SAVITRIBAI PHULE PUNE UNIVERSITY
(Formerly the University of Pune)

SYLLABUS FOR
FIRST YEAR B. ARCH.
2025 PATTERN

BOARD OF STUDIES IN ARCHITECTURE
FACULTY OF SCIENCE AND TECHNOLOGY

COURSE STRUCTURE

FIRST YEAR B.ARCH

(2025 Pattern)

Semester I

Sr. No	Subject Code	Course Title	No of Credits	Lecture Hours	Studio Hours	Total Hours	SS	SV	Total Marks
1	1202501	Basic Design	6	2	4	6		200	200
2	1202502	Building Construction and Materials I	4	1	3	4		150	150
3	1202503	Structures I	3	2	1	3		100	100
4	1202504	Fundamentals of Architecture	3	2	1	3	100		100
5	1202505	Architectural Drawing and Graphics I	3	1	2	3	100		100
6	1202506	Computer Aided Drawing I	3	1	2	3	100		100
7	1202507	Workshop I	4	1	3	4	150		150
		Total	**26**	**10**	**16**	**26**	**450**	**450**	**900**

Semester II

Sr. No	Subject Code	Course Title	No of Credits	Lecture Hours	Studio Hours	Total Hours	SS	SV	Total Marks
1	1202508	Architectural Design I	7	2	5	7		250	250
2	1202509	Building Construction and Materials II	4	1	3	4		150	150
3	1202510	Structures II	3	2	1	3		100	100
4	1202511	Architectural Diagramming, Sketching, Visualisation	2	1	1	2	50		50
5	1202512	Architectural Drawing and Graphics II	3	1	2	3	100		100
6	1202513	Computer Aided Drawing II	3	1	2	3	100		100
7	1202514	Workshop II	4	1	3	4	150		150
		Total	**26**	**9**	**17**	**26**	**400**	**500**	**900**

SEMESTER I

BASIC DESIGN		
Semester I B.Arch.		
Course Code	1202501 (SV)	
Teaching Scheme	Examination Scheme	
Total Contact Hours/ Week: 6	Sessional (CIA 75+EA 75) Viva (INT 25+ EXT 25)	 150 50
Lecture Hours/ Week: 2	Total Marks	200
Studio Hours/ Week: 4	Total Credits	6

COURSE DESCRIPTION :

Architectural Design is at the core of the five year program in Architecture. Design stream is a new stream for students entering this program. The course of Basic Design is aimed at introducing the students to the basic components and principles of design in both two and three dimensions. It also introduces students to the concept of space design and the elements that define space. The course is a combination of explanatory lectures by teachers and individual hands-on work by the students. The course has an interface with the following courses: Workshop I and II, Fundamentals of Architecture, and Space and Place.

COURSE OBJECTIVES :

1. Introducing basic components and principles of design.
2. Apply in developing 2D and 3D compositions.
3. Introducing the concept and elements of spatial design
4. Introducing models and drawings as tools of conceptualization and furthering of design thought process.

BROAD COURSE OUTCOMES :

At the end of the course, the students are expected to develop:

1. Ability to comprehend the use of components and the principles of their organization in architectural design.
2. Ability to apply the understanding of form in creation and analysis of architectural form.
3. Ability to apply the understanding of scale and proportion.
4. Ability to analyse space and elements of space making and create simple designs and represent these through drawings and models
5. Ability to describe the characteristics and qualities of a design created by using the components and composition principles mentioned hereunder.

COURSE CONTENT :

Unit 1: Form

Identifying and describing various types of architectural forms (single, compound, complex, additive, subtractive, etc.) and their assemblies, understanding the concerns of architectural form (relation to ground, relation to sky, corner, profile, light and shadow), reducing complex architectural forms to constituent platonic forms and analysing their assembly to understand the interrelationship of their parts.

Unit 2: Composition

Understanding the concept and application of geometry (shapes, additive and subtractive shapes, alignment, regulating lines, modularity), pattern (repetition, type and variation), composition (schema, figure and ground, symmetry, balance) in architectural design, and demonstrating the understanding through analysing existing architectural designs and making one's own 2D and/or 3D compositions.

Unit 3: Scale and Proportion

Understanding the concept of Scale as extent, as comparative attribute of size, (but not as a means of representation and communication); demonstration of the understanding through the use of various scales for making 2D and/or 3D compositions.

Understanding the concept of Proportion (ratios of parts of a shape/ form, ratios of occupied-unoccupied, solid and void, light and dark) in architectural design; understanding and identifying various proportioning systems used by various designers through time (one third, golden ratio, human proportions, modular, geometry based proportions, etc.); demonstrating the use of some proportioning systems through making various 2D and/or 3D compositions.

Unit 4: Space

Understanding the concept of defined, built and enclosed space. Understanding the various methods of defining and enclosing space. Understanding the role of light in the experience of space. Understanding the elements of space making, describing their role in experience building, and applying the knowledge through one's own 3D installation/ model.

SESSIONAL WORK :

It is recommended that each college define the outcomes of the Units specified in the Course Contents. These outcomes need to be assessable through the following sessional work:

Analytical and/or creative assignments to cover all the above units. Each unit to have at least one dedicated assignment. Additional assignments may combine two or more units. Total number of assignments should not be less than five. (Digital media may be used as tools but final assignments must be in hard copy and physical models as applicable.

RECOMMENDED READING :

1. Basics of Design. Friedrich Christoph Wagner. Edition Axel Menges.
2. Learning Basic Design. Pradnya Chauhan. Abhivikas Niketan Publications.
3. Architecture : Form Space and Order – Francis D. K. Ching
4. Elements of Space Making – Yatin Pandya
5. Operative Design: A Catalog of Spatial Verbs.-Anthony di Mari, Nora Yoo. Lawrence King Publishing.
6. 101 Things I Learned in Architecture School. Matthew Frederick. The MIT Press.
7. Graphics Thinking for Arhitects and Designers. Paul Laseau. John Wiley & Sons, Inc.

BUILDING CONSTRUCTION AND MATERIALS I		
Semester I B.Arch.		
Course Code	1202502 (SV)	
Teaching Scheme	Examination Scheme	
Total Contact Hours/ Week: 4	Sessional (CIA 50+EA 50) Viva (INT 25+ EXT 25)	 100 50
Lecture Hours/ Week: 1	Total Marks	150
Studio Hours/ Week: 3	Total Credits	4

COURSE DESCRIPTION :

Building Construction is an important stream and part of the core subjects of Architecture. It is spread across eight semesters as Building Construction and Materials I to VIII. The objective is to train students in progressively complex and advanced building construction technologies and materials. Building Construction and Materials I exposes students to components of a building and various conventional natural and nature based building materials and construction of chiefly compression members. Tension members are introduced in Semester II completing the structural system from foundation to roof. The course also deals with the relevance of climate and life cycle of the building materials as deciding criteria for effective selection of the same.

COURSE OBJECTIVES :

1. To introduce students to the conventional building materials in Architecture.
2. To illustrate and demonstrate the construction of a building from foundation to roof with emphasis on building components in compression.
3. To understand climate as one of the important criteria in material choice.
4. To understand the life cycle of the building materials from sourcing to application to recycling/ reuse.

BROAD COURSE OUTCOMES :

At the end of the course, the students are expected to develop:

1. Ability to understand, identify and draw parts of a building in a load bearing structure such as foundation, walls, and roofs using natural or nature based materials such as mud, brick and stone.
2. Ability to describe the different types of mud construction techniques for wall construction and describe and draw masonry wall construction using brick and stone.

3. Ability to describe and draw spanning members like lintels, arches, and various roofing systems in load bearing construction.
4. Ability to select appropriate building materials and techniques with climate and local characteristics as criteria.
5. Ability to understand the life cycle of mud/ earth, brick, and stone as building materials and their behavioral response to climatic factors.

COURSE CONTENT :

All the units must be taught with explorations in the following building components:
a. Foundation and sub-structure b. Walling systems c. Spanning of openings d. Roofing systems

Unit 1: Soil Mechanics

1. Foundation and its relation to soil bearing capacities and identification of hard strata
2. Different types of soils and strata, concept of bulb of pressure

Unit 2: Mud construction

1. Introduction to mud, earth, and clay a building materials including different types and properties and their limitations.
2. Substructure: Foundations and plinth construction, including damp proofing, using different techniques such as Adobe, Rammed Earth concrete, CSEB masonry
3. Wall construction: Cob, Wattle and Daub, Rammed earth, Mud concrete, CSEB, etc.
4. Spanning of openings in mud walls using masonry, timber, stone and composite lintels.
5. Roofing: Arches, Vaults, Domes including Jack arches, Nubian domes

Unit 3: Stone masonry

1. Introduction to stone as a building material including types of stone, sources, properties and their limitations.
2. Substructure: Foundation and plinth construction, including damp proofing, such as : Strip, Pier foundations, and foundations on sloping site in stone masonry
3. Wall: Different stone masonry systems such as random rubble, coursed rubble, and ashlar masonry and its relation to wall thickness and span; Role of Through stones, Bonder stones in masonry.
4. Spanning of openings using masonry, timber, stone, and RCC lintels.
5. Roofing: Roof using stone slabs with steel/ timber framing (Shahabad flooring, Stone slabs on beams).

Unit 4: Brick Masonry

1. Introduction to brick as a building material, its manufacturing, physical properties, various tests, and its limitations.
2. Substructure: Foundation and plinth construction, including damp proofing, Strip, and Pier foundations, and foundation on sloping sites in brick masonry.
3. Wall: Conventional masonry bonds for wall thickness ranging from half brick to two brick thick walls, innovative bonds such as Rat-trap bond.
4. Spanning of openings using brick masonry such as built-up lintels, different types of arches, timber and RCC lintels.
5. Roofing: Arches, Vaults, Domes including Jack arches, Nubian domes, etc.

Unit 5: Flooring

1. Idea of in-situ (monolithic) flooring using mud and various natural additives such as Gobar (cow dung). Stone tile flooring.
2. Focus on: Creation of plinth and subgrade for flooring, Damp proofing, and finishing in-situ floorings using dividers using glass / brass strips etc.

Unit 6: Selection of Building Materials

1. Effect of climatic factors like sun, wind, and rain on the building materials mentioned above and the building elements constructed employing them.
2. Life cycle from sourcing to application to recycling/ reuse of the building materials mentioned above.

SESSIONAL WORK :

It is recommended that each college defines the outcomes of the Units specified in the Course Contents. These outcomes need to be assessable through the following sessional work:

1. Notes, sketches and exercises reflecting students understanding / learning on Unit 1, Unit 6, and all the building materials mentioned above.
2. Sketches and Market Survey on building materials studied.
3. Minimum 2 tutorials covering Unit 1 and Unit 6, and any other units as per the choice of the college.
4. Minimum 4 Drawing sheets covering Unit 2, Unit 3 and Unit 4 with essential content as follows (details or other content may be added by each college)
    a. Cross sections from foundation to roof covering each building component using the above mentioned material.
    b. Masonry bonds and systems using above mentioned materials.

RECOMMENDED READING :

1. Soil Mechanics and Foundations – B.C. Punmia
2. Building with Earth – Gernot Minke
3. Manual on Cost-Effective Construction Using Stabilised Mud – HUDCO / Auroville Earth Institute
4. Brick by Brick: An Anthology on Architecture and Building – Laurie Baker
5. Architecture & the Indian Village – Laurie Baker
6. Handbook of Low Cost Housing – A.K. Lal
7. Building Construction Illustrated – Francis D.K. Ching
8. Building Materials – Rangwala
9. Cradle to Cradle: Remaking the Way We Make Things – William McDonough & Michael Braungart

STRUCTURES I		
Semester I B.Arch.		
Course Code	1202503 (SV)	
Teaching Scheme	Examination Scheme	
Total Contact Hours/ Week: 3	Sessional (CIA 25+EA 25) Viva (INT 25+ EXT 25)	 50 50
Lecture Hours/ Week: 2	Total Marks	100
Studio Hours/ Week: 1	Total Credits	3

COURSE DESCRIPTION :

Structures I to IV are designed to equip students with a comprehensive understanding of the safety, serviceability, and stability of structural systems. The course series enables learners to comprehend the fundamentals of structural behaviour of buildings and its components, identify various modes of structural failure and explore appropriate remedial measures, estimate sizes of the key structural members based on structural strength and loading systems, and employ appropriate materials, geometry, and support systems for the optimal structural performance.

COURSE OBJECTIVES :

1. To understand the load transfer within a structure.
2. To understand and apply the basic principles of load-bearing construction.
3. To understand the behaviour of simply supported spanning members and short compression members.
4. To demonstrate relationship between structural behaviour (types of loads, spans and support reactions), size and shape, and choice of material.

BROAD COURSE OUTCOMES :

At the end of the course, the students are expected to develop:

1. Ability to estimate the gravity loads on a structure
2. Ability to estimate cross-section of simply supported members for a given structural material
3. Ability to estimate cross section of short columns and footings
4. Ability to determine safety of simply supported members against shear, bending and deflection
5. Ability to select appropriate material for various structural members.

COURSE CONTENT:

Unit 1: Observing and Understanding Structures

1. Types of structural members—slabs, beams, arches, walls, columns, and trusses and tensile members.
2. Building as an assembly of structural members: flat roofs (slabs, beams), curved roofs (vaults and domes), sloping roofs (trusses). Support members like walls, columns, foundations.
3. Transfer of loads in loadbearing and framed structural systems.

Unit 2 - Loads and Equilibrium

1. Concept of Dead Loads, Live Loads, Wind loads, Snow Loads, Seismic Loads
2. Estimation of dead load (self-weight) as density x volume, calculation of weight of various structural components; Estimation of live loads in kN/m^2 or kg/m^2
3. Concept of point load and uniformly distributed load (udl)
4. Understanding and Constructing Free body diagrams and concept of Equilibrium for simply supported spanning members with point load and uniformly distributed load (udl), short columns and footings

Unit 3: Material Properties

1. Concept of Stress, Strain, Elasticity; Understanding material behaviour for ductile and brittle materials and elastic constants for Mud, Brick, Stone, Wood, Bamboo as well as for RCC and Steel
2. Concept of Tension, Compression, Torsion, Shear, Bending Strength and comparative analysis for various construction materials.

Unit 4: Geometrical Properties

1. Understanding the properties like cross sectional area, centre of gravity, centroid, moment of inertia of a cross section.
2. Understanding importance of C.G. in structures and structural components.
3. Demonstrating with examples the effect of change (increase/reduction) in cross section on tensile and compressive stresses in members like cables, masonry walls, columns and footings.
4. Demonstrating with examples the effect of increase/reduction in Moment of Inertia of horizontal spanning members (beams)
5. Components of structural analysis - Geometry, Loads, Reactive Forces, Internal Forces and Moments

Unit 4: Analysing Structures- Simply Supported Spanning Members

1. Estimating support reactions for simply supported beams
2. Understanding the behaviour and modes of failure in simply supported spanning members: shear, bending and excessive deflection.

3. Estimating the effect of point load and uniformly distributed load (udl) on shear force and bending moment.
4. Estimating the effect of point load and uniformly distributed load (udl) on shear stress, bending stress and deflection at supports and end span

SESSIONAL WORK :

It is recommended that each college define the outcomes of the Units specified in the Course Contents. These outcomes need to be assessable through the following sessional work:

Sessional work should reflect the understanding and ability of the students as described above after learning Structures I. It should contain following assignments which are to be done individually by each student.

1. Diagrammatical representation of load transfer and structural behaviour for various structural components.
2. Estimation of dead and live loads for a room with small spans.
3. Compilation of material properties for standard construction materials.
4. Identifying and representing probable location of shear and bending failures (cracks) for a given simply supported spanning element.
5. Estimate maximum bending stress and shear stress for a given simply supported beam and comment on its safety.
6. Estimate cross sectional size/s of short walls and columns based on loads acting on them.
7. Estimate deflection of given simply supported beam and comment on its usability.

Minimum 2 tutorials covering all Units.

RECOMMENDED READING :

1. Architecture and Engineering – Salvadori and Tempel
2. Mechanics of Solids – Dr. H. J. Shah
3. Strength of Materials – S. Ramamrutham
4. Strenght of Materials- R. K. Bansal
5. Structural Analysis- S. S. Bhavikatti
6. Theory of Structures- S. P. Gupta and G. S. Pandit

FUNDAMENTALS OF ARCHITECTURE		
Semester I B.Arch.		
Course Code	1202504 (SS)	
Teaching Scheme	Examination Scheme	
Total Contact Hours/ Week: 3	Sessional (CIA 50+EA 50)	100
Lecture Hours/ Week: 2	Total Marks	100
Studio Hours/ Week: 1	Total Credits	3

COURSE DESCRIPTION :

This course is meant to focus on the experiential learning of architecture through site visits, film, art or literature. This experience is to be understood in relation to the various lenses such as embodied perception, individual and collective, beauty, and gender to name a few. It is a course that encourages experiencing and reading as complimentary activities.

COURSE OBJECTIVES :

1. To introduce the students to the profession and work of an architect.
2. To introduce the students to the aspects shaping architecture viz- socio-cultural, demographic, geographic, economic, legislative etc.
3. To experience architecture and develop the ability to describe the experience.
4. To be able to analyse the architectural experience into various aspects that create it.
5. To understand architecture not only as a physical object but as an entity that is understood by various users and critics through various perspectives and associations

BROAD COURSE OUTCOMES :

At the end of the course, the students are expected to develop:

1. Ability to experience architecture and describe it through various means.
2. Ability to analytically read texts about various perceptions about architecture.
3. Ability to understand how architecture is connected to people, especially through their activities, associations, and perception.
4. Ability to communicate the understanding of architecture beyond its physicality through various forms like reflective essays, graphical narratives, photo essays, or film

COURSE CONTENT :

Unit 1: Profession of Architecture and Work of an Architect

1. Ethical responsibilities of an Architect
2. Architect as a change-maker
3. User -centric design and architectural profession

Unit 2: Aspects affecting the making of architecture.

1. Regulatory context
2. Climatic context
3. Socio-cultural context
4. Economic context

Unit 3: Space and Place

1. Concept of 'Space' and 'Place' – What makes a "Place" out of a "Space"?.
2. 'Place making' as fundamental to architecture. The role of human activity in the making of a "Place".
3. Understanding places where people feel sense of ownership, pride, and belonging and where they can interact and engage with each other.
4. Role of built form in place making.

Unit 4: Embodied Perception of Space

1. Perception of space in relation to human body.
2. Interaction of the human body and space to form a perception of the space.
3. Experiencing architecture by using multiple senses like touch, climatic comfort, smell, sounds, etc.

Unit 5: Memory and Space

1. Associations of history, myths, stories, memories, etc. with a building.
2. Varying perceptions of a building due to varying associations.
3. Memory and Memorials – What are memorials, what do they represent, how do they communicate the memories.

Unit 6: Individual and Collective Space

1. How is the individual connected to its surroundings? Understanding a building not as an isolated individual but as part of the larger whole.
2. How do we define "public" and "private" space? Ideas of physical/ visual access, separation, sharing, encouraging and discouraging the "outsider".

3. Home as a private realm. Individual's relationship with home. What creates identity of the home.

Unit 7: Privileged - Underprivileged and the Built environment

1. Role of Gender in the built environment.
2. Children in the Built environment.
3. Design for all.
4. Marginalised communities in the Built environment.

Unit 8: Aesthetics in Architecture

1. What is beauty in architecture?
2. Role of ornament in architecture.

SESSIONAL WORK :

It is recommended that each college define the outcomes of the Units specified in the Course Contents. These outcomes need to be assessable through the following sessional work:

1. Minimum 1 assignment will be done on any 4 Units.
2. Minimum 2 of these assignments will be based on actual experience during field visits.
3. Along with field visits the topics may also be explored through Film, Art, and Literature
4. The assignments could be in the form of reflective essays, graphical narratives, photo essays, or films

RECOMMENDED READING :

1. Materials and Meaning in Architecture: Essays on the Bodily Experience of Buildings – Coleman, Nathaniel, India: Bloomsbury Publishing, 2020.
2. The Eyes of the Skin: Architecture and the Senses – Pallasmaa, Juhani,United Kingdom: Wiley, 2012.
3. The Routledge Handbook of Placemaking. United Kingdom – Taylor & Francis, 2020.
4. Women and the Built Environment. India – Zubaan, 2007.
5. The Nature of Order: The phenomenon of life – Alexander, Christopher, United Kingdom: Center for Environmental Structure, 2002.
6. Designing Memory: The Architecture of Commemoration in Europe, 1914 to the Present. India – Tanović, Sabina, Cambridge University Press, 2019.
7. Children, Youth and the City. United Kingdom – Horschelmann, Kathrin., van Blerk, Lorraine, Taylor & Francis, 2013.
8. Life Between Buildings: Using Public Space – Gehl, Jan, United Kingdom: Island Press, 2011.
9. Pattern Language – Christopher Alexander et al. Oxford University Press.

ARCHITECTURAL DRAWING AND GRAPHICS I		
Semester I B.Arch.		
Course Code	1202505 (SS)	
Teaching Scheme	Examination Scheme	
Total Contact Hours/ Week: 3	Sessional (CIA 50+EA 50)	100
Lecture Hours/ Week: 1	Total Marks	100
Studio Hours/ Week: 2	Total Credits	3

COURSE DESCRIPTION :

The course Architectural Drawing and Graphics I introduces graphics as an effective language of communication in Architecture and Design. It equips students with skills to represent three-dimensional objects, form, and space using various formats and mediums of technical drawings/ sketching, etc. It also introduces them to the various projection systems to draft accurately three dimensional objects and building components using paper and pencil. It also reinforces the student's understanding of planar and solid geometry.

COURSE OBJECTIVES :

1. To introduce Architectural Graphics as an effective language of communication, its components, grammar, annotations, etc.
2. To equip students with skills of representation of three-dimensional objects, form, and space using various formats and mediums of drawings and sketching.
3. To introduce students to various projection systems (orthographic, isometric, axonometric, etc.) to represent objects, building components.
4. To introduce planar and solid geometry and its relevance in architectural forms.

BROAD COURSE OUTCOMES :

At the end of the course, the students are expected to develop:

1. Ability to comprehend solid geometrical objects (simple and composite) and represent them in various drawing formats such as
   a. Freehand sketches capturing form, texture/s, light, and shadows
   b. Plan, elevations, and sections (freehand sketch + manual drafting)
   c. Isometric and axonometric view (freehand sketch + manual drafting)
2. Ability to understand and draw various annotations, symbols, material indications of building components, and use them appropriately in drawings

3. Ability to understand the concept of scale and choose an appropriate scale for drawing.
4. Ability to read, understand and reproduce Architectural drawings of a simple building.

COURSE CONTENT :

Unit 1: Architectural Graphics

1. Introduction to Graphics as a language/ means of correct communication in Architecture and Design, its importance, advantages, and limitations over conventional spoken and written languages.
2. Architectural Graphics as a peculiar language to communicate built environment. Components of Architectural Graphics such as Technical Drawings, Presentation Drawings, Documentation Drawings, etc.
3. The idea of technical drawings as a universal system to accurately represent three dimensional objects, buildings, and spaces.

Unit 2: Hand Sketching

1. Importance of free-hand sketching in Architecture to perceive, draw and document building/s, building element/s, and space/s.
2. Various techniques and tools used for free-hand sketching to capture size, shape, textures, light, shades, and shadows (paper and pencil/ pen, digital sketching tools)
3. Sketching various three dimensional objects, buildings, spaces to capture and document the same (students may be encouraged to convert these drawings to plans, elevations, etc.)

Unit 3: Architectural Drawing and Drafting

1. Introduction to various tools for drawing and their application techniques.
2. Various types of lines, their meanings, and application.
3. Representation of simple three dimensional objects in two dimensional formats such as plan, elevation, and section as free-hand drawing.
4. Annotations and their meaning, material representations enhancing information of the drawings
5. Meaning and importance of text in the drawings and its delineation for clear legibility.

Unit 4: Plane and Solid Geometry

1. Introduction to the planar geometry and graphical construction methods.
2. Generative principles of various three dimensional objects.
3. Surface development of various three-dimensional objects.

Unit 5: Architectural Projection Systems- Drafting

1. Introduction to various projection systems in Architectural Drawing (such as orthographic, isometric, and axonometric), their principles and methods of projection to create technically correct drawings.
2. Meaning and relevance of plan, section, and elevation, and constructing them using Orthographic projection.
3. Three dimensional solids, hollow objects, and simple architectural forms and building elements using all the projection systems.

Unit 6: Scale Drawings

1. Introduction to scale as a tool of proportion. Its relevance in representation of various built forms.
2. Overview of Architectural metric scale & graphics scale, necessity of scaled drawings in architecture.
3. Architectural lettering and dimensioning techniques.

SESSIONAL WORK :

Sessional work should cover freehand as well as drafted drawings. Emphasis of freehand drawings should be on developing hand skills and therefore on the quantity of assignments that serve as practice. Emphasis of technically drafted drawings should be on learning the projections techniques and thereby produce accurate drawings.

Assignments should cover contents from Unit 2 to Unit 6. It is recommended that each college define the outcomes of the Units specified in the Course Contents. These outcomes need to be assessable through the following sessional work:

1. A minimum of five A1 drafted sheets for projection systems as mentioned in Unit 5 are expected.
2. Freehand drawings covering contents of Unit 2 and Unit 3 are to be sufficient in number such as to ensure correct representation and control of hand.
3. Sufficient number of exercises on A3 or A4 sheets covering the contents of Unit 4.
4. Summative assignment should cover drafting of plans, sections and elevations of a given simple building using projection systems and annotations learnt

RECOMMENDED READING :

1. Architectural Graphics – Francis D. K. Ching, John Wiley and Sons Ltd.
2. Engineering Drawing: Plane and Solid Geometry – Bhatt, N.D. and Panchal V.M , Charotar Pub

3. Architectural Graphics,2nd ed, illustrated – C. Leslie Martin, Macmillan, University of Minnesota.
4. Engineering Drawing [Geometrical Drawing] – Gill, P.S., Dewan Suhil Kumar Kataria, Ludhiana
5. Building Drawing: with an integrated approach to build environment – Shah, M.G., Kale, C.M. and Patki, S.Y., Tata McGraw-Hill Pub., Delhi, 2000.
6. Principles of Three-Dimensional Design – Wucius Wong. Van Nostrand Reinhold Company.
7. Construction and Design Manual: Drawing for Architects. – Natascha Meuser. DOM Publishers.
8. Any other learning resources as and when recommended by faculty.

COMPUTER AIDED DRAWING I		
Semester I B.Arch.		
Course Code	1202506 (SS)	
Teaching Scheme	Examination Scheme	
Total Contact Hours/ Week: 3	Sessional (CIA 50+EA 50)	100
Lecture Hours/ Week: 1	Total Marks	100
Studio Hours/ Week: 2	Total Credits	3

COURSE DESCRIPTION :

Architectural practices across the world are fast shifting to Computer Aided Drafting (CAD) and Building Information Modelling (BIM). As a result, the skill to use computer based drafting software has become imperative in the training for Architects. Though such skill is necessarily practiced, polished, and updated while in practice, and cannot be entirely taught in the curriculum for Architecture, it is intended that the students are taught the basics of such a digital tool. The courses of Computer Aided Drafting I and II are designed for the same purpose

COURSE OBJECTIVES :

1. To understand CAD software and applications as a tool of drafting Architectural drawings.
2. To use various tools in the software to produce correct drawings
3. To create presentable and printable formats of drawings.

BROAD COURSE OUTCOMES :

At the end of the course, the students are expected to develop:

1. Ability to set up the CAD workspace for drafting
2. Ability to use various tools within the software to create 2D drawings from geometric shapes with annotations and dimensions.
3. Ability to create and use layers in the software.
4. Ability to create annotations and dimensions to a scale appropriate to the scale of printing the drawing.
5. Ability to use plot styles, line weights, colours, etc. to create print layouts in a presentable format.

COURSE CONTENT :

Unit 1: Introduction to Computer Aided Drafting

1. Role and scope of CAD in architectural drawing and documentation.
2. Introduction to the user interface: toolbars, ribbon, command line, palettes, workspace management.
3. Understanding coordinate systems (absolute, relative, polar).
4. Setting up a new drawing: units, limits, scale, layers, templates.
5. Drawing aids: SNAP, GRID, ORTHO, OSNAP, POLAR, and their use in precision drafting.

Unit 2: Basic Tools for 2D Drawings

1. Drawing tools: Line, Polyline, Circle, Arc, Ellipse, Rectangle, Polygon.
2. Modifying tools: Move, Copy, Rotate, Mirror, Offset, Trim, Extend, Fillet, Chamfer, Array (Rectangular & Polar).
3. Object selection methods and object snaps for precision editing.

Unit 3: Layers, Text, and Dimensioning

1. Understanding layer properties: creation, naming, colour, line-type, visibility control.
2. Introduction to Layer standards as per architectural conventions (e.g. wall, furniture, doors).
3. Learning Text commands: Single-line and multi-line text, justification, text styles, heights.
4. Introduction to Dimensioning tools: Linear, Aligned, Radius, Diameter, Angular, and Leader dimensions, setting a dimension style
5. Introduction to annotation scaling and hatching tools.

Unit 4: Drawing Management, Layouts & Plotting

1. Model space vs. Paper space: understanding layouts and viewports.
2. Setting up title blocks and sheet layouts.
3. Scale management and plotting drawings to specified paper sizes (e.g., A3, A2, A1).
4. Plot styles (CTB/STB files), line weights, PDF export.
5. Introduction to compiling a set of drawings.

SESSIONAL WORK :

It is recommended that each college define the outcomes of the Units specified in the Course Contents. These outcomes need to be assessable through the following sessional work:

1. Assignments on shapes and commands as detailed in Unit II. A3 size prints (multiple small assignments recommended)

2. Geometric Composition Drawing - Geometric 2D compositions using layers, hatch patterns, standard line weights, annotations, and dimensions – A3 size prints (multiple small assignments recommended)
3. Copying a simple Floor Plan with Text & Dimensions - Draft a simple plan with using layers management and showing furniture blocks, text annotation, and dimensions – Prints of the same plan to at least 3 different scales.
4. Raw file (soft format) of the assignment of drawing a floor plan to demonstrate the understanding and use of various drafting tools like model space, paper space, layers, blocks, hatches, line types, colour, etc.
5. Soft format (pdf) file of the above assignment for final printing to demonstrate the understanding of layouts, borders, nameplate, line weights, monochrome printing, appropriate scaling of drawing, appropriate sizing of text and annotations, etc.

RECOMMENDED READING:

1. AutoCAD Beginners Guide to 2D, 3D Drawings – Kendrol Phillips – Open Resource E book
2. Learning AutoCAD 2024: A Project-Based Approach – Sham TickooCadcim Technologies
3. Mastering AutoCAD 2023 and AutoCAD LT 2023 – George Omura, Sybex
4. Architectural Graphics – Francis D.K. Ching
5. Various Online Resources

WORKSHOP I		
Semester I B.Arch.		
Course Code	1202507 (SS)	
Teaching Scheme	Examination Scheme	
Total Contact Hours/ Week: 4	Sessional (CIA 75+EA 75)	150
Lecture Hours/ Week: 1	Total Marks	150
Studio Hours/ Week: 3	Total Credits	4

COURSE DESCRIPTION :

Models have been used by architects for various purposes ranging from articulating form to presentation to clients and the common people, from testing structural behaviour to studying site context, and from studies of light and shadow to deciding finishes. Both, hand-made and digital models serve these purposes. The importance of models in the iterative design process has been stressed upon by many Architects and academicians. It is therefore necessary that students of Architecture learn basic model making skills for both, hand-made and digital mediums. The two courses viz. Workshop I and Workshop II are designed for this purpose. While Workshop I focus on hand-skills, Workshop II exposes students to advanced and digital model making skills. This subject has an interface with Basic Design, Architectural Drawing and Graphics I, Architectural Design I to VII, and Architectural Design Project.

COURSE OBJECTIVES :

1. To understand the types and uses of Architectural models.
2. To learn to use different materials and appropriate tools to make Architectural models.
3. To develop hand skills and visualization skills.
4. To practice safety measures while working with tools.

BROAD COURSE OUTCOMES :

At the end of the course, the students are expected to develop:

1. Ability to understand the role and importance of models in the design decision making process and design communication
2. Ability to build models of varied scales and of various types.
3. Ability to work with various model making materials and techniques and select appropriate materials and techniques for the purpose of the model.

COURSE CONTENT :

Unit 1: Scales in Models

1. Introduction to various scales used for models as per their type and role in design process and communication.

Unit 2: Materials

1. Introduction to various materials and tools used in Architectural model making such as
    a. Papers and boards of different thicknesses and textures such as mount-board, corrugated board, file card, model paper etc.
    b. Foam boards, PVC and Acrylic sheets, Cork Sheets
    c. Balsa or Pine wood, Bamboo strips or sticks
    d. Modelling clay, POP, Gypsum
    e. Metal wires and meshes, sheet metal
    f. Fabric
2. Choice of materials depending on purpose of the model, scale of the model, level of detail, etc.
3. Materials and finishes for making Model base.

Unit 3: Techniques and Tools

1. Hand-cutting and joining
2. Folding/ Origami/ Kirigami
3. Carpentry tools (hand and machine)
4. Hand moulding and casting
5. Use of various adhesives
6. Tying techniques

Unit 4: Types of Models

Various types of models and their purpose

1. Conceptual Models / Schematic models
2. Massing/ Volumetric Models
3. Site models
4. Context models
5. Structural models
6. Façade models
7. Sectional models
8. Models for a detail/component/ building element
9. Presentation models

SESSIONAL WORK:

It is recommended that each college define the outcomes of the Units specified in the Course Contents. These outcomes need to be assessable through the following sessional work:

1. Assignments to be framed on any six of the above-mentioned model types from unit 4 using materials mentioned in Unit 2 and tools techniques in Unit 3.
2. It is recommended that at least 3 types of materials from the above list in Unit 2 should be used employing appropriate and varied techniques listed in Unit 3 in the making of these models.
3. The models are to be assessed for the skill of making. The designs and data may be provided by the teacher for making the models.

RECOMMENDED READING :

1. Designing with Models: A Studio Guide to Architectural Process Models. – Mills, Criss B., Germany: Wiley, 2011.
2. Model Making for Architects – Driscoll, Matt, United Kingdom: Crowood, 2013.
3. Architectural Modelmaking. Russia – Dunn, Nick, Laurence King Publishing, 2010.
4. Architectural Models: Construction Techniques – Wolfgang Knoll and Martin Hechinger. McGraw-Hill, Inc.
5. Architectural Models: Works of Architect Balkrishna Doshi – Snehal Shah. Akshara Foundation.

SEMESTER II

ARCHITECTURAL DESIGN I		
Semester II B.Arch.		
Course Code	1202508 (SV)	
Teaching Scheme	Examination Scheme	
Total Contact Hours/ Week: 7	Sessional (CIA 100+EA 100) Viva (INT 25+ EXT 25)	 200 50
Lecture Hours/ Week: 2	Total Marks	250
Studio Hours/ Week: 5	Total Credits	7

COURSE DESCRIPTION :

Architectural design is at the core of the five year program in Architecture. Architectural Design is envisaged as a process rather than a product. The student is expected to learn to analyse various aspects of design and then take design decisions regarding them pertaining to one's individual design project. A comprehensive consideration of such design decisions along with an iterative process and tools for design thinking will lead a student to a design proposal. The subject is spread over seven semesters as Architectural Design I to VII. The complexity of the design aspects to be considered goes on progressively increasing in each successive semester. The subject has an interface with Architectural Design Project wherein the student is equipped to take comprehensive design decisions of all aspects of a design project considered together.

COURSE OBJECTIVES :

1. To understand Architectural Design as a process rather than a product.
2. To learn to analyse various aspects of design and then take design decisions regarding them pertaining to one's individual design project.
3. To create a design proposal based on a comprehensive consideration various design decisions using an iterative process and tools for design thinking

BROAD COURSE OUTCOMES :

At the end of the course, the students are expected to develop

1. Ability to observe through case/ precedent studies the possibilities that each of the aspects of design offers and choose with reasoning the most apt possibility as a design decision for further iterations.
2. Ability to comprehensively consider the design decisions so made for all aspects and modify those decisions as required for the overall appropriateness and quality of the design project.

3. Ability to generate and compare iterations of design for the given project based on preferences and refinement of various design decisions and then make a final design proposal for the project. Ability to employ various tools like sketches, models, simulations, technical drawings, etc. for the iterative process.
4. Ability to communicate final design proposal for a project with correct technical drawings, presentation drawings, and models using various media.

COURSE CONTENT :

Unit 1: Anthropometry and function

To analyse a given function into its smaller components and space requirements; Working out/ finding sizes of spaces and elements to facilitate the human occupants to carry out the functions efficiently and effectively.

Unit 2: Structural assemblies and materials

To explore possibilities of creating space using simple assemblies of structural elements; Employing known materials to create an efficient and aesthetic assembly of structural and non-structural parts .

Unit 3: Response to immediate surroundings

To analyse the site and surroundings of a building project for aspects like access, neighbouring buildings/ open spaces, prominent geographical features, and views and identifying strategies of response to these aspects.

Unit 4: Use of Elements of Space Making

To analyse built space/s for the role of space making elements in their creation and of their distinguishing characteristics and overall experience of the space. To demonstrate effective choice of the elements and their articulation to achieve a stated purpose.

Unit 5: Experience and quality of space

To identify and describe the experiential quality of a space. To analyse the aspects that lend the space this quality. To identify parameters for evaluating quality of space and apply them to a chosen existing space.

Unit 6:

Design of a small built and covered space/s or building using knowledge of the above Units1 to 5. Open space design may be considered in addition so as to complement the built and covered space or building design. The space/ building is recommended to house a single function.

SESSIONAL WORK :

It is recommended that each college define the outcomes of the Units specified in the Course Contents. These outcomes need to be assessable through the following sessional work:

It is recommended that the classroom work about the above units be supplemented with field visits to understand the characteristics of architecture for the above-mentioned aspects.

Sessional work should comprise of:

1. Analytical or exploratory assignments for each Unit from Unit 1 to 5
2. Design proposal as mentioned in Unit 6 represented through adequate and technically drawn and presented drawings in hard copy and physical model/s. (Sketches, digital models, machine created models, digital views, etc. may supplement the above mandatory requirement).

RECOMMENDED READING :

1. Living Areas (Internal Spaces) – Shirish Vasant Bapat. Bela Books.
2. The Elements of Modern Architecture: Understanding Contemporary Buildings – Antony Radford, Amit Srivastava, Selen Morkoc. Thames and Hudson.
3. How the Other Half Builds. Vol 1 – Vikram Bhatt, Jesus Navarrete, Avi Friedman et al. Centre for Minimum Cost Housing, McGill University.
4. Spaces in Traditional Indian Architecture – Yatin Pandya. Mapin.
5. A. J. Metric Handbook.
6. Metric Handbook
7. Precedents in Architecture – Roger H. Clark and Michael Pause. John Wiley & Sons.

BUILDING CONSTRUCTION AND MATERIALS II		
Semester II B.Arch.		
Course Code	1202509 (SV)	
Teaching Scheme	Examination Scheme	
Total Contact Hours/ Week: 4	Sessional (CIA 50+EA 50) Viva (INT 25+ EXT 25)	 100 50
Lecture Hours/ Week: 1	Total Marks	150
Studio Hours/ Week: 3	Total Credits	4

COURSE DESCRIPTION :

Building Construction is an important stream and part of the core subjects of Architecture. It is spread across eight semesters as Building Construction and Materials I to VIII. It aims to train students in progressively complex and advanced construction technologies and materials employed in the building industry. Building Construction and Materials II exposes students to various conventional and traditional building materials with a focus on members in tension and spanning members. This semester builds on the learnings of Semester I completing the idea of a comprehensive structure from foundation to roof. The course also deals with the aspects of climate and life cycle of the building materials as considerations for selecting and employing them.

COURSE OBJECTIVES :

1. To facilitate comprehension of how to work with conventional materials in Architecture.
2. To understand and study various building materials, their properties, and limitations.
3. To understand and describe the construction of a structure/ building from foundation to roof with focus on spanning and tensile members.
4. To understand climate as one of the important criteria while choosing materials.
5. To understand the life cycle of materials from sourcing to application to recycling/ reuse.

BROAD COURSE OUTCOMES :

At the end of the course, the students are expected to develop:

1. Ability to understand and identify parts of a building using timber or bamboo structural members.

2. Ability to understand, resolve, describe and draw various timber and bamboo construction techniques for framing systems to infill panels and also describe and draw timber and bamboo frames with infill walls/ membranes.
3. Ability to describe and draw spanning systems using trusses, purlins, and rafters along with various roof coverings.
4. Ability to describe properties, and the life cycle of timber and bamboo as building materials as well as their performance with respect to weather and climatic forces.
5. Ability to understand construction of doors and windows including an assessment of various proprietary systems of doors and windows helping the selection process.
6. To describe constituents and processes of making different kinds of plasters and floor finishes.

COURSE CONTENT :

Unit 1: Timber framed structures

1. Introduction to timber as a building material including various types of timber/ wood, its processing, market forms, properties, and joinery systems.
2. Foundation: Grillage foundations, Piers and posts
3. Walls: Frames and panels/ infill walls
4. Lintels : Timber monolithic and built-up lintels
5. Roofing: Various spanning systems including trusses and members such as purlins, rafters etc. Introduction to principle of a truss, various roof covering materials from clay tiles to roofing sheets.

Unit 2: Bamboo

1. Introduction to bamboo as a building material including types, processing, properties, and joinery.
2. Foundation: Bamboo foundation Piers and posts
3. Walls: Frame and panelled walling systems
4. Lintels : Lintels using Bamboo built-up sections
5. Roofing: Bamboo Trusses, Rafters, purlins and their joining methods in detail. Introduction to thatch and other coverings over Bamboo framing.

Unit 3: Doors and Windows

1. Concept and function of openings in buildings such as doors, windows, ventilators, skylight, etc. and their primary functions such as lighting, ventilation, access, privacy, weather proofing, view, transitions, aesthetics, etc.
2. Construction principles of timber doors and windows and their components such as frames, shutters, shutter frames and infill panels.
3. Operating mechanisms in doors and windows: Pivoted, folding, sliding, sliding and folding, rolling, louvers, etc.
4. Various proprietary systems for Doors and Windows

The proprietary systems for doors and windows (uPVC, Aluminium, Steel profiles) with focus on various criteria for selection, application and performance.

Unit 4: Renders and finishes

1. Introduction to Cement and lime as binding building materials including their types, sources, properties, and limitations.
2. Cement plasters, lime plasters including proportions of their ingredients,process of application, curing, treatments and precautions.
3. IPS and Terrazzo flooring system.

Unit 5: Selection of Building Materials

1. Effect of climatic factors like sun, wind, and rain on the building materials mentioned above and the building elements made with them employing different techniques.
2. Life cycle from sourcing to application to recycling of the building materials mentioned above.

SESSIONAL WORK :

It is recommended that each college define the outcomes of the Units specified in the Course Contents. These outcomes need to be assessable through the following sessional work:

1. Notes and Sketches reflecting students understanding / learning about building materials mentioned above.
2. Sketches and Market Survey of Proprietary systems mentioned in Unit 3, and various building materials mentioned above.
3. Minimum 2 tutorials covering Unit 1to Unit 5.
4. Minimum 4 Drawing Sheets covering:
    a. Unit 1and Unit 2 showing component assembly from foundation to roof for a particular material (details or other content may be added by each college)
    b. Unit 3 showing assembly of doors and windows

No drawing sheet is expected for proprietary systems

RECOMMENDED READING :

1. Timber Construction Manual – American Institute of Timber Construction
2. Building Construction Illustrated – Francis D.K. Ching
3. Building with Bamboo: Design and Technology of a Sustainable Architecture – Gernot Minke
4. Bamboo and Cane Construction – NEERI or INBAR Publications (India-specific)
5. Manual for Bamboo Structures – Jules J.A. Janssen (INBAR)

6. Architectural Detailing: Function, Constructability, Aesthetics – Edward Allen
7. Doors, Windows and Glass – CPWD Handbook (India)
8. Modern Plastering Techniques – B.N. Baliga
9. Laurie Baker's Sketchbooks / Costford Construction Notes

STRUCTURES II		
Semester II B.Arch.		
Course Code	1202510 (SV)	
Teaching Scheme	Examination Scheme	
Total Contact Hours/ Week: 3	Sessional (CIA 25+EA 25) Viva (INT 25+ EXT 25)	 50 50
Lecture Hours/ Week: 2	Total Marks	100
Studio Hours/ Week: 1	Total Credits	3

COURSE DESCRIPTION :

Structures I to IV are designed to equip students with a comprehensive understanding of the safety, serviceability, and stability of structural systems. The course series enables learners to comprehend the fundamental structural behaviour of buildings and components, identify various modes of structural failure and explore appropriate remedial measures, estimate sizes of key structural members based on structural strength and loading systems, and employ appropriate materials, geometry, and support systems efficiently for the optimal structural performance.

COURSE OBJECTIVES :

1. To understand the behaviour of cantilever, continuous, fixed, and overhanging beams.
2. To estimate the load-carrying capacity of long compression members
3. To understand and apply the basic principles of load-bearing construction.

BROAD COURSE OUTCOMES :

At the end of the course, the students are expected to develop:

1. Ability to estimate cross sections of cantilever members.
2. Ability to select continuous/fixed/overhanging members for efficient spanning.
3. Ability to determine load carrying capacity of a compression member.
4. Ability to analyse load bearing structures.

COURSE CONTENT :

Unit 1: Analysing Structures- Cantilever Spanning Members

1. Estimating support reactions
2. Understanding the modes of failure for cantilever spanning members: shear, bending and excessive deflection.
3. Estimating the effect of point load and udl on shear force, bending moment
4. Estimating the effect of point load and udl on shear stress, bending stress and deflection at supports and end span

Unit 2: Concept of Continuity, Fixity, and Overhang

1. Understanding the effect of continuity (in members like continuous rafters, continuous beams, etc.)
2. Understanding the effect of fixity (in members like lintels)
3. Understand the bending behaviour of overhanging beam (for balconies and corridors)
4. Comparison of bending behaviour and support reactions for continuous, overhang and fixed spanning members

Unit 3: Analysing Structures- Compression Members

1. Understanding Slenderness ratio and its effect on column behaviour
2. Estimating load carrying capacity of long columns using Rankine's method
3. Understanding the behaviour of eccentrically loaded columns or piers (where centre line of beams are not intersecting with centre line of columns)
4. Estimating the size of columns and footings using the Middle Third Rule and its application in eccentrically loaded columns and footings

Unit 4:

1. Principles of load bearing construction including spacing and thickness of walls, piers, spanning of slabs, area of opening, location of opening, horizontal and vertical bands
2. Application of the above principles for analysing a given building and suggesting rectifications

SESSIONAL WORK :

It is recommended that each college define the outcomes of the Units specified in the Course Contents. These outcomes need to be assessable through the following sessional work:

Sessional work should reflect the understanding and ability of the students as listed above after learning Structures I. It should contain following assignments which re to be done individually by each student.

1. Indicate possible location of shear and bending cracks for a given cantilever, continuous, fixed, overhanging beam.
2. Estimate maximum bending stress and shear stress for a given cantilever beam and comment on safety
3. Estimate maximum bending stress and shear stress for a given continuous or fixed or overhanging beam and comment on safety.
4. Estimate deflection of given cantilever beam and comment on it's usability.
5. Estimate load carrying capacity of long columns based on buckling.
6. Analyse given load bearing structures based on principles of load bearing construction and suggest rectifications – at least three.

Minimum 2 tutorials covering all Units.

RECOMMENDED READING :

1. Architecture and Engineering – Salvadori and Tempel
2. Mechanics of Solids – Dr. H. J. Shah
3. Strength of Materials – S. Ramamrutham
4. Strenght of Materials- R. K. Bansal
5. Structural Analysis- S. S. Bhavikatti
6. Theory of Structures- S. P. Gupta and G. S. Pandit

ARCHITECTURAL DIAGRAMMING, SKETCHING, VISUALISATION		
Semester II B.Arch.		
Course Code	1202511 (SS)	
Teaching Scheme	Examination Scheme	
Total Contact Hours/ Week: 2	Sessional (CIA 25+EA 25)	50
Lecture Hours/ Week: 1	Total Marks	50
Studio Hours/ Week: 1	Total Credits	2

COURSE DESCRIPTION :

This course is an introduction to graphical skills that are very critical to Architects and Designers as they are mediums to analyse and express reality and effective design process for translating abstract ideas graphically. They could be classified as: sketching what is seen and perceived, making analytical diagrams representing a place/ site or a building, visualising and translating thoughts and abstract ideas graphically.

COURSE OBJECTIVES :

1. To understand various skills of visualisation and graphical representation.
2. To develop ability to sketch and document what is seen.
3. To develop ability to convert and draw a building or built environment as analytical diagrams.
4. To develop ability to graphically represent ideas, thoughts.

BROAD COURSE OUTCOMES :

At the end of the course, the students are expected to develop:

1. Ability to graphically represent a building or a space
2. Ability to draw interior and exterior views of a building, and streetscapes
3. Ability to render sketches
4. Ability to diagrammatically represent various kinds of analysis through diagrams and sketches.
5. Ability to effectively use graphic components like shapes, arrows, lines, colour, etc. for effective communication through diagrams.
6. Ability to use 2D and 3D tools to visualise architectural forms/ spaces.

COURSE CONTENT :

Unit 1 - Sketching

1. Exercises for Hand-eye coordination.
2. Perspective views- interiors, exteriors, streetscapes, buildings.
3. Human proportions- proportions of the human body, humans in relation to buildings, spaces, and objects such as furniture elements.
4. Rendering- tonal values, shade shadows, material textures, etc.

Unit 2 - Diagramming

1. Types of Diagrams - Concept diagrams, Network diagrams, Bubble diagrams, Matrix diagrams, Analytical diagrams
2. Various accepted components of a diagram - lines, arrows, signs, symbols
3. Principles of composing
4. Methods and systems of abstracting reality to comprehend meanings
5. Analytical diagramming for the built environment.

Unit 3 - Visualisation

1. Tools for visualisation: Hand tools and software tools
2. Methods of graphical representation of abstract ideas
3. Hybrid modes of visualisation of the built environment

SESSIONAL WORK :

It is recommended that each college define the outcomes of the Units specified in the Course Contents. These outcomes need to be assessable through the following sessional work:

1. Minimum 2 assignments will be done on each unit.
2. Assignments for Unit 1 are to be sufficient in number such as to ensure correct representation and control of hand.

RECOMMENDED READING :

1. Design Drawing – Ching, Francis D. K.., Juroszek, Steven P, United Kingdom: Wiley, 2010.
2. Sketch Like an Architect: Step-by-Step from Lines to Perspective. – Drazil, David, Czechia: Sketch Like an Architect, 2020.
3. Architectural Drawing: A Visual Compendium of Types and Methods – Yee, Rendow, United Kingdom: Wiley, 2013.

4. The Art of City Sketching: A Field Manual – Abrams, Michael C, United States: Taylor & Francis, 2014.
5. Making Marks: New Architects' Sketchbooks – Jones, Will, United Kingdom: WW Norton, 2019.
6. Architectural Diagrams, Germany: DOM Publishers, 2015.
7. Drawing for Landscape Architecture: Sketch to Screen to Site – Hutchison, Edward, United Kingdom: Thames & Hudson, 2011.
8. The Architecture Drawing Book – Charles Hind, Fiona Orsini, Susan Pugh. RIBA
9. Understanding Architecture Through Drawing. Brian Edwards. Taylor and Francis.
10. Drawn to Design – Eric J. Jenkins. Birkhauser
11. Graphics Thinking for Arhitects and Designers – Paul Laseau. John Wiley & Sons, Inc.
12. Envisioning Architecture: An Analysis of Drawing. Iain Fraser, Rod Henmi. John Wiley & Sons, Inc.

ARCHITECTURAL DRAWING AND GRAPHICS II		
Semester II B.Arch.		
Course Code	1202512 (SS)	
Teaching Scheme	Examination Scheme	
Total Contact Hours/ Week: 3	Sessional (CIA 50+EA 50)	100
Lecture Hours/ Week: 1	Total Marks	100
Studio Hours/ Week: 2	Total Credits	3

COURSE DESCRIPTION :

The course Architectural Drawing and Graphics II is in continuation with Architectural Drawing and Graphics I exploring further tools and methods of graphical representation in Architecture, and their enhancements for effective communication. The course explores and equips students with techniques of developing three dimensional representations through perspective drawings, effects of light and shade through Sciography. It also empowers students with various rendering techniques in Architectural drawings.

COURSE OBJECTIVES :

1. To equip students to use projection methods to draw composite solids and understand its relevance to Architectural form.
2. To introduce the idea of perspective drawings and learn to construct technically accurate perspective drawings using various techniques.
3. To introduce students to the importance of light, shades and shadows in Architecture and represent the same through Sciography.
4. To introduce various methods of rendering drawings along with the use of perspective and Sciography for presentation.

BROAD COURSE OUTCOMES :

At the end of the course, the students are expected to develop:

1. Ability to comprehend solid objects, especially derived from building forms and parts, and represent them in drawing format such as plan, elevations, and sections using both, freehand and orthographic projection methods.
2. Ability to understand and draw various perspective views of objects/ buildings and interiors and be able to appropriately represent the depth, form and proportion of the objects/ buildings and building components.

3. Ability to understand the concept of Sciography and be able to demonstrate the interaction of light with objects graphically both freehand and orthographic projection drawings.

COURSE CONTENTS :

Unit 1: Orthographic Projections

1. Orthographic projections of solid and hollow 3D composite objects, especially derived from building forms or parts.
2. Drawing complex 3D objects especially derived from building forms using orthographic, isometric and axonometric projections.

Unit 2: Perspective Drawing

1. Introduction to the principles of perspective drawings and understanding of all relevant terms.
2. Drawing of one-point and two-point perspective of simple and composite objects, building exteriors, and interiors.

Unit 3: Sciography

1. Understand and apply principles of Sciography— freehand and projection techniques of drawing shades and shadows of simple and composite geometrical solids.
2. Techniques of drawing shade and shadow on buildings or parts of buildings.
3. Introduction to Sciography in perspective.

Unit 4: Rendering

1. Introduction and application of various hand rendering techniques for architectural presentations for various drawing formats such as plans, sections, elevations, and views.

SESSIONAL WORK :

It is recommended that each college define the outcomes of the Units specified in the Course Contents. These outcomes need to be assessable through the following sessional work:

1. Sessional work should cover freehand as well as drafted drawings. Emphasis of freehand drawings should be on developing hand skills and therefore on the quantity of assignments that serve as practice.
2. Emphasis of technically drafted drawings should be on learning the projections techniques and thereby produce accurate drawings.
3. Assignments should be based on each unit. A minimum of six A1 drafted sheets covering Unit 1 and Unit 3 are expected.

4. Freehand drawings are to be sufficient in number such as to ensure correct representation and control of hand.

RECOMMENDED READING :

1. Architectural Graphics – Francis D. K. Ching, John Wiley and Sons Ltd.
2. Engineering Drawing: Plane and Solid Geometry – Bhatt, N.D. and Panchal V.M , Charotar Pub
3. Architectural Graphics,2nd ed, illustrated – C. Leslie Martin, Macmillan, University of Minnesota.
4. Architectural drawing; perspective, light and shadow, rendering – Morgan, Sherley W and William Feay Shellman, Jr, McGraw-Hill, 1950
5. Civil Engineering Drawing, Rangwala, Charotar Pub., Anand
6. Rendering with pen and ink – Robert W. Gill, Thames and Hudson. London
7. Drawing Perspective: Methods for Artists – Peter Boerboom and Tim Proetel. Rockport.
8. Professional Perspective Drawing for Architects and Engineers – Friedrich W. Capelle.McGraw-Hill Book Company
9. Any other learning resources as and when recommended by faculty.

COMPUTER AIDED DRAWING II		
Semester II B.Arch.		
Course Code	1202513 (SS)	
Teaching Scheme	Examination Scheme	
Total Contact Hours/ Week: 3	Sessional [CIA 50+EA 50]	100
Lecture Hours/ Week: 1	Total Marks	100
Studio Hours/ Week: 2	Total Credits	3

COURSE DESCRIPTION :

Architectural practices across the world have shifted to Computer Aided Drafting (CAD) and Building Information Modelling (BIM). As a result, the skill to use computer based drafting software has become imperative in the training for Architects. Though such skill is necessarily practiced, polished, and updated while in practice, and cannot be entirely taught in the curriculum for Architecture, it is intended that the students are taught the basics of such a digital tool. The courses of Computer Aided Drafting I and II are designed for the same purpose.

COURSE OBJECTIVES :

1. To use advanced utilities in CAD
2. To make basic 3D models and render them in the digital workspace.
3. To use file portability for rendering drawings.

BROAD COURSE OUTCOMES :

At the end of the course, the students are expected to develop:

1. Ability to work with advanced utilities in CAD.
2. Ability to make basic forms in the 3D workspace.
3. Ability to make a rendered presentation drawing of a simple building

COURSE CONTENT :

Unit 1: Advanced 2D Drafting and Documentation Standards

1. Working with and creating dynamic blocks and their attributes
2. Using external references (XREFs) and managing multiple files.
3. Rastering, scaling, tracing of external images

4. Importing files from other programs
5. IS/ NBC guidelines for line conventions, symbols, and annotations.

Unit 2: Three Dimensional Drafting Fundamentals

1. Introduction to the 3D modelling interface in CAD or other parallel 3D software
2. Creating and modifying 3D solids
3. Isometric views, UCS manipulation, and 3D navigation.
4. Visual styles and basic rendering concepts.

Unit 3: Rendering and Presentation

1. 2 D presentation drawings using hatches, line types, and blocks
2. Incorporating images and photographs in CAD presentations

Unit 4: CAD Integration & File Management

1. File types: DWG, DXF, PDF, DWF, STL – their uses and limitations.
2. Importing/exporting between CAD and SketchUp/Photoshop/Illustrator/Revit etc. for modelling and rendering
3. File management in design studios (naming, backups, file structure).

SESSIONAL WORK :

It is recommended that each college define the outcomes of the Units specified in the Course Contents. These outcomes need to be assessable through the following sessional work:

1. Presentation Drawings of a small building - floor plans, sections, and elevations with required annotation and dimensions
2. Drawing created by tracing from a raster image and plotting it to various scales.
3. Isometric and shaded views of 3D Form Exploration using 3D modeling software
4. Rendered Drawing with floor plans, sections, elevations and view drafted and rendered using two or more software programs

RECOMMENDED READING :

1. AutoCAD Beginners Guide to 2D, 3D Drawings – Kendrol Phillips – Open Resource E book
2. Sham Tickoo – Learning AutoCAD 2024: A Project-Based Approach, Cadcim Technologies
3. Francis D.K. Ching – Building Construction Illustrated
4. Metric Handbook planning and Design Data by David Adler, Architectural Press
5. Various Online Resources

WORKSHOP II		
Semester II B.Arch.		
Course Code	1202514 (SS)	
Teaching Scheme	Examination Scheme	
Total Contact Hours/ Week: 4	Sessional (CIA 75+EA 75)	150
Lecture Hours/ Week: 1	Total Marks	150
Studio Hours/ Week: 3	Total Credits	4

COURSE DESCRIPTION :

Models have been used by architects for various purposes ranging from articulating form to presentation to the common people, from testing structural behaviour to studying site context, and from studies of light and shadow to deciding finishes. Both, hand-made and digital models serve these purposes. Importantly, the importance of models in the iterative design process has been stressed by many Architects and academicians. It is therefore necessary that students of Architecture learn basic model making skills for both, hand-made and digital mediums. The two courses viz. Workshop I and Workshop II are designed for this purpose. While Workshop I focus on hand-skills, Workshop II exposes students to advanced and digital model making skills. This subject has an interface with Basic Design, Architectural Drawing and Graphics I, Architectural Design I to VII, and Architectural Design Project.

COURSE OBJECTIVES :

1. To introduce the various processes of digital model making, especially as an iterative tool to design decision making.
2. To learn basic model making and rendering skills using the digital medium.
3. To learn to create the workflow and use various advanced machines to produce physical versions of digital models.

BROAD COURSE OUTCOMES :

At the end of the course, the students are expected to develop:

1. Ability to create simple 3D models in the digital space.
2. Ability to render digital models using various software and make them presentation ready.
3. Ability to employ advanced machines to make physical models using digital tools.

COURSE CONTENT :

Unit 1: 3D Modelling Software

1. Creating Computer Aided / Digital 3D models of simple and composite objects/ building forms using commands and processes in any chosen software.

Unit 2: Inter-software Portability

1. Management and portability of files between various software for the purpose of rendering, processing and printing to scale.
2. Basic rendering techniques for digital models using various software.

Unit 3: Physical Models from Digital Processes

1. Creating physical models of the following using advanced machine tools (CNC cutters, LASER cutters, etc.)/ digital fabrication (3D printing) tools.
    a. Basic forms
    b. Building components/ elements
    c. Building form
2. Making physical models of the same digital model to different scales.

SESSIONAL WORK :

It is recommended that each college define the outcomes of the Units specified in the Course Contents. These outcomes need to be assessable through the following sessional work:

1. Minimum of 2 assignments for Unit 1, 2 and 3 each.
2. Assignments for Unit 1 may be in hard prints
3. Assignments for Unit 2 may be in hard prints or final rendered computer files ready for presentation.
4. Assignments for Unit 3 are to be physical models.
5. The assignments may be based on work done in Architectural Design I or Building Construction and Materials I and II studios.

RECOMMENDED READING :

1. Various websites on paper art like NO-BU-RU.COM,
2. Various You-tube videos on paper art.
3. Architectural Models – Rolf Janke, Publisher - Frederick A. Praeger;
4. Model Making for Architects and Engineers – John Tayor, Publisher - McGraw-Hill Inc., US
5. Sketchup for Dummies – Adian Chopra, Publisher – For Dummies.