

**1AR1: ECOLOGY AND BUILT ENVIRONMENT**


**B.ARCH.: 1<sup>st</sup> Semester**  
**2L**

**Max. Marks: 100**  
**Exam Hours: 3**

UNIT	CONTENTS	CONTACT HOURS
I	<b>Fundamentals of Ecology &amp; Environment</b> – Fundamentals of ecology and environment, including basic ecological principles, components of ecosystems, and their functions; study of the interrelationship between natural resources (such as air, water, soil, and biodiversity), sustainable habitats, and urban systems; understanding the impact of human activities on the environment; concept of ecological footprints as a measure of resource consumption and environmental impact; discussion on strategies for reducing ecological footprints in architecture and urban design to promote sustainability.	6
II	<b>Human activities and Environment</b> – Impact of human activities on ecology and the environment, focusing on major forms of pollution such as water, air, and noise; examination of the causes and consequences of environmental degradation, including deforestation, habitat loss, and resource depletion; understanding the science and implications of climate change, including global warming, extreme weather events, and rising sea levels; exploration of the link between environmental changes and the occurrence of natural disasters such as floods, droughts, cyclones, and earthquakes; discussion on mitigation measures and the role of architecture in reducing environmental impact.	6
III	<b>Environmental Planning and Design</b> - Environmental planning and design principles for creating sustainable and livable built environments; built environment concepts in relation to ecological balance and human well-being; sustainable architecture practices to achieve energy efficiency, low waste generation, and environmental friendliness; design strategies for climate-responsive and green buildings that minimise carbon footprint.	8
IV	<b>Environmental Legislations</b> – Environmental legislations in India aimed at protecting and conserving natural resources, controlling pollution, and promoting sustainable development; important acts such as the Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act, and Forest Conservation Act;	6



Member Secretary



Chairman

	role and responsibilities of government departments and agencies such as the Ministry of Environment, Forest and Climate Change (MoEFCC), Central Pollution Control Board (CPCB), and State Pollution Control Boards (SPCBs); influence of legislations on architectural and urban development practices.	
V	<b>Environmental Impact Assessment (EIA) -</b> Fundamentals of EIA as a tool for evaluating the potential environmental effects of proposed projects; understanding the objectives, scope, and legal framework of EIA in India; step-by-step study of the EIA process including screening, scoping, baseline data collection, impact prediction, mitigation measures, and preparation of the Environmental Management Plan (EMP); overview of environmental clearance procedures for projects related to the built environment; role of government authorities and public participation in the EIA process; discussion on the significance of EIA in promoting sustainable and responsible architectural development.	4
	<b>TOTAL</b>	<b>30</b>

**COURSE OUTCOME (CO):**

Upon successful completion of the course, students will be able to:

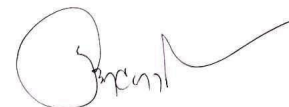
<b>C01</b>	Understand ecology principles, analyse resource-urban system relationships, and apply strategies to reduce ecological footprints.
<b>C02</b>	Understand human environmental impacts, analyse causes and effects, and apply strategies for mitigation.
<b>C03</b>	Understand sustainable design principles, analyze climate-responsive planning, and apply strategies for green integrated buildings.
<b>C04</b>	Understand key environmental legislations, analyse their implications for development, and apply compliance measures in architectural practice
<b>C05</b>	Understand EIA fundamentals, analyse project environmental impacts, and apply clearance procedures for built environment projects

**REFERENCE BOOKS:**

S.No.	NAME OF AUTHORS / BOOKS/ PUBLISHER	YEAR OF PUBLICATION
1.	Engne P. Odum and Garry W Barreit "Fundamentals of Ecology" Thomson – Brooks/Cole	2006



Member Secretary

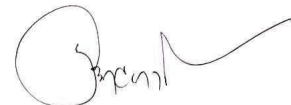


Chairman

2.	A.K.Jain "Ecology and Nature Resource Management for Sustainable Development" Management Publishing Co.	2001
3.	Goudi Andren "The human impact in Natural Environment", Basic Btackwell, Oxford	1981
4.	McHarg Ian "Design with Nature" - Natural History Press, New York	1969
5.	James Steele, "Ecological Architecture", Thames & Hudson	2005



**Member Secretary**



**Chairman**

**1AR2: BUILDING MATERIALS-I**

**B.ARCH.: 1<sup>st</sup> Semester**

**Max. Marks: 100**

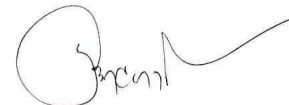
**2L**

**Exam Hours: 3**

UNIT	CONTENTS	CONTACT HOURS
I	<p><b>Earth, Soil and Laterite</b></p> <p>Types and properties of earth, soil, and laterite; construction systems including adobe, rammed earth, wattle and daub, and Compressed Stabilized Earth Blocks (CSEB); problems and remedial measures in earth, soil, and laterite construction; soil stabilizers; physical tests; BIS specifications; protective finishes. Modern stabilized earth technologies, such as interlocking CSEB blocks and modular earth systems used in sustainable housing. Basic idea of integrating moisture barriers or geotextile layers in earth construction for better durability. Study of Machines &amp; Equipment's for transportation, preparation and laying of earth, soil and laterite.</p>	6
II	<p><b>Clay Products and Pozzolanas</b></p> <p>Types of tiles, characteristics of good tiles, tile manufacturing; earthenware, stoneware, porcelain, clay blocks; natural and artificial pozzolanic materials; advantages of pozzolanas; storage; chemical and physical characteristics of fly ash; BIS specifications; use of clay products in building components; protective finishes. Emerging applications of fly ash bricks and hollow clay blocks as sustainable alternatives. Recycled clay products and their environmental benefits. Study of Machines &amp; Equipment's for manufacturing, transportation, preparation of clay products</p>	6
III	<p><b>Bricks</b></p> <p>Composition of good brick earth; manufacturing process; properties and qualities of good bricks; classification; market forms such as hollow, bullnose, and perforated bricks; uses in buildings; storage; physical tests; substitutes; BIS specifications; protective finishes. Study of Machines &amp; Equipment's for manufacturing, transportation, preparation and laying of brick.</p>	8
IV	<p><b>Lime and Sand</b></p> <p>Sources and classification of lime; characteristics and manufacturing; uses in building elements; BIS classification; natural sources and classification of sand; properties of sand; classification of mortars; proportion of lime mortar. Study of Machines &amp;</p>	6



**Member Secretary**



**Chairman**

	Equipment's for manufacturing, transportation, preparation and laying of building lime.	
V	<b>Building Stones</b> Classification of rocks; quarrying; properties of building stones; common types and uses; qualities of good stones; defects and remedial measures; physical tests such as absorption, hardness, and crushing; artificial stones; dressing and finishes; BIS specifications; protective finishes. Study of Machines & Equipment's for manufacturing, transportation, preparation and laying of building stone.	4
	<b>TOTAL</b>	<b>30</b>

**COURSE OUTCOME (CO):**

Upon successful completion of the course, students will be able to:

<b>CO1</b>	Understand earth, soil, and laterite properties, analyze construction methods and issues, and apply suitable techniques for durable and sustainable earth construction
<b>CO2</b>	Understand clay products and pozzolanas, analyze their properties and uses, and apply sustainable production and construction methods.
<b>CO3</b>	Understand brick materials and types, analyze properties, standards, and uses, and apply suitable methods for production and construction.
<b>CO4</b>	Understand lime and sand types and sources, analyze their properties and uses in construction, and apply appropriate methods for preparation and application
<b>CO5</b>	Understand types and properties of building stones, analyze their uses, defects, and standards, and apply suitable methods for preparation and construction.

**REFERENCE BOOKS:**

S.No.	NAME OF AUTHORS / BOOKS/ PUBLISHER	YEAR OF PUBLICATION
1.	Engine P. Odum and Garry W Barreit "Fundamentals of Ecology" Thomson – Brooks/Cole	2006
2.	A.K.Jain "Ecology and Nature Resource Management for Sustainable Development" Management Publishing Co.	2001
3.	Goudi Andren "The human impact in Natural Environment", Basic Btackwell, Oxford	1981
4.	McHarg Ian "Design with Nature" – Natural History Press, New York	1969
5.	James Steele, "Ecological Architecture", Thames & Hudson	2005



Member Secretary



Chairman

**1AR3: ARCHITECTURAL STRUCTURES-I**


**B.ARCH.: 1<sup>st</sup> Semester**

**Max. Marks: 100**

**2L**

**Exam Hours: 3**

UNIT	CONTENTS	CONTACT HOURS
I	<b>Forces:</b> Concept of force and its role in structural stability; methods of graphical representation of forces; study of coplanar and non-coplanar forces, and differentiation between concurrent and non-concurrent force systems; techniques for composition and resolution of coplanar forces using both graphical and analytical approaches; application of fundamental force laws including the Triangle Law of Forces, Polygon Law of Forces, and Parallelogram Law of Forces for solving equilibrium problems in structural systems.	8
II	<b>Types of Loads:</b> Requirements of good structures in terms of safety, stability, and economy; detailed understanding of different types of loads including dead loads, live loads, wind loads, impact loads, and earthquake loads; concepts of concentrated loads, uniformly distributed loads, and varying loads; examination of load systems and critical combinations of loads as per relevant standards; analysis of the effects of earthquake forces on buildings and wind loads on tall structures, with reference to applicable codes and design guidelines.	4
III	<b>Simple Stresses and Strains:</b> Concept of stress and strain in three dimensions and generalized Hooke's law; Young's modulus; Tension test of mild steel and other materials: true and apparent stress, ultimate strength, yield stress and permissible stress; Stresses in prismatic & non prismatic members and composite members; Thermal stresses; Shear stress, Shear strain, Modulus of rigidity, Complementary shear stress; Poisson's ratio, Volumetric strain, Bulk modulus, relation between elastic constants; Stresses in composite members, Compatibility condition.	8
IV	<b>Centroids and Moment of Inertia in plane:</b> Study of centroids and centre of gravity for simple, composite, and built-up sections in two dimensions; determination of moments of inertia of plane figures; application of the parallel axis theorem and perpendicular axis theorem; concept and calculation of product of inertia and radius of gyration; analysis of built-up steel sections for structural applications.	6
V	<b>Structural concepts:</b> Types of structures including load-bearing, framed, trussed, and composite systems; fundamentals of design philosophies such as working stress, ultimate load, and limit state methods; concept and calculation of factor of safety for structural	4



Member Secretary



Chairman

	reliability; overview of design codes and standards with emphasis on their role in safe and economical construction; introduction to IS 456:2000 for reinforced concrete design and IS 800:2007 for steel structure design, including their scope, provisions, and applications in architectural practice.	
	<b>TOTAL</b>	<b>30</b>

**COURSE OUTCOME (CO):**

Upon successful completion of the course, students will be able to:

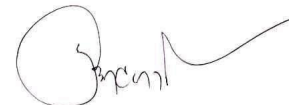
<b>C01</b>	Understand types of forces, analyze their behavior, and apply techniques to resolve coplanar force systems.
<b>C02</b>	Understand types and effects of structural loads, analyse their influence on stability and safety, and apply load considerations in structural design
<b>C03</b>	Understand concepts of stress and strain, analyse material behaviour under various loads, and apply principles to determine stresses in structural members.
<b>C04</b>	Understand centroids and moments of inertia, analyse their structural applications, and apply theorems to compute section properties.
<b>C05</b>	Understand types of structural loads, analyze performance requirements, and apply load combinations to assess effects on buildings.

**REFERENCE BOOKS:**

<b>S.No.</b>	<b>NAME OF AUTHORS / BOOKS/ PUBLISHER</b>	<b>YEAR OF PUBLICATION</b>
1.	B.C.Punmia, "Strength of Materials", Laxmi Publications (P) Ltd., New Delhi	2006
2.	Ashok Jhunjhunwala, "Engineering Mechanics", Tata McGraw Hills	2009
3.	Singer and Patel, "Strength of Material", Harper Collins Publishers	2008
4.	Timoshenko & Gere, "Mechanics of Structures", CBS Publishers and Distributers.	2009
5.	S.B Junnarkar, "Mechanics of Structures Vol. I & II", Charotar Publishing House, Anand	2009



**Member Secretary**



**Chairman**

**1AR4: ARCHITECTURAL GRAPHICS-I**

**B.ARCH.: 1<sup>st</sup> Semester**

**Max. Marks: 100**

**1L, 4S**

UNIT	CONTENTS	CONTACT HOURS
I	<b>Introduction to Architectural Drafting-</b> Fundamental role of architectural graphics as the visual language of architecture. Drafting instruments such as drawing boards, T-squares, set squares, compasses, scales, and templates, while emphasizing accuracy, neatness, and consistency in representation. Learning to draw straight & curved lines with different qualities. Terminology & abbreviations used in architectural drawing. Introduction to digital drafting environments, gaining initial exposure to CAD platforms to understand how conventional instruments translate into digital tools.	9
II	<b>Lettering and Line Types</b> –Precision in lettering and linework, critical for maintaining clarity and readability in architectural drawings. Different types of lettering for titles, annotations, and notes, to maintain uniformity in height, spacing, and style. Line conventions, including outlines, construction lines, hidden lines, center lines, dimension lines, hatching, and cutting-plane lines, are systematically introduced. Hierarchy of lines in drawings, to communicate design intentions effectively.	9
III	<b>Scale in Architecture</b> –Concept of scale as an indispensable tool in architectural representation. Plain and diagonal scales to understand proportional reduction and enlargement of drawings. Exercises on scaling site plans, floor plans, elevations, and sections, to represent objects of varying sizes accurately within limited drawing spaces. This unit also introduces digital scaling tools in CAD and plotting software, allowing students to cross-check manual scaled drawings with digitally drafted ones for precision and consistency.	12
IV	<b>Orthographic Projections - Fundamentals</b> – Foundation of orthographic projections as a method for representing three-dimensional objects on two-dimensional planes. Projections of points, lines, and planes, determining true lengths, traces, and inclinations in relation to the horizontal and vertical reference planes. The distinction between first-angle and third-angle projection methods practical exercises. Simple objects in plan and elevation, to read and represent architectural forms. CAD software to validate manual work, allowing students to visualize how orthographic drawings are automatically generated in digital platforms.	21



Member Secretary



Chairman

V	<b>Orthographic Projections – Solids and Complex Geometry –</b> Orthographic projections to plane figures and solid forms. Projections of prisms, pyramids, cones, cylinders, spheres, and tetrahedrons in various orientations with respect to the reference planes. Alongside simple solids, drafting of complex geometric shapes commonly encountered in architecture, such as arches, vaults, domes, and curved profiles, to build familiarity with more intricate forms. Exercises focus on accuracy in both manual drafting and cross-verification using 3D digital modeling software, bridging traditional and modern approaches.	24
	<b>TOTAL</b>	<b>75</b>

**COURSE OUTCOME (CO):**

Upon successful completion of the course, students will be able to:

<b>CO1</b>	Understand the basics of drafting instruments and conventions, analyse the role of line quality in representation, and apply manual and digital tools for precise drawings.
<b>CO2</b>	Understand lettering standards and line hierarchies, analyse their importance in communication, and apply them in manual and CAD-based drawings.
<b>CO3</b>	Understand the principles of scaling, analyse its use in architectural drawings, and apply plain and diagonal scales for accurate reductions and enlargements.
<b>CO4</b>	Understand the concepts of orthographic projections, analyse the relationship of points, lines, and planes to reference planes, and apply projections in plans and elevations.
<b>CO5</b>	Understand the projection of solids and complex shapes, analyse their orientation in space, and apply orthographic methods using both manual and digital techniques.

**REFERENCE BOOKS:**

S.No.	NAME OF AUTHORS / BOOKS/ PUBLISHER	YEAR OF PUBLICATION
1.	Philip Meggs, "A History of Graphic Design", John Wiley & Sons; 3 edition	1998
2.	N.D.Bhatt, "Elementary Engineering", Charotar Publishing House, Anand	1991



Member Secretary

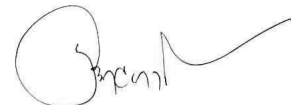


Chairman

3.	Edward J.Muller, James G. Fausett, Philip A. Grau, "Architectural Drawing and Light Construction", Prentice hall New Jersey	1991
4.	Alexander W. White, "The elements of Graphic Design Space, Unity, Page, Architecture and Types", All worth press, 1 edition.	2002
5.	Francis D.K.Ching with Steven P. Juroszek, "Design Drawing", John wiley & sons, NY.	1998



**Member Secretary**



**Chairman**


**1AR5: BUILDING CONSTRUCTION-I**

**B.ARCH.: 1<sup>st</sup> Semester**


**Max. Marks: 100**

**1L, 3S**

UNIT	CONTENTS	CONTACT HOURS
I	<p><b>Earth, Soil and Laterite</b></p> <p>Application of earth, soil, and laterite in various building elements such as foundations, load-bearing walls, plinths, and low-cost wall systems. Use of stabilized earth blocks and rammed earth in walls and retaining walls. Typical details for earth damp-proofing, soil treatment, and protective finishes. Representation of these materials in building construction drawings.</p>	9
II	<p><b>Clay Products and Pozzolanas</b></p> <p>Use of clay tiles, earthenware, stoneware, porcelain, and clay blocks in walls, roofs, and flooring. Application in detailing tiled pitched roofs, ridge tiles, floor finishes, partition walls, and wall cladding. Typical details for junctions, weathering courses, and protective finishes for clay products. Representation of clay materials in plans, sections, and elevations.</p>	6
III	<p><b>Bricks and Brick Masonry</b></p> <p>Application of bricks in building elements such as foundations, walls, openings, arches, lintels, and copings. Various bonding patterns, junctions, and offsets in brickwork. Classification and detailing of arches in brick masonry construction. Use of bricks in decorative brickwork, ventilators, and parapet walls. Drafting conventions for brick hatching and bond representation in working drawings.</p>	18
IV	<p><b>Lime, Sand and Mortars</b></p> <p>Use of lime and sand in mortars for masonry joints, plastering, pointing, and finishes in foundations, walls, and ceilings. Detailing of lime plaster and pointing for exposed brickwork and stone masonry. Representation of different mortar finishes in sections and details. Methods of surface preparation for finishes using lime-based mortars.</p>	12
V	<p><b>Building Stones</b></p> <p>Use of stones in various building elements such as foundations, load-bearing walls, floors, and retaining walls in load-bearing construction. Classification and detailing of arches in stone masonry. Construction of staircases, ramps, retaining walls, columns, and piers in stone. Use of stone in door and window frames, lintels, sills,</p>	15



Member Secretary



Chairman

	copings, and other structural and architectural components. Drafting conventions for different types of stone masonry and surface finishes in drawings.	
	<b>TOTAL</b>	<b>60</b>

**COURSE OUTCOME (CO):**

Upon successful completion of the course, students will be able to:

<b>C01</b>	Understand the use of earth, soil, and laterite in construction, analyze detailing and protective treatments, and apply appropriate methods for representing these materials in building drawings.
<b>C02</b>	Understand applications of clay products and pozzolanas in building elements, analyze detailing and protective finishes, and apply standards to represent them accurately in drawings.
<b>C03</b>	Understand applications of bricks in various building elements, analyze construction details, and apply standards to prepare accurate construction drawings.
<b>C04</b>	Understand the use of lime, sand, and mortars in masonry and finishes, analyze detailing for joints and plastering, and apply standards to represent them accurately in construction drawings
<b>C05</b>	Understand the use of stones in structural and architectural elements, analyze masonry and detailing for various components, and apply standards to prepare accurate construction drawings.

**REFERENCE BOOKS:**

<b>S. No.</b>	<b>NAME OF AUTHORS / BOOKS / PUBLISHER</b>	<b>YEAR OF PUBLICATION</b>
1.	S.C.Rangwala, "Engineering Materials", Charota Publishing Housing Pvt. Ltd. Anand (Gujrat)	1997
2.	Sushil Kumar, "Building Construction", M/s. Standard Publishers & Distributors, Delhi	2003
3.	Robin Barry, "The construction of buildings (Vol. I-V)", Blackwell publishing	2000
4.	Francis D.K.Ching, "Building Construction Illustrated", John Wiley	1975
5.	Handbook on Building Construction Practices, BIS, New Delhi	1997



Member Secretary



Chairman

**1AR6: ARTS & BASIC DESIGN - I**

**B.ARCH.: 1<sup>st</sup> Semester**

**Max. Marks: 100**

**1L, 3S**

UNIT	CONTENTS	CONTACT HOURS
I	<b>Elements of Visual Arts:</b> Brief historical review of Fine arts and interdependency of Visual arts, Architecture, painting & sculpture. Exposure to the life & works of famous artists & art forms. Theories related to visual perception –Proximity, repetition, simplest and largest figure, continuity & closure, Figure & ground relationship. Study of Line, Form, Colour, Texture, Space through Observation, Perception and Expression. Study of classification of colours with different hues , values and shades. Colour wheel and colour composition, Properties of colour.	12
II	<b>Principles of Art and Design:</b> Exploration of the basic principles of composition such as Balance, Proportion, Harmony, Contrast, Emphasis, character with building examples. Ordering principles such as Axis, Symmetry, Hierarchy, Datum, Rhythm & Repetition etc. and its role in architectural expression.	12
III	<b>Two Dimensional Explorations:</b> Introduction to Principles of Organization/ Composition. Study of Visual properties of 2-Dimensional forms both Geometrical & Non-Geometrical surfaces and visual textures, optical illusions etc. Emphasizing on Elements and Principles of Art and Design by Composing Shapes and Forms in Various Mediums.	16
IV	<b>Indoor and Outdoor Sketching:</b> Learning to Draw by Seeing and Observing. Free hand line sketching and drawing of natural & manmade, Still and Moving Objects such as Human Figures, Vegetation, Automobiles, Historic or new built up structures etc.	12
V	<b>Rendering:</b> Shading Techniques using Materials such as Pencils, Pencil Colours, Water Colours, Poster Colours, Pen and Ink, charcoal & crayons for development of environmental and architectural ideas. Simple geometric objects, complex geometries and objects in nature & Architecture, shade and shading techniques.	8
	<b>Total</b>	<b>60</b>



Member Secretary




Chairman

**COURSE OUTCOME (CO):**


Upon successful completion of the course, students will be able to:

<b>CO1</b>	Understand visual arts concepts, analyze perception theories, and apply artistic principles.
<b>CO2</b>	Understand design principles, analyze ordering systems, and apply them in architectural composition.
<b>CO3</b>	Understand the principles of 2D composition, analyze visual elements such as form, texture, and illusion, and apply them to create structured designs using various mediums.
<b>CO4</b>	Understand observational drawing, analyze natural and built forms, and apply freehand sketching to depict various subjects.
<b>CO5</b>	Understand shading, analyze form and light, and apply rendering techniques using different media.

<b>S.No.</b>	<b>NAME OF AUTHORS / BOOKS/ PUBLISHER</b>	<b>YEAR OF PUBLICATION</b>
1.	Robert Gill, "Rendering with pen and ink", Thames & Hudson	1990
2.	Gianni A. Sarcone, "Drawing & Illustration", Arcturus Publication	2012
3.	Otto G. Ocvirk, "Art Fundamentals", Mcgraw Hill	2006
4.	Gianni A. Sarcone, "Drawing optical illusions", Arcturus Publication	2012
5.	Trudy Friend, "Landscape problem and solutions", David & Charles	2005



**Member Secretary**



**Chairman**

**1AR7: COMPUTER APPLICATION-I**

**B.ARCH.: 1<sup>st</sup> Semester**


**Max. Marks: 100**

**2S**

UNIT	CONTENTS	CONTACT HOURS
I	<b>Computer Applications in Architecture:</b> Role of Computers in Architectural design, Evolution of CAD in Architecture, Overview of digital tools: Drafting, 3D modeling, rendering, and BIM. Comparison of manual vs digital drafting. Introduction to drafting and modeling software relevant to architecture viz. AutoCAD, ZWCAD, Draft sight, Google Sketchup, 3ds Max etc. Key differences/similarities between AutoCAD, ZWCAD, Draft sight	2
II	<b>Sketch up for visualization:</b> Interface overview: Navigation, toolbars, and templates. Introduction to basic modeling tools-Drawing and editing tools (Push/Pull, follow me, move, scale, rotate, copy), groups and components. Architectural Modeling-Modeling building, applying material and textures, working with scenes and styles. Exercise based on above tools-Single function unit, simple and complex forms.	8
III	<b>Fundamentals of 2D drafting software:</b> Introduction to the workspace - Title bar, menu bar, ribbon/toolbars, drawing area, command line, status bar. Types of workspaces: Drafting & Annotation, 3D Basics (briefly introduced). Tool palettes and customization. Using the command line effectively. Navigating the drawing (Zoom, Pan, Mouse Controls), Unit setup, Basic drafting tools-Line, Polyline, Rectangle, circle, Hatch, Text. Modify the drawing by using copy, trim, fillet, offset, rotate, mirror, etc. Introduction to dimension style-Dimensioning and Labeling (e.g. room names, door/window tags)	8
IV	<b>Enhancing drawing skills-</b> Understanding line types:- Continuous, dashed, dotted, centerline, hidden lines, use in architectural context (e.g., centerlines, property lines, hidden objects), Applying and customizing line type scales (LTSCALE, PSLTSCALE), Understanding line weights-Importance of visual hierarchy (thick for cut sections, medium for outlines, thin for details), Assigning line weights through layers or manually, Controlling line weight display and plotting. Hatch Patterns and Gradient Fills. Isometric view for visualization- Setting up isometric grid and snap settings Drawing isometric shapes using-Ellipses for circles (isocircles), Isometric axes (30° angles), Using "Isoplane" (F5 key) to switch between left, right, and top planes, Creating simple	8



Member Secretary



Chairman

	isometric furniture or room layouts for visual representation	
V	<b>Creating and managing Layers</b> - Using layers effectively to control visibility and organization, applying colors and plot styles for presentation, Setting its properties, assign layers to existing drawing. Managing layers. Various Utility tools – Area, Volume, Quick select.	4
	<b>TOTAL</b>	30

**COURSE OUTCOME (CO):**

Upon successful completion of the course, students will be able to:

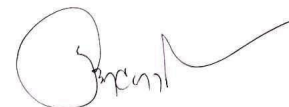
<b>C01</b>	Understand digital tools in architecture, analyse CAD applications, and apply drafting and modeling software effectively
<b>C02</b>	Understand SketchUp interface, analyse modeling tools, and apply them for architectural visualization.
<b>C03</b>	Understand 2D drafting workspace, analyse drawing tools, and apply them to create and modify architectural drawings.
<b>C04</b>	Understand line types and weights, analyse their architectural use, and apply them with hatching and isometric drafting techniques
<b>C05</b>	Understand layer management, analyse utility tools, and apply them for organized architectural drawings.

**REFERENCE BOOKS:**

S.No.	NAME OF AUTHORS / BOOKS/ PUBLISHER	YEAR OF PUBLICATION
1.	Cadfolks, "Autocad 2014 for Beginners", Create Space Independent Publishing Platform	2014
2.	Bill Fane, "AutoCAD 2014 For Dummies", John Wiley & Sons	2013
3.	Randy H. Shih, "Exploring DraftSight" Schroff Development Corp	2009
4.	Chris Grover, "Google Sketch Up", Shroff/O'Reilly	2009
5.	Kelly L. Murdock, "Google® SketchUp and SketchUp Pro 7 Bible"	2009



Member Secretary



Chairman

**1AR8: WORKSHOP**

**B.ARCH.: 1<sup>st</sup> Semester**

**Max. Marks: 100**

**3S**

UNIT	CONTENTS	CONTACT HOURS
I	<p><b>Model Making:</b> Fundamentals of three-dimensional model construction through two key approaches. Surface Modelling creating basic geometric forms: such as cubes, cuboids, cylinders, cones, and pyramids using single-surface development techniques through precise cutting and pasting. Form Modelling on constructing basic geometries using thermocol and various solid materials to explore and understand the properties, behavior, and structural characteristics of different materials.</p>	9
II	<p><b>Model Making-Complex Forms and Digital Fabrication:</b> Construction of complex forms to enhance proficiency in model making. Creating complexity through the addition to and subtraction from basic geometric shapes, using materials such as paper, mount sheets, mount boards, and similar media. Digital-to-physical workflow, integrating 3D printing, laser cutting, and CNC milling to translate digital designs into physical models. Use of CAD software such as Rhino, SketchUp, or Fusion 360 for precision model planning prior to fabrication.</p>	9
III	<p><b>Photography:</b> Fundamentals of photography as a visual communication tool for architectural documentation and creative expression. Study of different types of cameras, their components, and accessories, along with the characteristics and applications of various lenses and films. Essential technical controls, including camera settings, aperture, shutter speed, exposure value (E.V.), ISO, white balance, and color management. Composition techniques through the viewfinder to effectively capture scale, proportion, light, shadow, and texture in both natural and built environments. Camera settings for different lighting conditions and perspectives, for documenting architectural spaces.</p>	9
IV	<p><b>Carpentry &amp; Metal Workshop:</b> Fundamental woodworking and metalworking techniques relevant to architectural model making, prototyping, and construction. Different types of wood joints: such as butt joints, dovetail joints, rebates, tongue-and-groove, and other</p>	9



**Member Secretary**



**Chairman**

	<p>traditional and modern connections along with the proper use of hand tools and power tools for cutting, shaping, and assembling wood.</p> <p>Basic techniques for cutting, welding, molding, bending, and bolting, as well as safe handling of metalworking tools and equipment. Applications of wood and metal fabrication in architectural practice, from structural components to detailed finishes.</p>	
V	<p><b>Modeling &amp; Casting Techniques:</b> Developing spatial understanding, craftsmanship, and creative expression while translating design concepts into physical models. Modeling and casting techniques through volumetric studies using clay and Plaster of Paris. Clay modeling from basic to complex forms, types of clay and their properties, casting methods in POP and other materials, including mold-making and finishing.</p>	9
	<b>Total</b>	<b>45</b>

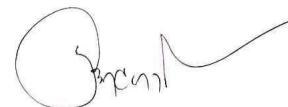
**COURSE OUTCOME (CO):**

Upon successful completion of the course, students will be able to:

<b>C01</b>	Understand basic 3D geometric forms, analyse material properties and structural behavior, and apply modelling techniques to construct accurate physical models.
<b>C02</b>	Understand complex forms, analyse digital-to-physical workflows, and apply CAD with fabrication tools for precise models
<b>C03</b>	Understand photography fundamentals, analyse technical controls and composition, and apply techniques to document architectural spaces.
<b>C04</b>	Understand photography principles, analyse technical settings and composition, and apply techniques to capture architectural spaces
<b>C05</b>	Understand modelling and casting principles, analyse material properties and methods, and apply techniques to create and finish physical forms



Member Secretary



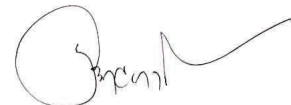
Chairman

**REFERENCE BOOKS:**

<b>S.No.</b>	<b>NAME OF AUTHORS / BOOKS/ PUBLISHER</b>	<b>YEAR OF PUBLICATION</b>
1.	Donald Stoltenberg, "The Artist & Built Environment", Davis Publication	1980
2.	Keith Critchlow, " Order in Space", Thames & Hudson	2000
3.	R.C.Gupta, "Basic Shop Theory carpentry", Dhanpat Rai publications	
4.	Edword Luice Smith, Paul J Karlstroam," Fletcher Benton", Harry N Abrams publications, First Edition	1990
5.	Robert J. Lang, "Origami animals", Crescent Books Publishers	1992



**Member Secretary**



**Chairman**

**2AR1: HUMANITIES**

**B.ARCH.: 2<sup>nd</sup> Semester**

**Max. Marks: 100**

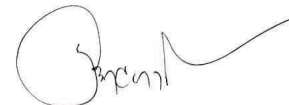
**2L**

**Exam Hours: 3**

UNIT	CONTENTS	CONTACT HOURS
I	<b>Introduction to Sociology:</b> Relationship between Sociology and Architecture and its relevance: Society and its types, Family as the basic Unit of 'Society'. Man, Environment and Society, Sociological aspects in the history of the evolution of housing/ shelter forms. Human as resource. Maslow theory of hierarchy	6
II	<b>Power Structure in Society:</b> Power structures in society and their influence on community organisation and development; concept of social stratification and its implications for social equity and access to resources; key theories of social stratification including Davis and Moore's functional theory and Karl Marx's conflict theory; institutions of local self-government in both rural and urban contexts, with emphasis on the structure, roles, and functions of the Gram Panchayat in villages and Municipality in towns and cities; discussion on the relevance of these institutions in participatory planning and community development.	6
III	<b>Social Problems:</b> Major social problems affecting urban and rural communities, including urbanisation, overcrowding, slum formation, and housing issues; development programmes aimed at improving living conditions in both urban and rural societies; social challenges related to the interaction, isolation, privacy, accessibility, conflict, and alienation arising from the planning and design of various building types; needs of different age groups and population groups in architectural design; socio-spatial problems such as migration, high-density settlements, slum conditions, and the implications of high-rise living on social interaction and well-being.	4 2
IV	<b>General Economics Concepts:</b> General economic concepts relevant to architecture and construction, including demand and supply, elasticity of demand, types of markets and competition, price determination, and concepts of cardinal and ordinal utility;	2



**Member Secretary**



**Chairman**

	factors of production and their role in the building industry; overview of elementary economic planning, with broad features of ongoing five-year plans and their influence on the location, construction, and financing of architectural projects, particularly in housing; key agencies, institutions, and organisations both governmental and non-governmental that directly or indirectly impact the economic aspects of architectural projects.	2  2
V	<b>Land Economics:</b> Land economics, focusing on land as a limited and valuable resource and the factors influencing demand for land acquisition; economics of regional development, exploring the relationship between economic growth and regional planning, key regional economic theories, and the challenges and opportunities in achieving balanced regional development; examination of building economics, including sources of finance (public and private), interest rates, rents, taxes, insurance, recurring costs, and patterns of disposable income and expenditure that influence construction and housing demand.	2  2  2
	<b>TOTAL</b>	<b>30</b>

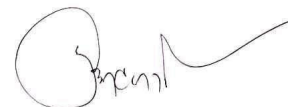
**COURSE OUTCOME (CO):**

Upon successful completion of the course, students will be able to:

<b>C01</b>	Understand sociology in architecture, analyse human–environment relations, and apply concepts to responsive design.
<b>C02</b>	Understand social stratification and governance, analyse their community roles, and apply concepts to inclusive planning
<b>C03</b>	Understand social and spatial issues, analyse community impacts, and apply design solutions for diverse needs
<b>C04</b>	Understand economic concepts, analyse their impact on construction, and apply institutional knowledge to project development
<b>C05</b>	Understand land, regional, and building economics, analyse their planning impacts, and apply financial principles to projects



Member Secretary



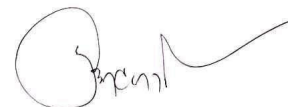
Chairman

**REFERENCE BOOKS:**

<b>S. No.</b>	<b>NAME OF AUTHORS / BOOKS/ PUBLISHER</b>	<b>YEAR OF PUBLICATION</b>
1.	Arora, "Surveying", Raj Sons Publications Pvt. Ltd.	1996
2.	S.C.Rangwala, "Surveying & Levelling", Charotar Publishing House, Anand (Gujarat)	2005
3.	Dr. B.C.Punmia, "Surveying", Laxmi Publication (P) Ltd., New Delhi	2002
4.	William Irvine, "Surveying for Construction", McGraw Hill Book Co., New Delhi	1995
5.	John Clancy, "Site Surveying & Levelling", Arnold London	1991



**Member Secretary**



**Chairman**

**2AR2: CLIMATOLOGY**

**B.ARCH.: 2<sup>nd</sup> Semester**

**Max. Marks: 100**

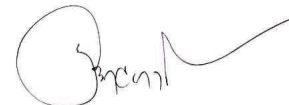
**2L**

**Exam Hours: 3**

UNIT	CONTENTS	CONTACT HOURS
I	<b>Fundamentals of Climate and Architecture:</b> Principles of climatology and their relevance to architecture. distinction between weather and climate. Relationship between the Earth and the Sun, study of the planet's axial tilt, rotation, and revolution, effects on seasonal variations. Key concepts such as solar radiation, the Earth's energy balance. Macroclimate and microclimate, detailing the various environmental and geographical factors that influence local climate conditions. fundamental elements of climate: temperature, humidity, solar radiation, wind, and precipitation as essential variables in climate-responsive design.	4
II	<b>Solar Geometry and Shading Design:</b> Solar geometry and its direct application in the design of climate-responsive buildings. solar altitude, azimuth, declination, hour angle, and the equation of time. The use of sun path diagrams for analyzing solar movement across different latitudes and times of the year. Various types of shading devices, such as horizontal, vertical, egg-crate, and movable systems, in terms of their form, function, and suitability for different climates. Solar control strategies, including the integration of shading, glazing, and surface treatments, to enhance comfort and energy efficiency. Practical exercises for application of these concepts in designing architectural elements that effectively manage solar gain.	6
III	<b>Climate Analysis and Thermal Comfort:</b> Major climate classification systems, including the Köppen-Geiger model, and classification of Indian climatic zones: hot-dry, warm-humid, composite, temperate, and cold. interpret climate data from agencies such as the India Meteorological Department (IMD), Meteonorm, and NASA SSE. Climate characteristics and climate-responsive design strategies, addressing aspects such as building orientation, form, site layout, landscape integration, and environmental sustainability. The principles of thermal comfort are explained through an understanding of influencing factors such as metabolic rate, clothing	8



**Member Secretary**

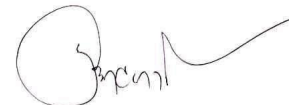


**Chairman**

	insulation, air temperature, humidity, air velocity, and radiant temperature. Modes of heat transfer—conduction, convection, and radiation alongside thermal comfort indices such as Effective Temperature (ET), Corrected Effective Temperature (CET), Predicted Mean Vote (PMV), and Predicted Percentage Dissatisfied (PPD). use of psychrometric and bioclimatic charts to make informed design decisions.	
IV	<b>Thermal Behaviour of Building Materials and Passive Design:</b> Thermal performance of building materials and the role of passive design strategies in creating comfortable indoor environments. Thermal properties of materials, including conductivity, resistance, transmittance (U-value), thermal capacity, and emissivity, as well as dynamic performance indicators such as time lag and decrement factor. The concept of thermal bridging, along with methods for identifying and mitigating its effects. A variety of passive heating and cooling techniques, including building orientation, optimized form, envelope design, and the strategic placement of openings. Advanced passive systems such as wind towers, solar chimneys, roof ponds, earth-air tunnels, trombe walls, solarium, radiant cooling and heating, geo thermal cooling etc. Examination of traditional and vernacular architecture from different climatic regions, highlighting time-tested environmental control mechanisms.	6
V	<b>Daylighting, Ventilation, and Sustainable Practices:</b> Role of daylight and ventilation in enhancing energy efficiency, indoor comfort, and environmental quality. The fundamental principles of daylighting, including daylight factor, daylight autonomy, and daylight contours, as well as manual and simulation-based assessment methods. Ventilation strategies: natural, mechanical, and mixed-mode with attention to their role in maintaining indoor air quality, controlling humidity, and improving thermal comfort. Influence of openings on ventilation efficiency in terms of their size, position, and orientation, along with air change rates and standards such as ASHRAE 55. Sustainable practices through the application of guidelines from the Energy Conservation Sustainable Building Code (ECSBC) and the National Building Code (NBC), as well as compliance with green building rating systems like LEED, IGBC, and GRIHA. Integrate daylighting, ventilation, and passive thermal	6



Member Secretary



Chairman

	control into a holistic, climate-responsive design approach.	
	<b>TOTAL</b>	<b>30</b>

**COURSE OUTCOME (CO):**

Upon successful completion of the course, students will be able to:

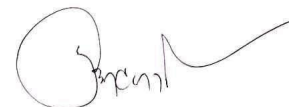
<b>CO1</b>	Understand climate principles, analyse Earth–Sun relationships, and apply key climate elements essential for climate-responsive design.
<b>CO2</b>	Understand solar geometry, analyse sun paths, and apply shading strategies for buildings in diverse climatic conditions
<b>CO3</b>	Understand climate classifications, analyse climate data, and apply climate-responsive design strategies using thermal comfort indices and environmental charts.
<b>CO4</b>	Understand thermal behaviour of materials, analyse passive design options, and apply them in building design.
<b>CO5</b>	Understand daylighting and ventilation principles, analyse their performance, and apply sustainable design standards.

**REFERENCE BOOKS:**

<b>S. No.</b>	<b>NAME OF AUTHORS / BOOKS/ PUBLISHER</b>	<b>YEAR OF PUBLICATION</b>
1.	Milli Majumdar, "Energy Efficient Buildings in India", Teri & MNES	2001
2.	Arvind Krishnan, "Climate Responsive Architecture – A design handbook for energy efficient buildings", Tata McGraw Hill, Delhi	2001
3.	Koenigsberger, "Manual on tropical housing & building", Orient Longman	1975
4.	Ishwarchand, P.K.Bhargava, "The Climatic Data Handbook", CBRI Roorkee & Tata McGraw Hills Delhi.	1999
5.	Randall McMillan, "Environmental Science in Building", Palgrave	1983



Member Secretary



Chairman


**2AR3: BUILDING MATERIALS -II**

**B.ARCH.: 2<sup>nd</sup> Semester**

**Max. Marks: 100**

**2L**

<b>UNIT</b>	<b>CONTENTS</b>	<b>CONTACT HOURS</b>
I	<b>Cement:</b> Introduction to the Indian cement industry; composition and properties of cement; setting action; manufacturing process; tests and storage methods; varieties of cement and their applications in various building elements and components; BIS specifications. Introduction to green cements such as low-carbon and blended cements. Study of machines and equipment used for transportation, mixing, and laying of cement in construction works.	8
II	<b>Plastics and Polymers</b> Brief history of plastics; polymerization processes; classification and properties; fabrication of plastic articles; applications in building construction and building services; geo-synthetics and their classification, properties, and uses; geo-textiles; natural and synthetic rubber; uses of rubber in building construction; vulcanization of rubber. Study of machines and equipment used for fabrication and installation of plastic and polymer-based building materials.	4
III	<b>Timber</b> Classification and structure of trees; defects in timber; qualities of good timber; preservation and seasoning methods; market forms and uses; important Indian timber species; BIS specifications. Terms related to sloped timber roofs; wooden roof trusses and their types; coverings for sloped timber roofs using various materials. Bamboo, as an alternative sustainable material. Study of machines and equipment used for harvesting, processing, and installation of timber and timber roof structures.	6
IV	<b>Industrial Timber</b> Properties of veneers, plywood, block board, fibre boards, impregnated timber, compreg timber, and other industrial timber products; applications in building works; BIS specifications. Protective finishes for timber and industrial timber products. Engineered wood products like cross-laminated timber (CLT) and glue-laminated timber	8



**Member Secretary**



**Chairman**

	as emerging sustainable materials. Study of machines and equipment for manufacturing, finishing, and installation of industrial timber components.	
V	<b>Asbestos, Asphalt, Bitumen, and Tar</b> Introduction and historical context; types and forms of asbestos, properties, uses, and harmful effects; natural and residual asphalt, types, and applications; bitumen and its market forms, modified bitumen, and various types of tar; uses of these materials in building construction. Safe handling and disposal of asbestos, bans and modern substitutes. Use of polymer-modified bitumen for roads and buildings for better performance. Study of machines and equipment for handling, transportation, preparation, and laying of asphalt, bitumen, and tar in construction projects.	4
	<b>TOTAL</b>	<b>30</b>

**COURSE OUTCOME (CO):**

Upon successful completion of the course, students will be able to:


<b>C01</b>	Understand cement types, properties, and manufacturing, analyze tests and standards, and apply appropriate methods for use in construction.
<b>C02</b>	Understand types and properties of plastics, polymers, and rubber, analyze their fabrication and applications in construction, and apply suitable methods for installation and use.
<b>C03</b>	Understand timber types, structure, and properties, analyze defects, preservation, and standards, and apply suitable methods for processing and using timber and bamboo in construction.
<b>C04</b>	Understand properties of industrial timber products, analyze their applications and standards, and apply suitable methods for manufacturing, finishing, and installation, including sustainable engineered wood.
<b>C05</b>	Understand types, properties, and uses of asbestos, asphalt, bitumen, and tar, analyze their applications, risks, and standards, and apply safe and effective methods for handling and construction

**REFERENCE BOOKS:**

S. No.	NAME OF AUTHORS / BOOKS/ PUBLISHER	YEAR OF PUBLICATION
1.	S.C.Rangwala, "Engineering Materials", Charotar Publishing Housing Pvt. Ltd. Anand (Gujrat)	1997



Member Secretary

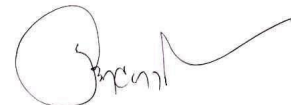


Chairman

2.	Sushil Kumar, "Building Construction", M/s. Standard Publishers & Distributors, Delhi	2003
3.	Robin Barry, "The construction of buildings (Vol. I-V)", Blackwell publishing	2000
4.	Francis D.K.Ching, "Building Construction Illustrated", John Wiley	1975
5.	Handbook on Building Construction Practices, BIS, New Delhi	1997



**Member Secretary**



**Chairman**

**2AR4: ARCHITECTURAL STRUCTURES-II**


**B.ARCH.: 2<sup>nd</sup> Semester**

**Max. Marks: 100**

**2L**

**Exam Hours: 3**

UNIT	CONTENTS	CONTACT HOURS
I	<b>Shear Force and Bending Moment:</b> Study of axial force, shear force, and bending moment in structural members; understanding the principles and significance of shear force diagrams (SFD) and bending moment diagrams (BMD) for different beam configurations; analysis of simply supported beams, cantilever beams, and overhanging beams under various loading conditions; calculation and graphical representation of SFD and BMD for beams subjected to concentrated loads and uniformly distributed loads (UDL); application of structural analysis concepts to determine maximum shear force and bending moment for safe and efficient beam design.	8
II	<b>Bending Stresses in Beams:</b> Bending stresses in beams with emphasis on pure bending and the theory of simple bending; derivation and application of the bending equation; calculation of bending stresses for beams with different cross-sectional shapes; determination of section modulus for various sections and its significance in strength design; analysis of the distribution of normal stress due to bending; evaluation of bending stresses at any section of simply supported and cantilever beams subjected to various loading conditions, including concentrated and distributed loads.	4
III	<b>Slope and Deflection:</b> Relationship between load, shear force, and bending moment in beams; introduction to the concepts of slope and deflection in determinate beams; calculation of slope and deflection using the Double Integration Method for cantilever beams under various loading conditions and simply supported beams with symmetrical loading; application of Macaulay's Method for determining slope and deflection in simply supported beams with unsymmetrical loading; use of the Moment Area Method for slope and deflection analysis in simply supported beams subjected to various loading types; understanding the importance of deflection control for structural safety and serviceability.	8



**Member Secretary**




**Chairman**

IV	<b>Determinacy:</b> Concepts of determinacy in structural systems, explaining the difference between determinate and indeterminate structures, as well as redundant frames. Various types of indeterminacy, including static indeterminacy (degree of redundancy), internal static indeterminacy, external static indeterminacy, and kinematic indeterminacy (degree of freedom). Methods for calculating indeterminacy and solving related numerical problems. Analysis of frames and trusses, particularly pre-jointed plane frames, through techniques such as the Method of Joints and Method of Sections for determining member forces.	6
V	<b>Columns or Struts:</b> Study of columns and struts, focusing on both short and long columns. Concept of buckling load and explains Euler's Buckling Theory along with its limitations. Different end conditions of columns, along with the calculation of the equivalent length of a strut. The slenderness ratio and its significance in column stability.	4
	TOTAL	30

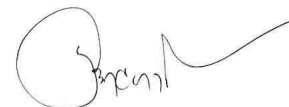
**COURSE OUTCOME (CO):**

Upon successful completion of the course, students will be able to:

<b>C01</b>	Understand shear force and bending moment concepts, analyse beams under various loads, and apply SFD and BMD for structural design
<b>C02</b>	Understand bending stress principles, analyse stress distribution in different beam sections, and apply bending equations for structural analysis
<b>C03</b>	Understand slope and deflection concepts, analyse determinate beams using various methods, and apply results to ensure structural performance
<b>C04</b>	Understand structural determinacy principles, analyse indeterminacy and member forces, and apply analytical methods to frames and trusses.
<b>C05</b>	Understand column behavior and buckling theory, analyse structural scenarios for critical loads, and apply principles to solve practical stability and design problems.



Member Secretary



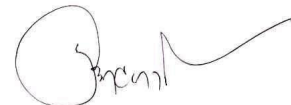
Chairman

**REFERENCE BOOKS:**

<b>S. No.</b>	<b>NAME OF AUTHORS / BOOKS/ PUBLISHER</b>	<b>YEAR OF PUBLICATION</b>
1.	B.C.Punmia, "Strength of Materials", Laxmi Publications (P) Ltd., New Delhi	2006
2.	R. K. Bansal, "Engineering Mechanics & Strength of Materials", Laxmi Publications (P) Ltd.	2008
3.	V.S.Prasad, "Structural Mechanics & Analysis"	2005
4.	Singer and Patel, "Strength of Material", Harper Collins Publishers.	2009
5.	Timoshenko & Gere, "Mechanics of Structures", CBS Publishers and Distributors	2006



**Member Secretary**



**Chairman**

**2AR5: ARCHITECTURAL GRAPHICS-II**

**B.ARCH.: 2<sup>nd</sup> Semester**

**Max. Marks: 100**

**1L, 5S**

UNIT	CONTENTS	CONTACT HOURS
I	<b>Metric and Axonometric Projections:</b> Axonometric methods like plan and elevation oblique projection methods, isometric drawing methods to represent solids and architectural forms in 3D. Construct developed surfaces for model-making and use digital platforms like CAD or SketchUp to produce and verify axonometric views.	18
II	<b>Sections and Interpenetration of Solids:</b> Sectional drawings and the slicing of solids at different angles, along with interpenetration of forms such as cones and cylinders. Spatial visualization are supported by digital modeling tools to clarify complex intersections.	18
III	<b>Perspective Projections:</b> Principles of perspective drawing, including vanishing points, cone of vision, and eye levels, to construct one-, two-, and three-point perspectives. Both manual drawings and digital visualization tools are used to explore perspectives at worm's eye, bird's eye, and normal views.	18
IV	<b>Sciography - Shadows and Light:</b> Fundamentals of shade and shadow, behavior of light on simple planes and solids. sciographic techniques in orthographic and isometric drawings, with exercises extending to complex geometrical forms like domes and vaults, supported by digital shadow simulation tools.	18
V	<b>Rendering and Representation Techniques:</b> Various methods of architectural rendering to enhance clarity and depth in drawings. Freehand and digital rendering with pencils, ink, markers, and color media, along with the use of hatching, stippling, and tonal variation to communicate materiality and texture. Techniques for representing contours, slopes, and terrain in both 2D and 3D views, to strengthen topographic visualization. Integration of manual and digital rendering approaches to create presentation-ready drawings that effectively communicate architectural ideas.	18
	<b>TOTAL</b>	<b>90</b>



**Member Secretary**



**Chairman**

**COURSE OUTCOME (CO):**

Upon successful completion of the course, students will be able to:

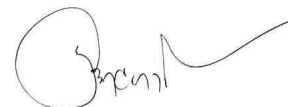
<b>C01</b>	Understand axonometric principles, analyse their role in 3D representation, and apply them to solids and developed surfaces.
<b>C02</b>	Understand sectional views and intersections, analyse complex spatial relationships of solids, and apply slicing and interpenetration techniques in drawings.
<b>C03</b>	Understand the principles of perspective, analyse spatial depth and vanishing point systems, and apply one-, two-, and three-point perspectives to architectural views.
<b>C04</b>	Understand the fundamentals of shade and shadow, analyse the effect of light on 2D and 3D forms, and apply sciographic methods in manual and digital drawings.
<b>C05</b>	Understand rendering and topographic representation, analyse techniques for contours, slopes, depth, and materials, and apply manual and digital media to produce visually rich architectural drawings.

**REFERENCE BOOKS:**

<b>S. No.</b>	<b>NAME OF AUTHORS / BOOKS/ PUBLISHER</b>	<b>YEAR OF PUBLICATION</b>
1.	Guptill, Arthur L. — Rendering in Pen and Ink. Watson-Guptill Publications.	1976
2.	Gordon, Robert Philip. — Perspective Drawing: A Designer's Method. Fairchild Books (Bloomsbury).	2012
3.	Tal, Daniel. — Rendering in SketchUp: From Modeling to Presentation. Wiley.	2013
4.	Attebery, Craig. — <i>The Complete Guide to Perspective Drawing: From One-Point to Six-Point</i> . Routledge.	2017
5.	Francis D.K.Ching with Steven P. Juroszek, "Design Drawing", John wiley & sons, NY.	1998



Member Secretary



Chairman

**2AR6: BUILDING CONSTRUCTION-II**

**B.ARCH.: 2<sup>nd</sup> Semester**

**Max. Marks: 100**

**1L, 3S**

UNIT	CONTENTS	CONTACT HOURS
I	<b>Cement:</b> Use of cement in masonry mortars for joints in brick or block walls and stonework; application in plaster finishes for walls, ceilings, and parapets. Detailing of internal and external plaster layers, base coats, final coats, and junctions with other building elements. Typical working drawings showing mortar bedding, pointing, plaster edges, drip moulds, and protective weathering as per BIS guidelines for mixing and surface preparation. Use of cement in flooring (IPS).	12
II	<b>Plastics and Polymers:</b> Application of PVC & Rubber in various building elements & components, Vinyl, Linoleum & rubber flooring, plastic doors & windows, PVC roofing, Glass fiber reinforced plastic sheets for roofing.	12
III	<b>Timber:</b> Details of carpentry joints in timber, wall construction in timber. Study of timber fasteners. Columns & Piers in timber. Roofs in timber. Timber flooring like woodblock and parquet floor. Doors in timber such as braced and battened, panelled, glazed and sliding. Windows in timber such as panelled, battened, glazed, top hung, pivoted, gable window, dormer window, bay window, French window, etc.	12
IV	<b>Industrial Timber:</b> Various building elements such as walls, roof, floor and openings in industrial timber. Wall paneling and flooring construction using industrial timber. Door, windows in industrial timber.	12
V	<b>Bamboo:</b> Use of bamboo as a sustainable material in partitions, posts, lightweight framing, and simple roof structures. Basic details include wall framing, column footings, simple trusses, and joinery with protective treatments and finishes. Application in working drawings for bamboo walls, roofs, and connections using standard conventions.	12
	<b>TOTAL</b>	<b>60</b>



**Member Secretary**



**Chairman**


**COURSE OUTCOME (CO):**

Upon successful completion of the course, students will be able to:

<b>C01</b>	Understand cement applications in masonry, plastering, and flooring, analyze detailing and protective treatments, and apply standards in working drawings.
<b>C02</b>	Understand applications of plastics, PVC, and rubber in building elements, analyze detailing for floors, roofs, and openings, and apply standards to represent these materials in construction drawings.
<b>C03</b>	Understand timber construction in structural and non-structural elements, analyze joints, fasteners, and detailing for floors, roofs, doors, and windows, and apply standards to prepare accurate drawings.
<b>C04</b>	Understand applications of industrial timber in walls, roofs, floors, and openings, analyze construction details, and apply standards to prepare accurate working drawings.
<b>C05</b>	Understand the use of bamboo in sustainable building elements, analyze framing and joinery details, and apply standards to prepare accurate working drawings

**REFERENCE BOOKS:**

<b>S. No.</b>	<b>NAME OF AUTHORS / BOOKS/ PUBLISHER</b>	<b>YEAR OF PUBLICATION</b>
1.	S.C.Rangwala, "Engineering Materials", Charotar Publishing Housing Pvt. Ltd. Anand (Gujrat)	1997
2.	Sushil Kumar, "Building Construction", M/s. Standard Publishers & Distributors, Delhi	2003
3.	Robin Barry, "The construction of buildings (Vol. I-V)", Blackwell publishing	2000
4.	Francis D.K.Ching, "Building Construction Illustrated", John Wiley	1975
5.	Handbook on Building Construction Practices, BIS, New Delhi	1997



Member Secretary



Chairman


**2AR7: ART & BASIC DESIGN-II**

**B.ARCH.: 2<sup>nd</sup> Semester**


**Max. Marks: 100**

**1L, 3S**

UNIT	CONTENTS	CONTACT HOURS
I	<b>Form</b> – fundamentals of form in art and basic design, exploring its connection with nature and its role in visual expression. Visual and emotional effects of primary geometric forms like sphere, cube, pyramid, cylinder, cone and their variations. Properties such as proportion, scale, symmetry, and balance, and how these influence perception. Different methods of transforming forms, including dimensional changes, subtractive processes, and additive processes. The articulation of forms through texture, surface treatment, and material. Hands-on exercises, sketches, and model-making to develop sensitivity to form and its expressive potential.	12
II	<b>Space</b> – Space as a fundamental element of design and defined by Horizontal elements (floors, ceilings, ground planes) and vertical elements (walls, columns, partitions). The role of openings like doors, windows, skylights in connecting or separating spaces and influencing light, ventilation, and views is explored. Spatial relationships such as adjacency, overlap, and interlocking, as well as spatial organization patterns including centralized, linear, radial, clustered, and grid forms. Learning will be reinforced through sketches, diagrams, and physical models.	12
III	<b>Anthropometry</b> – Study of human body dimensions and their relationship to space design. Measurements of the human body in standing, sitting, bending, and other postures, along with body proportions and graphic representation techniques. The connection between basic human activities such as sitting, sleeping, walking, working and their corresponding spatial requirements. Minimum and optimum area standards for various functions, considering comfort, movement, and accessibility. The learning process will include drawings, scaled diagrams, and ergonomic analysis exercises.	12
IV	<b>Proportion and Scale</b> – Concepts of proportion and scale in design,	8



**Member Secretary**



**Chairman**

	focusing on both visual perception and human scale. Historical and theoretical approaches to proportion, including the Golden Section, Modular theory by Le Corbusier, and the Japanese Ken system. Theories in nature, art, and architecture, and how they influence aesthetics, harmony, and functionality. Practical exercises will involve analyzing examples, creating proportion-based compositions, and applying these principles to architectural and design projects.	
V	<b>3D Explorations</b> - Creation and study of three-dimensional forms using fundamental design principles such as repetition, symmetry, rotation, and rhythm. Techniques to develop murals, sculptures, and installations, exploring form, volume, texture, and composition. A range of materials like clay, plaster of Paris, wood, paper, and metal will be used to understand material behavior and finishing methods. Abstraction will be employed as a conceptual tool for generating innovative ideas and translating them into expressive three-dimensional works.	16
	<b>TOTAL</b>	<b>60</b>

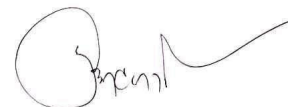
**COURSE OUTCOME (CO):**

Upon successful completion of the course, students will be able to:

<b>C01</b>	Understand the properties of forms, analyse their transformations, and apply articulation techniques in creative design.
<b>C02</b>	Understand the elements that define space, analyse spatial relationships and organizations, and apply these principles in creative design solutions.
<b>C03</b>	Understand human body dimensions, analyse activity-based spatial needs, and apply anthropometric data to functional design solutions.
<b>C04</b>	Understand proportion theories, analyse their applications, and apply scale principles to create visually and functionally balanced designs.
<b>C05</b>	Understand 3D design principles, analyse form and material behavior, and apply abstraction to create expressive three-dimensional compositions.



Member Secretary



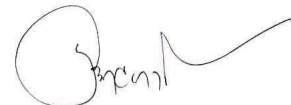
Chairman

**REFERENCE BOOKS:**

<b>S. No.</b>	<b>NAME OF AUTHORS / BOOKS/ PUBLISHER</b>	<b>YEAR OF PUBLICATION</b>
1.	Francis D.K. Ching, "Architecture Form, Space & Order", John Wiley & Sons, Incorporated	2007
2.	Simon Unwin, "Analysing Architecture", Routledge	2003
3.	Debkumar Chakrabarti, "Indian Anthropometric Dimensions", NID	1997
4.	Alvin R. Tilly, "The measures of man & woman human factors in design", Whitney library of design, NY.	1993
5.	K.W.Smithies, "Principles of Design in Architecture", Van Nostrand Reinhold company.	1981



**Member Secretary**



**Chairman**

**2AR8: COMPUTER APPLICATION-II**

**B.ARCH.: 2<sup>nd</sup> Semester**

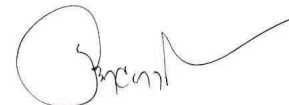
**Max. Marks: 100**

**2S**

<b>UNIT</b>	<b>CONTENTS</b>	<b>CONTACT HOURS</b>
I	<b>Introduction to Advanced CAD commands</b> - Introduction to advanced CAD commands for efficient drafting and design workflows; definition and benefits of using blocks in CAD; creating and inserting blocks for repetitive design elements; working with external references (Xrefs), including their types and file formats such as DWG, DWF, PDF, and image Xrefs; managing Xrefs through the XREF palette for collaborative and large-scale projects; integrating scanned drawings or raster images into CAD environments; creating and managing attributes to store and display additional information within CAD drawings.	2
II	<b>Layout and print setting</b> -Layout and print settings in CAD for organising and presenting drawings effectively; purpose of layouts in preparing designs for printing; creating layouts using the Layout Wizard; working with viewports including creation with the MVIEW command, resizing, moving, and locking viewports; setting viewport scales such as 1:100 or 1:50 for accurate representation; understanding paper size selection, plot scale settings, and the relationship between paper space and model space to ensure precise and professional output.	10
III	<b>Introduction Building Information Modeling (BIM)</b> - Definition of BIM, key concepts, and advantages over traditional CAD workflows; differences between CAD and BIM in terms of data integration, efficiency, and collaboration; familiarisation with the BIM user interface and workspace navigation; creating and modifying real building elements such as walls (types, properties, height, thickness, materials, and structural layers), doors (types and parameter modifications), windows (styles and sizes), floors (insertion, material selection, and thickness adjustment), and designing stairs and railings with appropriate parameters.	6
IV	<b>Customization</b> -Customisation in BIM for enhancing design accuracy and efficiency; editing element properties including	6



**Member Secretary**



**Chairman**

	dimensions such as height, width, and length; modifying levels and constraints to maintain design intent; adjusting the location, orientation, and alignment of elements; applying appropriate materials for realistic representation; inserting components from the BIM library such as furniture, fixtures, appliances, and lighting; modifying and precisely placing loaded components within the design; BIM tools to create a simple building form while integrating customised elements for functionality and aesthetics.	
V	<b>Site</b> - Introduction to site creation in BIM, including generating and modifying topographic surfaces; applying realistic surface finishes to represent various ground conditions; working with contours to model terrain accurately; assigning appropriate materials to site elements for visual and technical accuracy; inserting site components such as trees, plants, and landscaping elements; adding parking lots with layout detailing; and incorporating site furniture including benches, lights, and other outdoor amenities to create a complete and realistic site model.	6
	<b>TOTAL</b>	30

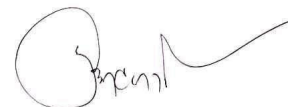
**COURSE OUTCOME (CO):**

Upon successful completion of the course, students will be able to:

<b>C01</b>	Understand advanced CAD commands, analyse block and Xref applications, and apply integration techniques for efficient drafting
<b>C02</b>	Understand layout and print settings, analyse viewport and scale management, and apply plotting techniques for accurate presentation
<b>C03</b>	Understand BIM concepts and advantages, analyse building element properties, and apply BIM tools to create accurate architectural models.
<b>C04</b>	Understand BIM customisation, analyse element modifications and placements, and apply tools to create functional building forms
<b>C05</b>	Understand BIM site modeling, analyse topography and material applications, and apply components to create realistic site layouts



Member Secretary




Chairman

**REFERENCE BOOKS:**

<b>S. No.</b>	<b>NAME OF AUTHORS / BOOKS/ PUBLISHER</b>	<b>YEAR OF PUBLICATION</b>
1.	Cadfolks, "Autocad 2014 for Beginners", Create Space Independent Publishing Platform	2014
2.	Bill Fane, "AutoCAD 2014 For Dummies", John Wiley & Sons	2013
3.	George Omura , Brian C. Benton, "Mastering AutoCAD 2014 and AutoCAD LT 2014", John Wiley & Sons	2013
4.	Chuck Eastman, Paul Teicholz , Rafael Sacks, Kathleen Liston, "BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors", John Wiley & Sons	2008
5.	Scott MacKenzie, "Learning ArchiCAD 17", Packt Publishing	2014



**Member Secretary**



**Chairman**