



Approved by AICTE, New Delhi | Affiliated to Anna University, Chennai

Accredited by NAAC with 'A' Grade

#27, Thayanur, Tiruchirappalli - 620009

**REGULATION 2024  
CURRICULUM AND SYLLABUS FOR FIRST YEAR  
CHOICE BASED CREDIT SYSTEM**

**B.DES. DESIGN**

**Approved in the First Board of Studies meeting and passed  
in the first Academic Council meeting held on 18.07.2024  
and 10.08.2024 respectively.**

**CARE COLLEGE OF ENGINEERING:: TIRUCHIRAPPALLI 620 009**  
**(AN AUTONOMOUS INSTITUTION)**

**REGULATION 2024**  
**CURRICULUM AND SYLLABUS FOR FIRST YEAR**  
**CHOICE BASED CREDIT SYSTEM**

**B.DES. DESIGN**

**Institute Vision**

Transform Lives through Education and Research.

**Institute Mission**

To impart quality education to students through critical thinking, creativity, leadership and spirit of Entrepreneurship.

**Institute Values**

We develop in each member the ability and passion to work effectively for the betterment of humanity with cultural awareness, high ethical and moral values and a sense of social responsibility.

**Department Vision**

To be a centre of excellence in design education and research, empowering future generation to use design as a tool to create value, solve problems and find meaningful solution.

**Department Mission**

1. To cultivate an academic culture that promotes critical thinking, creativity, and ethical responsibility,
2. To prepare students to excel in design and make a positive impact on society

**PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)**

1. Become an adaptable and prolific designer who can provide design solutions to society's realized and unrealized needs.
2. Collaborate independently in design teams of any size, contributing to various design stages and organizations that honor diverse stakeholders and nature.
3. Become a contributor to the design discipline through higher studies, research, and development.
4. Become a thinker and entrepreneur who can direct the design world towards a better future in the metamodern world.

**PROGRAMME OUTCOMES (POs)**

After going through the four years of study, our B.Des. graduates will exhibit the ability to:

PO	Graduate Attribute	Programme Outcome
1	Design comprehension	Understand the various elements and principles involved in each phase of the design process.
2	Design exploration	Explore and represent abstract design ideas using different mediums (manual/ digital).
3	Design articulation	Communicate via various mediums - speech, text, image, text with clarity and brevity.

4	Anthropological Awareness	Appreciate and analyze design in the anthropological scope to be effective and harmonious for varied cultures.
5	Critical thinking	Analyze with awareness of objectivity and subjectivity, toward a better future with optimism.
6	Design implementation	Tangibilize the designs with knowledge of appropriate materials and their related processes.
7	Design commitment	Understand the need for design evolution and participate whenever the need arises.
8	Ecological Awareness	Understand the relationships between ecology and the design to reduce the harms of the Anthropocene.
9	Design refinement	Analyze and amend the design for varied criteria.
10	Ethical awareness	Serve as an effective professional designer and be ethical towards fellow designers, clients, and various stakeholders of design.
11	Design research	Practice appropriate research methods in design career and/or academic career.
12	Social awareness	Realize social impacts of design and use it as a catalyst for positive change.

**CURRICULUM SEMESTER I**

S. No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	S		
THEORY COURSES								
1.	U24DS111	Design Appreciation	PCC	2	0	0	2	2
2.	U24HS111	Language and English Skills	HSMC	2	0	0	2	2
3.	U24SL111	History of Arts	SLA	2	0	0	2	2
THEORY CUM STUDIO COURSES								
4.	U24SL123	Visual Arts	SLA	1	0	3	4	4
5.	U24DS123	2D Representation Techniques	PCC	1	0	3	4	4
STUDIO COURSES								
6.	U24DS132	Basic Design Studio	PCC	0	0	6	6	6
TOTAL				8	0	12	20	20

**CURRICULUM SEMESTER II**

S. No.	Course Code	Course Title	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	S		
THEORY COURSES								
1.	U24DS211	Form Appreciation	PCC	2	0	0	2	2
2.	U24SL211	Materials and Manufacturing	SLA	2	0	0	2	2
3.	U24SL221	History of Technology	SLA	2	0	0	2	2
THEORY CUM STUDIO COURSES								
4.	U24SL233	Advanced Visual Arts	SLA	1	0	3	4	4
5.	U24DS223	3D Representation Techniques	PCC	1	0	3	4	4
STUDIO COURSES								
6.	U24DS232	Advanced Design Studio	PCC	0	0	8	8	8
TOTAL				8	0	14	22	22



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## Department of Design

### Regulation 2024 Third Semester Curriculum

Sl. No	Course Code	Course Name	Category	No. of periods/week			Total Periods per week	Credits
				L	T	S		
1	U24SL311	Semiotics for Designers	SLA	2	0	0	2	2
2	U24SL321	Ergonomics for Designers	SLA	2	0	0	2	2
3	U24SL331	Psychology for Designers	SLA	2	0	0	2	2
4	U24SL343	Design Research	SLA	1	0	3	4	4
5	U24DS313	Information Design	PCC	1	0	3	4	4
6	U24DS322	Linear Design Project	PCC	0	0	8	8	8
			<b>Total</b>	<b>8</b>	<b>0</b>	<b>14</b>	<b>22</b>	<b>22</b>

**SYLLABUS SEMESTER I****U24DS111****DESIGN APPRECIATION**

L	T	P	C
2	0	0	2

**Course Objective:**

To be sure about design, its history and its possibilities from case studies.

To study significant designs and designers throughout history, including those from diverse backgrounds and non-traditional fields.

To investigate the design practices of tribal communities in Tamil Nadu, India, and worldwide.

**UNIT I HISTORY OF DESIGN****6**

Design in nature. Design eras. Design movements. Contemporary and future designs. Design Eras, Design Movements - Prehistory, Arts and Crafts Movement, Ancient, Art Nouveau, Classical, De Stijl, Medieval, Bauhaus, Renaissance, Art Deco, Baroque, International Style, Rococo, Modernism, Neoclassicism, Postmodernism, Romanticism, Brutalism, Victorian, Minimalism, Industrial, High-Tech, Modern, Pop Art, Postmodern, Memphis Group, Contemporary, Digital Design, Meta modernism, Ecological Design.

**UNIT II GREAT DESIGNS****6**

Great designs from different times and places. Great designers and non-designers of history. Design in daily life. Different verticals of design.

**UNIT III DESIGN FUNDAMENTALS****6**

Design elements - Line, Shape, Form, Space, Texture, Color, Value, Pattern. Design principles - Contrast, Balance, Emphasis, Proportion, Hierarchy, Repetition, Rhythm, Pattern, Movement, Unity, Harmony, Variety, Scale. Design levels - Conceptual Design, Schematic Design, Detailed Design, Prototyping, Testing and Refinement, Production Design, Post-Production Evaluation. Design definition. Design Terminologies.

**UNIT IV NEW PERSPECTIVES: COMMUNITY DESIGN****6**

Design in tribal areas of Tamil Nadu. Design in Indian tribals. Design in tribals of the world.

**UNIT V NEW PERSPECTIVES: OCEAN CENTRIC HISTORY****6**

History of ocean or water centric design. Design for Water transport. Design in coastal cultures.

**TOTAL: 30 PERIODS****Text Books**

1. Design: A Very Short Introduction by John Heskett (Author)
2. Design: The Whole Story by Elizabeth Wilhide
3. Design History and the History of Design by John A Walker and Judy Attfield
4. Design: History, Theory and Practice of Product Design by Bernhard E. Bürdek.

**Reference Books**

1. "Visual Grammar" by Christian Leborg
2. "Design History: Understanding Theory and Method" by Kjetil Fallan
3. "Universal Principles of Design" by William Lidwell, Kritina Holden, and Jill Butler
4. "Form, Function, and Design" by Paul Jacques Grillo.

<b>Course Outcomes: At the end of the course, the students will be able to</b>		
<b>CO</b>	<b>Course Outcome Statement</b>	<b>Knowledge level</b>
CO1	Describe the progression of design through different historical periods and movements.	Understanding
CO2	Design in daily life and across various industries and verticals.	Applying
CO3	Design terminologies and understand the different levels of design.	Applying

**U24HS111****LANGUAGE AND ENGLISH SKILLS**

L	T	P	C
2	0	0	2

**Course Objective:**

- To give an introduction to the concepts and evolution of language in human society including its various expressions and functions.
- To Instill basic skills of English language in everyday situations involving speaking, listening, reading, writing, presenting.
- To enable the use of language to think, express an experience and communicate larger meaning.

**UNIT I INTRODUCTION TO LANGUAGE AND LINGUISTICS****6**

Communication in humans and animals. Language in humans – definition, function and hypotheses of evolution. Some concepts of language - Phonetics, Phonology, Morphology, Syntax, Semantics, Pragmatics.

**UNIT II ENGLISH - SPEAKING AND LISTENING****6**

Everyday communication and human interaction through language. Speaking and listening. Simple class exercises.

**UNIT III ENGLISH - READING, WRITING, PRESENTING****6**

Reading and writing. Language comprehension skills through reading and writing. Presenting information and ideas. Simple exercises.

**UNIT IV LANGUAGE AS EXPRESSION AND COGNITION****6**

Language as expression – poetry, prose, literature, etc., Cognitive function of language. Cognitive role of language in constructing reality, abstracting, projecting the future. Simple exercises.

**UNIT V LANGUAGE AS DISCOURSE****6**

Thinking, talking and writing about ideas and situations within a social context and conveying broader meaning and abstraction. Discourse, dialectic. Simple class exercises.

**TOTAL: 30 PERIODS****Text Books**

1. Sharon Heidenreich, 'English for Architects and Civil Engineers', Springer, 2014
2. [www.cambridgescholars.com](http://www.cambridgescholars.com).
3. [www.robertdwatkins.com/Englishworkbook.pdf](http://www.robertdwatkins.com/Englishworkbook.pdf)
4. N. Chomsky, 'Reflections on Language', Fontana, 1975.
5. Steve Pinker, 'The Language Instinct', Penguin, 2015.
6. R.L. Trask, 'Language and Linguistics: The Key Concepts', Routledge, 2007.
7. R.L. Trask, 'Language: The Basics', Routledge 1999

**Reference Books**

1. Chris Mounsey, 'Essays and Dissertation', Oxford University Press, 2005.
2. Sidney Greenbaum, 'The Oxford English Grammar', Oxford University Press, 2005.
3. Krishna Mohan and Meera Banerji, 'Developing Communication Skills', 2nd edition, Laxmi Publications, 2009.

<b>Course Outcomes: At the end of the course, the students will be able to</b>		
<b>CO</b>	<b>Course Outcome Statement</b>	<b>Knowledge level</b>
CO1	Understanding of the basic role of language in humans.	Understanding
CO2	Develop skill and confidence in everyday requirements of the English language.	Understanding
CO3	Express an experience, explore meaning and construct reality through language.	Understanding

**U24SL111****HISTORY OF ARTS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Course Objective:**

- To learn major and minor movements in art.
- To learn art movements in and across different civilizations and cultures.
- To look at the effects of world events on art and vice versa.

**UNIT I HISTORY OF ART****6**

Eras. Prehistory. Ages. Premodern. Modern. Metamodern.

**UNIT II ART MOVEMENTS****6**

Early modern movements. Modern movements. Digital movements. Early Modern Movements: Art Nouveau, Bauhaus, De Stijl, Futurism, Constructivism, Modern Movements: Modernism, International Style, Brutalism, Postmodernism, High-tech Architecture, Deconstructivism, Digital Movements: Digital Minimalism, Pragmaticism, Algorithmic Design, Generative Design, Virtual Reality Design, Augmented Reality Design.

**UNIT III REGIONAL ART****6**

Japanese art. African art. colonial art exchanges. Art exchanges before colonization.

**UNIT IV GREAT ART FROM HISTORY****6**

Great art from history. Great artists in history. Mona Lisa, The Starry Night, The Persistence of Memory, The Scream, The Last Supper, Girl with a Pearl Earring, Guernica, The Birth of Venus, The Creation of Adam, American Gothic. Leonardo da Vinci, Vincent van Gogh, Salvador Dalí, Edvard Munch, Michelangelo, Johannes Vermeer, Pablo Picasso, Sandro Botticelli, Rembrandt, Grant Wood.

**UNIT V ART THEORY****6**

Elements of Art. Principles of Art. Art around. Evolution of Aesthetics. Evolution of art education.

**TOTAL: 30 PERIODS****Text Books**

1. Composition: Understanding Line, Notan and Color by Arthur Wesley Dow
2. The Story of Art, by E. H. Gombrich
3. Introducing Aesthetics: A Graphic Guide (Graphic Guides) by Christopher Kul-Want (Author), Piero Pierini (Illustrator)
4. The meaning of art by Herbert Read.

**Reference Books**

1. India: A Story through 100 Objects by Vidya Dehejia.



<b>Course Outcomes: At the end of the course, the students will be able to</b>		
<b>CO</b>	<b>Course Outcome Statement</b>	<b>Knowledge level</b>
CO1	Understand of Art History and Movements.	Understanding
CO2	Analysis of Regional and Cultural Art.	Analyzing
CO3	Understanding Art Theories and Aesthetic Principles.	Understanding

**U24SL121****VISUAL ARTS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>1</b>	<b>0</b>	<b>3</b>	<b>4</b>

**Course Objective:**

- To give an understanding of how to use different mediums to represent ideas on paper.
- To give an introduction to the discipline of visual art and its various facets.
- To introduce the importance of art and its relation to design through study and hands on work of techniques and mediums of Art.
- To introduce the vocabulary of Visual Arts in terms of elements and principles in application.

**UNIT I INTRODUCTION TO FREEHAND SKETCHING**

Exercises include freehand drawing and sketching studies - Exploring Line, Shape, Tone, Texture and Depth. Quality of line, Drawing shapes in proportion, Composition of shapes, Contour Drawing, Still Life Drawing, Line Studies. Basics of drawing one point and two-point perspectives. Construct basic to complex 3d platonic forms using the freehand method. Value Studies.

**UNIT II INTRODUCTION TO ART MEDIUMS**

Explore different mediums for sketching - Pencil, Ball pen, Ink pen, Charcoal sticks, brush pen etc. Explore different mediums and its techniques for artwork - oil and dry Pastels, Poster colors, Water colors, Oil colors, Glass colors, Fabric colors etc.

**UNIT III INTRODUCTION TO GESTALT PRINCIPLES**

Visual Tension, Visual Weight, Visual Direction, Visual Balance. Introduction to Gestalt Principles, Proximity, Symmetry, Similarity, Common Fate, Continuation, Isomorphism, Closure, Figure and Ground, Focal Point, Simplicity, Pragnaz, Unity.

**UNIT IV COLOR THEORY AND APPLICATION**

Learn the basics of color mixing, color relationships, and the impact of color in design. Create color wheels, practice mixing paints, and explore complementary, analogous, and triadic color schemes. Develop the ability to match colors accurately. Select colors from photographs or paintings and mix paints to match them precisely.

**UNIT V INTRODUCTION TO PRINT TECHNIQUES TO REPLICATE ARTWORKS**

Woodcut and Linocut, Lithography techniques, Etching and Engraving. Old Printing techniques, Letter press, Typography. Digital Printing process.

**TOTAL: 60 PERIODS****Text Books**

1. Bert Dodson, "Keys to Drawing," North Light Books, 1990.
2. Betty Edwards, "The New Drawing on the Right Side of the Brain," Tarcher, 1999.
3. Arthur L. Gupitill, "Rendering in Pen and Ink," Watson-Gupitill, 1997.
4. Bert Dodson, "Keys to Drawing with Imagination," North Light Books, 2006.
5. Rudolf Arnheim, "Art and Visual Perception: A Psychology of the Creative Eye," University of California Press, 1974.
6. Stephen Palmer, "Vision Science: Photons to Phenomenology," MIT Press, 1999.
7. Josef Albers, "Interaction of Color," Yale University Press, 1971.
8. Johannes Itten, "The Art of Color," John Wiley & Sons, 1974.

9. Carol Wax, "The Mezzotint: History and Technique," Abrams, 1990.
10. Adolf Dehn, "Water Color Painting," Studio Publications, 1950.

### Reference Books

1. Kimon Nicolaides, "The Natural Way to Draw: A Working Plan for Art Study," Houghton Mifflin Harcourt, 1990.
2. Robert S. Oliver, "Perspective Drawing: A Step-by-Step Handbook," Dover Publications, 1995.
3. William F. Powell, "Color Mixing Recipes for Portraits," Walter Foster, 2005.
4. Ray Smith, "The Artist's Handbook," DK Publishing, 2009.
5. Richard Zakia and Per Madsen, "Perception and Imaging: Photography as a Way of Seeing," Focal Press, 2012.
6. Maurice Merleau-Ponty, "Phenomenology of Perception," Routledge, 2012.
7. Patti Mollica, "Color Theory: An Essential Guide to Color," Walter Foster Publishing, 2013.
8. Michael Wilcox, "Blue and Yellow Don't Make Green," School of Color Publishing, 2001.
9. William M. Ivins Jr., "Prints and Visual Communication," MIT Press, 1969.
10. Bamber Gascoigne, "How to Identify Prints: A Complete Guide to Manual and Mechanical Processes from Woodcut to Ink Jet," Thames & Hudson, 2004.

Course Outcomes: At the end of the course, the students will be able to		
CO	Course Outcome Statement	Knowledge level
CO1	Draw Freehand Sketching Techniques.	Applying
CO2	Develop Expertise in Art Mediums and Techniques.	Applying
CO3	Understand of Gestalt Principles and Color Theory.	Understanding

**U24DS122**

**2D REPRESENTATION TECHNIQUES**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>1</b>	<b>0</b>	<b>3</b>	<b>4</b>

### Course Objective:

- To develop an understanding of Geometrical Drawing.
- To master drawing the Geometric Shapes and Surfaces.
- To enable students to construct physical planar models of geometric shapes and surfaces.
- To familiarize students with the terminology and methods of orthographic, isometric, axonometric, and perspective projections.

### UNIT I FOUNDATIONS OF GEOMETRICAL DRAWING

Relation between Geometry and Form. Introduction to Basic Elements: point, line, plane, solid. Definition of Geometrical Drawing. Drawing Lines and Angles.

### UNIT II DRAWING GEOMETRIC SHAPES AND SURFACES

Drawing Shapes/Planar Surfaces: Triangle, square, rhombus, rectangle, polygon, hexagon, etc. Drawing Circles and Curves: Tangents, curves, conic sections (hyperbola, parabola, ellipse).

### UNIT III CONSTRUCTING AND SKETCHING PHYSICAL MODELS

Construction of Physical Planar Models: All the above shapes and surfaces. Viewing models from different angles. Sketching with Light, Shade, and Shadow.

### UNIT IV SECTION OF SOLIDS

Understanding Sections of Solids: Cutting block models, viewing from different angles, and sketching. True Shape of Sections: Analyzing and sketching true shapes. Simple Intersection of Solids: Creating composite forms through block models. Viewing and Sketching Composite Forms: Different angles, light, shade, and shadow.

**UNIT V BASICS OF PERSPECTIVE**

Types of Perspective Projections: One-point, two-point, three-point. Key Terminologies: Picture plane, stationary point, vanishing point, cone of vision, eye level. Methods of Constructing Perspectives. Drawing Perspective Projections of Simple Planar Surfaces/Shapes. Sciography for Perspective projections.

**TOTAL: 60 PERIODS****Text Books**

1. Robert S. Oliver, "Perspective Drawing: A Step-by-Step Handbook," Dover Publications, 1995.
2. Francis D. K. Ching, "Architectural Graphics," John Wiley & Sons, 2015.
3. David H. Ross, "Freehand Figure Drawing for Illustrators," Watson-Guptill, 2015.
4. Paul Laseau, "Freehand Sketching: An Introduction," W. W. Norton & Company, 2000.
5. Matthew Frederick, "101 Things I Learned in Architecture School," MIT Press, 2007.
6. Peter Stanyer, "The Complete Book of Drawing Techniques," Arcturus Publishing, 2012.
7. Francis D. K. Ching, "Design Drawing," John Wiley & Sons, 2010.
8. Keith H. Cullum, "Perspective Drawing," McGraw-Hill, 1989.
9. John Raynes, "The Complete Guide to Perspective Drawing: From One-Point to Six-Point," North Light Books, 2005.
10. Ernest R. Norling, "Perspective Made Easy," Dover Publications, 1999.

**Reference Books**

1. Ivor H. Seeley, "Building Quantities Explained," Macmillan, 1993.
2. John Montague, "Basic Perspective Drawing: A Visual Approach," John Wiley & Sons, 2012.
3. James Richards, "Freehand Drawing and Discovery," John Wiley & Sons, 2013.
4. Michael E. Doyle, "Color Drawing: Design Drawing Skills and Techniques for Architects, Landscape Architects, and Interior Designers," John Wiley & Sons, 2011.
5. Charles B. Wiest, "The Art of Perspective Drawing," McGraw-Hill, 2004.

<b>Course Outcomes: At the end of the course, the students will be able to</b>		
<b>CO</b>	<b>Course Outcome Statement</b>	<b>Knowledge level</b>
CO1	Develop Proficiency in Geometrical Drawing.	Understanding
CO2	Develop Skill in Drawing Complex Geometric Shapes.	Understanding
CO3	Construct and Sketching Physical Models.	Understanding
CO4	Understand of Projections and Sciography.	Understanding

**U24DS133****BASIC DESIGN STUDIO**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>

**Course Objective:**

- To understand how design principles and elements manifest in everyday observations and natural phenomena.
- To acquire and utilize a comprehensive design vocabulary to effectively articulate design concepts and intentions.
- To develop proficiency in using Gestalt principles to ensure cohesive and visually appealing design compositions.
- To explore and apply diverse print techniques to accurately replicate and enhance art and design compositions.
- To experiment with different materials to create textured and relief artworks, gaining insights into light, shadow, and spatial depth.

## CONTENT

Understanding design emerges naturally from everyday life and observations of nature. It involves utilizing design elements and principles adeptly to imbue creations with significance. Effective communication of design ideas hinges on employing precise design vocabulary. Mastery of shape and its arrangement in two-dimensional space across various mediums is essential. Applying Gestalt principles enhances design coherence and aligns with human perceptual tendencies. Meaningful use of color draws inspiration from natural palettes and the artistic legacies of masters, enriching visual compositions. Fundamental knowledge of geometry and form underpins effective representation techniques. Exploring diverse print methods facilitates the faithful reproduction of art and design compositions. Experimenting with different materials enables the creation of textured and relief works, fostering an understanding of light, shadow, and spatial depth.

**TOTAL: 90 PERIODS**

### Text Books

1. Robin Williams, "The Non-Designer's Design Book", Peachpit Press, 2014.
2. Johannes Itten, "The Elements of Color: A Treatise on the Color System of Johannes Itten Based on His Book The Art of Color", John Wiley & Sons, 1970.
3. Ellen Lupton, Jennifer Cole Phillips, "Graphic Design: The New Basics", Princeton Architectural Press, 2008.
4. Kim Smith, "Design Fundamentals: Elements, Attributes, & Principles", Fairchild Books, 2012.
5. Francis D.K. Ching, "Architecture: Form, Space, and Order", John Wiley & Sons, 2014.
6. Lidwell, William, et al. "Universal Principles of Design", Rockport Publishers, 2010.

### Reference Books

1. Anthony C. Antoniades, 'Poetics of Architecture: Theory of Design', John Wiley and Sons, 1992.

<b>Course Outcomes: At the end of the course, the students will be able to</b>		
<b>CO</b>	<b>Course Outcome Statement</b>	<b>Knowledge level</b>
CO1	Apply theoretical knowledge to create designs that effectively communicate intended meanings and concepts.	Applying
CO2	Integrate design principles to enhance the communicative impact of their visual compositions.	Applying
CO3	Apply Gestalt principles to create visually coherent and aesthetically pleasing design solutions.	Applying
CO4	Reproduce and enhance art and design compositions.	Applying

**SYLLABUS SEMESTER II****U24DS211****FORM APPRECIATION**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Course Objective:**

- To introduce students to the fundamental elements and principles of design.
- To understand the cultural influences on the interpretation and evolution of form.
- To explore basic geometric shapes and their applications in design.
- To analyze form and space in design.

**UNIT I ELEMENTS AND PRINCIPLES OF DESIGN 6**

Elements: Line, shape, form, space, color, texture, and value. Principles: Balance, contrast, emphasis, movement, pattern, rhythm, and unity. Application: How these elements and principles contribute to the creation and appreciation of form.

**UNIT II HISTORICAL AND CULTURAL CONTEXTS OF FORM 6**

Historical Analysis: Study of significant forms and shapes in various historical periods (e.g., Renaissance, Baroque, Modernism). Cultural Significance: Understanding how different cultures influence and interpret form. Evolution of Form: How the perception and use of form has evolved over time.

**UNIT III GEOMETRY AND PROPORTION IN DESIGN 6**

Geometric Forms: Exploration of basic geometric shapes and their application in design. Proportional Systems: Golden ratio, Fibonacci sequence, and other systems used to achieve aesthetically pleasing forms. Symmetry and Asymmetry: Impact of symmetrical and asymmetrical forms on design aesthetics. Computation of geometry and proportion.

**UNIT IV FORM AND SPACE 6**

Form and Space, Basic Forms, Transformation of forms, Formal Collisions of Geometry, Defining Space, Spatial Organization, Spatial Relationships, Circulation.

**UNIT V MATERIALITY, TEXTURE, LIGHT AND SHADOW 6**

Material Properties: How different materials influence the perception and creation of form. Surface Texture: Role of texture in enhancing or altering the perception of form. Light Interaction: How light influences the perception of form. Shadow and Depth: Use of shadows to create depth and dimension in forms. Lighting Techniques: Different lighting techniques to highlight and manipulate form perception. Tactility and Interaction: How the physical interaction with materials and textures affects form appreciation.

**TOTAL: 30 PERIODS****Text Books**

1. Johannes Itten, "The Art of Color: The Subjective Experience and Objective Rationale of Color," John Wiley & Sons, 1997.
2. Wucius Wong, "Principles of Form and Design," John Wiley & Sons, 1993.
3. Rudolf Arnheim, "Art and Visual Perception: A Psychology of the Creative Eye," University of California Press, 1974.
4. Hugh Honour and John Fleming, "A World History of Art," Laurence King Publishing, 2009.
5. Ernst Gombrich, "The Story of Art," Phaidon Press, 1995.
6. Kimberly Elam, "Geometry of Design: Studies in Proportion and Composition," Princeton Architectural Press, 2001.
7. Jay Hambidge, "The Elements of Dynamic Symmetry," Dover Publications, 2005.
8. Francis D. K. Ching, "Architecture: Form, Space, and Order," John Wiley & Sons, 2014.
9. Simon Unwin, "Analysing Architecture," Routledge, 2014.
10. Robert McCarter, "Louis I. Kahn," Phaidon Press, 2005.
11. Gail Peter Borden, "Material Precedent: The Typology of Modern Tectonics," John Wiley & Sons, 2010.

12. Peter Zumthor, "Atmospheres: Architectural Environments - Surrounding Objects," Birkhäuser, 2006.

### Reference Books

1. Nikolaus Pevsner, "An Outline of European Architecture," Pelican Books, 1963.
2. Mario Livio, "The Golden Ratio: The Story of Phi, the World's Most Astonishing Number," Broadway Books, 2003.
3. John F. Pile, "Interior Design," Pearson, 2014.

<b>Course Outcomes: At the end of the course, the students will be able to</b>		
<b>CO</b>	<b>Course Outcome Statement</b>	<b>Knowledge level</b>
CO1	Identify and apply elements such as line, shape, form, space, color, texture, and value in design.	Understanding
CO2	Understand Historical and Cultural Influences.	Understanding
CO3	Develop Skill in Geometry and Proportion.	Understanding
CO4	Understand and apply concepts related to material properties, texture, light, shadow, and spatial organization to enhance form perception.	Understanding

**U24SL211**

**MATERIALS AND MANUFACTURING**

**L T P C**  
**2 0 0 2**

### Course Objective:

- To understand the fundamental differences between natural and synthetic materials, as well as their physical, mechanical, thermal, electrical, and optical properties.
- To explore the various types, properties, and uses of materials found in nature, including wood, stone, metals, natural fibers, and leather.
- To study synthetic materials, their classifications, properties, uses, and the advancements in smart materials, nano-materials, and biodegradable materials.
- To familiarize students with various manufacturing processes and their applications, including casting, molding, forging, machining, welding, joining, 3D printing, and surface treatments, with a focus on sustainability and environmental impact.

### UNIT I INTRODUCTION TO MATERIALS

**6**

Natural vs. Synthetic Materials, Organic vs. Inorganic Materials. Physical Properties: Density, Hardness, Elasticity, Plasticity. Mechanical Properties: Strength, Toughness, Ductility, Malleability. Thermal Properties: Conductivity, Expansion, Resistance. Electrical Properties: Conductivity, Insulation. Optical Properties: Transparency, Reflectivity, Refractivity.

### UNIT II MATERIALS IN NATURE

**6**

Wood: Types, Properties, Uses. Stone: Types, Properties, Uses. Metals: Types, Properties, Uses. Natural Fibers: Cotton, Wool, Silk, Hemp, Leather: Uses.

### UNIT III SYNTHETIC MATERIALS

**6**

Plastics: Types, Properties, Uses. Composites: Types, Properties, Uses. Synthetic Fibers: Nylon, Polyester, Acrylic. Advanced Materials: Smart Materials, Nano-materials, Biodegradable Materials.

### UNIT IV MANUFACTURING PROCESSES

**6**

Casting, Molding, Forging, Machining, Welding, Joining, 3D Printing and Additive Manufacturing, Surface Treatments: Coating, Painting, Plating. Woodworking tools and processes.

**UNIT V SUSTAINABILITY IN MATERIALS****6**

Recyclable and Recycled Materials, Biodegradable Materials, Life Cycle Analysis of Materials, Eco-friendly Manufacturing Processes. Sustainability and Environmental Impact while selecting materials.

**TOTAL: 30 PERIODS****Text Books**

1. Mark Miodownik, 'Stuff Matters: Exploring the Marvelous Materials That Shape Our Man-Made World', Houghton Mifflin Harcourt, 2014.
2. Michael F. Ashby and Kara Johnson, 'Materials and Design: The Art and Science of Material Selection in Product Design', Butterworth-Heinemann, 2013.
3. William D. Callister Jr., 'Materials Science and Engineering: An Introduction', Wiley, 2014.
4. Nancy G. H. Adams, 'Materials: Engineering, Science, Processing and Design', Butterworth-Heinemann, 2017.
5. Brian Curley, 'Material Matters: New Materials in Design', Black Dog Publishing, 2005.

**Reference Books**

1. David Blockley, 'Engineering: A Very Short Introduction', Oxford University Press, 2012.
2. D.K. Ching, 'Building Construction Illustrated', Wiley, 2014.
3. Vijay Kumar Thakur, 'Handbook of Composites from Renewable Materials', Wiley-Scrivener, 2017.
4. Julian Vincent, 'Survival of the Fittest: How Materials Shape the Evolution of Organisms', Cambridge University Press, 2018.
5. M. F. Ashby, 'Materials Selection in Mechanical Design', Butterworth-Heinemann, 2016.

<b>Course Outcomes: At the end of the course, the students will be able to</b>		
<b>CO</b>	<b>Course Outcome Statement</b>	<b>Knowledge level</b>
CO1	differentiate between natural and synthetic materials and understand their properties and applications in design.	Understanding
CO2	Explain the materials found in nature, their properties, and how to effectively utilize them in design projects.	Understanding
CO3	Identify and apply synthetic materials, including advanced materials, in their design projects, understanding their benefits and limitations.	Understanding
CO4	Understand and apply various manufacturing processes, considering sustainability and environmental impacts in material selection and design implementation.	Understanding

**U24SL221****HISTORY OF TECHNOLOGY**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Course Objective:**

- To give understanding of architecture as an outcome of the act of design by human society across history and region.
- To give an introduction to the discipline of architecture and its various facets.
- To introduce the importance of form and its relation to design through study of nature and manmade environment.
- To introduce the vocabulary of form and space in terms of elements, principles, attributes and its organization.

**UNIT I ERAS TECHNOLOGY****6**

Different eras and their technologies. An overview from origins of technology to contemporary and future technologies. Technology in non-human species. Ocean centric vs Land centric histories: wheel vs ship history. Ocean or water centric technological history.

**UNIT II PREMODERN TECHNOLOGY****6**

Each pre modern era in detail. Technology before farming. Classical era. Alexandria and Heron. Early modern eras.

**UNIT III MODERN TECHNOLOGY****6**

Early modern. Industrialization. Post war. Digital revolution. Internet era. Social media era. Future technologies.

**UNIT IV TRIBAL AND INDIGENOUS TECHNOLOGY****6**

Introduction to Indigenous Knowledge Systems, Traditional Agricultural Practices, Indigenous Architecture and Construction, Traditional Craftsmanship and Tool Making, Communication and Storytelling.

**UNIT V INTRODUCTION TO MACHINE LANGUAGE AND AI****6**

Early Foundations of Computing and Machine Language: Alan Turing, Alonzo Church, Assembly language. Development of High-Level Programming Languages: LISP, C, Python. Early Concepts of Artificial Intelligence: Dartmouth Conference, ELIZA. Machine Learning and Neural Networks. Ethical and Societal Implications of AI.

**TOTAL: 30 PERIODS****Text Books**

1. The Sea and Civilization: A Maritime History of the World Paperback by Lincoln Paine
2. India: A Story through 100 Objects by Vidya Dehejia
3. The Philosophy of Technology: An Introduction Don Ihde
4. The Infinite Bit: An Inside Story of Digital Technology
5. James Burke, 'Connections', Simon & Schuster, 1978.
6. Lewis Mumford, 'Technics and Civilization', Harcourt, Brace & Company, 1934.
7. Jared Diamond, 'Guns, Germs, and Steel: The Fates of Human Societies', W. W. Norton & Company, 1997.
8. Brian Fagan, 'The Long Summer: How Climate Changed Civilization', Basic Books, 2004.
9. George Basalla, 'The Evolution of Technology', Cambridge University Press, 1988.
10. Lynn White Jr., 'Medieval Technology and Social Change', Oxford University Press, 1962.
11. Bertrand Gille, 'The History of Techniques', Gordon & Breach, 1986.
12. Thomas P. Hughes, 'American Genesis: A Century of Invention and Technological Enthusiasm, 1870-1970', Viking Penguin, 1989.
13. Mark Dery, 'Escape Velocity: Cyberculture at the End of the Century', Grove Press, 1996.
14. Kevin Kelly, 'What Technology Wants', Viking Penguin, 2010.

**Reference Books**

1. Walter Isaacson, 'The Innovators: How a Group of Hackers, Geniuses, and Geeks Created the Digital Revolution', Simon & Schuster, 2014.
2. Marshall McLuhan, 'Understanding Media: The Extensions of Man', McGraw-Hill, 1964.
3. Kate Shilton, 'Constructing an Ethical Framework for Big Data Research', Taylor & Francis, 2016.
4. Martin Ford, 'Rise of the Robots: Technology and the Threat of a Jobless Future', Basic Books, 2015.
5. Kate A. Berry and Martha L. Henderson, 'Geographic Thought: A Praxis Perspective', Routledge, 2003.
6. Margaret Mead, 'Coming of Age in Samoa: A Psychological Study of Primitive Youth for Western Civilization', William Morrow, 1928.
7. Paul E. Ceruzzi, 'A History of Modern Computing', MIT Press, 1998.
8. John Markoff, 'Machines of Loving Grace: The Quest for Common Ground Between Humans and Robots', HarperCollins, 2015.
9. Stuart Russell and Peter Norvig, 'Artificial Intelligence: A Modern Approach', Prentice Hall, 2010.
10. Nick Bostrom, 'Superintelligence: Paths, Dangers, Strategies', Oxford University Press, 2014.



<b>Course Outcomes: At the end of the course, the students will be able to</b>		
<b>CO</b>	<b>Course Outcome Statement</b>	<b>Knowledge level</b>
CO1	Appreciate the patterns of the past of technologies to counter the future of technology.	Understanding
CO2	Understand the evolution and development of artificial intelligence and machine learning.	Understanding

**U24SL232****ADVANCED VISUAL ARTS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>1</b>	<b>0</b>	<b>3</b>	<b>4</b>

**Course Objective:**

- To introduce students to the fundamental elements of form making, such as points, lines, planes, and solids, and their relation to geometry.
- To familiarize students with key terminologies and attributes of form, including texture, contour, shape, volume, and more, essential for accurate design description and communication.
- To explore the principles of biomimicry and natural patterns, understanding how organic forms and natural processes inspire and influence design.
- To develop skills in using visual language, symbolism, and semantics to create emotionally and culturally resonant designs.
- To equip students with a variety of form generation techniques, from conceptual sketching and prototyping to advanced computational and digital modeling tools.

**UNIT I FUNDAMENTALS OF FORM MAKING**

Relation between Geometry and Form, Introduction to Basic Elements: Point, Line, Plane, Solid. Single curved and doubly curved surfaces. Developable surfaces.

**UNIT II FORM AND FORM ATTRIBUTES**

Terminologies: Surface, Texture, Contour, Profile, Shape, Form, Volume, Mass, Density, Curvature, Symmetry, Asymmetry, Proportion, Scale, Geometry, Organic Form, Inorganic Form, Tangent, Intersection, Gradient, Transition, Perforation, Transparency, Opacity, Reflectivity, Matte, Gloss, Smoothness, Roughness, Concavity, Convexity, Tactility, Modularity, Dynamic Form, Static Form, Ergonomics, Aesthetics, Functionality.

**UNIT III NATURE AND FORM**

Biomimicry, Organic Forms, Natural Patterns, Fractals, Symmetry in Nature, Asymmetry in Nature, Natural Textures, Natural Materials, Evolutionary Design, Environmental Adaptation, Structural Efficiency, Natural Color Palettes, Fluid Dynamics, Growth Patterns, Cellular Structures, Geometric Forms in Nature, Topology, Surface Tension, Natural Proportions, Golden Ratio, Fibonacci Sequence, Ecosystem Interactions, Ecological Impact, Sustainability, Biodegradability, Renewable Resources, Natural Light Interaction, Weathering and Aging, Biomaterials, Environmental Responsiveness.

**UNIT IV FORM AND EXPRESSION**

Emotional Design, Visual Language, Symbolism, Semantics, Ergonomics, User Interaction, Aesthetic Appeal, Brand Identity, Cultural Context, Narrative Design, Sensory Experience, Texture and Tactility, Color Psychology, Proportional Systems, Balance and Harmony, Contrast and Emphasis, Dynamic Forms, Static Forms, Visual Hierarchy, Gestalt Principles, Form Simplification, Complexity and Detail, Light and Shadow, Material Expression, Surface Treatment, Iconography, Metaphor in Design, User Perception, Contextual Relevance, Functional Expression.

**UNIT V FORM GENERATION**

Conceptual Sketching, Ideation Techniques, Morphological Analysis, Form Development, Prototyping, Parametric Design, Generative Design, 3D Modeling, Surface Modeling, Solid Modeling, CAD Tools, Computational Design, Algorithmic Design, Digital Sculpting, Subdivision Modeling, NURBS Modeling, Topology Optimization, Rapid Prototyping, Additive Manufacturing, Subtractive Manufacturing, Material Exploration, Surface Finishing, Ergonomic Considerations, Aesthetic Considerations, Functional Integration, User-Centered Design, Design Iteration, Form Exploration, Design Refinement, Concept Validation.

**TOTAL: 60 PERIODS****Text Books**

1. John Montague, 'Basic Perspective Drawing: A Visual Approach', Wiley, 2013.
2. Stuart Melvin Shum, 'Architectural Representation and the Perspective Hinge', MIT Press, 2004.
3. Janine Benyus, 'Biomimicry: Innovation Inspired by Nature', William Morrow, 2002.
4. Philip Ball, 'Patterns in Nature: Why the Natural World Looks the Way It Does', University of Chicago Press, 2016
5. Don Norman, 'Emotional Design: Why We Love (or Hate) Everyday Things', Basic Books, 2004.
6. Bruno Munari, 'Design as Art', Penguin, 2008.

**Reference Books**

1. Francis D.K. Ching, 'Architectural Graphics', Wiley, 2015
2. Paul Lewis, 'Manual of Section', Princeton Architectural Press, 2016.
3. Tom Kelley, 'The Art of Innovation: Lessons in Creativity from IDEO, America's Leading Design Firm', Crown Business, 2001.
4. Michael F. Ashby, 'Materials and Design: The Art and Science of Material Selection in Product Design', Butterworth-Heinemann, 2013.

<b>Course Outcomes: At the end of the course, the students will be able to</b>		
<b>CO</b>	<b>Course Outcome Statement</b>	<b>Knowledge level</b>
CO1	Apply fundamental geometric principles to create and analyze complex forms, understanding the relationship between basic elements and their spatial configurations.	Applying
CO2	Demonstrate proficiency in using precise terminology to describe the attributes and characteristics of forms, enhancing their ability to communicate design concepts effectively.	Applying
CO3	Integrate principles of biomimicry and natural patterns into their design processes, creating sustainable and ecologically responsive forms.	Applying
CO4	Develop the ability to use visual language and semantics to create designs that are not only functional but also emotionally and culturally meaningful.	Applying
CO5	Explain competence in various form generation techniques, including digital modeling and rapid prototyping, enabling them to iterate and refine design concepts efficiently and effectively.	Applying

**U24DS222****3D REPRESENTATION TECHNIQUES**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>1</b>	<b>0</b>	<b>3</b>	<b>4</b>

**Course Objective:**

- To provide foundational understanding of Geometric Solids and Model Construction.
- To ensure proficiency in Projections and Sciography.
- To develop advanced techniques in Sections, Intersections, and Digital Rendering.

**UNIT I INTRODUCTION TO GEOMETRIC SOLIDS AND MODEL CONSTRUCTION**

Introduction to Geometric Solids: Cube, prism, pyramids, cones, cylinders. Generation of Solids: Constructing physical models from lines and planar surfaces (concept of development). Construction of Block Models: Building solid models. Viewing and Sketching Models: Different angles, light, shade, and shadow.

**UNIT II PROJECTIONS AND SCIOGRAPHY OF SOLIDS - ORTHOGRAPHIC**

Drawing Problems: Orthographic, isometric, and axonometric projections of solids in different positions. Sciography for Projections: Shadow and shading techniques. Orthographic Projection of Solids: Techniques and exercises. Sciography for Orthographic Projections: Application on simple solids.

**UNIT III PERSPECTIVE PROJECTIONS AND SCIOGRAPHY OF SOLIDS**

Sciography for Perspective Projections. Types of Perspective Projections: One-point, two-point, three-point. Key Terminologies: Picture plane, stationary point, vanishing point, cone of vision, eye level. Methods of Constructing Perspectives. Drawing Perspective Projections of Simple Planar Surfaces/Shapes.

**UNIT IV ADVANCED PROJECTION DRAWING**

Drawing Problems: Orthographic, isometric, and axonometric projections of sections and intersections. Dynamic Perspective Drawing: Techniques for complex solids. Advanced Shading and Rendering: Using markers for detailed surface textures. Sketching Complex Surfaces: Techniques for advanced materials.

**UNIT V DIGITAL RENDERING AND HIGH-FIDELITY MOCKUPS**

Advanced Digital Techniques: Adobe Illustrator and Photoshop. Digital Rendering: Procreate and Sketchbook. Creating High-Fidelity Digital Mockups: Techniques for realistic digital models. Advanced Shading and Rendering: Digital tools for complex surfaces and materials.

**TOTAL: 60 PERIODS****Text Books**

1. Francis D.K. Ching, 'Architectural Graphics', Wiley, 2015.
2. Paul Lewis, Marc Tsurumaki, David J. Lewis, 'Manual of Section', Princeton Architectural Press, 2016
3. Robert W. Gill, 'Rendering with Pen and Ink', Thames & Hudson, 1984.
4. I.H. Morris, 'Geometrical Drawing for Art Students', Longmans, Green, and Co., 1912.
5. Ernest R. Norling, 'Perspective Made Easy', Dover Publications, 1999.
6. Scott Robertson, 'How to Render: the fundamentals of light, shadow and reflectivity', Design Studio Press, 2014.

**Reference Books**

1. John Montague, 'Basic Perspective Drawing: A Visual Approach', Wiley, 2013.
2. Thomas E. French, 'Engineering Drawing and Graphic Technology', McGraw-Hill, 1986.
3. Edward J. Muller, 'Projection Drawing', McGraw-Hill, 1986.
4. Michael E. Doyle, 'Color Drawing: Design Drawing Skills and Techniques for Architects, Landscape Architects, and Interior Designers', Wiley, 2011.

<b>Course Outcomes: At the end of the course, the students will be able to</b>		
<b>CO</b>	<b>Course Outcome Statement</b>	<b>Knowledge level</b>
CO1	Demonstrate the ability to construct physical models of geometric solids and accurately view and sketch them from different angles.	Understanding
CO2	Explain proficiency in perspective projection and shading techniques, creating visually coherent and realistic representations.	Understanding
CO3	Demonstrate advanced skills in digital rendering, producing high-fidelity mockups with realistic textures and complex surfaces.	Understanding

**U24DS233****ADVANCED DESIGN STUDIO**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>8</b>	<b>8</b>

**Course Objective:**

- To explore natural form and observation.
- To enhance design communication skills.
- To experiment with color, texture, and prototyping.

**CONTENT**

Understanding form naturally from everyday life and observations of nature. Understanding how design elements and principles apply in form and space. Effectively communicating surfaces and forms by employing apt design vocabulary. Mastering form and its play in 3-dimensional space across various mediums is essential. Applying design principles to enhance design coherence and human perception of form and space. Making meaningful use of color and texture and understanding their influence on the perception of form. Exploring diverse manufacturing and prototyping methods. Building and manipulating form with different materials to foster an understanding of light, shadow, and spatial depth.

**TOTAL: 120 PERIODS****Text Books**

1. Francis D.K. Ching, 'Form, Space, and Order', Wiley, 2014.
2. Rudolf Arnheim, 'The Dynamics of Architectural Form', University of California Press 2009.
3. Rudolf Arnheim, 'Art and Visual Perception: A Psychology of the Creative Eye', University of California Press, 2004.
4. Josef Albers, 'Interaction of Color', Yale University Press, 2013.
5. William Lidwell, Kritina Holden, Jill Butler, 'Universal Principles of Design', Rockport Publishers, 2010.

**Reference Books**

1. László Moholy-Nagy, 'The New Vision: Fundamentals of Bauhaus Design, Painting, Sculpture, and Architecture', Dover Publications, 2012.
2. George D. Deming, 'Design Basics 3D', Cengage Learning, 2015.
3. Richard S. Hunter and Richard W. Harold, 'The Measurement of Appearance', Wiley, 1987.
4. John F. Pile, 'Interior Design', Prentice Hall, 2003.
5. Colin Ware, 'Information Visualization: Perception for Design', Morgan Kaufmann, 2012.
6. Kumar Vyas, 'Design and Environment- A Primer', National Institute of Design, 2009

<b>Course Outcomes: At the end of the course, the students will be able to</b>		
<b>CO</b>	<b>Course Outcome Statement</b>	<b>Knowledge level</b>
CO1	Apply Proficiency in Natural Form and Design Principles.	Applying
CO2	Design vocabulary to articulate surfaces and forms.	Applying
CO3	Apply diverse manufacturing and prototyping methods, demonstrating an understanding of light, shadow, and spatial depth in their form-building projects.	Applying

**Department of Design****Regulation 2024 Third Semester Syllabus**

<b>U24SL311</b>	<b>SEMIOTICS FOR DESIGNERS</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Course Objective:**

- Define semiotics as the study of signs, symbols, and their meanings in communication, emphasizing how it helps decode messages in visual and material culture.
- Apply semiotic principles to the design profession to enhance communication, user experience, and cultural relevance in visual and product design.
- Compare various Western schools of semiotics, such as structuralism and post-structuralism, focusing on their influence on media, art, and design.

**UNIT 1: INTRODUCTION TO SEMIOTICS 6**

Definition of Semiotics - Scope and Related Subjects: Linguistics, Aesthetics, Logic, Media Studies - History of Semiotics: Plato, Aristotle, Yaskha, Pāṇini, Tolkappiyar, Augustine of Hippo, John Locke - Types of Signs: Natural Signs vs. Conventional Signs - Key Figures & Concepts: Vilayanur Ramachandran – Synesthesia, Kiki-Bouba Effect - Western Schools of Semiotics: Moscow, Prague, Copenhagen, American, Paris, Tartu - Theoretical Approaches: Functionalism, Formalism, Structuralism, Post-Structuralism - Contemporary Divisions: Eco-semiotics & Digital Semiotics.

**UNIT 2: STRUCTURALISM 6**

Structuralism, Ferdinand de Saussure and His Theories: Langue and Parole, Dyadic Model of Signs, Arbitrariness of Signs, Diachronic and Synchronic Analysis, Syntagm and Paradigm, Pragmatism and Charles Sanders Peirce: Triadic Model of Signs, Categories of Signs: Icon, Index, Symbol, C.W. Morris: Syntax, Semantics, and Pragmatics

**UNIT 3: POST-STRUCTURALIST SCHOOL 6**

Post-Structuralism, Key Thinkers: Roland Barthes, Jacques Derrida, Julia Kristeva, Core Concepts: Denotation and Connotation, Studium and Punctum, Death of the Author, Logocentrism, Différance and Binary Oppositions, Deconstruction, Intertextuality, Myth, Communication Models: Shannon-Weaver Model, Marshall McLuhan – Medium is the Message.

**UNIT 4: CONTEMPORARY SEMIOTICS 6**

Anthroposemiotics, Biosemiotics, Zoo semiotics, Phyto semiotics, Key Thinkers: Jakob von Uexküll, Thomas Sebeok, Juri Lotman, Winfried Nöth, Kalevi Kull, Timo Maran, Core Concepts: Umwelt, Affordances, Consortium, Semiosphere, Eco Semiosphere, Semiotic Ground, Semicide, Eco-Field Hypothesis, Ecological Communication Model, Digital Semiotics, Jean Baudrillard – Simulation, Simulacra, and Hyper-reality

**UNIT 5: INDIAN SEMIOTICS 6**

Indigenous & Tribal Semiotics: Tamil Semiotics, Indian Semiotics, Tribal Signs and Codes, Tolkappiyam: Porulathikaram, Indian Texts & Thinkers: Idukuri and Karanappeyar, Thina and Semiotics of Culture, Saussure and Sanskrit Influence, Indian Semiotics: Vedanga, Nirukta, Vyakarana, Yaksha, Pāṇini, Patañjali, Bhartṛhari, Sphota Theory: Vakyapada, Masters of Indian Aesthetics: Bharata, Daṇḍin, Vāmana, Kuntaka, Kṣemendra, Pre-Dhvani (Prācīna) School and Post-Dhvani School, Ānanda Vardhana – Dhvanyāloka, Key Concepts in Indian Semiotics: Rasa,

Dhvani, Rīti, Alankāra, Guṇa, Kuntaka, Auchitya, Three Layers of Dhvani: Abhidha, Lakshana, Vyanjana.

**Total: 30 Periods**

### Course Outcomes

CO	At the end of the course, the students will be able to	Knowledge Level
CO1	Identify key elements of communication that influence meaning-making.	Understanding
CO2	Evaluate the impact of meaning-making in popular or controversial communication designs.	Evaluating
CO3	Integrate semiotic principles in all phases of a communication design project to enhance clarity and effectiveness.	Analyzing
CO4	Demonstrate ethical responsibility by assessing the societal impact of communication beyond the project brief.	Creating
CO5	Interpret and apply Indian semiotic concepts by analyzing indigenous sign systems, classical texts, linguistic theories, and aesthetic principles.	Evaluating

### Text Books

- 1 **Ferdinand de Saussure**, Course in General Linguistics, Open Court Publishing, 1983 (original lectures from 1906–1911, compiled posthumously).
- 2 **V. Murugan (Translator)**, Tolkappiyam: Porulathikaram, International Institute of Tamil Studies, (Year not clearly available; check edition for publication year).
- 3 **Charles Sanders Peirce**, Pragmatism as a Principle and Method of Right Thinking: The 1903 Harvard Lectures on Pragmatism, edited by Patricia Ann Turrissi, SUNY Press, 1997.
- 4 **Roland Barthes**, Mythologies, Translated by Annette Lavers, Hill and Wang, 1972.
- 5 **Jeff Collins (Author), Bill Mayblin (Illustrator)**, Introducing Derrida: A Graphic Guide, Icon Books, 1999.
- 6 **Bharata Muni**, A Treatise on Ancient Indian Dramaturgy and Histrionics: Natyasastram, Translated by M.M. Ghosh, Asiatic Society (original publication early 20th century; various reprints, e.g., 1951, 2002).

### Reference Books

- 1 **Winfried Nöth**, Handbook of Semiotics, Indiana University Press, 1990.
- 2 **Tony Jappy**, Introduction to Peircean Visual Semiotics, Bloomsbury, 2013.
- 3 **Roland Barthes**, Camera Lucida, Translated by Richard Howard, Hill and Wang, 1981.
- 4 **Roland Barthes**, Signs and Images: Writings on Art, Cinema and Photography, Translated by Chris Turner, Hill and Wang (varies by edition; compiled posthumously, check latest edition for year).
- 5 **Timo Maran**, Ecosemiotics: The Study of Signs in Changing Ecologies, Cambridge Scholars Publishing, 2017.

- 6 **Bimal Krishna Matilal**, The Word and the World: India's Contribution to the Study of Language, Oxford University Press, 1990.
- 7 **Manish Chandi and Madhuri Ramesh**, Walking is the Way of Knowing: In a Kadar Forest, Tara Books, 2017.

<b>U24SL321</b>	<b>ERGONOMICS FOR DESIGNERS</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
		<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Course Objective:**

- Understand the key principles of ergonomics and how they influence design decisions.
- Gain practical experience in applying ergonomics to product design, workplace environments, and user interfaces.
- Develop the skills to conduct ergonomic assessments and improve existing designs based on human factors.
- Learn how to design for diverse user groups, considering factors like physical ability, culture, and demographic differences.

**UNIT 1 ERGONOMICS AND HUMAN ANATOMY 6**

Definition and history of ergonomics, Importance of ergonomics in design, Overview of human factors and their impact on design decisions, Human Anatomy & Physiology for Design: Basic understanding of human anatomy relevant to design, Anthropometric data and its role in design, Range of motion and physical capabilities, Case studies of ergonomic failures

**UNIT 2 ERGONOMICS IN PRODUCT DESIGN 6**

Designing for comfort, usability, and safety, Ergonomic principles in tools, furniture, and everyday products, Hands-on analysis of product designs (e.g., chairs, keyboards, etc.), Ergonomics and Inclusive Design, Designing for users with disabilities, Universal design principles and accessibility, Case studies in inclusive design (e.g., adaptive technology, user interface design for all). Medical systems and products.

**UNIT 3 WORKPLACE ERGONOMICS 6**

Principles of ergonomic workstation design, Adjusting furniture and equipment for maximum comfort, Ergonomic assessments for office, factory, and home workspaces, Ergonomic Evaluation Methods, Ergonomic tools and techniques (e.g., posture analysis, stress testing, user feedback), Conducting ergonomic assessments of designs and environments, Hands-on activities: conducting ergonomic evaluations of common products.

**UNIT 4 CASE STUDIES IN ERGONOMICS 6**

In-depth study of successful and failed ergonomic designs, Good and Bad Ergonomics case studies in : Chairs, Kitchen Tools, Household Tools like vacuum cleaners. Washing machines, Mobile phones, Computer mouse and Keyboard and Critical analysis of product redesigns.

**UNIT 5 DESIGNING FOR DIFFERENT DEMOGRAPHICS 6**

Age, gender, and cultural considerations in ergonomic design, Ergonomics for children, elderly, and people with physical limitations, Customization in ergonomic designs for varied user needs, Prototyping and User Testing, Iterative design process: from concept to prototype, Conducting user testing for ergonomic products, Analyzing feedback and making adjustments to design.

**TOTAL: 30 PERIODS**

**Course Outcomes**

<b>CO</b>	<b>At the end of the course, the students will be able to</b>	<b>Knowledge Level</b>
<b>CO1</b>	Demonstrate an understanding of fundamental principles of ergonomics, human anatomy, and their application in product design	<b>Understanding</b>
<b>CO2</b>	Analyze and evaluate the ergonomic aspects of various products (e.g., chairs, tools, computer mice) and provide detailed ergonomic critiques.	<b>Analyzing</b>
<b>CO3</b>	Identify products with poor ergonomic design and propose improved redesign solutions using ergonomic principles.	<b>Evaluating</b>
<b>CO4</b>	Develop a complete ergonomic design for a product by integrating user research, prototyping, and testing methodologies.	<b>Creating</b>
<b>CO5</b>	Design inclusive ergonomic products by considering diverse user needs and apply iterative prototyping and user testing to refine their designs	<b>Applying</b>

**Text Books**

- 1 **K.H.E. Kroemer & H.B. Kroemer**, Ergonomics: How to Design for Ease and Efficiency, Prentice Hall, 2000.
- 2 **Henry Dreyfuss Associates**, The Measure of Man and Woman: Human Factors in Design, Wiley, 2001.
- 3 **R.S. Bridger**, Introduction to Ergonomics, CRC Press, 2008.
- 4 **Mark S. Sanders & Ernest J. McCormick**, Human Factors in Engineering and Design, McGraw-Hill Education, 1993.
- 5 **K.H.E. Kroemer & H.B. Kroemer**, Ergonomics: How to Design for Ease and Efficiency, Prentice Hall, 2000.
- 6 **Don Norman**, The Design of Everyday Things, Basic Books, 2013 (Revised Edition).

**Reference Books**

- 1 **Jan Dul & Bernard Werkmeister**, Ergonomics for Beginners: A Quick Reference Guide, CRC Press, 2008.
- 2 **Martin Helander**, A Guide to Human Factors and Ergonomics, CRC Press, 2005.
- 3 **William Lidwell, Kritina Holden & Jill Butler**, Universal Principles of Design, Rockport Publishers, 2003.
- 4 **Karl H.E. Kroemer**, Fitting the Human: Introduction to Ergonomics, CRC Press, 2008.
- 5 **Vivek D. Bhise**, Ergonomics in Product Design and Development, CRC Press, 2011.

**U24SL331****PSYCHOLOGY FOR DESIGNERS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Course Objective:**

- Investigate how users think, feel, and act to inform the design of user-centered products and experiences.
- Apply psychological concepts such as affordances, feedback, human-computer interaction, empathy mapping, and design testing to enhance usability and engagement.
- Explore psychological principles of perception, and emotional triggers to improve aesthetic appeal impact in design.



**UNIT 1 PSYCHOLOGY (BEHAVIOURAL) AND COGNITIVE PRINCIPLES 6**

Psychology, Behavioural psychology, Cognitive psychology, Psychology in design, Psychology of shapes, colour, font, space, Cognitive principles and biases, Principles of Psychology in design, Colour psychology, Mental model, Memory Models, Sensory adaptation. Importance of ethical and inclusive design. Neuroscience case studies to understand psychology.

**UNIT II PSYCHOLOGICAL PRINCIPLES IN DESIGN 6**

Hick's law, Gestalt principles, Confirmation bias. Anchoring bias, Visual hierarchy, Miller's law, Jakob's law, Social proof, Priming, Cognitive load, Fitt's law, Von Restorff effect, Juxtaposition, Tesler's law, Aesthetic-usability effect, Familiarity bias, Goal gradient effect, Decision fatigue, Labour illusion, Feedforward, Discoverability, Banner Blindness, Decoy effect, Attentional bias, framing, empathy gap, Visual anchors, Survivorship bias, etc.

**UNIT III USER BEHAVIOUR AND PRODUCTS 6**

Human factors and ergonomics, Cognitive psychology in industrial design, sensory design, Emotional design in industrial products, Behavioural psychology in product usage, Safety and risk perception, sustainability and environmental psychology, Social and cultural psychology, User research and testing.

**UNIT IV USER BEHAVIOUR AND UI/UX 6**

Cognitive Psychology in UX, Behavioural psychology and decision making (Fogg behaviour model), Emotional design, Human computer interaction, Visual perception and interaction, Motivation and habit, Visual perception and interaction, Accessibility and inclusive design, User research and testing, Social psychology in UI/UX.

**UNIT V USER BEHAVIOUR AND SPACES 6**

Environmental psychology, perception and wayfinding, emotional and psychological impact of spaces, behavioural psychology and space usage, Ergonomics and human factors in spaces, Social and Cultural Psychology in Spatial Design, Cognitive Load and Spatial Functionality, Sustainability and Environmental Impact, Therapeutic and Healing Environments, User Research and Spatial Testing.

**Total: 30 Periods**

**Course Outcomes**

<b>CO</b>	<b>At the end of the course, the students will be able to</b>	<b>Knowledge Level</b>
<b>CO1</b>	Explain behavioral and cognitive psychology concepts and assess their influence on design decisions.	<b>Understanding</b>
<b>CO2</b>	Apply psychological laws and cognitive biases to optimize user experience and product interaction.	<b>Applying</b>
<b>CO3</b>	Examine the roles of cognitive, emotional, and environmental psychology in shaping product and space design.	<b>Analysing</b>
<b>CO4</b>	Design user-centered, engaging, and inclusive UI/UX solutions using principles of cognitive and behavioral psychology.	<b>Creating</b>
<b>CO5</b>	Analyze and implement environmental and behavioral psychology principles to create user-centered spaces that consider ergonomics, emotional and cognitive responses, cultural context, and sustainability.	<b>Analysing</b>

### Text Books

- 1 **Don Norman**, The Design of Everyday Things, Basic Books, 2013.
- 2 **Susan Weinschenk**, 100 Things Every Designer Needs to Know About People, New Riders, 2011.
- 3 **Stephen Anderson**, Seductive Interaction Design: Creating Playful, Fun, and Effective User Experiences, New Riders, 2011.
- 4 **Don Norman**, Emotional Design: Why We Love (or Hate) Everyday Things, Basic Books, 2004.
- 5 **Dan Ariely**, Predictably Irrational: The Hidden Forces That Shape Our Decisions, Harper, 2008.
- 6 **Scott Plous**, The Psychology of Judgment and Decision Making, McGraw-Hill, 1993.

### Reference Books

- 1 **Nir Eyal**, Hooked: How to Build Habit-Forming Products, Portfolio, 2014.
- 2 **Barry Schwartz**, The Paradox of Choice: Why More Is Less, Harper Perennial, 2004.
- 3 **Steve Krug**, Don't Make Me Think: A Common Sense Approach to Web Usability, New Riders, 2000.
- 4 **Daniel Kahneman**, Thinking, Fast and Slow, Farrar, Straus and Giroux, 2011.
- 5 **Robert Cialdini**, Influence: The Psychology of Persuasion, Harper Business, 2006.

**U24SL343**

**DESIGN RESEARCH**

<b>L</b>	<b>T</b>	<b>S</b>	<b>C</b>
<b>1</b>	<b>0</b>	<b>3</b>	<b>4</b>

### Course Objective:

- Introduce the design process with a strong focus on practice-based design research methods.
- Foster critical and rational thinking to identify and solve complex problems with deeper meaning.
- Guide learners to identify, understand, and investigate a chosen topic or problem through systematic inquiry.
- Synthesize research findings into meaningful insights that inform effective ideation and solution development.
- Cultivate empathy and recognize opportunities within challenges, emphasizing the distinct nature of design research over conventional research methods.

### UNIT I INTRODUCTION TO RESEARCH

**12**

Introduction to research – its importance & purpose. Key qualities/characteristics/skillsets of a researcher. Research in various fields. Difference between Design research and other research practices. Key differences & importance of Data – Information – Insights. Epistemology - Positivism, Interpretivism, Constructivism and Pragmatism Understanding the relevant target group: Users, Customers, Internal & external stakeholders, Experts, Vendors.

**UNIT II INTRODUCTION TO DESIGN PROCESS (RESEARCH)****12**

Introducing Design process - most popular design thinking framework - double diamond model, through activity. (Initial exposure to different phases of design process: Discover | Define | Ideate | Validate & Iterate | Outcome).

Introduction to Design Research - Understanding the research goals, objectives, timelines, resources, & target groups. Arriving at Initial brief (Hypothesis to be investigated). Planning & execution of Secondary & Primary research (Data collection, consolidation). Synthesis of research data to arrive at key insights & opportunity areas. Arriving at an actionable brief for ideation.

**UNIT III RESEARCH TYPES****12**

Relevant research types: Primary research (Direct data collection through field based or remotely); Secondary research (Existing data/information through Case studies, Competitor study, Trend study, Study on policies/law/norms). Quantitative & Qualitative research and how it can be utilized together. Design Ethnography, Participatory & Co-Design Research and Research-Through-Design

**UNIT IV RESEARCH METHODOLOGIES IN DESIGN****12**

Relevant Methodologies: Formal interviews (Structured & Semi-structured); Informal discussions (unstructured); Ethnography; Focus group discussions; Social experiments; Shadowing; Card Sorting; Survey; Games/Activities as a methodology; Survey; User testing (feedback collection) & Usability testing. Sampling in quantitative research (Survey); Sampling in qualitative research.

Basic introduction to other useful tools/methods: Personas, Journey mapping, Mind maps, Stakeholder maps, Empathy maps, SWOT analysis, Bull's eye, Root cause analysis (5 whys), XY Matrix (Ex: Impact effort matrix), Life Cycle Assessment

**UNIT V RESEARCH ETHICS AND SELF REVIEW****12**

Self-Review: Reflecting upon the course/their own work, introspect & present the learnings/any new process/methods/tools that one has arrived at.

Ethics: Plagiarism/credits. Consent. Respecting participant boundaries/privacy & time. Facts Vs Fake data. Personal bias/preconceived notions/personal beliefs. Self-awareness on the impact & purpose for which your research is going to be used. Confidentiality of participant identity. Non-Disclosure Agreement. Fake promises. Being an advocate of Research.

**Course Outcomes**

<b>CO</b>	<b>At the end of the course, the students will be able to</b>	<b>Knowledge Level</b>
<b>CO1</b>	Identify the importance of research and distinguish between design research and other research methodologies.	<b>Remembering</b>
<b>CO2</b>	Apply the design thinking framework to conduct primary and secondary research and synthesize data into actionable insights.	<b>Applying</b>
<b>CO3</b>	Utilize qualitative and quantitative methods, including interviews, surveys, journey mapping, and SWOT analysis.	<b>Applying</b>
<b>CO4</b>	Develop ethical research practices, ensure data integrity, and present findings through clear visualization and reporting.	<b>Evaluating</b>
<b>CO5</b>	Reflect on the research process and demonstrate ethical awareness in responsible and respectful research conduct.	<b>Creating</b>

**Text Books**

- Blessing, Lucienne T.M., and Amaresh Chakrabarti.** DRM, a Design Research Methodology. Springer, 2009.

- 2 **Richey, Rita C., and James D. Klein.** Design and Development Research: Methods, Strategies, and Issues. Routledge, 2007.
- 3 **Kelly, Anthony E., Richard A. Lesh, and John Y. Baek, eds.** Handbook of Design Research Methods in Education. Routledge, 2008.
- 4 **Goodwin, Kim.** Designing for the Digital Age: How to Create Human-Centered Products and Services. Wiley, 2009.
- 5 **Dunne, David.** Design Thinking at Work: How Innovative Organizations Are Embracing Design. University of Toronto Press, 2018.

### Reference Books

- 1 **Brown, Tim.** Change by Design: How Design Thinking Creates New Alternatives for Business and Society. Harvard Business Press, 2009.
- 2 **Lewrick, Michael, Patrick Link, and Larry Leifer.** The Design Thinking Playbook: Mindful Digital Transformation of Teams, Products, Services, Businesses and Ecosystems. Wiley, 2018.
- 3 **Cross, Nigel.** Design Thinking: Understanding How Designers Think and Work. Berg, 2011.
- 4 **Stickdorn, Marc, and Jakob Schneider.** This is Service Design Thinking: Basics, Tools, Cases. Wiley, 2011.
- 5 **IDEO.org.** The Field Guide to Human-Centered Design. IDEO.org, 2015.

**U24DS313**

**INFORMATION DESIGN**

<b>L</b>	<b>T</b>	<b>S</b>	<b>C</b>
<b>1</b>	<b>0</b>	<b>3</b>	<b>4</b>

### Course Objective:

- Apply principles of information design to organize and present information effectively.
- Develop skills to visualize and communicate data in a clear and accessible manner.
- Transform raw data into structured, engaging narratives through visual storytelling techniques.
- Design user-centered information systems for multiple media platforms, ensuring clarity and impact.

### UNIT I: INTRODUCTION TO INFORMATION DESIGN (12)

Basics of Information Design, principles of effective communication through structured data. Understanding and defining information needs in different contexts, Data Humanism, History of Information Design. Information architecture, including taxonomy, navigation, and labeling for organizing complex data. Introduction to data types (quantitative, qualitative, categorical, and continuous) and data structures (hierarchical, relational, and networked). Fundamentals of information hierarchy and its role in guiding user attention. Designing for clarity with a focus on typography, color theory, contrast, spacing, and layout. Accessibility considerations in information design, including WCAG (Web Content Accessibility Guidelines) and inclusive design principles.

**UNIT II: DATA VISUALIZATION TECHNIQUES (12)**

Fundamentals of data representation, exploring different visualization methods for effective communication. Chart types: Bar, line, pie, scatter plots, heatmaps, treemaps, radar charts, and bubble charts. Best practices for selecting the right chart based on data type and audience. Diagrammatic Representations: Flowcharts for process mapping, timelines for chronological representation, mind maps for conceptual structuring, and network diagrams for relational data. Interactive vs. static visualizations and their impact on storytelling. Case studies on successful data visualizations in print and digital media, analyzing the effectiveness of different visualization approaches.

**UNIT III: USER EXPERIENCE AND INTERACTION DESIGN (12)**

Role of user experience (UX) in information design, ensuring clarity and usability. Basics of user interface (UI) design relevant to presenting information, including layout structuring, typography selection, and visual balance. Importance of user-centered design processes, incorporating user research, personas, and usability heuristics. Introduction to usability testing methods, including A/B testing, eye-tracking, and heuristic evaluations. Principles of designing for multiple platforms, including responsive design for web, adaptive layouts for mobile, and optimized formats for print. Web design standards and privacy guidelines, including data security considerations, GDPR compliance, and ethical concerns in user data handling.

**UNIT IV: TOOLS AND TECHNOLOGIES IN DATA VISUALIZATION (12)**

Exploring industry-standard tools for data visualization, including D3.js, Tableau, Power BI, and their applications in analytics and reporting. Building live dashboards for real-time data visualization, enabling businesses and organizations to track dynamic datasets. Introduction to data literacy, covering basic statistics, data cleaning techniques, and exploratory data analysis for effective visualization. Understanding data storytelling frameworks, combining insights with appropriate graphical representation. Practical exercises in using software tools to create compelling, informative, and interactive visualizations.

**UNIT V: ADVANCED TOPICS AND APPLICATIONS (12)**

Role of narrative and storytelling in information design, applying storytelling techniques to make data engaging and meaningful. Visual narratives to guide user understanding, improving decision-making through intuitive representation. Applications of infographics, instructional design, and corporate reporting, designing materials for education, business intelligence, and government communication. Emerging trends in information design, including augmented reality (AR) visualizations, machine learning-driven data representations, and automated infographic generation. Ethical considerations in visualization, avoiding misinformation, bias, and misleading graphical representation. Best practices in responsible and transparent data communication.

**Course Outcomes**

CO	At the end of the course, the students will be able to	Knowledge Level
CO1	Apply principles of information design to organize and present data clearly and accessibly.	Applying
CO2	Create effective data visualizations using charts, diagrams, and storytelling techniques.	Creating
CO3	Implement UX/UI design principles to enhance usability and user engagement.	Creating
CO4	Utilize industry-standard tools and explore emerging technologies in data and information design.	Applying

<b>CO5</b>	Evaluate and refine information design solutions for clarity, accessibility, and visual impact.	<b>Evaluating</b>
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### Text Books

- 1 **Edward Tufte**, The Visual Display of Quantitative Information, Graphics Press, 2001
- 2 **Colin Ware**, Information Visualization: Perception for Design, Morgan Kaufmann, 2012
- 3 **Alberto Cairo**, The Functional Art: An Introduction to Information Graphics and Visualization, New Riders, 2012
- 4 **Dona M. Wong**, The Wall Street Journal Guide to Information Graphics, W.W. Norton & Company, 2010
- 5 **Sandra Rendgen**, Information Graphics, Taschen, 2012

### Reference Books

- 1 **Nathan Yau**, Visualize This: The FlowingData Guide to Design, Visualization, and Statistics, Wiley, 2011
- 2 **Kim Rees and Dino Citraro**, Data Visualization for Success: Interviews with 40 Experienced Designers, Flamant, 2017
- 3 **Stephen Few**, Show Me the Numbers: Designing Tables and Graphs to Enlighten, Analytics Press, 2012
- 4 **Garr Reynolds**, Presentation Zen: Simple Ideas on Presentation Design and Delivery, New Riders, 2008
- 5 **Andy Kirk**, Data Visualisation: A Handbook for Data Driven Design, SAGE Publications, 2016

**U24DS322**

**LINEAR DESIGN PROJECT**

**L T S C**  
**0 0 8 8**

### Course Objective:

- Investigate and apply semiotic principles to effectively use signs, symbols, and visual language that enhance clarity and meaning in design communication.
- Incorporate cognitive ergonomics to develop intuitive, user-friendly interfaces that align with human perception, attention, and memory processes.
- Utilize design psychology techniques to shape user behavior, foster deeper engagement, and craft emotionally resonant, meaningful user experiences.
- Conduct comprehensive design research to gather user insights, identify needs, and translate findings into evidence-based design solutions.
- Apply information design principles to structure and present complex data in a way that enhances user understanding, navigation, and decision-making.

## CONTENT

Gaining hands-on experience with real-life design challenges is invaluable. It requires understanding human behavior and how user interactions influence design outcomes. Clear and effective communication of design ideas relies on the precise use of visual language, signs, and symbols. Mastery of spatial, product, and cognitive ergonomics across different scales is crucial. Applying design research methods to gather user insights enables informed decision-making. Presenting research data in a meaningful and structured way enhances comprehension and analysis. A strong foundation in distinguishing user needs from wants helps identify design opportunities. Developing a detailed design brief and outlining a structured, step-by-step design process is essential. The final design solution may take the form of a prototype in communication design (digital or print), product design, or spatial design.

### Project Typology to be considered for the Linear Design process.

- Context: The context for the project should be in and around the campus so that it is accessible for the students easily. Like, college canteen, Hostel, Mess, Classroom etc
- Complexity: Everyday activities and tasks involving non professional individuals should be taken into consideration.
- Scale: The scale of the project should be limited to the size where there is a minimum of 1:2 physical prototype feasible.
- Fields of Specialization: The fields can be Information system ( Digital or print ), Spatial experience, Furniture, Product, Small application or a small design intervention system.
- Personal Challenges can also be considered as a design project.

## Course Outcomes

CO	At the end of the course, the students will be able to	Knowledge Level
CO1	Explain the design process and demonstrate its application in real-world contexts.	Understanding
CO2	Demonstrate effective use of visual language, signs, and symbols to communicate design ideas clearly through sketches, models, and prototypes.	Applying
CO3	Analyze and infer insights from collected data.	Evaluating
CO4	Translate insights into clearly defined problems and formulate a design brief.	Analysing
CO5	Develop, prototype, and test design solutions with users in context.	Creating

## Text Books

- 1 **Tim Brown**, Change by Design: How Design Thinking Creates New Alternatives for Business and Society, Harvard Business Press, 2009
- 2 **Jeanne Liedtka and Tim Ogilvie**, Designing for Growth: A Design Thinking Tool Kit for Managers, Columbia University Press, 2011
- 3 **Don Norman**, The Design of Everyday Things, Basic Books, 2013
- 4 **Nigel Cross**, Design Thinking: Understanding How Designers Think and Work, Bloomsbury Academic, 2011
- 5 **Michael G. Luchs, Scott Swan, and Abbie Griffin (Eds.)**, Design Thinking: New Product Development Essentials from the PDMA, Wiley, 2015

### **Reference Books**

- 1 **Peter G. Rowe**, Design Thinking, MIT Press, 1987
- 2 **Larry Keeley, Helen Walters, Ryan Pikkell, and Brian Quinn**, Ten Types of Innovation: The Discipline of Building Breakthroughs, Wiley, 2013
- 3 **Richard Buchanan and Victor Margolin (Eds.)**, Discovering Design: Explorations in Design Studies, University of Chicago Press, 1995
- 4 **Christoph Meinel and Larry Leifer (Eds.)**, Design Thinking: Understand – Improve – Apply, Springer, 2011
- 5 **John Heskett**, Design: A Very Short Introduction, Oxford University Press, 2002