS AND WINDOWS 10
Brief study of aluminium products- market forms of aluminium, aluminium extrusions- sketches of the above.
Aluminium doors and windows- design details. Doors- operable, sliding, pivoted, fixed.
Windows- operable, sliding, fixed, louvered. Ventilators- top hung, bottom hung, pivoted, louvered.

Exercises of the above through case studies and drawings.

UNIT IV ALUMINIUM PARTITIONS, STAIRS, CURTAIN WALLING, ROOFING 15
Partitions- fixed partitions, false ceiling, shopfront, using aluminium – construction methods and details.
Aluminium staircase- design and construction details- including detailing of handrail and baluster.
Aluminium roofing- Northlighting, glazing bar, roofing sheets - construction details including gutter details
Aluminium Curtain walling- design and construction details.

Exercises of the above through case studies and drawings.

UNIT V PLASTICS 15
Primary plastic building products for walls, partitions and roofs - design and construction details.
Secondary building products for windows, doors, rooflights, domes, and handrails- design and construction details.
Exercises of the above through case studies and drawings.
Quality assurance measures and testing procedures related to material, workmanship and performance for the above topics.

TOTAL: 75 PERIODS

REQUIRED READING

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

AD9306 ARCHITECTURAL DESIGN IV L T P/S C 0 0 16 8

AIM:
To explore the design of buildings addressing the socio – cultural & economic needs of contemporary urban society.

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

CONTENT:
Scale and Complexity: Buildings and small complexes that address the social and cultural needs of contemporary urban life (residential, Commercial, institutional) with a thrust on experiential qualities; multi bayed, multiple storied and circulation intensive; passive and active energy
Areas of concern/ focus
- behavioral aspects and user satisfaction
- socio-cultural aspects
designing for the differently abled  
Building byelaws and rules  
Appropriate materials and construction techniques  
Climatic design

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

TOTAL: 240 PERIODS

REQUIRED READING
4. Ernst Neuferts Architects Data, Blackwell 2002

REFERENCES
1. Richard P. Dober, Campus Planning
2. Kanvinde, Campus Planning in India

AD 9351                               DESIGN OF STRUCTURES III   L T P/S C
                                          3 0 0 3

AIM:
The course is structured to teach the design of Reinforced concrete column, footings and retaining walls and to introduce the concept of pre-stressed concrete.

OBJECTIVES:
- To use limit state design for the analysis and design of columns.
- To enable the learning of design of structural elements like footings, retaining walls and masonry walls.
- To understand the principle, methods, advantages and disadvantages of pre stressed concrete.

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

UNIT II   DESIGN OF FOOTINGS     10
Types of footings – Design of wall footings – Design of Axially loaded rectangular footing (Pad and sloped footing). Design of Combined Rectangular footings.
UNIT III DESIGN OF RETAINING WALLS 10
Types of Retaining walls – Design of RCC cantilever Retaining walls.

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

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

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

REFERENCES:
4. Krishna Raj, Prestressed Concrete Structures

AD9352 HISTORY OF ARCHITECTURE AND CULTURE VI L T P/S C
3 0 0 3

AIM:
To expose the students to the diverse postmodern directions in architecture in the Western world from the 1960s onwards as well as the architectural production of India from the end of colonial rule to the contemporary period.

OBJECTIVES:
- To introduce the context for the critiques of modern architecture and the evolution of new approaches.
- To study in detail the different postmodern 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 Indianness.

CONTENT:

UNIT I CRITIQUING MODERNISM 9
UNIT II  AFTER MODERNISM – I

UNIT III  AFTER MODERNISM – II

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

UNIT V  POST INDEPENDENT ARCHITECTURE IN INDIA

REQUIRED READING:

REFERENCES:
8. Brian Brace Taylor, Geoffrey Bawa, Thames & Hudson

AD9353  PROFESSIONAL PRACTICE AND ETHICS I
AIM:
To provide the students a general understanding of the architectural profession and the importance of ethics in professional practice.

OBJECTIVES:
• To give an introduction to the students about the architectural profession.
• To enable the students to grasp the elementary issues concerning professional practice.
• To teach the students about the role of professional and statutory bodies in the conduct of professional practice.
To teach the students about the importance of code of conduct and ethics in professional practice.

To expose the students some of the important legislation which have a bearing on the practice of architectural profession.

CONTENT:

UNIT I  INTRODUCTION TO THE ARCHITECTURAL PROFESSION
Importance of Architectural Profession – Role of Architects in Society – Alternatives open on entering the profession – Registration of Architects – Architect’s office and its management (location, organization structure, responsibility towards employees, consultants and associates, elementary accounts, tax liabilities).

UNIT II  PROFESSIONAL ETHICS AND CODE OF CONDUCT
Role of Indian Institute of Architects – Architects Act 1972 (intent, objectives, provisions with regard to architectural practice) – Council of Architecture (role and functions) – Importance of ethics in professional practice (Council of Architecture guide lines) – Code of conduct for architects as prescribed by Council of Architecture, punitive action for professional misconduct of an architect.

UNIT III  ARCHITECT’S SERVICES & SCALE OF FEES
Mode of engaging an architect – Comprehensive services, partial services and specialised services – Scope of work of an architect – Schedule of services – Scale of fees (Council of Architecture norms) – Mode of payment – Terms and conditions of engagement.

UNIT IV  ARCHITECTURAL COMPETITIONS

UNIT V  LEGAL ASPECTS & LEGISLATION

TOTAL: 45 PERIODS

REQUIRED READING:

REFERENCES:
AIM:
To provide technical knowledge to integrate sound control in relation to building functions.

OBJECTIVES:
• To understand the science behind acoustical design.
• To expose students to understand noise control and sound transmission and absorption.
• To familiarize the students with various building and interior elements which lend to better hearing conditions.
• To familiarize the students with the basic principles of acoustic design for spaces and building types which require good hearing conditions.

CONTENT:

UNIT I  FUNDAMENTALS  5
Sound waves, frequency, intensity, wave length, measure of sound, decibel scale, speech and music frequencies, human ear characteristics - Tone structure.

UNIT II  SOUND TRANSMISSION AND ABSORPTION  6
Outdoor noise levels, acceptable indoor noise levels, sonometer, determinate of density of a given building material, absorption co-efficient and measurements, choice of absorption material, resonance, reverberation, echo, exercises involving reverberation time and absorption co-efficient.

UNIT III  NOISE CONTROL AND SOUND ABSORPTION  5
Types of noises, transmission of noise, transmission loss, noise control and sound insulation, remedial measures and legislation.

UNIT IV  CONSTRUCTIONAL MEASURES  6
Walls/partitions, floors/ceilings, widow/doors, insulating fittings and gadgets, machine mounting and insulation of machinery.

UNIT V  ACOUSTICS AND BUILDING DESIGN  8
Site selection, shape, volume, treatment for interior surfaces, basic principles in designing open air theatres, cinemas, broadcasting studios, concert halls, class rooms, lecture halls, schools, residences. Call Centers, Office building and sound reinforcement systems for building types.

TOTAL: 30 PERIODS

REQUIRED READINGS:

REFERENCES:
AIM:
Learning of building construction will not realize its full objectives unless it is supplemented by a thorough understanding of the methods for achieving sound detailing. It is necessary for the students to understand the principles of detailing as applicable to various structural and non-structural situations in Indian context.

OBJECTIVES:
• To enable students to appreciate the challenges in detailing for both the newly designed buildings as well as while carrying out additions and alterations to existing buildings.
• To enable students to understand the various Fittings, Furniture & Equipment (FFE) that are needed in buildings and their installation methods.
• To train students towards adopting an integrated approach while dealing with complex buildings incorporating various allied requirements.

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

Exercises of the above through case studies and drawings.

UNIT II DETAILING OF WALLS, ROOFS AND FLOORING FOR INSTITUTIONAL BUILDINGS 20
a) Detailing of a residence - selected spaces.
b) Detailing of classrooms, library (in school, college)
c) Detailing of lecture hall, auditorium, exhibition spaces

Exercises of the above through case studies and drawings.

UNIT III DETAILING OF WALLS, ROOF, FLOORING FOR COMMERCIAL BUILDINGS 20
a) Detailing of shop-fronts, office spaces for commercial buildings including detailing of crucial elements such as entrance porches, main doors, staircases, show-windows, enclosed and air-conditioned atrium spaces.
b) Detailing of façade and selected spaces for apartment buildings, hotels and hostels.

Exercises of the above through case studies and drawings.

UNIT IV DETAILING OF BUILT-IN FURNITURE AND FITTINGS 10
Detailing of built-in elements like kitchen counters, cupboards, cabinets, toilets, toilet fitting.

Exercises of the above through case studies and drawings.

UNIT V DETAILING OF EXTERIOR AND INTERIOR ARCHITECTURAL ELEMENTS 15
Detailing of architectural elements like indoor fountains, water walls, transparent floors, street furniture, hard and soft landscape, swimming pools, water bodies and courtyard spaces.
Detailing of interior architectural elements in existing buildings (e.g. Staircase in bookshops, restaurants, playpen in restaurants, reception areas in hotel lobbies etc.)

**Exercises of the above through case studies and drawings.**

**REQUIRED READING**

TOTAL: **75 PERIODS**

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

**REFERENCES**

1. Susan Dawson, Architect’s Working Details(Volume 1-10), 2004
2. Swimming Pools, Lane Book Company, Menlo Park, California
3. Nelson L Burbank, House Carpentry Simplified, Simmons-Board- Man
4. Publishing Corporation, New York,
5. Landscape Construction

**AD9356 ARCHITECTURAL DESIGN V**

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**AIM:**

To explore 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.

**OBJECTIVES:**

- To create an awareness with regard to the design of green buildings and sustainable architecture.
- To inculcate the importance of services integration and construction in spatial planning in the context of design of High-rise buildings and service intensive buildings.
- To highlight on the importance of High rise buildings as elements of identity in urban areas and urban design principles that govern their design.
- To explore computer aided presentation techniques involving 2D and 3D drawings, walk through and models as required.

**CONTENT:**

Scale and Complexity: Advanced and complex problems involving large scale Multi-storeyed buildings and complexes for Residential/ Commercial/ Institutional/ Mixed-Use in an urban context with focus on visual characteristics, service integration and sustainable practices.

Areas of focus/ issues:

- sustainable building practices, green issues, alternative energy
- intelligent building techniques and service integration
- Architectural Detailing
- Advanced building practices
Typology/ project: office building, multi-use centre, convention center, multiplex, corporate complex, health care and hospitality building

TOTAL: 240 PERIODS

AD9401 INTERNSHIP PROGRAM

AIM:
To expose students to the daily realities of an architectural practice through a one year intensive internship program

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.

The internship program would be done in offices empanelled by the Institution and in firms registered under the Council of Architecture.

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

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

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

TOTAL: 36 WEEKS
AD9451  INTERNSHIP PROGRAM II  L T P/S C  x x x x 10

AIM:  To expose students to the daily realities of an architectural practice through a one year intensive internship program

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.

The internship program would be done in offices empanelled by the Institution and in firms registered under the Council of Architecture.

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

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

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

TOTAL: 36 WEEKS

AD9452  DISSERTATION  L T P/S C  x x x 3

Design studio emphasize on explaining and understanding Architecture primarily through the mode of making. Dissertation offers an opportunity to look at architecture, history and design primarily through textual. However, like design, dissertation involves process of observation, reflection and abstraction. Students are encouraged to choose any topic of their interest. 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.

REFERENCES
2. Linda Grant and David Wang, Architectural Research Methods, John Wiley Sons, 2002

AD9501 PROFESSIONAL PRACTICE AND ETHICS II

AIM:
To expose the students to advanced issues concerning architectural practice such as Tendering, Contracting including alternative practices in project execution, Arbitration and Project management and to enable them to understand the implications of globalisation on architectural practice.

OBJECTIVES:
• To further the students understanding of the professional practice.
• To enable the students to grasp the advanced issues concerning professional practice such as tendering, contracting including alternative practices in project execution, arbitration and project management.
• To expose the students to the implications of globalisation on professional practice with particular reference to WTO and GATS.
• To expose the students on some of the important legislations concerning architectural practice in India as well as International laws.

CONTENT:

UNIT I TENDER
Types of Tenders-Open and closed tenders-Conditions of tender-Tender documents-Tender notice-Concept of EMD-Submission of tender-Tender scrutiny-Tender analysis-Recommendations- E tendering (advantages, procedure, conditions).

UNIT II CONTRACT & ARBITRATION
Contents of Contract document (Articles of Agreement, Terms and Conditions of Contract, Important clauses – Appendix) – Arbitration (Definition, Advantages of arbitration, Sole and joint arbitrators, Role of umpires, Award, Conduct of arbitration proceedings) – Arbitration clause in contract agreement (role of architect, excepted matters) – case studies.

UNIT III NEW TRENDS IN PROJECT FORMULATION AND EXECUTION
Turn key offer (Expression of interest, Request for Proposal Document, Conditions for inviting turn key offer, finalisation of the bidder) – Current practices in Project execution [Build operate and Transfer (BOT), Build Operate Lease and Transfer (BOLT) and Build Operate and Own (BOO) and others – case studies.

UNIT IV IMPLICATIONS OF GLOBALISATION IN ARCHITECTURAL PRACTICE
Globalisation (meaning, advantages) – WTO and GATS and their relevance to architectural profession in India – Pre-requisites for Indian architects to work in other countries – Preparedness and infrastructure requirements for global practice – Entry of foreign architects in India (views for and against) – Information Technology and its impact on architectural practice.
UNIT V EMERGING SPECIALISATIONS FOR AN ARCHITECT

Construction management (Role, function, and responsibilities of a construction manager) – Project management (Concept, Objectives, Planning, Scheduling, Controlling and Role and Responsibilities of project manager) – Suitability of architect as construction / project manager – Programme evaluation review Techniques (event, activity, dummy network rules, graphical guidelines for network – PERT network).

TOTAL: 45 PERIODS

REQUIRED READING:
5. WTO and GATT guidelines.

REFERENCES:

AD9502 SPECIFICATIONS AND ESTIMATION

AIM:
To enable students understand the method of writing specifications for the various items of works involved in the building to expose him / her the procedure involved in estimating quantities of materials and works, various costs involved, various financial institutions and to prepare feasibility report of a project – simple projects will be introduced for preparation of specification and estimates.

OBJECTIVES:
- To inform to students the need and importance of specification, how to write specification – important aspects of the design of a specification.
- To inform to students the need for estimation the concept of abstract and detailed estimates based on measurement of materials and works.
- To inform to students cost control and budgeting and operation cost and to make students know the various financial agencies involved in land and building development.
- To enable students understand the importance of feasibility report, implication and importance of valuation and depreciation.

UNIT I SPECIFICATION

UNIT II  SPECIFICATION WRITING  10
Brief Specification for 1st class, 2nd class, 3rd class building. Detailed specification for earthwork excavation, plain cement concrete, Reinforced concrete, first class and second class brickwork, Damp proof course, ceramic tiles/marble flooring and dadooring, woodwork for doors, windows frames and shutters, cement plastering, painting & weathering course in terrace.

UNIT III  ESTIMATION  10
Types & purpose, Approximate estimate of buildings – Bill of quality, - Requirement for preparing estimation, factors to be considered, - principles of measurement and billing, contingencies, Elementary billing and measurement of basic materials like brick, wood, concrete and unit of measurement for various items of work – abstract of an estimate.

UNIT IV  DETAILED ESTIMATE  10
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 using centre line method and long and short wall method.

UNIT V  COST ESTIMATING & COST BUDGETTING  10
Function of Cost planner – liaison with consultant, operation cost Exercise in variation, Cost adjustment and Cost analysis.

TOTAL 45 PERIODS

REQUIRED BOOKS:
1. Estimating, Costing and Valuation(Professional practice) By Rangwala – S.C
   CHAROTAR PUBLISHING HOUSE, INDIA.

REFERENCES

AD9503  HUMAN SETTLEMENT PLANNING  L T P/S C
3 0 0 3

AIM:
To provide an overview of the vocabulary of Human settlements, while looking at planning concepts and processes in urban and regional planning and urban renewal.

OBJECTIVES:
• To introduce the elements of Human settlements and the classification of Human settlements.
• To outline the form and structure of settlements and illustrating through case studies.
- To familiarize the students with modern concepts of Settlement Planning.
- To outline the scope and content of Urban planning, Urban renewal and Regional planning and the various plans to be prepared.

### UNIT I INTRODUCTION

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

### UNIT III PLANNING CONCEPTS
Planning concepts and their relevance to Indian Planning practice in respect of Ebenezer Howard – Garden city concepts and contents – Patrick Geddes – Conservative surgery – case study – C.A. Perry – Neighborhood concept Le Corbusier – concept and case studies

### UNIT IV URBAN PLANNING
Scope and Content of Master plan – planning area, land use plan and Zoning regulations – zonal plan – need, linkage to master plan and land use plan – planned unit development (PUD) – need, applicability and DCR

### UNIT V URBAN RENEWAL AND REGIONAL PLANNING
Urban Renewal Plan – Meaning, Redevelopment, Rehabilitation and Conservation – Regional Plan – Area delineation, Land utilization plan, hierarchical system of settlements, their sizes and functions

**TOTAL: 45 PERIODS**

**REQUIRED READING:**

**REFERENCES:**
AIM:
To understand the continuity of built environment from the macro to the micro scale as well as to make aware of the discipline of urban design

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 6
Components of urban space and their interdependencies- outline of issues/ aspects of urban space and articulation of need for urban design- scope and objectives of urban design as a discipline

UNIT II HISTORIC URBAN FORM 10
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

UNIT III THEORISING AND READING URBAN SPACE 10
Ideas of Imageability and townscape: Cullen, Lynch- place and genius loci- collective memory- historic reading of the city and its artefacts: Rossi- social aspects of urban space: life on streets and between buildings, gender and class, Jane Jacobs, Wiiliam Whyte

UNIT IV ISSUES OF URBAN SPACE 10
Understanding and interpreting of urban problems/ issues- place-making and identity, morphology: sprawl, generic form, incoherence, privatized public realm- effects/ role of real estate, transportation, zoning, globalisation - ideas of sustainability, heritage, conservation and renewal- contemporary approaches : idea of urban catalyst, transit metropolis, community participation.

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

TOTAL: 45 PERIODS

REQUIRED READING:
2. Edmund Bacon , Design of Cities , Penguin, 1976
4. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999
5. Time Saver Standards for Urban Design
6. Kevin Lynch, Image of the City
REFERENCES:
4. Urban Design Futures
5. Geoffrey Broadbent, Emerging Concepts in Urban Space Design

AD 9505  ARCHITECTURAL DESIGN VI  L T P/S C
0 0 16 8

AIM:
To explore the continuity and dynamics of urban form with a thrust on the interrelationships between the disciplines of architecture, urban design and town planning

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

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

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

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

REQUIRED READING:
2. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999
3. I. Jawgeih, Life between Buildings, - Using Public Space, Arkitektens Forleg 1987
4. Time Savers Standard for Urban Design
5. Urban design Futures

TOTAL: 240 PERIODS
REFERENCES:

OBJECTIVE:
All the five years of architectural design 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, rural settlements, environmental design, conservation and heritage precincts, landscape design, housing etc. However, the specific thrust should be architectural design of built environment.

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

TOTAL: 510 PERIODS

REQUIRED READING:
1. Linda Grant and David Wang, Architectural Research Methods, John Wiley Sons, 2002

REFERENCES:
2. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999
AIM:
To study everyday architecture in the traditional context built in various cultural and geographical regions of India with an emphasis on building types, use, materials, construction and building process.

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.

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

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

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

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

UNIT V WESTERN INFLUENCES ON VERNACULAR ARCHITECTURE OF INDIA
Colonial influences on the Tradition Goan house
Evolution of the Bungalow from the traditional bangla, Victoria Villas – Planning principles and materials and methods of construction.
Settlement pattern and house typologies in Pondicherry and Cochin.

TOTAL: 45 PERIODS

REQUIRED READINGS:
AD9022 ENERGY EFFICIENT ARCHITECTURE

AIM:
In the face of a crisis of depleting resources the aim is to familiarize the student with passive design consideration and the use of non renewable sources of energy in buildings.

OBJECTIVES:
• To inform the need to use renewable sources of energy in view of the depleting resources and climate change.
• To familiarise the students with passive design considerations and passive heating and cooling of buildings and the various methods used.
• To inform about the importance of day lighting and natural ventilation in building design through analysis and case studies.

UNIT I ARCHITECTURE AND ENERGY
Solar System and Earth - Renewable Sources of Energy - Global Climates and Architecture in Historic Perspective - Contemporary Trends - Sustainability and Architecture

UNIT II SOLAR PASSIVE ARCHITECTURE
Design Considerations involving Site Conditions, Building Orientation, Plan form and Building Envelope - Heat transfer and Thermal Performance of Walls and Roofs

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

UNIT IV PASSIVE COOLING
Evaporative Cooling - Nocturnal Radiation cooling - Passive Desiccant Cooling - Induced Ventilation - Earth Sheltering - Wind Tower - Earth Air Tunnels

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

TOTAL: 45 PERIODS

REQUIRED READING:
REFERENCES:

AD9023 STRUCTURE AND ARCHITECTURE L T P/S C
3 0 0 3

AIM:
This course is geared towards the integration of contemporary structural design in the form making process of architectural design. It will encourage the student to exercise judgement in areas of structure, form and process.

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

UNIT I HISTORY OF STRUCTURAL DESIGN IN THE PRE INDUSTRIAL ERA 9
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 9
Post Industrial modular construction of large span and suspension structures in steel and concrete- projects of Pier Nuigi Nervi, Maillart, Candella, Buckminster Fuller and Eero Saarinen.

UNIT III CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDY – I 8
The select case studies could include
KCR Terminal at Hung Hom, Hong Kong, B3 Offices in Stockley Park , Sainsbury Centre for Visual Art, Renault Centre and Swindon UK by Normal Foster and Standsted Airport Terminal, London, UK by Fosters/Arup
British Pavillon EXPO 1992, Seville, Spain and Waterloo International Terminal by Nicholas Grimshaw

UNIT III CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDY – II 8
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 10
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.

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

AD9024 COMPUTER APPLICATIONS IN ARCHITECTURE L T P/S C 1 0 4 3

AIM:
This course aims to introduce the digital art to the students through series of sessions of demonstration of software and projects and to engage students with media in the specific Context and Design fundamentals.

OBJECTIVES:
- To impart training in video editing, image editing and vector editing.
- To impart training in Pixel and vector animation
- To impart training in web presentations to enable web publishing.
- To introduce students to Flash and Director to enable the production of presentations and CDs

CONTENT:
UNIT I VIDEO EDITING 15
Importing avis and mpegs, sequencing, cutting trimming, decrease and increase the speed of the movie, filters, transitions, output settings, saving the output.

UNIT II IMAGE EDITING & VECTOR EDITING 10
Using tools, transparency, layers, masking, effects, image adjustments, transform, text, history, gradient (fill types), cropping, image size, resolution, keyboard shortcuts, etc. image editing (pixel image types) using tools. Vector characters, bizer and grip editing, transform, fill types, text formatting, colour overlays, etc.
UNIT III  PIXEL AND VECTOR ANIMATION  10
GIF animation and other various animation types, morphing etc. vector animation – using time line, understanding sequencing, using symbols (library), shape and motion Tweening

UNIT IV  WEB  9
Web presentations, understanding links & navigation, creating web pages, creating ‘folder tree’

UNIT V  NON LINEAR PRESENTATION (FLASH & DIRECTOR)  15
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-rooms

TOTAL: 60 PERIODS

REQUIRED READINGS:

REFERENCES:
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

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

REFERENCES
1. Victor Papanek, Design for the real world
2. Edward De Bono, Lateral Thinking
3. Design methods - Christopher Jones

AD9026 INTERIOR DESIGN L T P/S C
3 0 0 3

AIM:
The objective of the course to create awareness and exposure to interior design as a discipline that is closely related to the field of architecture and supplementing it. It would offer a rudimentary knowledge and overview of the various aspects of interior design.

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

UNIT I  INTRODUCTION TO INTERIOR DESIGN  9
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  9
Overview of interior and furniture design in the Western context through the ages relating to historical context, design movements and ideas - overview of folk arts and crafts of India with reference to their role in interior decoration.

UNIT III  COMPONENTS OF INTERIOR SPACE- INTERIOR TREATMENT AND FINISHES  9
Treatment of components such as floors, ceilings, walls, partitions, window treatments, accessories, etc., in terms of their choice and design related to materials, methods of construction, colour, texture, etc., based on functional, aesthetic and psychological criteria

UNIT IV  COMPONENTS OF INTERIOR SPACE- LIGHTING AND LANDSCAPING  9
Interior lighting - different types of lighting - types of lighting fixtures- their effects and suitability in different contexts
Interior landscaping elements: rocks, plants, water, flowers, fountains, paving, artifacts, etc., their physical properties and effects on spaces

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

TOTAL: 45 PERIODS

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

REFERENCES:
1. Helen Marie Evans, An Invitation to design, Macmillan Pub Co 1982
4. Kathryn B.Hiesinger and George H.Marcus, Landmarks of twentieth Century Design; Abbey Ville Press 1993
5. Susanne Slesin and Stafford Cliff, Indian Style, Clarkson N.Potter, Newyork 1990
AIM:
To enable the understanding of the factors that led to the growth of settlements and the changing scenario in the contemporary world.

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

CONTENT:

UNIT I  IMPORTANCE OF EVOLUTION OF HUMAN SETTLEMENTS  10
Origin of civilization, effects of civilization on Human settlements, determinants of Human settlements, ancients towns in India.

UNIT II  HISTORICAL PERIODS AND GROWTH OF HUMAN SETTLEMENTS  10
Ancient, medieval, renaissance, industrial and post industrial age

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

UNIT IV  HUMAN SETTLEMENTS AS POLITICAL EXPRESSION  10

UNIT V  HUMAN SETTLEMENTS IN A CHANGING WORLD  6
Global city and city origion and Global economy and Trade, information and communication technology and its impact on cities, city of the future and future of cities.

TOTAL: 45 PERIODS

REFERENCES:

REQUIRED READING:
5. Pirenne H (1925) Medieval cities, Princeton Press
AIM:
The objective of the course is to understand and appreciate art in terms of its form, content and context through the study of works of art over history in order to develop a sensitivity towards aesthetics which is a necessary component of architecture.

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.

CONTENT:

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:

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

TOTAL :45 PERIODS
REQUIRED READING
1. Fred, S. Kleiner, Gardener’s Art through Ages, Harcourt College Publishers, 2001
3. Edith Thomory- a History of Fine Arts in India and the West, Orient Longman Publisher’s Pvt. Ltd, New Delhi

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

AD9071 URBAN HOUSING L T P/S C
3 0 0 3

AIM:
The course is designed to inform about the process of housing in the context of the scarcity housing resources in India.

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

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

Housing demand and supply – National Housing Policy – Housing agencies and their role in housing development – impact of traditional life style – Rural Housing, Public, private sector housing.

UNIT II SOCIO-ECONOMIC ASPECTS
Social economic factors influencing housing affordability – equity in housing development sites and services/-slum upgradation community participation – Indira Awas Yojana
Crime prevention, Health principles in Housing.
UNIT III  HOUSING STANDARDS 7

UNIT IV  SITE PLANNING AND HOUSING DESIGN 10
Site Planning:
Selection of site for housing, consideration of physical characteristics of site, locational factors, orientation, climate, topography – Landscaping.

Housing design:
Traditional housing, row housing, cluster housing – apartments and highrise housing relating to Indian situations – case studies in India – integration all types of services, parking, incorporation of green sustainable practices – prefabrication in housing.

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

REFERENCES:
5. HUDCO publications – Housing for low income, sector model.

TOTAL: 45 PERIODS

AD9072  DIGITAL ART  L T P/S C
1 0 4 3

AIM:
This unit aims to introduce the digital art to the students through series of sessions of demonstration of software and projects.

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 15
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 like ADOBE PREMIERE. Image editing (pixel image types) using tools, Vector
characters, bizer and grip editing, transform, fill types, text formatting, colour overlays, etc in ADOBE PHOTOSHOP

UNIT II          OVERLAPPING TECHNIQUE (2D ANIMATION WITH MOVIE)              20
Project: Import Movie file in the editing software like premiere and overlap the 2D Animation film created using Flash. 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 in Flash/Director. Through this scripting tools will be taught.
Tools: Scripting in software like Flash/ Director 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: Software like fruity loops and sound forge 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-rooms.

TOTAL: 75 PERIODS

REQUIRED READING:
1. Photoshop 7 Bible Professional Edition, Wiley John & Son INC, New York, DekeMcClelland,

REFERENCES:

AD9073          PRINCIPLES OF TRADITIONAL INDIAN ARCHITECTUR                  L T P/S C
                                             3 0 0 3

AIM:
To provide theoretical knowledge base on the uniqueness of Indian traditional Architecture principles, the meaning of space, the manifestation of energy, the selection of site and how integration of built form with site happens at metaphysical level based on articulation of celestial grid.

OBJECTIVES:
- To introduce the principles of Vastu and Vaasthu and relationship between building and site.
- To familiarize the students with the units of measurement in traditional architecture.
- To introduce concepts of orientation and cosmogram according to the Vasthu Purusha Mandala.
• To study the detailing and design of various building components and their material and method of construction.

CONTENT:

UNIT I INTRODUCTION 9
Vastu and Vaastu - its definition and classification - Relationship to earth.

Features of good building site - good building shapes - macro, micro, enclosed and material spaces - relationship between built space, living organism and universe - impact of built space on human psyche.

UNIT II MEASUREMENT AND RESONANCE TO VIBRATION 9
Units of measurement - Tala system and Hasta system of measures

Theory of vibration - vibration as time, equation of time and space - Time space relationship and measurement of the same.

UNIT III SITE PLANNING AND COSMOGRAM 9
Orientation of building, site, layout and settlement - positive and negative energies - importance of cardinal and ordinal directions - The celestial grid or mandala and its types.

The Vaastu Purusha Mandala and its significance in creation of patterns, and lay-outs, Types of lay-outs. Simple design of residential buildings.

UNIT IV COMPONENTS AND DETAILING 9
Building heights - Base and basement - wall and roof specifications - column and beam designs - Pitched roof and domical roofs - significance of pyramid.

UNIT V MATERIALS AND CONSTRUCTION 9
Use of wood, stone, metal, brick and time - marking technology, corbelling technology, jointing technology - foundations for heavy and light structures - Landscaping in and around buildings - Aesthetics in Indian Architecture.

REQUIRED READINGS:
4. Dr. V.Ganapati Sthapati - "Sthapatya Veda" Dakshina Publishing House, Chennai-41, India, 2001

REFERENCES:
3. Ananda Kentish Coomaraswamy, Symbolism of Indian Architecture” – Historical Research Documentation Programme, Jaipur, 1983
AIM:
To familiarize students with landscape architecture as a discipline and the many facets it entails.

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

CONTENT:

UNIT I   INTRODUCTION
Introduction to landscape architecture, ecology, ecological balance, landscape conservation, reclamation and landscaping of derelict lands, environmental impact assessment.

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

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

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

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

REQUIRED READING:

REFERENCES:
AIM:
The course is designed to give the students an overview of the building industry and the various advancements in the area of construction technology and practice.

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

CONTENT:
UNIT I GENERAL BUILDING REQUIREMENTS 6
Classification of buildings - Sites and Services - Requirements of parts of buildings.

UNIT II CONSTRUCTION SYSTEMS 10
Planning - Cast in situ construction (ready mixed pumped etc.) Reinforced concrete and prestressed concrete constructions precast concrete and pre-fabrication system - Modular coordination – Structural schemes.

UNIT III CONSTRUCTION PRACTICE 10
Manufacture, storage, transportation and erection of precast component forms, moulds and scaffoldings in construction - safety in erection and dismantling of constructions.

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

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

TOTAL : 45 PERIODS

REQUIRED READINGS:

REFERENCES:
AIM:
This course is designed to address Conservation as an idea that enhances quality of life, as an effective planning strategy, a criticism of universal modernism and a way to address issues of memory and identity. An overview of current status of conservation in India is also provided

OBJECTIVES:

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

CONTENT:

UNIT I    INTRODUCTION TO CONSERVATION

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

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

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

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

TOTAL: 45 PERIODS

REQUIRED READING
REFERENCES:
1. B.K. Singh, State and Culture, Oxford, New Delhi

AD9077 CONTEMPORARY PROCESSES IN ARCHITECTURE

L T P/S C
3 0 0 3

AIM:
This course is designed to understand the relation between digital technology, media and architecture. It is also looks at how technology enables critical engagement with architecture and is addressed through theories and practices proposed by contemporary architects.

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

CONTENT:
UNIT I INTRODUCTION
6

UNIT II ASPECT OF DIGITAL ARCHITECTURE
9

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
10

UNIT V SEMINAR
10
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 + Umemotto, Lars Spuybroek / NOX Architects, UN studio, Diller Scofidio, Dominique Perrault, Decoi, Marcos Novak, Foreign Office Architects, Asymptote, Herzog and de Meuron, Neil Denari.

TOTAL: 45 PERIODS
REQUIRED READING
2. Ignasi de Sola Morales, High Tech: Functionalism of Rhetoric
8. Peter Eisenmann, Diagram: An Original Scene of Writing, Diagram Diaries

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

AD9078 SAFETY SYSTEMS AND BUILDING MANAGEMENT L T P/S C
3 0 0 3

AIM:
The course is designed to impart basic knowledge in Safety, security and building automation and integrated building management systems

OBJECTIVE:
• To familiarize the student with minimum safety requirements for a high rise building with exposure to NBC.
• To study fire alarm systems and fire suppression systems and their installation..
• To inform students of various types of security systems and their application in building.
• To outline the importance and objectives of an Integrated building management system.

CONTENT:

UNIT I SAFETY REQUIREMENTS
Minimum safety requirements for a building, particularly for a high rise building according to the National Building Code.

UNIT II FIRE ALARM SYSTEMS
Objectives of a Fire Alarm System, Essential components of a Fire Alarm System, Technology of detection, Type of Statutory Standards followed in direction, Explanation on the essential
clauses, various types of technologies employed in the Fire Alarm System, basic knowledge on how a Fire Alarm System is designed and installed

UNIT III  FIRE SUPPRESSION SYSTEMS:  10
Objectives of a Fire Suppression System, Explanation on fire triangle, Essential components of a Fire Suppression System, different types of Fire Suppression Systems, Type of Statutory Standards followed in Suppression, Explanation on the essential clauses and basic knowledge on how a Fire Suppression System is designed and installed.

UNIT IV  SECURITY SYSTEMS  10
Introduction to different types of Security Systems and why they are required. Introduction to Access Control, CCTV, Intruder Alarm and Perimeter protection Systems, Essential components of each system, various types of technologies employed in these Systems, basic knowledge on how they are designed and installed.

UNIT V  INTEGRATED BUILDING MANAGEMENT SYSTEM  8
The objectives of the Integrated Building Management System (IBMS), the list of utility, safety and security systems that are generally monitored and controlled through IBMS, the various components of IBMS, types of integration with the utility, safety and security systems and the basic knowledge on how they are designed and installed.

TOTAL: 45 PERIODS

REQUIRED READING:
1. Building Automation Systems – A Practical Guide to selection and implementation – Author: Maurice Eyke
2. National Building Code of India 1983 (SP 7:1983 Part IV) – Published by Bureau of Indian Standards
3. IS 2189 – Selection, Installation and Maintenance of Automatic fire Detection and Alarm System – Code of Practice (3rd Revision) – Published by Bureau of Indian Standards.

REFERENCES:
1. The Principles and Practice of Closed Circuit Television – Author: Mike Constant and Peter Turnbull
3. Fire Suppression Detection System – Author: John L. Bryan
4. Design and Application of Security/Fire Alarm system – Author: John E. Traister.
5. CCTV Surveillance – Author: Herman Kruegle

AD9079  ADVANCED STRUCTURES  L T P/S C
3 0 0 3

AIM:
The aim of this course is design pre-stressed concrete beams and the estimation of the loss of pre-stressing.

OBJECTIVES:
- To study loss of pre-stress and design requirements for determinate beams.
- To study the design of flat slabs and High Rise structures.
- To study the concepts of tensile structures, grids, domes, shells and folded plates.
CONTENT:

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

UNIT II    FLAT SLABS  8

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

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

UNIT V    GRIDS, DOMES AND FOLDED PLATES  7

TOTAL: 45 PERIODS

REQUIRED READING:

REFERENCES:
1.  P. Dayarathnam, prestressed concrete structures, Oxford and IBM publishing Co., New Delhi, 1982
AIM:
To provide an overview of the concepts of sustainable practices in planning the built environment.

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

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

UNIT II
Eco system and food chain, natural cycles – Ecological footprint – Climate change and Sustainability.

UNIT III

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

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

REFERENCES:

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

TOTAL: 45 PERIODS
AIM:
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 India and lives lost during past earthquakes due to damage of homes and other buildings are enormous.

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

CONTENT:
UNIT I
Fundamentals of earthquakes
- Earth's structure, seismic waves, plate tectonics theory, origin of continents, seismic zones in India.
- Predictability, intensity and measurement of earthquake
- Basic terms - fault line, focus, epicentre, focal depth etc.

UNIT II
Site planning, performance of ground and buildings
- 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
I. Seismic design codes and building configuration
   Seismic design code provisions – Introduction to Indian codes
   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
II. Various types of construction details
   a) Seismic design and detailing of non-engineered construction- masonry structures, wood structures, earthen structures.
   b) Seismic design and detailing of RC and steel buildings
   c) Design of non-structural elements- Architectural elements, water supply, drainage, electrical and mechanical components

UNIT V
III. Urban planning and design
   a) Vulnerability of existing buildings, facilities planning, fires after earthquake, socio-economic impact after earthquakes.
   b) Architectural design assignment- Institutional masonry building with horizontal spread and height restriction, multi-storeyed RC framed apartment or commercial building.
REQUIRED READING:
1. Guidelines for earthquake resistant non-engineered construction, National Information centre of earthquake engineering (NICEE, IIT Kanpur, India)
2. C.V.R Murthy, Andrew Charlson. “Earthquake design concepts”, NICEE, IIT Kanpur India.

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