# I & II Semester Curriculum

## B.Arch

### Semester I

#### Theory

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**Total** 12 0 22 24

### Semester II

#### Theory

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**Total** 12 0 22 24
# I & II SEMESTERS SYLLABI

## B. ARCH

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

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

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

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

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

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

**TOTAL: 45 PERIODS**

### TEXT BOOK:

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

UNIT I        PREHISTORIC AGE

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

UNIT III      ANCIENT RIVER VALLEY CIVILIZATIONS: MESOPOTAMIA
Ziggurat of Ur, Urnamu – Palace of Sargon, Khorsabad – Palace at Persepolis

UNIT IV        CLASSICAL PERIOD: GREECE

UNIT V        CLASSICAL PERIOD: ROME

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

TOTAL : 45 PERIODS
REFERENCES

AR6102 THEORY OF ARCHITECTURE - I

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

UNIT I INTRODUCTION TO ARCHITECTURE

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

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

UNIT IV ELEMENTS OF ARCHITECTURE – SPACE

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

TOTAL: 45 PERIODS
REQUIRED READINGS:

REFERENCES:

AR6103 BUILDING MATERIALS - I L T P/S C
3 0 0 3

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

UNIT I SOILS
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
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
Bamboo – Bamboo as plant classification, species, geographical distribution, Anatomy of Bamboo, Properties, strength, processing, harvesting, working of Bamboo tools – Treatment and preservation of Bamboo and uses of Bamboo. Cane, gate, coir, coconut - Growth, Form, Shape, Leaves, Flowering, Propagation Roofing materials – Thatch, grass, Bamboo, reeds – Basics – Case studies and applications.
UNIT IV STRAW BALES
Straw as a building material-physical aspects - Basics, Fire, moisture, insects and pests proof. Plastering straw bale walls, straw bale roof.

UNIT V ROCKS AND STONES

REQUIRED READINGS:

REFERENCES:

AR6111 ARCHITECTURAL DRAWING - I
OBJECTIVES
- To introduce the concepts and fundamentals of architectural drawing, to develop representation skills and to nurture the understanding of the nature of geometrical forms and simple building forms and to teach the language of architectural and building representation in two- and three- dimensions; To introduce the basics of measured drawing.

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

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

UNIT III GEOMETRICAL DRAWING: SOLID GEOMETRY
Multi- view projection of solids – cube, prism, pyramids, cones, cylinders etc.; Sections of solids, true shape of solids.
UNIT IV    GEOMETRICAL DRAWING: AXONOMETRIC PROJECTION  10
Isometric, plan oblique and elevation oblique projection of planes, solids and combination of
solid etc.

UNIT V    MEASURED DRAWING  20
Isometric, plan oblique and elevation oblique projection of planes, solids and combination of
solid etc.

TOTAL : 75 PERIODS

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

REFERENCES:

AR6112    ART STUDIO

L  T  P/S  C
0  0  5  3

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

UNIT I    DRAWING  24
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.
Exercise involving Indoor and out door sketching – Spot sketching -  Drawing from
imagination – Study of 3 D effects through light and shade from nature – Tools and materials
– Illustration – Study of human being and mobiles.

UNIT II    PAINTING I  12
Introduction of painting – Colour – Properties of colour – Colour schemes – Types of colours
- Application and visual effects of colour. Exercise involving Study of colour – Properties of
paper, brush and other tools – Basic washes – 3D effects from still-life, nature and built
environment using mono chromatic and multi colour.
UNIT III  PAINTING II

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

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

TOTAL: 75 PERIODS

REQUIRED READINGS

REFERENCES:

AR6113  BASIC DESIGN

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

Contents:
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: 180 PERIODS

REQUIRED READINGS:

REFERENCES:

AR6201 MECHANICS OF STRUCTURES - I L T P/S C
3 0 0 3

OBJECTIVES:
- To enable a student to understand the effect of action of forces on a body and the concept of equilibrium of the body through exercises.
- To determine the internal forces induced in truss members due to external loads by working out problems.
- To calculate the sectional properties (centroid, moment of inertia, section modulus and radius of gyration) for various sections by working out problems.
- To study the stress – strain behaviors of steel and concrete due to axial loads and to determine the stresses and strains developed in solids due to external action through select problems.
- To derive the relationship between elastic constants and solving problems.
UNIT I  FORCES AND STRUCTURAL SYSTEMS
Types of force systems - Resultant of forces-Lami's theorem- principle of moments
varignon’s theorem - principle of equilibrium (no reaction problems) - simple problems

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

UNIT III  PROPERTIES OF SECTION
Centroid- Moment of Inertia - Section modules – Radius of gyration - Theorem of
perpendicular axis - Theorem of parallel axis –simple problems.

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

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

TOTAL: 45 PERIODS

REQUIRED READINGS

REFERENCES:
   Delhi 1994.
   1989.

AR6202  HISTORY OF ARCHITECTURE AND CULTURE - II
        L T P/S C
        3 0 0 3

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

UNIT I  ANCIENT INDIA
Indus Valley Civilization: culture and pattern of settlement.- Aryan civilization – theories and
debates of origin- origins of early Hinduism - Vedic culture - Vedic village and rudimentary
forms of bamboo and wooden construction - origins of Buddhism and Jainism.

UNIT II  BUDDHIST ARCHITECTURE
Evolution of Buddhism, Buddhist thought, art and culture - Hinayana and Mahayana
Buddhism - interaction of Hellenic & Indian Ideas in Northern India - evolution of building
typologies- the stupa, vihara and the chaitya hall - symbolism of the stupa - architectural
production during Ashoka's rule Ashokan Pillar, Sarnath - rock cut caves at Barabar - Sanchi
Stupa- rock cut architecture in Ajanta and Ellora - Karli - viharas at Nasik - Rani gumpha,
Udaigiri - Takti Bahai, Gandhara.
UNIT III  EVOLUTION OF HINDU TEMPLE ARCHITECTURE  10
Hindu forms of worship – evolution of temple form - meaning, symbolism, ritual and social importance of temple - categories of temple - elements of temple architecture - early shrines of the Gupta and Chalukyan periods

UNIT IV  TEMPLE ARCHITECTURE - SOUTHERN INDIA  12
Brief history of South India - relation between Bhakti period and temple architecture - of temple towns - Dravidian Order - evolution and form of gopuram

UNIT V  TEMPLE ARCHITECTURE - NORTHERN INDIA  7
Temple architecture of Gujarat, Orissa, Madhyapradesh and Rajasthan - their salient features Lingaraja Temple, Bhuvaneswar - Sun temple, Konarak. - Somnatha temple, Gujarat, Surya kund, Modhera Khajuraho, Madhyapradesh - Dilwara temple, Mt. Abu
TOTAL: 45 PERIODS

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

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

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

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

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

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

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

TOTAL :45 PERIODS

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

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

AR6204        BUILDING MATERIALS - II
L T P/S C
3 0 0 3

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

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

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

UNIT III TIMBER 8

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

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

TOTAL: 45 PERIODS

REQUIRED READINGS

REFERENCES:

AR6211 BUILDING CONSTRUCTION - I L T P/S C
0 0 5 3

OBJECTIVES
- To involve students in a number of drawing exercises that will analyze the various building components in a simple load bearing structure.
- To involve students in a number of drawing exercises that will look at the design and detail of simple structures using naturally occurring materials such as mud, bamboo, straw, etc.
- To involve students in a number of drawing exercises that will look at the design and detail of various building components in a simple load bearing structure using stone.
UNIT I  
**INTRODUCTION**  
10  
Functional requirements of building and its components, introduction to concept of load bearing and framed structures. Exercises – involving the same.

UNIT II  
**SOILS**  
20  
Detailing of walls, roofs, flooring and foundations using soils (rammed earth, compressed blocks). Design exercises using soil for building components in small scale buildings like laborer’s house, art centre, snack bar including detailing of arches, walls, door and window openings and understanding of the same through case studies.

UNIT III  
**BAMBOO**  
13  
Design and Construction Techniques using bamboo for building components for small scale buildings like snack bar, tree house including detailing of doors and windows, arches, barrel walls, weave structures and understanding of the same through case studies.

UNIT IV  
**STRAW BALES**  
12  
Design Exercises: using straw bales for building components for Load bearing, Post and Beam systems, Foundations systems, Roofing options, plastering, door and window detailing for small scale buildings and understanding of the same through case studies.

UNIT V  
**STONE**  
20  
Design Exercises – Using stone (Ashlar, rubble etc.,) for building components including detailing of arches, corbels, coping, sills, lintels, corbels, arches, cladding in small scale buildings like classrooms, library and community hall and understanding the same through case studies.

**TOTAL: 75 PERIODS**

**REQUIRED READINGS:**


**REFERENCES:**


AR6212  
**ARCHITECTURAL DRAWING - II**  
L T P/S C 0 0 5 3

**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 scioigraphy.
- To involve students in a number of exercises that will help to understand the measured drawing method to document buildings of architectural interest using simple and advance techniques of representation.

UNIT I  
**SCIOGRAPHY**  
10  
UNIT II  PERSPECTIVE: SCIENTIFIC METHOD  25
Characteristic of perspective drawing. Concepts and methods of perspective drawing. One point and two point perspective of simple geometrical shapes like cube, prism, combination of shapes, simple one, two and three-point perspective of building interiors and exteriors. Adding of figures, trees furniture etc., shade and shadows and applying rendering techniques.

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

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

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

TOTAL:  75 PERIODS

REQUIRED READINGS:

REFERENCES:
I. MEASURED DRAWING

II. PERSPECTIVE

III. SCIOGRAPHY

AR6213   ARCHITECTURAL DESIGN - I   L T P/S C
         0 0 12 6

OBJECTIVES:
- To enable the conceptualization of form, space and structure through creative thinking and to initiate architectural design process deriving from first principles.
To involve students in a design project(s) that will involve simple space planning and the understanding of the functional aspects of good design.

To involve students in a small scale building project(s) which will 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.

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

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

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

TOTAL: 180 PERIODS

REQUIRED READING:
4. Ernst Neuferts Architects Data, Blackwell 2002

REFERENCES: