CARE COLLEGE OF ENGINEERING
(An Autonomous Institution)

Approved AICTE New Delhi | Affiliated to Anna University Chennai
No 27, Thayanur, Tiruchirappalli 620 009

Regulations 2024
Undergraduate Degree
B.Des. Design
Full Time Programme
Curriculum and Syllabus

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Chairperson
Board of Studies

HoD - Design
CARE College of Engineering (Autonomous)
No. 27, Thayanur, Trichy - 620 009.

Principal

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CARE College of Engineering (Autonomous)
No. 27, Thayanur, Trichy - 620 009.

CARE COLLEGE OF ENGINEERING
(An Autonomous Institution)

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School of 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, innovation and entrepreneurship, nurturing creative, socially responsible designers who develop sustainable and user-centred solutions for societal needs.

Department Mission

M1 – Design Excellence: To provide a rigorous, practice-oriented design education that develops creativity, design thinking, visual communication, critical inquiry and problem-solving capabilities.

M2 – Human-Centred Innovation: To nurture designers who understand human needs, cultural contexts and societal challenges and translate them into meaningful, inclusive and accessible design solutions.

M3 – Technology and Sustainability: To integrate emerging technologies, digital tools, materials, research and sustainable practices into the design process.

M4 – Entrepreneurship and Collaboration: To foster interdisciplinary collaboration, industry engagement, design entrepreneurship and the ability to translate innovative ideas into viable products, services and experiences.

Program Educational Objectives

PEO 1 – Professional Design Competence: Graduates will establish themselves as competent design professionals capable of applying design principles, human-centred research, creative problem-solving and iterative design methodologies to develop effective and meaningful design solutions.

PEO 2 – Innovation and Technological Adaptability: Graduates will contribute to design innovation by integrating emerging technologies, digital tools, interdisciplinary knowledge and contemporary design practices to address evolving user, industry and societal needs.

PEO 3 – Entrepreneurship and Leadership: Graduates will demonstrate the ability to lead collaborative design teams, manage design projects and pursue entrepreneurial opportunities by translating creative concepts into viable products, services, systems and experiences.

PEO 4 – Social Responsibility and Lifelong Growth: Graduates will advance inclusive, ethical and sustainable design practices while pursuing lifelong learning, professional development and contributions to societal well-being.

Program Outcomes

PO1	**Design Knowledge:** Apply fundamental knowledge of design principles, visual elements, design history, aesthetics, materials, processes, human factors and relevant scientific, technological and cultural concepts to design problems.
PO2	**Problem Analysis:** Identify, investigate and analyse user needs and design challenges using observation, interviews, contextual inquiry, secondary research and appropriate analytical methods.
PO3	**Design and Development of Solutions:** Design products, services, interfaces, systems and experiences by synthesising user requirements, functional needs, aesthetics, usability, feasibility and contextual constraints.
PO4	**Design Research and Experimentation:** Conduct design research, develop hypotheses, explore alternatives, build prototypes, test concepts and interpret qualitative and quantitative feedback to refine design solutions.
PO5	**Modern Design Tools and Technologies:** Select and use appropriate digital design software, visualisation tools, prototyping methods, fabrication technologies and emerging technologies, including AI-enabled tools, while recognising their limitations.
PO6	**User, Society and Context:** Design with an understanding of human behaviour, accessibility, inclusivity, cultural diversity, social contexts and the effects of design decisions on individuals and communities.
PO7	**Sustainability and Environmental Responsibility:** Evaluate material choices, resource consumption, product life cycles, environmental impacts and circular design principles to develop responsible and sustainable design solutions.
PO8	**Ethics and Professional Responsibility:** Apply ethical principles relating to user privacy, data protection, intellectual property, originality, accessibility, responsible AI use and professional conduct in design practice.

PO9	**Individual and Collaborative Work:** Work effectively as an individual and as a member or leader of multidisciplinary teams, respecting diverse perspectives and coordinating activities across design, technology, business and other disciplines.
PO10	**Communication and Design Documentation:** Communicate design concepts, research findings, processes and outcomes effectively through sketches, drawings, visual narratives, models, prototypes, digital portfolios, reports, presentations and professional discussions.
PO11	**Project Management, Entrepreneurship and Lifelong Learning:** Apply project planning, resource management, business awareness, entrepreneurial thinking and reflective learning to deliver design projects and adapt to evolving professional practices and technologies.

CARE COLLEGE OF ENGINEERING, TIRUCHIRAPPALLI 620 009

AN AUTONOMOUS INSTITUTION

REGULATIONS 2024

CHOICE BASED CREDIT SYSTEM

B.Des. DESIGN

CURRICULUM AND SYLLABI FOR I TO VIII SEMESTERS

SEMESTER I

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
THEORY COURSES										
1	U24DS111	Design Appreciation	PCC	2	0	0	2	2	40	60
2	U24HS111	Language and English Skills	HSMC	2	0	0	2	2	40	60
3	U24SL111	History of Arts	SLA	2	0	0	2	2	40	60
THEORY CUM PRACTICAL COURSES										
4	U24SL123	Visual Arts	SLA	1	0	3	4	4	50	50
5	U24DS123	2D Representation Techniques	PCC	1	0	3	4	4	50	50
PRACTICAL COURSES										
6	U24DS132	Basic Design Studio	PCC	0	0	6	6	6	60	40
			Total	**8**	**0**	**12**	**20**	**20**		

SEMESTER II

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
THEORY COURSES										
1	U24DS211	Form Appreciation	PCC	2	0	0	2	2	40	60
2	U24SL211	Materials and Manufacturing	SLA	2	0	0	2	2	40	60
3	U24SL221	History of Technology	SLA	2	0	0	2	2	40	60
THEORY CUM PRACTICAL COURSES										
4	U24SL233	Advanced Visual Arts	SLA	1	0	3	4	4	50	50
5	U24DS223	3D Representation Techniques	PCC	1	0	3	4	4	50	50
PRACTICAL COURSES										
6	U24DS232	Advanced Design Studio	PCC	0	0	8	8	8	60	40
			Total	**8**	**0**	**14**	**22**	**22**		

SEMESTER III

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
THEORY COURSES										
1	U24SL311	Semiotics for Designers	SLA	2	0	0	2	2	40	60
2	U24SL321	Ergonomics for Designers	SLA	2	0	0	2	2	40	60
3	U24SL331	Psychology for Designers	SLA	2	0	0	2	2	40	60
THEORY CUM PRACTICAL COURSES										
4	U24SL343	Design Research	SLA	1	0	3	4	4	50	50
5	U24DS313	Information Design	PCC	1	0	3	4	4	50	50
PRACTICAL COURSES										
6	U24DS322	Linear Design Project	PCC	0	0	8	8	8	60	40
			Total	**8**	**0**	**14**	**22**	**22**		

SEMESTER IV

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
THEORY COURSES										
1	U24SL411	Anthropology for Designers	SLA	2	0	0	2	2	40	60
2	U24SL421	Contemporary Materials for Designers	SLA	2	0	0	2	2	40	60
3	U24SL431	Design Philosophy	SLA	2	0	0	2	2	40	60
THEORY CUM PRACTICAL COURSES										
4	U24DS413	Eco-centric Design	PCC	1	0	3	4	4	50	50
5		Professional Elective Course – I	PEC	1	0	3	4	4	50	50
PRACTICAL COURSES										
6	U24DS422	Agile Design Project	PCC	0	0	8	8	8	60	40
			Total	**8**	**0**	**14**	**22**	**22**		

SEMESTER V

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
THEORY COURSES										
1	U24DS511	Systems Thinking	PCC	2	0	0	2	2	40	60
2	U24SL511	Programming and AI	SLA	2	0	0	2	2	40	60
3	U24HS511	Design Project Management	HSMC	2	0	0	2	2	40	60
THEORY CUM PRACTICAL COURSES										
4	U24DS523	Design Strategy	PCC	1	0	3	4	4	50	50
5		Professional Elective Course – 2	PEC	1	0	3	4	4	50	50
PRACTICAL COURSES										
6	U24DS532	Systems Design Project – I	PCC	0	0	8	8	8	60	40
7		Mandatory Course 1*	MC	3	0	0	3	0	100	-
			Total	**11**	**0**	**14**	**25**	**22**		

SEMESTER VI

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
THEORY COURSES										
1	U24HS611	Design Business Management	HSMC	2	0	0	2	2	40	60
THEORY CUM PRACTICAL COURSES										
2	U24DS613	Experience Design	PCC	1	0	3	4	4	50	50
3	U24EM613	Portfolio Design	EEC	1	0	3	4	4	50	50
4		Professional Elective Course	PEC	1	0	3	4	4	50	50
PRACTICAL COURSES										
5	U24DS622	Systems Design Project – II	PCC	0	0	8	8	8	60	40
6		Mandatory Course 2	MC	3	0	0	3	0	100	-
			Total	8		17	25	22		-

SEMESTER VII

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
PRACTICAL COURSES										
1	U24EM712	Professional Training	EEC					16	60	40

SEMESTER VIII

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
PRACTICAL COURSES										
1	U24EM812	Design Project	EEC					16	60	40

PROFESSIONAL ELECTIVE COURSES

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS/ WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
Vertical I: Product Experience (PE)										
1.	U24DSPE01	Prototyping	IV	1	0	3	4	4	50	50
2.	U24DSPE02	Product Design	V	1	0	3	4	4	50	50
3.	U24DSPE03	Furniture Design	VI	1	0	3	4	4	50	50
Vertical II: Digital Experience (DE)										
1.	U24DSDE01	Design with AR and VR	IV	1	0	3	4	4	50	50
2.	U24DSDE02	UI/UX Design	V	1	0	3	4	4	50	50
3.	U24DSDE03	Game Design	VI	1	0	3	4	4	50	50
Vertical III: Spatial Experience (SE)										
1.	U24DSSE01	Parametric Modelling	IV	1	0	3	4	4	50	50
2.	U24DSSE02	Retail Design	V	1	0	3	4	4	50	50
3.	U24DSSE03	Set Design and Art Direction	VI	1	0	3	4	4	50	50

MANDATORY COURSES

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
1	U24MC11	Disaster Risk Reduction and Management	MC	3	0	0	3	0	100	-
2	U24MC21	Environmental Science	MC	3	0	0	3	0	100	-
3	U24MC31	History of Science and Technology in India	MC	3	0	0	3	0	100	-
4	U24MC41	Personal Finance	MC	3	0	0	3	0	100	-
5	U24MC51	Well-Being with Traditional Practices- Yoga, Ayurveda and Siddha	MC	3	0	0	3	0	100	-

CREDIT DISTRIBUTION SUMMARY

B.Des. Design									
Category/Semester	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**Total**
HSMC: Humanities Social Sciences and Management Courses	2				2	2			**6**
SLA: Science and Liberal Arts Courses	6	8	10	6	2				**32**
PCC: Professional Core Courses	12	14	12	12	14	12			**76**
PEC: Professional Elective Courses				4	4	4			**12**
EEC: Employability Enhancement Courses						4	16	16	**36**
Total	**20**	**22**	**22**	**22**	**22**	**22**	**16**	**16**	**162**

CURRICULUM AND SYLLABUS

SEMESTER I

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
THEORY COURSES										
1	U24DS111	Design Appreciation	PCC	2	0	0	2	2	40	60
2	U24HS111	Language and English Skills	HSMC	2	0	0	2	2	40	60
3	U24SL111	History of Arts	SLA	2	0	0	2	2	40	60
THEORY CUM PRACTICAL COURSES										
4	U24SL123	Visual Arts	SLA	1	0	3	4	4	50	50
5	U24DS123	2D Representation Techniques	PCC	1	0	3	4	4	50	50
PRACTICAL COURSES										
6	U24DS132	Basic Design Studio	PCC	0	0	6	6	6	60	40
			Total	**8**	**0**	**12**	**20**	**20**		

ASSESSMENT SCHEME

Sl. No	Course Type	L	T	P	C	CIA Weightage (Theory)				CIA	ESE		CIA (W)	ESE (W)	Min. Marks to Pass for 100	
						T1	A1	T2	A2	Prac	Th	Prac			ESE	Total
1	U24DS111	2	0	0	2	60	40	60	40	-	100	-	40	60	45	50
2	U24HS111	2	0	0	2	60	40	60	40	-	100	-	40	60	45	50
3	U24SL111	2	0	0	2	60	40	60	40	-	100	-	40	60	45	50
4	U24SL123	1	0	3	4	-	-	60	40	100	-	100	50	50	45	50
5	U24DS123	1	0	3	4	-	-	60	40	100	-	100	50	50	45	50
7	U24DS132	0	0	6	6	-	-	-	-	100	-	100	60	40	45	50

(W) – Weightage

U24DS111	DESIGN APPRECIATION	L	T	S	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.

Detailed Syllabus

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

Learning Resources

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
5	"Visual Grammar" by Christian Leborg
6	"Design History: Understanding Theory and Method" by Kjetil Fallan
7	"Universal Principles of Design" by William Lidwell, Kritina Holden, and Jill Butler
8	"Form, Function, and Design" by Paul Jacques Grillo.

Course Outcomes:

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge level
CO1	Describe the progression of design through different historical periods and movements.	Understand
CO2	Design in daily life and across various industries and verticals.	Apply
CO3	Design terminologies and understand the different levels of design.	Apply

U24HS111	LANGUAGE AND ENGLISH SKILLS	L	T	S	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.

Detailed Syllabus

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

Learning Resources

1	Sharon Heidenreich, ‘English for Architects and Civil Engineers’, Springer, 2014
2	www.cambridgescholars.com.
3	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
8	Chris Mounsey, ‘Essays and Dissertation’, Oxford University Press, 2005.
9	Sidney Greenbaum, ‘The Oxford English Grammar’, Oxford University Press, 2005.
10	Krishna Mohan and Meera Banerji, ‘Developing Communication Skills’, 2nd edition, Laxmi Publications, 2009

Course Outcomes:

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge level
CO1	Understanding of the basic role of language in humans.	Understand
CO2	Develop skill and confidence in everyday requirements of the English language.	Understand
CO3	Express an experience, explore meaning and construct reality through language.	Understand

U24SL111	HISTORY OF ARTS	L	T	S	C
		2	0	0	2

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.

Detailed Syllabus

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

Learning Resources

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 Piero Pierini
4	The meaning of art by Herbert Read.
5	India: A Story through 100 Objects by Vidya Dehejia.

Course Outcomes:

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge level
CO1	Understand of Art History and Movements.	Understand
CO2	Analysis of Regional and Cultural Art.	Analyze
CO3	Understanding Art Theories and Aesthetic Principles.	Understand

U24SL123	VISUAL ARTS	L	T	S	C
		1	0	3	4

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.

Detailed Syllabus

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, Pragnanz, 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

Learning Resources

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. Guptill, "Rendering in Pen and Ink," Watson-Guptill, 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

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.	Apply
CO2	Develop Expertise in Art Mediums and Techniques.	Apply
CO3	Understand of Gestalt Principles and Color Theory.	Understand

U24DS123	2D REPRESENTATION TECHNIQUES	L	T	S	C
		1	0	3	4

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.

Detailed Syllabus

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

Learning Resources

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.
	Robert S. Oliver, "Perspective Drawing: A Step-by-Step Handbook," Dover Publications, 1995.

Course Outcomes:

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge level
CO1	Develop Proficiency in Geometrical Drawing.	Understand
CO2	Develop Skill in Drawing Complex Geometric Shapes.	Understand
CO3	Construct and Sketching Physical Models.	Understand
CO4	Understand of Projections and Sciography.	Understand

U24DS132	BASIC DESIGN STUDIO	L	T	S	C
		0	0	6	6

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: 60 PERIODS

Learning Resources

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.
7	Anthony C. Antoniades, ‘Poetics of Architecture: Theory of Design’, John Wiley and Sons,1992.

Course Outcomes:

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge level
CO1	Apply theoretical knowledge to create designs that effectively communicate intended meanings and concepts.	Apply
CO2	Integrate design principles to enhance the communicative impact of their visual compositions.	Apply
CO3	Apply Gestalt principles to create visually coherent and aesthetically pleasing design solutions.	Apply
CO4	Reproduce and enhance art and design compositions.	Apply

SEMESTER II

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
THEORY COURSES										
1	U24DS211	Form Appreciation	PCC	2	0	0	2	2	40	60
2	U24SL211	Materials and Manufacturing	SLA	2	0	0	2	2	40	60
3	U24SL221	History of Technology	SLA	2	0	0	2	2	40	60
THEORY CUM PRACTICAL COURSES										
4	U24SL233	Advanced Visual Arts	SLA	1	0	3	4	4	50	50
5	U24DS223	3D Representation Techniques	PCC	1	0	3	4	4	50	50
PRACTICAL COURSES										
6	U24DS232	Advanced Design Studio	PCC	0	0	8	8	8	60	40
			Total	**8**	**0**	**14**	**22**	**22**		

ASSESSMENT SCHEME

Sl. No	Course Type	L	T	P	C	CIA Weightage (Theory)				CIA	ESE		CIA (W)	ESE (W)	Min. Marks to Pass for 100	
						T1	A1	T2	A2	Prac	Th	Prac			ESE	Total
1	U24DS211	2	0	0	2	60	40	60	40	-	100	-	40	60	45	50
2	U24SL211	2	0	0	2	60	40	60	40	-	100	-	40	60	45	50
3	U24SL221	2	0	0	2	60	40	60	40	-	100	-	40	60	45	50
4	U24SL233	1	0	3	4	-	-	60	40	100	-	100	50	50	45	50
5	U24DS223	1	0	3	4	-	-	60	40	100	-	100	50	50	45	50
6	U24DS232	0	0	8	8	-	-	-	-	100	-	100	60	40	45	50

(W) – Weightage

U24DS211	FORM APPRECIATION	L	T	S	C
		2	0	0	2

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.

Detailed Syllabus

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

Learning Resources

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.

Course Outcomes:

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge level
CO1	Identify and apply elements such as line, shape, form, space, color, texture, and value in design.	Understand
CO2	Understand Historical and Cultural Influences.	Understand
CO3	Develop Skill in Geometry and Proportion.	Understand
CO4	Understand and apply concepts related to material properties, texture, light, shadow, and spatial organization to enhance form perception.	Understand



U24SL211	MATERIALS AND MANUFACTURING	L	T	S	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.

Detailed Syllabus

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

Learning Resources

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

Course Outcomes:

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge level
CO1	Differentiate between natural and synthetic materials and understand their properties and applications in design.	Understand
CO2	Explain the materials found in nature, their properties, and how to effectively utilize them in design projects.	Understand
CO3	Identify and apply synthetic materials, including advanced materials, in their design projects, understanding their benefits and limitations.	Understand
CO4	Understand and apply various manufacturing processes, considering sustainability and environmental impacts in material selection and design implementation.	Understand

U24SL221	HISTORY OF TECHNOLOGY	L	T	S	C
		2	0	0	2

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

Learning Resources

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.

Course Outcomes:

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge level
CO1	Appreciate the patterns of the past of technologies to counter the future of technology.	Understand
CO2	Understand the evolution and development of artificial intelligence and machine learning.	Understand

U24SL233	ADVANCED VISUAL ARTS	L	T	S	C
		1	0	3	4

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.

Detailed Syllabus

UNIT I FUNDAMENTALS OF FORM MAKING

Relation between Geometry and Form, Introduction to Basic Elements: Point, Line, Plane, Solid. Single curbed 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

Learning Resources

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

Course Outcomes:

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge level
CO1	Apply fundamental geometric principles to create and analyze complex forms, understanding the relationship between basic elements and their spatial configurations.	Apply
CO2	Demonstrate proficiency in using precise terminology to describe the attributes and characteristics of forms, enhancing their ability to communicate design concepts effectively.	Apply
CO3	Integrate principles of biomimicry and natural patterns into their design processes, creating sustainable and ecologically responsive forms.	Apply
CO4	Develop the ability to use visual language and semantics to create designs that are not only functional but also emotionally and culturally meaningful.	Apply
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.	Apply

U24DS223	3D REPRESENTATION TECHNIQUES	L	T	S	C
		1	0	3	4

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

Learning Resources

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.
7	John Montague, 'Basic Perspective Drawing: A Visual Approach', Wiley, 2013.

8	Thomas E. French, 'Engineering Drawing and Graphic Technology', McGraw-Hill, 1986.
9	Edward J. Muller, 'Projection Drawing', McGraw-Hill, 1986.
10	Michael E. Doyle, 'Color Drawing: Design Drawing Skills and Techniques for Architects, Landscape Architects, and Interior Designers', Wiley, 2011.

Course Outcomes:

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge level
CO1	Demonstrate the ability to construct physical models of geometric solids and accurately view and sketch them from different angles.	Understand
CO2	Explain proficiency in perspective projection and shading techniques, creating visually coherent and realistic representations.	Understand
CO3	Demonstrate advanced skills in digital rendering, producing high-fidelity mockups with realistic textures and complex surfaces.	Understand

U24DS232	ADVANCED DESIGN STUDIO	L	T	S	C
		0	0	8	8

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

Learning Resources

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

Course Outcomes:

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge level
CO1	Apply Proficiency in Natural Form and Design Principles.	Apply
CO2	Design vocabulary to articulate surfaces and forms.	Apply
CO3	Apply diverse manufacturing and prototyping methods, demonstrating an understanding of light, shadow, and spatial depth in their form-building projects.	Apply

SEMESTER III

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
THEORY COURSES										
1	U24SL311	Semiotics for Designers	SLA	2	0	0	2	2	40	60
2	U24SL321	Ergonomics for Designers	SLA	2	0	0	2	2	40	60
3	U24SL331	Psychology for Designers	SLA	2	0	0	2	2	40	60
THEORY CUM PRACTICAL COURSES										
4	U24SL343	Design Research	SLA	1	0	3	4	4	50	50
5	U24DS313	Information Design	PCC	1	0	3	4	4	50	50
PRACTICAL COURSES										
6	U24DS322	Linear Design Project	PCC	0	0	8	8	8	60	40
			Total	**8**	**0**	**14**	**22**	**22**		

ASSESSMENT SCHEME

Sl. No	Course Type	L	T	P	C	CIA Weightage (Theory)				CIA	ESE		CIA (W)	ESE (W)	Min. Marks to Pass for 100	
						T1	A1	T2	A2	Prac	Th	Prac			ESE	Total
1	U24SL311	2	0	0	2	60	40	60	40	-	100	-	40	60	45	50
2	U24SL321	2	0	0	2	60	40	60	40	-	100	-	40	60	45	50
3	U24SL331	2	0	0	2	60	40	60	40	-	100	-	40	60	45	50
4	U24SL343	1	0	3	4	-	-	60	40	100	-	100	50	50	45	50
5	U24DS313	1	0	3	4	-	-	60	40	100	-	100	50	50	45	50
6	U24DS322	0	0	8	8	-	-	-	-	100	-	100	60	40	45	50

(W) – Weightage

U24SL311	SEMIOTICS FOR DESIGNERS	L	T	P	C
		2	0	0	2

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.

Detailed Syllabus

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, Semiocide, 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, Thinai 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

Learning Resources

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 Turrisi, 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).
7	Winfried Nöth, Handbook of Semiotics, Indiana University Press, 1990.
8	Tony Jappy, Introduction to Peircean Visual Semiotics, Bloomsbury, 2013.
9	Roland Barthes, Camera Lucida, Translated by Richard Howard, Hill and Wang, 1981.
10	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).
11	Timo Maran, Ecosemiotics: The Study of Signs in Changing Ecologies, Cambridge Scholars Publishing, 2017.
12	Bimal Krishna Matilal, The Word and the World: India's Contribution to the Study of Language, Oxford University Press, 1990.
13	Manish Chandi and Madhuri Ramesh, Walking is the Way of Knowing: In a Kadar Forest, Tara Books, 2017.

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Identify key elements of communication that influence meaning-making.	Understand
CO2	Evaluate the impact of meaning-making in popular or controversial communication designs.	Evaluate
CO3	Integrate semiotic principles in all phases of a communication design project to enhance clarity and effectiveness.	Analyze
CO4	Demonstrate ethical responsibility by assessing the societal impact of communication beyond the project brief.	Create
CO5	Interpret and apply Indian semiotic concepts by analyzing indigenous sign systems, classical texts, linguistic theories, and aesthetic principles.	Evaluate



U24SL321	ERGONOMICS FOR DESIGNERS	L	T	P	C
		2	0	0	2

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.

Detailed Syllabus

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

Learning Resources

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

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Demonstrate an understanding of fundamental principles of ergonomics, human anatomy, and their application in product design	Understand
CO2	Analyze and evaluate the ergonomic aspects of various products (e.g., chairs, tools, computer mice) and provide detailed ergonomic critiques.	Analyze
CO3	Identify products with poor ergonomic design and propose improved redesign solutions using ergonomic principles.	Evaluate
CO4	Develop a complete ergonomic design for a product by integrating user research, prototyping, and testing methodologies.	Create
CO5	Design inclusive ergonomic products by considering diverse user needs and apply iterative prototyping and user testing to refine their designs	Apply

U24SL331	PSYCHOLOGY FOR DESIGNERS	L	T	P	C
		2	0	0	2

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.

Detailed Syllabus

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

Learning Resources

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

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Explain behavioral and cognitive psychology concepts and assess their influence on design decisions.	Understand
CO2	Apply psychological laws and cognitive biases to optimize user experience and product interaction.	Apply
CO3	Examine the roles of cognitive, emotional, and environmental psychology in shaping product and space design.	Analyze
CO4	Design user-centered, engaging, and inclusive UI/UX solutions using principles of cognitive and behavioral psychology.	Create
CO5	Analyze and implement environmental and behavioral psychology principles to create user-centered spaces that consider ergonomics, emotional and cognitive responses, cultural context, and sustainability.	Analyze

U24SL343	DESIGN RESEARCH	L	T	S	C
		1	0	3	4

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.

Detailed Syllabus

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.

Total: 60 Periods

Learning Resources

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

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Identify the importance of research and distinguish between design research and other research methodologies.	Understand
CO2	Apply the design thinking framework to conduct primary and secondary research and synthesize data into actionable insights.	Apply
CO3	Utilize qualitative and quantitative methods, including interviews, surveys, journey mapping, and SWOT analysis.	Apply
CO4	Develop ethical research practices, ensure data integrity, and present findings through clear visualization and reporting.	Evaluate
CO5	Reflect on the research process and demonstrate ethical awareness in responsible and respectful research conduct.	Create

U24DS313	INFORMATION DESIGN	L	T	S	C
		1	0	3	4

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.

Detailed Syllabus

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, tree maps, 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.
Total: 60 Periods

Learning Resources

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

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statements	Knowledge Level
CO1	Apply principles of information design to organize and present data clearly and accessibly.	Apply
CO2	Create effective data visualizations using charts, diagrams, and storytelling techniques.	Create
CO3	Implement UX/UI design principles to enhance usability and user engagement.	Create
CO4	Utilize industry-standard tools and explore emerging technologies in data and information design.	Apply
CO5	Evaluate and refine information design solutions for clarity, accessibility, and visual impact.	Evaluate

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 nonprofessional 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.

Learning Resources

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
6	Peter G. Rowe, Design Thinking, MIT Press, 1987
7	Larry Keeley, Helen Walters, Ryan Pikkel, and Brian Quinn, Ten Types of Innovation: The



	Discipline of Building Breakthroughs, Wiley, 2013
8	Richard Buchanan and Victor Margolin (Eds.), Discovering Design: Explorations in Design Studies, University of Chicago Press, 1995
9	Christoph Meinel and Larry Leifer (Eds.), Design Thinking: Understand – Improve – Apply, Springer, 2011
10	John Heskett, Design: A Very Short Introduction, Oxford University Press, 2002

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Explain the design process and demonstrate its application in real-world contexts.	Understand
CO2	Demonstrate effective use of visual language, signs, and symbols to communicate design ideas clearly through sketches, models, and prototypes.	Apply
CO3	Analyze and infer insights from collected data.	Evaluate
CO4	Translate insights into clearly defined problems and formulate a design brief.	Analyze
CO5	Develop, prototype, and test design solutions with users in context.	Create

SEMESTER IV

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
THEORY COURSES										
1	U24SL411	Anthropology for Designers	SLA	2	0	0	2	2	40	60
2	U24SL421	Contemporary Materials for Designers	SLA	2	0	0	2	2	40	60
3	U24SL431	Design Philosophy	SLA	2	0	0	2	2	40	60
THEORY CUM PRACTICAL COURSES										
4	U24DS413	Eco-centric Design	PCC	1	0	3	4	4	50	50
5		Professional Elective Course – I	PEC	1	0	3	4	4	50	50
PRACTICAL COURSES										
6	U24DS422	Agile Design Project	PCC	0	0	8	8	8	60	40
			Total	**8**	**0**	**14**	**22**	**22**		

ASSESSMENT SCHEME

Sl. No	Course Type	L	T	P	C	CIA Weightage (Theory)				CIA	ESE		CIA (W)	ESE (W)	Min. Marks to Pass for 100	
						T1	A1	T2	A2	Prac	Th	Prac			ESE	Total
1	U24SL411	2	0	0	2	60	40	60	40	-	100	-	40	60	45	50
2	U24SL421	2	0	0	2	60	40	60	40	-	100	-	40	60	45	50
3	U24SL431	2	0	0	2	60	40	60	40	-	100	-	40	60	45	50
4	U24DS413	1	0	3	4	-	-	60	40	100	-	100	50	50	45	50
5	PEC 1	1	0	3	4	-		60	40	100	-	100	50	50	45	50
7	U24DS422	0	0	8	8	-	-	-	-	100	-	100	60	40	45	50

(W) – Weightage

U24SL411	ANTHROPOLOGY FOR DESIGNERS	L	T	S	C
		2	0	0	2

Course Objective:

- To introduce anthropology as a discipline that studies human societies, cultures, and behaviours across time and space.
- To enable design students to recognize the cultural, social, and material contexts that shape human interactions and practices.
- To equip students with tools of observation, ethnography, and participant inquiry to inform human-centred design.
- To critically reflect on issues of identity, tradition, modernity, ritual, space, and material culture in everyday life.

Detailed Syllabus

UNIT 1: FOUNDATION OF ANTHROPOLOGY	**6**
Definition and evolution of Anthropology: From colonial roots to contemporary relevance. Scope & Branches of Anthropology – Physical, Cultural, Social, Visual, Linguistic. Key Thinkers: E.B. Tylor, Franz Boas, Margaret Mead. Core Concepts: Culture, Enculturation, Ethnocentrism, Cultural Relativism, Kinship, Social Structure. Role of Anthropology in Design: Human behaviour, cultural variation, user contexts. Indian context and Indian Anthropologists.	
UNIT 2: ETHNOGRAPHY & FIELDWORK METHODS	**6**
What is Ethnography? Immersion, observation, and participation. Key techniques including participant observation, field notes & journaling, etc., Ethics in fieldwork, informed consent, anonymity and respect. Introduction to Cultural Probes and Design Ethnography. Introduction to tools, such as visual diaries, mapping, storytelling, etc.,	
UNIT 3: EVERYDAY LIFE, RITUALS & SPATIAL PRACTICES	**6**
Anthropology of the Everyday. Ritual, Routine, Performance – Understanding Repetition & Symbolism. Anthropology of Space: Domesticity, Gendered Space, Thresholds, Temporary Architecture. Urban Anthropology: Public vs Private: Use of Streets, Markets, Shrines, and Courtyards. Anthropological Reading of a Designed Object or Place.	
UNIT 4: MATERIAL CULTURE & OBJECT BIOGRAPHIES	**6**
What is Material Culture? Objects as carriers of meaning and memory. Objects as Cultural Artifacts: Use, Memory, Transformation. The Life of Things – Ownership, Reuse, Discard. Material Semiotics and the Anthropology of Waste. Case Study: Traditional Craft, Heirloom Objects, or Everyday Artefacts. Indian examples.	
UNIT 5: VISUAL & DESIGN ANTHROPOLOGY	**6**
Visual Methods in Anthropology, Photography, Film, and Mapping in Anthropological Inquiry. Sensory Ethnography – Sound, Smell, Texture in Design Contexts. Design Anthropology: People, Products, and Participatory Practices.	
	Total: 30 Periods

Exercises

1	Empathy-building in user research; identifying cultural codes in product and space design.
2	Conducting real-world design research; grounding concept development in observation.
3	Informing spatial layouts, experience design, and user interaction based on social behaviour.
4	Inspiring form, texture, reuse and symbolism in product, packaging, furniture, and spatial design.



5	Developing design solutions based on context-rich, co-created, and ethically grounded insights.

Learning Resources

1	Spradley, J. P. Participant Observation. Waveland Press. A classic primer on ethnographic fieldwork and observational techniques (1980).
2	Pink, S. Doing Visual Ethnography. Sage Publications. Essential for learning how to use photography and film as research tools(2013).
3	Margaret Mead – Coming of Age in Samoa, Harper Perennial. Foundational ethnography with insights into youth, gender, and society. (1928)
4	Daniel Miller – Stuff. Polity Press, Introduces the anthropology of material culture and everyday things. (2010)
5	Tim Ingold – Making: Anthropology, Archaeology, Art and Architecture, Routledge, Blends anthropology and design in discussing how people engage with materials. (2013)
6	Nigel Barley – The Innocent Anthropologist. Eland Publishing, A humorous yet insightful look at fieldwork and cross-cultural misunderstandings (1983).
7	Csikszentmihalyi, M. & Rochberg-Halton, E. The Meaning of Things. Cambridge University Press. Explores how people find meaning and identity through their possessions. (1981)
8	Appadurai, A. (Ed.). The Social Life of Things: Commodities in Cultural Perspective. Cambridge University Press. Examines how objects circulate and acquire social value. (1986)
9	Gunn, W., Otto, T., & Smith, R. C. Design Anthropology: Theory and Practice. Bloomsbury. A foundational book for bridging anthropology and design. (2013)
10	Ramesh, M., & Chandi, M. Walking is the Way of Knowing: In a Kadar Forest. Tara Books. (2017)
11	Christina Wasson et al. (Eds.) – Applying Anthropology in the Global Village Routledge, Collection on practicing anthropology in design, user research, and organizational culture. (2016)

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Define key anthropological concepts and their relevance to design practice.	Understand
CO2	Apply ethnographic methods to observe and analyse human behaviour in context.	Apply
CO3	Interpret everyday rituals, spaces, and objects through cultural frameworks.	Analyze
CO4	Evaluate how material culture and social practices shape design opportunities.	Evaluate
CO5	Create ethnographically informed design narratives or visual mappings.	Create

U24SL421	CONTEMPORARY MATERIALS FOR DESIGNERS	L	T	S	C
		2	0	0	2

Course Objective:

- To introduce students to the breadth of contemporary material innovations
- To build a foundational understanding of material properties and behavior
- To evaluate material choice through the lens of sustainability and context
- To explore the sensory and cultural impact of materials on user experience
- To enable informed and ethical decision-making in material selection.

Detailed Syllabus

UNIT 1: UNDERSTANDING MATERIAL BEHAVIOUR	**6**
Physical and mechanical properties of materials, Material families: metals, polymers, ceramics, composites, etc., Form-function relationship in material choices, Cost, manufacturability, and availability factors, Failure and durability of materials, Selection tools (e.g., Ashby charts) and case studies.	
UNIT 2: SMART AND EMERGING MATERIALS	**6**
Shape-memory alloys, piezoelectrics, and conductive polymers, Self-healing, phase-changing, and programmable materials, Materials in robotics, healthcare, and electronics, Responsive surfaces and embedded interactivity,4D printing and future-forward materials, Case studies in cutting-edge product design.	
UNIT 3: SUSTAINABLE AND CIRCULAR MATERIALS	**6**
Biomaterials: mycelium, algae, bioplastics, Recycled and upcycled materials in design, Lifecycle analysis and material passports, Local sourcing and regenerative practices, Certifications and standards (Cradle-to-Cradle, EPEAT, etc.), Circular economy models in product design. Review the past materials and its relevance now, and comparative study of old and new materials.	
UNIT 4: MATERIAL NARRATIVE AND EXPERIENCES	**6**
Tactility, weight, texture, and multisensory materiality, Material semantics and emotional design, Creating perceived value through material finishes, Brand storytelling through material choice, Materials and user perception of quality and function, Cross-cultural material associations.	
UNIT 5: CONTEXT, CULTURE AND LOCALITY	**6**
Indigenous materials and traditional techniques, Local crafts and contemporary reinterpretation Geo-climatic material suitability in design, Ethics of sourcing and material exploitation Materials as cultural identity and resistance, Case studies from India and Global South. Explore material evolution in the Indian context.	
	Total: 30 Periods

Exercises

1	Material swatch exploration and documentation.
2	Sensory experience mapping of common objects.
3	Comparative analysis of traditional vs modern material for the same product.
4	Life cycle mapping of a selected product/material.
5	Mini case-study: A product made from smart or bio-materials.
6	Cultural deep-dive: One material's use across regions.

Learning Resources

1	Karana, E., Pedgley, O., & Rognoli, V. Materials Experience: Fundamentals of Materials and Design. Butterworth-Heinemann / Elsevier. Explores how materials shape user experience and emotional connection in design. (2014)
2	Lefteri, Chris. Making It: Manufacturing Techniques for Product Design. Laurence King Publishing. A comprehensive guide to contemporary manufacturing methods for designers. (2012)
3	Sudjic, Deyan. The Language of Things. W. W. Norton & Company. Discusses how objects communicate cultural values, identity, and meaning. (2009)
4	Dent, Andrew H., & Sherr, Leslie. Material Innovation: Product Design. Thames & Hudson. Showcases innovative uses of materials in modern product design. (2014)
5	Miodownik, Mark. Stuff Matters: Exploring the Marvelous Materials that Shape Our Man-Made World. Penguin Books. A fascinating look into the science and stories behind everyday materials. (2013)
6	McDonough, William, & Braungart, Michael. Cradle to Cradle: Remaking the Way We Make Things. North Point Press. A seminal work advocating sustainable design and closed-loop production systems. (2002)
7	Ratner, Buddy D. (Ed.). Biomaterials Science: An Introduction to Materials in Medicine. Academic Press / Elsevier. Comprehensive reference on materials used in biomedical and design applications. (2013)
8	Postrel, Virginia. The Substance of Style: How the Rise of Aesthetic Value Is Remaking Commerce, Culture, and Consciousness. HarperCollins. Explores how aesthetics influence consumer culture and design. (2003)
9	Ashby, Michael F., & Johnson, Kara. Materials and Design: The Art and Science of Material Selection in Product Design. Butterworth-Heinemann / Elsevier. A key text connecting engineering material properties with design thinking. (2014)

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Identify and categorize a wide range of contemporary and emerging materials.	Understand
CO2	Analyze and justify material choices in relation to specific product contexts.	Analyze
CO3	Integrate sustainability principles and apply lifecycle thinking in material selection.	Apply
CO4	Evaluate and articulate the sensory, emotional, and experiential roles of materials in design.	Evaluate
CO5	Interpret and connect materials to cultural contexts and design narratives.	Create

U24SL431	DESIGN PHILOSOPHY	L	T	S	C
		2	0	0	2

Course Objective:

- To understand the history of various schools of thought in design across time and cultures.
- To develop awareness of ethical, cultural, and social responsibility in design.
- To critically analyze the role of design in shaping society and user experience.
- To cultivate each student's unique design sensibility and personal philosophy

Detailed Syllabus

UNIT 1: FOUNDATION OF DESIGN PHILOSOPHY	**6**
What is philosophy in design? Design philosophy of various products ,Design vs. Art vs. Craft, Function vs. Aesthetics Form follows function – revisited, Design as problem-solving vs. exploration, Meaning, symbolism, and semiotics in design, Eastern vs. Western design ideologies, Design as a cultural act. Gandhian philosophy and design.	
UNIT 2: PHILOSOPHIES ACROSS DOMAINS	**6**
UX: Emotional Design (Don Norman), Product: Empathy & Minimalism-Dieter Rams, Naoto Fukasawa, Notable Quotes on Function and Form, Spatial: Phenomenology (Zumthor, Pallasmaa) Biomimicry & nature-based design, Japanese Zen design & Ma, Critical Regionalism, User psychology and design, Future-oriented & speculative philosophies	
UNIT 3: HISTORY AND EVOLUTION OF DESIGN THINKING	**6**
Art History, Pre-industrial craftsmanship ,Bauhaus and Modernism, Postmodernism & Critical Design, When Art becomes Design ? User-centered & Human-centered design, Inclusive and Universal design, Technology and its influence, Systems thinking, What is Data, Data era (unified data),How to design with just data.	
UNIT 4: ETHICS,RESPONSIBILITY AND IMPACT	**6**
What is ethical design? Greenwashing vs. true sustainability, Design and power, Responsibility to users, clients, and society, Privacy and surveillance(UX) , Design for marginalized voices, Design for circular economy Bias in design, Purpose-driven design	
UNIT 5: PERSONAL DESIGN PHILOSOPHY	**6**
Self-reflection in design, what do you value as a designer? Designing from belief vs. market Visual storytelling of personal journey, Influence of mentors and inspirations, Developing a personal design manifesto.	
Total: 30 Periods	

Exercise

1	Identify a product, architectural space, or interface design influenced by a philosophy tree. Document its revolutionary impact and map its design influences through a philosophy tree diagram
2	Sketch a product or spatial idea that balance function and form. Select a traditional object from your home or community, analyze its cultural context, compare its effectiveness with western alternatives and explore its economic impact.
3	Compare two objects – one handmade and one machine made – analyzing differences in design, function and value
4	UX: Redesign an app interface based on emotional intelligence
5	Design an accessible public object or interface
6	Create a visual or zine expressing your core design value

Learning Resources

1	Anne-Marie Willis & Tony Fry. Design Philosophy Papers. Team D/E/S Publications. A critical journal exploring design theory, philosophy, and sustainability in design discourse. (2000)
2	Kenya Hara. Designing Design. Lars Müller Publishers. A reflective exploration of Japanese design aesthetics and the concept of “emptiness” as creative potential. (2007)
3	Norman Potter. What is a Designer: Things, Places, Messages. Hyphen Press. A classic text examining the ethics, practice, and social role of design. (2002)
4	Guy Julier & Viviana Narotzky Moor (Eds.). Making Meaning: Cultural Production of Design. Berg Publishers. A scholarly collection on how design shapes and is shaped by culture. (2009)
5	Anthony Dunne & Fiona Raby. Speculative Everything: Design, Fiction, and Social Dreaming. MIT Press. Explores speculative design as a method for envisioning alternative futures. (2013)
6	Anne-Marie Willis & Tony Fry. Design Philosophy Papers. Team D/E/S Publications. A critical journal exploring design theory, philosophy, and sustainability in design discourse. (2000)
7	Don Norman. The Design of Everyday Things. Basic Books. A landmark text on human-centered design and usability principles in everyday products. (2013)
8	Juhani Pallasmaa. The Eyes of the Skin: Architecture and the Senses. John Wiley & Sons. Explores the role of multisensory experience in architectural perception. (2005)
9	Dieter Rams. Less But Better. Gestalten. A collection highlighting Rams’ minimalist design philosophy and influence on modern industrial design. (1995)
10	Christopher Alexander. The Timeless Way of Building. Oxford University Press. A foundational work discussing the organic, pattern-based process of creating meaningful architecture. (1979)
11	Naoto Fukasawa & Jasper Morrison. Super Normal: Sensations of the Ordinary. Lars Müller Publishers. Explores everyday design and the beauty of functional simplicity. (2007)
12	Peter Zumthor. Thinking Architecture. Birkhäuser Verlag. A reflective essay collection on atmosphere, materiality, and the emotional power of architecture. (2010)
13	Bruno Munari. Design as Art. Penguin Books. A classic manifesto exploring the intersection of art, design, and creativity in modern life. (1966)

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Identify and articulate core philosophical concepts and their relevance to design practice and theory.	Understand
CO2	Evaluate the ethical and societal implications of design decisions, integrating principles of sustainability and user-centricity in design solutions	Evaluate
CO3	Analyze and critique various historical and contemporary design philosophies and their impact on design movements and societal values	Analyze
CO4	Formulate and justify a personal design philosophy, applying theoretical frameworks to practical design challenges	Create
CO5	Interpret and apply philosophical reasoning to address complex design problems and anticipate future trends in the design field.	Evaluate



U24DS413	ECO-CENTRIC DESIGN	L	T	S	C
		1	0	3	4

Course Objective:

- Understand the historical evolution, principles, and ethics of ecological and sustainable design.
- Explore and apply Life Cycle Assessment (LCA) methods for evaluating environmental impacts across physical, digital, and spatial contexts.
- Develop strategies for sustainable material use, energy-efficient digital design, and biomimicry-based innovations.
- Integrate systems thinking and circular economy principles to create holistic, cross-disciplinary design solutions.
- Collaborate on multidisciplinary projects that demonstrate measurable environmental impact and reflective practice in design.

Detailed Syllabus

UNIT 1: FOUNDATIONS AND ECOLOGICAL PRINCIPLES **12**

History and evolution of ecological design, Key concepts: cradle-to-cradle, circular economy, biomimicry, regenerative design, Environmental psychology & design ethics, Cross-disciplinary case studies: eco-products, sustainable apps, green spaces.

UNIT 2: LIFE CYCLE ASSESSMENT AND IMPACT TOOLS **12**

Life Cycle Assessment (LCA) basics for physical, digital, spatial designs, Material impacts, energy use, end-of-life considerations, Digital resource impacts: data storage, server load, UI efficiency, Tools demo: Open LCA, Website Carbon Calculator, One Click LCA.

UNIT 3: SUSTAINABLE DESIGN STRATEGIES **12**

Low-impact materials & manufacturing, Energy-efficient UI/UX design and behavioral nudges, Biophilic design and biomimicry applications, Modular, passive, and resource-efficient spatial design, Workshop: Material & Digital Resource Passports.

UNIT 4: SYSTEMS THINKING AND CIRCULAR DESIGN **12**

Systems mapping across product, UI, and space, Circular economy principles: reuse, repair, waste-to-value, Designing integrated service ecosystems. Critical thinking on ecological responsibilities.

UNIT 5: INTEGRATED STUDIO PROJECT AND REFLECTION

Multidisciplinary team project combining product, UI/UX, spatial design, Measure environmental impact: energy, waste, resource savings, Final presentation to faculty and industry. Deliverables: prototypes, impact report, systems map, LCA summary.

Total: 60 Periods

Exercises

1	Activity: Mapping ecological footprints of product, UI, and space.
2	Assignment: Perform LCA on chosen design
3	Workshop: Material & Digital Resource Passports
4	Mini-project: Blueprinting an eco-design solution spanning discipline
5	Reflective essay: personal ecology in design practice
6	Case studies in sustainable design



Learning Resources

1	William McDonough & Michael Braungart. Cradle to Cradle: Remaking the Way We Make Things. North Point Press. A pioneering manifesto on sustainable, closed-loop design systems and eco-effectiveness. (2002)
2	Michael Braungart & William McDonough. The Upcycle: Beyond Sustainability—Designing for Abundance. North Point Press. A follow-up to Cradle to Cradle, proposing regenerative design solutions that go beyond minimizing harm. (2013)
3	Matthias Finkbeiner, Annekatrin Inaba, R. Tan, & R. Hischier. Life Cycle Assessment: Theory and Practice. Springer. A comprehensive academic resource detailing methodologies for assessing environmental impacts across product life cycles. (2016)
4	Daniel A. Vallero & Chris Brasier. Sustainable Design: The Science of Sustainability and Green Engineering. John Wiley & Sons. Explores the intersection of science, engineering, and design for environmental responsibility. (2008)
5	John R. Ehrenfeld. Sustainability by Design: A Subversive Strategy for Transforming Our Consumer Culture. Yale University Press. Examines sustainability as a mindset and moral imperative beyond technical solutions. (2008)
6	David Bergman. Sustainable Design: A Critical Guide for Architects and Interior, Graphic, and Industrial Designers. Princeton Architectural Press. A practical and critical overview of sustainable practices across design disciplines. (2012)
7	Janine M. Benyus. Biomimicry: Innovation Inspired by Nature. Harper Perennial. A groundbreaking work introducing how natural systems inspire sustainable innovations in design and technology. (1997)
8	Ezio Manzini. Design, When Everybody Designs: An Introduction to Design for Social Innovation. MIT Press. Explores design's evolving role in fostering social change and collaborative innovation. (2015)
9	Steffen Lehmann. Sustainable Architecture and Urban Design. Routledge. Examines strategies for sustainable city planning, architecture, and resource-efficient design. (2010)
10	Ken Yeang. Ecodesign: A Manual for Ecological Design. John Wiley & Sons. A comprehensive guide integrating ecological principles into architectural and urban design. (2006)

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statements	Knowledge Level
CO1	Analyze the history, principles, and ethical considerations of ecological design to inform sustainable decision-making.	Analyze
CO2	Apply Life Cycle Assessment (LCA) tools to evaluate environmental impacts of physical, digital, and spatial designs	Apply
CO3	Develop sustainable design strategies using low-impact materials, energy-efficient digital practices, and biomimicry-inspired approaches.	Create
CO4	Design integrated, circular solutions by applying systems thinking and service ecosystem mapping across disciplines.	Create
CO5	Produce and present a multidisciplinary eco-design project, supported by measurable impact data and reflective analysis.	Create



U24DS422	AGILE DESIGN PROJECT	L	T	S	C
		0	0	8	8

Course Objective:

- Understanding anthropology to deeply understand users' cultural contexts, behaviors, and needs, leading to more human-centered, adaptable design solutions.
- Understanding design philosophy to align design decisions with core values, ensuring purposeful, adaptable, and user-focused outcomes.
- Understanding ecological design to be adaptable, resource-efficient, and responsive to environmental and contextual changes.
- To apply prototyping and AR/VR tools for rapid visualization and assessment of initial design solution feasibility.
- Use acquired knowledge to develop flexible design solutions while embracing a fail-fast mindset and learning from mistakes.

CONTENT

Hands-on experience with real-world design challenges is one of the most valuable lessons a designer can have. It demands an awareness of how cultural contexts, human behaviors, and user needs shape the outcome of a design. Learning how successful designers think and make decisions enables you to anchor your work in core values, ensuring that every solution is purposeful, adaptable, and user-centered.

An ecologically conscious mindset—combined with an understanding of a design's life cycle and its environmental impact—guides you toward creating truly sustainable outcomes. Mastering contemporary visualization skills, from advanced rendering to AR/VR, empowers you to communicate ideas clearly and compellingly to a wide audience.

Above all, adaptability is key. Embracing change, failing fast, and learning quickly from those failures allows you to refine and improve ideas through rapid iterations. The final solution might emerge as a series of digital, physical, or spatial prototypes—each one tested and evolved to meet the demands of real-world challenges.

Project Typology to be considered for the Agile Design process.

- Your project begins with choosing a **context** you can easily access—this could be a physical space, a digital platform, or a spatial environment you can explore and study.
- Tackle a **complexity** that already exists in the real world: an existing design, product, or system that you can reimagine to be not only functional but also sustainable and ready for the future.
- Keep your **scale** practical. Your outcome should be a prototype—digital, physical, or a virtual space—that you can design, build, and test within the project timeframe.

You're free to explore a wide range of **fields**:

- Digital apps (web, Android, iOS)
- Virtual spatial experiences
- Urban furniture
- Products for mass manufacturing
- Redesign of an existing system
- Digital plugins for using design software efficiently

You can even turn a **personal challenge** into your project—sometimes the most impactful



solutions come from problems you've faced yourself.

Examples:

- Redesigning a Mobile App UI (User-Centered Design & Rapid Prototyping)
- Developing a Smart Home Product (Product Prototyping & Feature Iteration)
- Temporary Event Pavilion Design (Spatial Design & Visualization Tools)
- E-commerce Website Overhaul (Data-Driven Design Decisions)
- Urban Furniture Design (Public Space & Inclusive Design)

Learning Resources

1	Tim Brown. Change by Design: How Design Thinking Creates New Alternatives for Business and Society. Harvard Business Press. Introduces the principles of design thinking and its application to business innovation and social change. (2009)
2	Ezio Manzini. Design, When Everybody Designs: An Introduction to Design for Social Innovation. MIT Press. Explores the shift from professional design to collaborative, socially driven design practices. (2015)
3	Don Norman. The Design of Everyday Things. Basic Books. A foundational text on human-centered design, usability, and cognitive ergonomics. (2013)
4	Nigel Cross. Design Thinking: Understanding How Designers Think and Work. Bloomsbury Academic. Examines the cognitive processes and methods underlying expert design practice. (2011)
5	Michael G. Luchs, Scott Swan, & Abbie Griffin (Eds.). Design Thinking: New Product Development Essentials from the PDMA. John Wiley & Sons. A collection of perspectives linking design thinking to innovation management and product development. (2015)
6	Peter G. Rowe. Design Thinking. MIT Press. A seminal text exploring the cognitive and methodological processes behind design thinking. (1990)
7	Larry Keeley, Helen Walters, Ryan Pikkel, & Brian Quinn. Ten Types of Innovation: The Discipline of Building Breakthroughs. John Wiley & Sons. Discusses a systematic approach to innovation across products, services, and business models. (2013)
8	Richard Buchanan & Victor Margolin (Eds.). Discovering Design: Explorations in Design Studies. University of Chicago Press. A foundational collection on design theory, methodology, and interdisciplinary studies. (1995)
9	John Heskett. Design: A Very Short Introduction. Oxford University Press. A concise overview of design history, principles, and its impact on society. (2002)

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Use the agile design process and demonstrate its application in real-world contexts.	Understand
CO2	Showcase the use of prototyping and/or AR/VR through sketches, models, virtual environments, and physical prototypes.	Apply
CO3	Analyze existing designs to validate the design outcomes from the design process	Analyze
CO4	Be eco-conscious in using new age materials and systems for the design solutions	Evaluate
CO5	Fail fast - adapt and be agile in finding solutions.	Create

SEMESTER V

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
THEORY COURSES										
1	U24DS511	Systems Thinking	PCC	2	0	0	2	2	40	60
2	U24SL511	Programming and AI	SLA	2	0	0	2	2	40	60
3	U24HS511	Design Project Management	HSMC	2	0	0	2	2	40	60
THEORY CUM PRACTICAL COURSES										
4	U24DS523	Design Strategy	PCC	1	0	3	4	4	50	50
5		Professional Elective Course – 2	PEC	1	0	3	4	4	50	50
PRACTICAL COURSES										
6	U24DS532	Systems Design Project – I	PCC	0	0	8	8	8	60	40
7		Mandatory Course 1*	MC	3	0	0	3	0	100	-
			Total	**11**	**0**	**14**	**25**	**22**		

ASSESSMENT SCHEME

Sl. No	Course Type	L	T	P	C	CIA Weightage (Theory)				CIA	ESE		CIA (W)	ESE (W)	Min. Marks to Pass for 100	
						T1	A1	T2	A2	Prac	Th	Prac			ESE	Total
1	U24DS511	2	0	0	2	60	40	60	40	-	100	-	40	60	45	50
2	U24SL511	2	0	0	2	60	40	60	40	-	100	-	40	60	45	50
3	U24HS511	2	0	0	2	60	40	60	40	-	100	-	40	60	45	50
4	U24DS523	1	0	3	4	-	-	60	40	100	-	100	50	50	45	50
5	PEC 2	1	0	3	4	-	-	60	40	100	-	100	50	50	45	50
6	U24DS532	0	0	8	8	-	-	-	-	100	-	100	50	50	45	50
7	MC 1	3	0	0	0	-	-	-	-	-	-	-	100	-	-	50

(W) – Weightage

U24DS511	SYSTEMS THINKING	L	T	S	C
		2	0	0	2

Course Objective:

- Learn foundational principles of human-centered systems thinking to understand and address complex design challenges.
- Build skills in visualising systems using mapping tools such as network maps, process maps, and iceberg models.
- Develop the ability to uncover stakeholder needs, reframe problems, and identify leverage points for change.
- Explore how small, testable interventions can shift system behaviour using design levers and prototyping.
- Apply systems thinking mindsets to envision long-term system change rooted in human needs and real-world constraints.

Detailed Syllabus

UNIT I FOUNDATIONS & DEFINING THE SYSTEM CHALLENGE	**6**
Understanding systems and the value of a human-centered lens – System attributes -- Identifying a real systems challenge and framing it as a question -- Differentiating surface problems from systemic issues -- Recognizing actors, interactions, and early tensions -- Orienting oneself through zoom-in/zoom-out perspectives	
UNIT II VISUALISING THE SYSTEM	**6**
Creating system maps: network, process, iceberg models, causal loop diagrams and Stock-flow models -- Uncovering connections, flows, and relationships -- Visualising patterns vs. events and surface vs. deep structures -- Aligning multiple perspectives to build shared understanding -- Using mapping insights to clarify root causes	
UNIT III HUMANISING THE SYSTEM	**6**
Conducting stakeholder interviews to uncover needs and motivations -- Reframing the systems challenge from multiple perspectives -- Identifying leverage points where small changes create big impact -- Understanding mental models and behaviours within the system -- Translating insights into opportunities for redesign	
UNIT IV – REDESIGNING THE SYSTEM	**6**
Introduction to design levers for systemic intervention – Generating ideas and prioritising for impact and feasibility – Prototyping small changes using a systems lens – Testing solutions to deepen understanding of system behaviour – Learning from intended and unintended consequences.	
UNIT V ENVISIONING FUTURE SYSTEMS	**6**
Envisioning long-term systemic change through learning loops -- Understanding feedback, adaptation, and early signals -- Creating narratives of a future improved system -- Expanding spheres of influence and enabling systemic shifts -- Synthesising insights into a coherent systems change Story	
Total Periods: 30 periods	

Learning Resources

1	Donella H. Meadows, “Thinking in Systems: A Primer”, 2008, Chelsea Green Publishing
2	Derek Cabrera & Laura Cabrera, “Systems Thinking Made Simple: New Hope for Solving Wicked Problems”, 2015, Odyssean Press
3	Peter M. Senge, “The Fifth Discipline: The Art and Practice of the Learning Organization”, 1990, Doubleday
4	Fritjof Capra & Pier Luigi Luisi, “The Systems View of Life: A Unifying Vision”, 2014, Cambridge University Press



5	IDEO U, “Human-Centered Systems Thinking Toolkit”, 2021, IDEO.org
6	David Peter Stroh, “Systems Thinking for Social Change”, 2015, Chelsea Green Publishing
7	Peter H. Jones, “Design for Care: Innovating Healthcare Experience”, 2013, Rosenfeld Media
8	Donella H. Meadows, “Leverage Points: Places to Intervene in a System”, 1999, The Sustainability Institute
9	Ezio Manzini, “Design, When Everybody Designs: An Introduction to Design for Social Innovation”, 2015, MIT Press

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Understand human-centered systems thinking principles and tools.	Understand
CO2	Visualise systems using mapping methods that reveal structure and patterns.	Apply
CO3	Identify stakeholder needs, leverage points, and opportunities for systemic change.	Analyze
CO4	Prototype small, testable interventions to understand system behaviour.	Apply
CO5	Envision long-term systemic change using learning loops and future narratives.	Create

U24SL511	PROGRAMMING WITH AI	L	T	S	C
		2	0	0	2

Course Objective:

- Basics of Programming with Examples – Core Concepts: Algorithms, Variables, Flowcharts, Data types, Operators, Conditional Statements, loops, Functions Arrays lists Create,
- Object-Oriented Programming (Basic Idea), Programming Development Steps.
- Design and build responsive websites with AI tools for content and layout optimization, Integrate AI powered features for automation
- Design and build fully functional web applications without coding, understand database structure and app logic, create user authentication systems, Connect APIs and third-party services, Deploy live SaaS-style applications.
- Create designs that can integrate APIs and Payment Systems
- Create automate repetitive tasks, connect apps, and build processes without writing code. Which saves time, reduce errors, and streamline business operations

Detailed Syllabus

UNIT 1: WEBSITE BUILDER WITH NOCODE AND AI INTEGRATION	**6**
Basics of Programming with Examples and Core Concepts, Object-Oriented Programming (Basic Idea), Programming Development Steps .Website UX Principles, Application of AI in design, Accessibility & Usability Basics, No code website builder - Fundamentals, Interface & Box Model, Sections, Containers, Div Blocks. Dynamic Websites - Dynamic Templates, Create Blogs, Filtering & Search. Automation & Integration- Creating Forms, Email Automation, Payment Integration.	
UNIT 2: AI IN WEBSITE DESIGN	**6**
Design a landing page using UI tools – Make, AI for Content Generation, AI-assisted UX Writing, AI Image Generation, AI-based Search Engine Optimization, AI Chatbot Integration Tools: LLM (content, UX copy), Diffusion models (visual assets) and AI workflow automation	
UNIT 3: BUILDING APPLICATION WITH NO CODE	**6**
Website vs web application, User Flow Diagrams, Wireframing dashboards, Information Architecture, Minimum Viable Product Planning	
UNIT 4: API AND INTEGRATIONS	**6**
No code API Connector, REST API Basics (Conceptual), Payment Integration, Email Automation, Web Hooks.	
UNIT 5: WORKFLOW AUTOMATION	**6**
Workflow automation. Business value & use cases, Concepts: triggers, actions, conditions, filters, Automation vs scripting	
	Total: 30 Periods

Activity

1	Create a Low-fidelity website wireframes in Figma, Build a static 5-page website with reusable components in WIX. Tools: Squarespace, Web flow, Wix.com
2	Design a landing page using we – Make , Generate AI blog content, Create AI-powered landing page with Chat Bot
3	Build a responsive landing page using Bubble. Elements & Layout, Responsive Engine Tools: Bubble, Flutter Flow, Adalo, Glide
4	Connect external API and Integrate payment system using Stripe and Zapier. Tools: Zapier, Stripe
5	Build automation flows with Zapier- Automate forms, Auto email.

Learning Resources

1	Steve Krug, “Don’t Make Me Think: A Common-Sense Approach to Web Usability”, 2000, New Riders
2	Donald A. Norman, “The Design of Everyday Things”, 2013, Basic Books
3	Jeff Gothelf & Josh Seiden, “Lean UX: Designing Great Products with Agile Teams”, 2013, O’Reilly Media
4	Alan Cooper, Robert Reimann, David Cronin & Christopher Noessel, “About Face: The Essentials of Interaction Design”, 2014, Wiley
5	Alan Cooper et al., “About Face: The Essentials of Interaction Design”, 2014, Wiley
6	Nir Eyal, “Hooked: How to Build Habit-Forming Products”, 2014, Portfolio
7	Jenifer Tidwell et al., “Designing Interfaces”, 2019, O’Reilly Media
8	Melanie Mitchell, “Artificial Intelligence: A Guide for Thinking Humans”, 2019, Farrar, Straus and Giroux

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statements	Knowledge Level
CO1	Basics of Programming with Examples, Design and build professional websites using Web flow.	Understand, Create
CO2	Design using AI, Learn to use AI tools for content, layout, automation, and optimization	Applying
CO3	Learn to create AI-powered landing page with Chatbot.	Create
CO4	Connect external API and Integrate payment system.	Create
CO5	Build automation flows with Zapier, Zapier interface & components, Creating triggers & actions, Single-step vs multi-step, Filters Paths	Create

U24HS511	DESIGN PROJECT MANAGEMENT	L	T	S	C
		2	0	0	2

Course Objective:

- Explain the principles, processes, and tools of project management as applied to design-led projects and creative industries.
- Apply design thinking methodologies to plan, scope, schedule, and manage design projects across their life cycle
- Analyse time, cost, quality, and risk trade-offs in design projects and propose appropriate control strategies.
- Demonstrate effective leadership, communication, and collaboration in managing multidisciplinary design teams and stakeholders.
- Evaluate project performance using appropriate metrics, checklists, and review mechanisms,
- and document learning outcomes.

Detailed Syllabus

UNIT 1: INTRODUCTION TO DESIGN PROJECT & PROGRAM MANAGEMENT 6 Nature of design projects, Characteristics of design projects vs engineering/business projects, Project vs program management in design organizations, Role of the design project manager, Design thinking mindset in project leadership, Stakeholders, ethics, and professional responsibility, Governance structures in design organizations, Overview of project management maturity in design firms
UNIT 2: DESIGN THINKING–LED PROJECT PLANNING, SCOPE & MANAGEMENT 6 Problem framing and design briefs, translating user insights into project scope, Scope definition and scope creep in creative projects Work Breakdown Structure (WBS) for creative projects, Total Quality Project Management (TQPM), Aligning design intent, user needs, and business goals, Project scheduling techniques, Gantt charts, CPM, and network diagrams, Resource planning in multidisciplinary design teams, Managing creative workflows
UNIT 3: RISK CONTROL, COST & CREATIVE PROJECT MANAGEMENT 6 Project costing and budgeting, Fee structures in design firms, Risk identification and mitigation, Risk response planning and mitigation strategies, Creative project options and alternative delivery strategies, Creative project options under uncertainty, Decision-making under time and budget constraints
UNIT 4: DESIGN TEAMS, COLLABORATION & QUALITY ASSURANCE 6 Team structures in design organizations, Managing multidisciplinary and cross-functional teams, Leadership styles for creative teams, Communication through visualization and prototyping, Client coordination and approvals, Iterative quality assurance and change management, Change control processes in design projects, Co-creation and collaboration, Conflict resolution and negotiation in creative teams
UNIT 5: DESIGN PROJECT CONTROL, CLOSURE & LEARNING 6 Project Monitoring and control systems, KPIs and performance measurement, Checklist-based project control, managing deviations and corrective actions, Project audits and governance, Project closure, handover, and post-project learned, Knowledge management and continuous improvement
Total Periods: 30 Periods

Learning Resources

1	Frank A. Stasiowski & David Burstein, “Design Thinking for Program and Project Management”, 2011, Wiley
2	Frank A. Stasiowski, “Total Quality Project Management for the Design Firm”, 2006, Wiley
3	Jack R. Meredith & Samuel J. Mantel Jr., “Project Management: A Managerial Approach”, 2011, Wiley
4	Michael Dobson & Ted Leemann, “Creative Project Management: Innovative Project Options to Solve Problems on Time and Under Budget”, 2010, Wiley
5	Richard Newton, “Brilliant Checklists for Project Managers”, 2011, Pearson Education
6	Harold Kerzner, “Project Management: A Systems Approach to Planning, Scheduling, and Controlling”, Latest Edition, Wiley
7	Kathy Schwalbe, “Information Technology Project Management”, Latest Edition, Cengage Learning
8	Jim Highsmith, “Adaptive Project Framework: Managing Complex Projects”, 2009, Dorset House Publishing

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Explain the principles, processes, and tools of project management as applied to design-led projects and creative industries.	Understand
CO2	Apply design thinking methodologies to plan, scope, schedule, and manage design projects across their life cycle	Apply
CO3	Analyse time, cost, quality, and risk trade-offs in design projects and propose appropriate control strategies.	Analyze
CO4	Demonstrate effective leadership, communication, and collaboration in managing multidisciplinary design teams and stakeholders.	Analyze
CO5	Evaluate project performance using appropriate metrics, checklists, and review mechanisms, and document learning outcomes.	Evaluate

U24DS523	DESIGN STRATEGY	L	T	S	C
		1	0	3	4

Course Objective:

- Build foundational understanding of design strategy as a discipline connecting user needs, organisational goals, and system-level outcomes.
- Learn and apply IDEO's strategy process: from framing problems to generating strategic possibilities and testing assumptions.
- Develop ability to identify opportunity spaces, design value propositions, and make strategic choices.
- Strengthen capability to test assumptions rigorously before committing to a strategy.
- Practise synthesising insights into strategic narratives, roadmaps, and pitches through studio-based work.

Detailed Syllabus

Unit I STRATEGIC FOUNDATIONS & FRAMING THE PROBLEM	**3**
Strategy vs Planning - Design Strategy — Choices, Trade-Offs, and Strategic Intent -- The Strategy Process Map — Understanding How Strategy Is Designed -- Identifying and Articulating a Strategy Problem -- Framing the Strategic Question ("How Might We…?") -- Understanding Current Organisational Choices Using the Strategy Choice Cascade	
Unit II FROM PROBLEMS TO STRATEGIC POSSIBILITIES	**3**
Generating Multiple Strategic Possibilities -- Using "Where to Play" and "How to Win" to Shape Possibilities -- Expanding Opportunity Spaces Using Trends, Competitor Insight, and Signals -- Translating User + Market Insights into Strategic Directions -- Documenting and Comparing Possible Strategic Pathways	
Unit III CONDITIONS & BARRIERS	**3**
Understanding the truth of required conditions for success and its significance -- Surfacing Conditions Required for Success -- Identifying Barriers — Assumptions that may not be True -- Prioritising Barriers based on Uncertainty and Strategic Risk -- Mapping Assumptions Across Desirability, Feasibility, and Viability	
Unit IV TESTING TO LEARN — EXPERIMENTATION IN STRATEGY	**3**
Introduction to Strategic Testing Methods -- Types of Tests: Guerrilla, Indicative, and High-Fidelity -- Designing Experiments to Validate or Invalidate Assumptions -- Making Sense of test results for Decision-Making -- Reducing Strategic Risk Through Iterative Learning	
Unit V MAKING A STRATEGIC CHOICE & COMMUNICATING THE STRATEGY	**3**
Synthesising insights across the strategy process -- Choosing one strategic path — avoiding "doing everything" -- Creating a strategic roadmap and "North-Star" vision -- Communicating strategy through narratives and artefacts -- Preparing for adoption, alignment, and future adaptation	
Total Periods: **15 Periods**	

List of Experiments

Sl. No	List of Experiments
1.	Strategic Problem Framing Sprint
2	Generating Strategic Possibilities Portfolio
3	Conditions & Barriers Analysis
4	Strategic Test Design & Execution
5	Final Strategic Pitch & North-Star Roadmap
	Total Periods: 45 Periods

Learning Resources

1	Pascal Le Masson, Benoît Weil & Armand Hatchuel, “Strategic Management of Innovation and Design”, 2010, Cambridge University Press
2	Jennifer Riel & Roger L. Martin, “Creating Great Choices: A Leader’s Guide to Integrative Thinking”, 2017, Harvard Business Review Pres
3	Jeanne Liedtka & Tim Ogilvie, “Designing for Growth: A Design Thinking Toolkit for Managers”, 2011, Columbia University Press
4	Alexander Osterwalder, Yves Pigneur, Gregory Bernarda & Alan Smith, “Value Proposition Design”, 2014, Wiley
5	Vijay Kumar, “101 Design Methods: A Structured Approach for Driving Innovation in Your Organization”, 2012, Wiley
6	IDEO U, “Designing Strategy”, 2020, IDEO.org
7	Tim Brown, “Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation”, 2009, Harper Business
8	Larry Keeley, Helen Walters, Ryan Pikkel & Brian Quinn, “Ten Types of Innovation”, 2013, Wiley
9	W. Chan Kim & Renée Mauborgne, “Blue Ocean Strategy”, 2015, Harvard Business Review Press
10	Richard P. Rumelt, “Good Strategy/Bad Strategy: The Difference and Why It Matters”, 2011, Crown Business

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Explain core principles of design strategy and the Strategy Process Map.	Understand
CO2	Frame strategic problems and generate multiple strategic possibilities.	Apply
CO3	Identify conditions and barriers using “What Would Have to Be True?”.	Analyze
CO4	Design and conduct strategic tests to evaluate assumptions.	Apply
CO5	Make a strong strategic choice and communicate it with clarity	Create



U24DS532	SYSTEMS DESIGN PROJECT – I	L	T	S	C
		0	0	8	8

Course Objective:

- Understand Systems Thinking methodologies to analyse complex system-level design challenges and identify opportunities for strategic intervention.
- Understand Design Project Management principles to plan, manage, and execute the design project effectively.
- Understand strategic design approaches through Design Strategy methods aligned with user needs, organisational, and broader system goals.
- Integrate knowledge and skills gained through Professional Elective courses into feasible system design solutions.
- Apply learnings to deliver validated, industry-relevant systems design outcomes through iterative development and collaboration.

CONTENT

- Collaborating with industry offers designers an opportunity to engage directly with real-world systems shaped by organisational structures, stakeholders, and operational constraints. Such exposure encourages an understanding of complexity beyond individual products or services, helping designers approach challenges as interconnected systems that evolve within real social, technological, and business contexts.
- Developing system-level interventions requires aligning vision with execution. Design Strategy supports the identification of meaningful opportunity spaces and long-term value creation, while Design Project Management enables structured planning, coordination, and informed decision-making throughout the project lifecycle. Knowledge gained through Professional Elective courses further strengthens the designer's ability to translate systemic insights into feasible, context-responsive solutions grounded in technical and domain understanding.
- A successful Systems Design Project begins with carefully defining challenges and visualising systems to uncover patterns, relationships, and underlying causes that influence system behaviour. Integrating stakeholder perspectives ensures that system interventions remain grounded in real operational and social contexts. Students will identify leverage points where small interventions can generate meaningful systemic change. Through iterative testing and continuous learning, solutions gradually evolve into resilient and adaptable system designs capable of creating meaningful and lasting impact.

Project Typology to be considered for the Systems Design process:

The project must address a complex real-world system in one of the contexts: Tangible, Digital, Service or Spatial design, and should be accessible for study and intervention,

The challenge must operate at a system level, involving multiple stakeholders, interdependencies, cross-disciplinary integration, and identifiable feedback mechanisms.

The project scale must remain practical, culminating in a testable prototype—digital, physical, service, or spatial—developed and validated within the given timeframe.

The project should be preferably in collaboration with an industry partner or based on a data-supported real-world problem.

Students may explore system-level interventions across a wide range of domains:

- Public Service Systems (healthcare, sanitation, mobility, governance)
- Community and Social Innovation Systems
- Mobility and Transportation Systems
- Healthcare Service and Care Delivery Systems
- Agricultural and Rural Development Systems
- Retail and Omnichannel Experience Systems

Projects should focus on understanding the broader system level challenge rather than isolated product redesign.

Examples:

- Urban Public Health Appointment Redesign (Service map + scheduling prototype).
- Community Waste Segregation System (Service blueprint + engagement prototype).
- First- and Last-Mile Mobility System (Mobility model + routing prototype).
- Rural Primary Healthcare System (Care redesign + service prototype).
- Omnichannel Agricultural Retail System (Retail strategy + marketplace prototype).

Learning Resources

1	Donella H. Meadows, “Thinking in Systems: A Primer”, 2008, Chelsea Green Publishing
2	A.G. Lafley & Roger L. Martin, “Playing to Win: How Strategy Really Works”, 2013, Harvard Business Review Press
3	Alexander Osterwalder, Yves Pigneur, Gregory Bernarda & Alan Smith, “Value Proposition Design: How to Create Products and Services Customers Want”, 2014, Wiley
4	David Peter Stroh, “Systems Thinking for Social Change”, 2015, Chelsea Green Publishing
5	Larry Keeley, Helen Walters, Ryan Pikkel & Brian Quinn, “Ten Types of Innovation: The Discipline of Building Breakthroughs”, 2013, Wiley
6	Tim Brown, “Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation”, 2013, Harper Business
7	Donella H. Meadows, “Leverage Points: Places to Intervene in a System”, 1999, The Sustainability Institute

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Understand systems thinking principles and the structure of complex real-world systems.	Understand
CO2	Apply systems mapping, strategic thinking, and project management methods to execute an industry-collaborative systems design project.	Applying
CO3	Analyze system relationships, stakeholder needs, and leverage points to identify opportunities for effective system-level intervention.	Analyzing
CO4	Evaluate the feasibility and impact of proposed system interventions through testing, iteration, and stakeholder feedback.	Evaluating
CO5	Create validated system design solutions through iterative prototyping and strategic integration of insights from multiple disciplines.	Create

SEMESTER VI

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
THEORY COURSES										
1	U24HS611	Design Business Management	HSMC	2	0	0	2	2	40	60
THEORY CUM PRACTICAL COURSES										
2	U24DS613	Experience Design	PCC	1	0	3	4	4	50	50
3	U24EM613	Portfolio Design	EEC	1	0	3	4	4	50	50
4		Professional Elective Course 3	PEC	1	0	3	4	4	50	50
PRACTICAL COURSES										
5	U24DS622	Systems Design Project – II	PCC	0	0	8	8	8	60	40
6		Mandatory Course 2	MC	3	0	0	3	0	100	-
			Total	**8**		**17**	**25**	**22**		

ASSESSMENT SCHEME

Sl. No	Course Type	L	T	P	C	CIA Weightage (Theory)				CIA	ESE		CIA (W)	ESE (W)	Min. Marks to Pass for 100	
						T1	A1	T2	A2	Prac	Th	Prac			ESE	Total
1	U24HS611	2	0	0	2	60	40	60	40	-	100	-	40	60	45	50
2	U24DS613	1	0	3	4	-	-	60	40	100	-	100	40	60	45	50
3	U24EM613	1	0	3	4	-	-	60	40	100	-	100	40	60	45	50
4	PEC 3	1	0	3	4	-	-	60	40	100	-	100	50	50	45	50
5	U24DS622	0	0	8	8	-	-	-	-	100	-	100	50	50	45	50
6	MC	3	0	0	0	-	-	-	-	-	-	-	100	-	-	50

(W) – Weightage

U24HS611	DESIGN BUSINESS MANAGEMENT	L	T	S	C
		2	0	0	2

Course Objective:

- Understand innovation as a systemic and managed process
- Develop awareness of creative processes at individual, team, and organizational levels
- Apply innovation and creativity concepts to design and business contexts
- Build skills in creative leadership, collaboration, and Design Marketing
- Integrate strategy, creativity, and sustainability in design-led innovation

Detailed Syllabus

UNIT 1: DESIGN BUSINESS MANAGEMENT - INTRODUCTION	**6**
Introduction to Management, Design Management Fundamentals, Types of Innovation (Incremental, Radical, Disruptive), -- Design as a strategic business resource, Innovation and creativity in business contexts, Value creation through design, Systems view of design-driven innovation, -- Role of designers in innovation: Creative Management Practices, Leadership & Emotional Intelligence, Team Innovation, Organizational Conditions for Creativity, Knowledge Creation in Organizations	
UNIT 2: BUSINESS DEVELOPMENT AND VENTURE CREATION	**6**
Business and Objectives - Introduction to business models: Identifying Entrepreneurial Opportunity, Design-led Innovation -- Design Organization structures, Sole Proprietorship / Partnership / LLP / Pvt Ltd, Design Organization Brand Identify and brand Positioning -- Legal: Intellectual Property (IP), Copyright & Design Rights, Contracts & Client Agreements, Design Scope Definition -- Brief study on Design Business Finance & Sustainability: Startup Costs, Revenue Models. -- Cash Flow Management, Cost Control, Financial Planning, Profitability, Scalability, Sustainable Business Models	
UNIT 3: DESIGN AS STRATEGY IN BUSINESS	**6**
Design strategy and competitive advantage, Market dynamics and customer insight -- User-centred and experience-led value Strategy, Business models and design differentiation --Innovation Life cycle -- Key Concepts **-** Innovation Strategy, Market Pull vs Technology Push, User Experience, Design Differentiation	
UNIT 4: ORGANIZATION, CULTURE & LEADERSHIP	**6**
Creative Organisation types and its leadership styles, Open Innovation, Networks & Ecosystems, Alliances & Partnerships, User-led Innovation, Co-creation -- Managing creative professionals and partners, Types of leadership/ Managers in Small/Medium/Large Organization -- Design Culture: Need for finding and implementing unique design culture of organization	
UNIT 5: MARKETING FOR DESIGN BUSINESS	**6**
Role of marketing in design-led businesses, Evolution of marketing thought, Marketing concept and market orientation, Segmentation, targeting and positioning (STP), Product, service and experience marketing for design, Branding, brand identity and brand equity, Pricing strategies for creative offerings, Promotion, digital marketing and channels, Relationship marketing and customer lifetime value, Ethics and sustainability in marketing, Marketing metrics and performance measurement for design businesses	
	Total: 30 Periods

Learning Resources

1	Joe Tidd & John Bessant, “Managing Innovation: Integrating Technological, Market and Organizational Change”, 2009, Wiley
2	Philip A. Wickham, “Strategic Entrepreneurship”, 2006, Pearson Education
3	John Henry (Ed.), “Creative Management and Development”, 2006, SAGE Publications

4	John Storey & Graeme Salaman, “Managers of Innovation”, 2005, Blackwell Publishing
5	Philip Kotler & Gary Armstrong, “Principles of Marketing”, 2010, Pearson Education
6	Frank A. Stasiowski, “Total Quality Project Management for the Design Firm”, 2006, Wiley
7	Michael Dobson & Ted Leemann, “Creative Project Management: Innovative Project Options to Solve Problems on Time and Under Budget”, 2010, Wiley
8	Douglas Davis, “Creative Strategy and the Business of Design”, 2016, Allworth Press
9	Steve Blank & Bob Dorf, “The Startup Owner’s Manual”, 2012, K&S Ranch
10	Alexander Osterwalder & Yves Pigneur, “Business Model Generation”, 2010, Wiley

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Understand innovation as a systemic and managed process	Understand
CO2	Develop awareness of creative processes at individual, team, and organizational levels	Understand
CO3	Apply innovation and creativity concepts to design and business contexts	Apply
CO4	Build skills in creative leadership, collaboration, and Design Marketing	Apply
CO5	Integrate strategy, creativity, and sustainability in design-led innovation	Create

U24DS613	EXPERIENCE DESIGN	L	T	S	C
		1	0	3	4

Course Objective:

- To design Service Experiences connecting physical and digital worlds.
- To use Storytelling and Roleplay for low-fidelity prototyping of intangibles.
- To map the Customer Journey and Service Blueprint (Frontstage vs. Backstage).
- To understand the Experience Economy (memories vs. services).

Detailed Syllabus

UNIT I: THE EXPERIENCE ECONOMY	**3**
Services vs. Experiences -- The 4 Realms of Experience: Entertainment, Educational, Esthetic, Escapist -- The Peak-End Rule: Designing the "High Point" and "Ending" of a journey.	
UNIT II: SERVICE BLUEPRINTS	**3**
Mapping the "Backstage": Connecting User Actions (Front stage) with Employee Actions (Back stage). Identifying operational bottlenecks, Indigenous Brand Experiences.	
UNIT III: THE PHYGITAL INTERFACE	**3**
Focus: The "Doorways" between physical and digital. Trigger Technologies: Active (QR, NFC) vs. Passive (Geofencing, Beacons, Wi-Fi triangulation) -- Public Interfaces: Designing Kiosks and Digital Signage -- Ergonomics of Public Screens: Reach ranges, glare handling, and privacy filters -- The BYOD (Bring Your Own Device) Strategy: Designing interactions that rely on the user's phone versus installed hardware.	
UNIT IV: SEAMLESS ECOSYSTEMS & SPATIAL LOGIC	**3**
The Service Handoff: Choreographing the transition from App to Human interaction -- Data Continuity: Identifying "Friction Gaps" where users are forced to repeat information --Service Recovery: Designing "Offline Modes" and graceful degradation when tech fails.	
UNIT V: EXPERIENCE STAGING & PROTOTYPING	**3**
Bodystorming: Role-playing service scenarios with props to test flow and timing -- Wizard of Oz Testing: Simulating AI or system intelligence manually (human-behind-the-curtain) to validate concepts before coding -- Service Evidence: Designing the physical artifacts (Tickets, Receipts, Uniforms, Tokens) that prove the experience happened -- Pilot Testing: Running a "Live Beta" in a real-world environment, Regional Case Studies.	
	Total Periods: 15

List of Experiments

Sl. No	List of Experiments
1	The Trigger Audit: Map 5 different digital entry points on campus (Biometrics, QR, Card Readers) and critique their accessibility and speed.
2	Handoff Flowchart: Create a flow diagram for a "Click-and-Collect" service, specifically detailing the data transfer between the User App and the Store Clerk's Screen.
3	Bodystorming Session: Re-enact a "Hotel Check-in" process using cardboard props to identify bottlenecks in the physical layout.
4	Capstone Project: Redesign the "Campus Library Experience" including: • A Digital Entry (App feature). • A Phygital Touchpoint (Self-checkout Kiosk). • Service Evidence (A redesigned digital/physical receipt).
	Total Periods: 45 periods



Learning Resources

1	Marc Stickdorn, Markus Edgar Hormess, Adam Lawrence & Jakob Schneider, “This is Service Design Doing”, 2018, O’Reilly Media
2	B. Joseph Pine II & James H. Gilmore, “The Experience Economy”, 2011, Harvard Business Review Press
3	B. Joseph Pine II & James H. Gilmore, “The Experience Economy: Competing for Customer Time, Attention, and Money”, 2011, Harvard Business Review Press
4	Andy Polaine, Lavrans Løvlie & Ben Reason, “Service Design: From Insight to Implementation”, 2013, Rosenfeld Media
5	Dan Hill, “Dark Matter and Trojan Horses: A Strategic Design Vocabulary”, 2012, Strelka Press
6	Golden Krishna, “The Best Interface is No Interface”, 2015, New Riders

Course Outcomes

At the end of the course, the students will be able to		
CO	**Course Outcome Statement**	**Knowledge Level**
CO1	Analyze the difference between service delivery and experience staging.	Analyzing
CO2	Create Service Blueprints connecting front-stage actions with back-stage operations.	Creating
CO3	Design seamless transitions between physical and digital touchpoints.	Creating
CO4	Apply sensory design principles to enhance physical environments	Applying
CO5	Prototype intangible experiences using role-play and low-fidelity methods.	Evaluating

U24EM613	PORTFOLIO DESIGN	L	T	S	C
		1	0	3	4

Course Objective:

- Understand the purpose and types of design portfolios
- Curate and structure projects meaningfully
- Apply composition, visual hierarchy, grid systems, and typography in portfolio layouts
- Communicate design thinking and process effectively
- Create digital and physical portfolios for different platforms
- Present their work confidently in interviews and reviews

Detailed Syllabus

UNIT 1: INTRODUCTION TO PORTFOLIO DESIGN	**3**
Purpose of a portfolio: academic, professional, personal; Types of portfolios, Portfolio expectations across design domains; Understanding recruiters, studios and institutions.	
UNIT 2: PROJECT SELECTION & CURATION	**3**
Identifying strong vs weak projects; Quality vs quantity; Project relevance based on creative careers, structuring a project such as writing project descriptions and storytelling in design.	
UNIT 3: VISUAL LANGUAGE & LAYOUT DESIGN	**3**
Visual hierarchy and readability; Grid systems and alignment; Typography for portfolios; Colour usage and background control; Image selection and editing; Consistency in layouts, Introduction to Digital Tools like Adobe InDesign, Illustrator, Photoshop, Figma / Canva (optional).	
UNIT 4: PROCESS DOCUMENTATION & DESIGN THINKING	**3**
Communicating process vs final output; Design thinking stages in portfolios; Diagrams, sketches, wireframes, iterations; Case study format (especially for UX/Product); Reflective writing in design.	
UNIT 5: DIGITAL & PHYSICAL PORTFOLIOS	**3**
Digital portfolio formats; Physical portfolio basics; Portfolio customizations & Intellectual Property.	
Total: 15 Periods	

List of Exercises

1	Portfolio audit of senior/student/alumni samples
2	Shortlisting 6–9 projects and writing narratives
3	Designing portfolio grid templates
4	Converting one project into a detailed case study
5	Creating a digital portfolio draft + print mock-up
Total: 45 Periods	

Learning Resources

1	Donald A. Norman, “The Design of Everyday Things”, 2013, Basic Books
2	Zuzana Kubišová, “The Architect’s Pocket Guide to Portfolio Design”, 2024, Routledge
3	Donna M. Bender, “Design Portfolios: Presentation and Marketing for Interior Designers”, 2017, Bloomsbury Publishing
4	Ellen Lupton & Jennifer Cole Phillips, “Graphic Design: The New Basics”, 2015, Princeton Architectural Press
5	Jeff Gothelf & Josh Seiden, “Lean UX: Designing Great Products with Agile Teams”, 2016, O’Reilly Media
6	Sara Eisenman, “Building Design Portfolios: Innovative Concepts for Presenting Your Work”, 2008, Rockport Publishers

7	Susan Weinschenk, “100 Things Every Designer Needs to Know About People”, 2020, New Riders
8	Mike Monteiro, “Design Is a Job”, 2012, A Book Apart
9	Michael Janda, “Burn Your Portfolio: Stuff They Don’t Teach You in Design School, But Should”, 2013, New Riders
10	Jenifer Tidwell, Charles Brewer & Aynne Valencia, “Designing Interfaces: Patterns for Effective Interaction Design”, 2020, O’Reilly Media
11	Adrian Shaughnessy, “How to Be a Graphic Designer Without Losing Your Soul”, 2010, Princeton Architectural Press

Course Outcomes

CO	At the end of the course, the students will be able to	Knowledge Level
CO1	Identify different portfolio formats and industry expectations	Understand
CO2	Select and organize projects based on narrative and relevance Produce a professional digital and print-ready portfolio	Create
CO3	Apply design principles to portfolio layout and presentation	Apply
CO4	Produce a professional digital and print-ready portfolio	Create
CO5	Articulate design process, concept, and outcomes clearly	Understand

U24DS622	SYSTEMS DESIGN PROJECT – II	L	T	P	C
		0	0	8	8

Course Objective:

- Understand systems thinking methodologies for analyzing complex systems and identifying system-level design opportunities.
- Understand the role of design business management in aligning design solutions with strategic, organizational, and market considerations.
- Understand domain-specific concepts and methods introduced through the chosen professional elective course.
- Apply specialization-oriented design knowledge to develop solutions for real-world problems through an industry-collaborative systems design project.
- Create integrated system-level design interventions by synthesizing systems thinking, experience design, business considerations, and specialization knowledge.

Content

- The Systems Design Project – II introduces business oriented challenges through industry collaboration. This exposure helps students understand real-world constraints such as market needs, stakeholder priorities, and implementation feasibility. As a result, designers learn to approach complex systems by balancing user needs, system dynamics, and business viability.
- User Experience design ensures that system interventions remain centered on human needs and interactions across multiple touchpoints. Design Business Management helps designers consider value creation, strategy, and operational feasibility. Skills from the Professional Elective contribute specialized knowledge that supports effective system-level design solutions.
- Clearly defining challenges and visualizing systems help designers understand relationships between stakeholders, processes, and experiences. Humanizing system actors enables deeper insight into user needs and system behavior. Prototyping small interventions and testing them allows designers to observe system responses and refine solutions for effective system-level outcomes.

Project Typology to be considered for the Systems Design Project of Specialization:

The project must address a complex real-world system in one of the following domains: Tangible, Digital, Service, or Spatial design, and should be accessible for study and intervention.
The challenge must operate at a system level, involving multiple stakeholders, interdependencies, cross-disciplinary integration, and identifiable feedback mechanisms.
The project must integrate user experience, business considerations, and domain-specific knowledge from the chosen professional elective.
The project scale must remain practical, culminating in a testable prototype—digital, physical, service, or spatial—developed and validated within the given timeframe.
The project should preferably be conducted in collaboration with an industry partner or based on a real-world and market-driven problem supported by research and data.

Students may explore system-level interventions across a wide range of domains:

- Mobility and Transportation Systems
- Healthcare and Wellbeing Systems
- Retail and E-commerce Systems
- Manufacturing and Industrial Systems
- Digital Platforms and Service Ecosystems
- Financial Services and FinTech Systems

- Tourism and Hospitality Systems
- Logistics and Supply Chain Systems
- Energy and Resource Management Systems
- Projects should focus on understanding the broader system level challenge rather than isolated product redesign.

Examples:

- Last-mile mobility system (Mobility service prototype).
- Hospital patient journey system (Healthcare UX prototype).
- Omnichannel retail system (Retail platform prototype).
- Logistics coordination system (Logistics dashboard prototype).
- Community energy management system (Energy platform prototype).

Learning Resources

1	Donella H. Meadows, “Thinking in Systems: A Primer”, 2008, Chelsea Green Publishing
2	Marc Stickdorn, Adam Lawrence, Markus Hormess & Jakob Schneider, “This is Service Design Doing: Applying Service Design Thinking in the Real World”, 2018, O’Reilly Media
3	Alexander Osterwalder, Yves Pigneur, Gregory Bernarda & Alan Smith, “Value Proposition Design: How to Create Products and Services Customers Want”, 2014, Wiley
4	Ludwig von Bertalanffy, “General System Theory: Foundations, Development, Applications”, 2013, George Braziller
5	Donald A. Norman, “The Design of Everyday Things”, 2013, Basic Books
6	A.G. Lafley & Roger L. Martin, “Playing to Win: How Strategy Really Works”, 2013, Harvard Business Review Press

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Understand the structure, stakeholders, and dynamics of complex systems using systems thinking concepts and methods.	Understand
CO2	Apply user experience, business strategy, and domain-specific knowledge to develop system-level design interventions.	Apply
CO3	Analyze system relationships, stakeholder interactions, and feedback mechanisms to identify opportunities for design intervention.	Analyze
CO4	Evaluate proposed system design solutions through prototyping, testing, and stakeholder feedback to assess feasibility and effectiveness.	Evaluate
CO5	Create a validated system-level design solution addressing a real-world industry problem through an integrated design process.	Create

SEMESTER VII

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
PRACTICAL COURSES										
1	U24EM712	Professional Training	EEC					16	60	40

U24DS712	PROFESSIONAL TRAINING	L	T	S	C
		-	-	-	16

Course Objective:

- To provide comprehensive exposure to professional design practice, including its scope, evolving needs, and industry challenges.
- To develop familiarity with the various stages involved in real-world design projects, from concept development to final execution.
- To encourage active participation in these stages as much as possible within the framework of a specific design practice, enabling practical learning and professional growth

Content

Industry Training will be undertaken in professional design studios, firms, or organizations in India, or abroad with prior approval from the institution. The organisation should be design driven and preferably multidisciplinary. The training aims to provide students with practical exposure to professional design practice through participation in real-world projects.

During the training period, students will gain experience in various stages of design projects through direct involvement or observation. These may include project initiation and ideation, research and concept development, preparation of design presentations, design drawings and documentation, participation in design discussions, client interactions, coordination with consultants or technical teams, and exposure to project execution or implementation processes.

The progress of the training will be periodically reviewed through the submission of logbooks and documentation of work carried out during the internship, supported by progress reports from the employer.

Students will be evaluated based on their engagement and contribution in the professional environment, including understanding of design practice, adherence to schedules, professional conduct, ability to execute assigned design tasks, participation in research and ideation, teamwork, involvement in meetings or reviews, and exposure to project implementation activities.

At the end of the training, students must submit a portfolio of work completed during the internship, certified by the host organization. The portfolio will be assessed through a viva voce examination.

Course Outcome

At the end of the course, the students will be able to

CO	Course Outcome Statements	Knowledge Level
CO1	Understand the professional environment and workflow of design practices within a studio, firm, or organization.	Understand
CO2	Apply design knowledge and skills in the preparation of concept, schematic, presentation, and working drawings or related design outputs.	Apply
CO3	Demonstrate the ability to participate in research, ideation, and design development processes in real-world projects.	Apply
CO4	Collaborate effectively within a professional team environment and engage in discussions, reviews, and client interactions.	Apply
CO5	Document and present professional work through a portfolio that reflects practical learning and project involvement during the training period.	Create

SEMESTER VIII

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
PRACTICAL COURSES										
1	U24EM812	Design Project	EEC					16	60	40

Detailed Syllabus Semester VIII

U24DS812	DESIGN PROJECT	L	T	S	C
		-	-	-	16

Course Objective:

- To enable students to identify and investigate a relevant design problem or opportunity through research, analysis, and engagement with industry practices.
- To develop the ability to conceptualize, design, and execute a comprehensive design project by integrating creative, technical, and contextual considerations.
- To enhance students' professional communication and presentation skills through the documentation, visualization, and defense of their design outcomes.

Content

The Design Project represents the culmination of the design education process and demonstrates the student's ability to explore, develop, and execute a comprehensive design solution. This capstone project will be undertaken in collaboration with a professional design studio, firm, or organization, enabling students to engage with real-world design challenges.

Students will identify and develop a project topic in consultation with both academic and industry mentors. The topic should have strong design potential and may address a specific problem, opportunity, or theme relevant to contemporary design practice. The project may be project-based, focusing on the development of a specific design proposal, or research-led, where study and investigation inform the development of a design solution, which can be a self-sponsored project. Students are required to submit the proposed topic for approval along with a brief outline describing the project intent, design objectives, area of focus, scope of study and design, potential challenges, relevant case studies, methodology, and expected outcomes. The project may engage with a wide range of themes such as contemporary societal needs, sustainability, user-centered design, innovation in materials or technology, spatial and experiential design, urban or community-oriented design, heritage and conservation contexts, or other emerging areas of design practice.

The progress of the Design Project will be reviewed periodically through presentations and discussions with faculty and industry mentors. These reviews will guide the development of the project from research and concept exploration to design development and final resolution.

At the end of the semester, students must submit the final Design Project for evaluation through a viva voce examination. The final submission will include documentation of the research and design process, concept development sheets, design proposal and presentation drawings, relevant models or prototypes (if applicable), detailed drawings or design documentation of a key component, and a project report summarizing the entire design process and outcomes, along with a soft copy of all submitted work

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Identify and define a relevant design problem or opportunity through research, contextual analysis, and consultation with academic and industry mentors.	Analyze
CO2	Apply design thinking and creative problem-solving skills to develop innovative and feasible design solutions.	Create
CO3	Integrate research insights, user needs, technical considerations, and contextual factors into the development of a comprehensive design proposal.	Create
CO4	Demonstrate the ability to communicate design ideas effectively through drawings, models/prototypes, visual presentations, and written documentation.	Apply
CO5	Present and defend the final design project, demonstrating professional competence, critical thinking, and reflection on the design process and outcomes.	Evaluate

PROFESSIONAL ELECTIVES

VERTICAL I: PRODUCT EXPERIENCE (PE)

S. No.	Course Code	Course Title	Semester	Periods Per Week			Total Contact Periods	Credits
				L	T	S		
1.	U24DSPE01	Prototyping	IV	1	0	3	4	4
2.	U24DSPE02	Product Design	V	1	0	3	4	4
3.	U24DSPE03	Furniture Design	VI	1	0	3	4	4

U24DSPE01	PROTOTYPING	L	T	P	C
		1	0	3	4

Course Objective:

- To develop hands-on skills in building, testing design ideas and iterative mindset for exploration and refinement
- To understand materials, tools, and processes used in prototyping
- To integrate user feedback in the design evolution.
- To develop fluency in building prototypes of varying fidelity
- To communicate design intent effectively through tangible prototypes

Detailed Syllabus

UNIT 1: FOUNDATION OF PROTOTYPING **3**

Role of prototyping in the design process , Differences between model making and prototyping Understanding “looks-like”, “works-like”, and “feels-like” prototypes , Prototyping as a tool for thinking, testing, and communication , Prototyping across stages of the design process.

UNIT 2: LOW, MEDIUM AND HIGH - FIDELITY PROTOTYPES **3**

Characteristics of low-, mid-, and high-fidelity prototypes , choosing fidelity based on design stage and objective , Techniques for sketch modeling and quick mockups, Mid-fidelity prototypes for functional testing , High-fidelity prototypes for detailing and presentation, when to move from one fidelity level to another.

UNIT 3: TOOLS AND MATERIALS OVERVIEW **3**

Hand tools and power tools: usage and safety, Introduction to laser cutting, 3D printing, and CNC Working with paper, cardboard, foam, wood, and acrylic, Adhesives, fastening methods, and joints, Understanding material behavior and properties, Digital tools and file prep for fabrication. Sustainable, low waste methods and eco-friendly materials in prototyping.

UNIT 4: PROTOTYPING MINDSET : TEST, LEARN, REPEAT **3**

Iterative prototyping and versioning, Timeboxing and rapid cycles, integrating user feedback into iterations, Learning through failure and quick testing, Cost-effective hacks and improvisation Documenting process and evolution.

UNIT 5: PROTOTYPING AS STORYTELLING TOOLS **3**

Communicating function and intent through form, using prototypes to simulate user experience Prototypes as tools in stakeholder conversations, Designing for interaction and emotion Storyboarding and context-based testing, Preparing prototypes for presentations and critiques.

Total: 15 Periods

List of Exercises

Sl. No	List of Exercises
1	Sketch modelling challenge with basic materials
2	Build a medium-fidelity ergonomic prototype
3	One-day rapid prototyping and feedback loop
4	Collaborative build using mixed materials
5	Final prototype showcase with storytelling focus
	Total Periods: 45

Learning Sources

1	Bjarki Hallgrimsson, Prototyping and Modelmaking for Product Design, Laurence King Publishing, (2012).
2	Chris Lefteri, Making It: Manufacturing Techniques for Product Design, Laurence King Publishing, (2012).
3	Koos Eissen & Roselien Steur, Sketching: Drawing Techniques for Product Designers, BIS Publishers, (2007).
4	Tom Kelley, The Art of Innovation: Lessons in Creativity from IDEO, America's Leading Design Firm, Currency/Doubleday,(2001).
5	Karl T. Ulrich & Steven D. Eppinger, Product Design and Development, McGraw-Hill Education, (2015).
6	Scott Hurff, Designing Products People Love: How Great Designers Create Successful Products, O'Reilly Media, (2016).
7	Steve Krug, Don't Make Me Think: A Common Sense Approach to Web Usability, New Riders, (2014).
8	Don Norman, The Design of Everyday Things, Basic Books, (2013).
9	Sung Jang & Martin Thaler, 101 Things I Learned in Product Design School, Three Rivers Press, (2020)
10	Dustyn Roberts, Making Things Move: DIY Mechanisms for Inventors, Hobbyists, and Artists, McGraw-Hill Education, (2010).

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statements	Knowledge Level
CO1	Demonstrate understanding of material behavior and manufacturing constraints	Understand
CO2	Ability to build functional and aesthetic prototypes across fidelity levels	Create
CO3	Use digital and manual tools appropriately for prototyping	Apply
CO4	Translate user insights into refined design iterations	Analyze
CO5	Present prototypes with clarity, precision, and storytelling	Create

U24DSPE02	PRODUCT DESIGN	L	T	S	C
		1	0	3	4

Course Objective:

- To leverage Generative AI tools (free/open-source) to accelerate research, ideation, and visualization workflows.
- To apply rigorous Design for Manufacturing (DFM) principles to ensure concepts are technically feasible for mass production.
- To design for Contextual & Frugal Innovation, addressing extreme constraints and local cultural needs.
- To conceptualize "Smart Objects" that seamlessly blend physical form with digital utility, focusing on user interaction and ergonomics

Detailed Syllabus

UNIT I: AI-ASSISTED RESEARCH & STRATEGY	**3**
Using LLMs to generate Product Design Specifications (PDS) -- Market Gap Analysis: Using AI to compare features of competitor products -- User Persona Generation: Creating detailed synthetic user profiles and scenarios to guide design -- Defining the "Product Architecture" (Layout of internal components vs. external form).	
UNIT II: RAPID FORM FINDING WITH GEN AI	**3**
Sketch-to-Model Workflow: Using AI tools to turn free hand **form-based sketches** into realistic 3D-looking renders instantly to validate ideas -- Prompt Engineering for Industrial Design: Generating mood boards and form variations using Image Creator -- Selecting the best AI-generated concept and refining it for CAD.	
UNIT III: DESIGN FOR MANUFACTURING (DFM)	**3**
Detailed study of Injection Molding requirements (Draft angles, Parting lines, Uniform wall thickness) -- Designing Ribs and Bosses for structural strength -- Snap-fits vs -- Fasteners: Designing assembly details in CAD -- AI for Materials: Using AI to research sustainable material alternatives (e.g., bio-plastics) suitable for mass production.	
UNIT IV: CONTEXTUAL INNOVATION & SMART CONCEPTS	**3**
Frugal Innovation (Jugaad): Designing for extreme constraints (cost, resource, or environment) vs. Over-engineering -- Case studies of product failures due to cultural misalignment -- Designing Smart Objects: Conceptualizing products that possess "Ambient Intelligence" (e.g., Smart Home devices, Wearables) -- Focusing on the Form of Intelligence: How to design interaction cues (light, sound, texture) instead of just adding screens.	
UNIT V: AI RENDERING & VISUAL STORYTELLING	**3**
Replacing heavy rendering engines with AI Visualization -- Using ControlNet (in web tools) to texturize white CAD block-models -- Generating "In-Context" backgrounds using AI (e.g., placing a designed product into a realistic environment automatically) -- Creating the final Product Presentation Board using AI-assisted layout tools.	
	Total: 15 Periods

List of Experiments

Sl. No	List of Experiments
1	AI Sketch Iteration: Sketch 3 rough ideas, use Vizcom to render them realistically, and select one for development.
2	Frugal Redesign: Analyze a complex, expensive product (e.g., an electric shaver) and redesign it for a rural market with 50% fewer parts and "Jugaad" repairability.



3	DFM Detailing: Create a detailed CAD model of an enclosure with proper Lip-and-Groove joints, screw bosses, and draft analysis.
4	Capstone Project: Design a "Smart or Contextual" product (e.g., a smart wellness device or a low-cost agricultural tool), focusing on the *interaction* and *form factor*, presented using AI-generated lifestyle imagery.
	Total Periods: 45

Learning Resources

1	Rob Thompson, “Manufacturing Processes for Design Professionals”, 2007, Thames & Hudson
2	Navi Radjou, Jaideep Prabhu & Simone Ahuja, “Jugaad Innovation: Think Frugal, Be Flexible, Generate Breakthrough Growth”, 2012, Jossey-Bass
3	Mike Kuniavsky, “Smart Things: Ubiquitous Computing User Experience Design”, 2010, Morgan Kaufmann
4	IDEO.org, “The Field Guide to Human-Centered Design”, 2015, IDEO.org
5	Google PAIR (People + AI Research), “People + AI Guidebook”, 2019, Google PAIR
6	Karl T. Ulrich & Steven D. Eppinger, “Product Design and Development”, 2015, McGraw-Hill

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Utilize Generative AI to accelerate the transition from concept sketch to visual representation.	Apply
CO2	Create production-ready CAD models that adhere to DFM and assembly constraints.	Create
CO3	Analyze cultural and economic constraints to develop frugal, context-sensitive design solutions.	Analyze
CO4	Create product concepts that effectively communicate "Smart" functionality through form and interaction.	Create
CO5	Generate high-quality product visualizations and presentations using AI-assisted workflows.	Create

U24DPEE03	FURNITURE DESIGN	L	T	S	C
		1	0	3	4

Course Objective:

- Introduce students to the fundamentals of furniture design, materials, making, and workshop practices.
- Analysing iconic furniture designs and understanding their joinery and manufacturing techniques.
- Build knowledge of the furniture design process from research to prototyping.
- Application of ergonomics and anthropometric principles in furniture design.
- Introduce students to hands on prototyping and technical drawings.
- Learning about various finishing techniques used on wooden surfaces.
- Understanding how to do costing for a furniture.

Detailed Syllabus

UNIT I INTRODUCTION TO FURNITURE DESIGN & PRACTICES 3

Furniture Design through History – Evolution from modern to contemporary practices. Iconic Furniture and Designers – Barcelona Chair (Ludwig Mies van der Rohe), Eames Lounge Chair (Charles & Ray Eames), Wassily Chair (Marcel Breuer), Tulip Chair (Eero Saarinen), Egg Chair (Arne Jacobsen), Red Blue Chair (Gerrit Rietveld), Ghost Chair (Philippe Starck), Gravity Chair (Peter Opsvik), Mira Chair (George Nakashima), Bull Chair (Hans Wegner). Design Analysis – Study of form, function, ergonomics, materials, joinery, and manufacturing processes used in iconic furniture designs.
Workshop Orientation: Tools, machinery, safety guidelines, and working practices in furniture design.

UNIT II: MATERIALS & JOINERY 3

Introduction to furniture materials: -- Study of wood (cutting, sawing, hardwoods and softwoods, artificial and natural seasoning), Engineered wood (plywood, particle boards, MDF, etc.), Bamboo (solid bamboo, hollow bamboo, bamboo boards, bamboo sections and bamboo joineries),Metal (MS, SS, aluminium, brass, etc.),Plastic and upholstery and their applications in furniture design. -- Joinery details in wood (edge-to-edge joints, wedge joints, mortise and tenon joints, dovetail joints, box joints, finger joints, mitre joints, half-lap joints, beam joints, three-axis joints, notch and cog joints). -- Adhesives (types of adhesives used in wooden joineries and how to use them: Synthetic resin adhesives , synthetic rubber based adhesive, Epoxy adhesives, cyanide based adhesives. Wood finishes (oil, vax, duco, lacquer, PU), staining in wood, and resin coating techniques

UNIT III DESIGN PROCESS IN FURNITURE DESIGN 3

Space analysis, user study, case studies, identifying design constraints, sustainability and considerations. Concept sketching, ideation, and refinement -- Preparation of technical drawings (top view, front and side views, isometric view, zoomed details of joineries and fasteners, component drawings in 1:1 scale for production with a detailed table of material finishes and dimensions of each component) -- Simple scale modelling techniques -- Prototyping methods -- Basics of product photography and process documentation -- Furniture design costing: Estimating material, labor, finishing, packaging, and transportation costs for a designed furniture

UNIT IV ERGONOMICS & ANTHROPOMETRY 3

Application of ergonomics in furniture design (zero gravity posture, dimension standards and ergonomic considerations to follow in furniture design, pain points, anthropometric data, ergonomic comfort, and posture analysis).

UNIT V: DESIGN PROJECT & PROTOTYPING 3

Problem identification and brief formulation (finding a space and studying the area to design a simple wooden furniture for that space) -- Design development using the complete furniture design process -- Ergonomic validation -- Preparation of working drawings (with detailed dimensions, annotations,



schedules, and symbols) -- Scale modeling and prototyping of a simple wooden furniture -- Assembly and finishing of the furniture -- Product photography -- Final class exhibition (final finished product and an A2 sheet explaining the process with sketches and notes behind the design and product development)
Total:15 Periods

List of Experiments

Sl. No	List of Experiments
1	Sketch and analyze three iconic furniture designs, documenting details, materials, joinery, and manufacturing methods (with notes, overall dimensions, and annotations -each furniture on an A3 sheet)
2	Create a scaled physical model of one selected iconic furniture piece using appropriate materials.
3	Make any three wooden joinery samples demonstrating different construction techniques out of these, one should be a new joinery explored by the student (should use hard wood eg: Gana teak)
4	Develop a design for a simple wooden furniture through user study, ergonomic exploration, and ideation.
5	Final functional prototype (pine wood should be avoided)with technical drawings, costing estimate, and product photography.
	Total Periods: 45

Learning Resources

1	Stuart Lawson, “Furniture Design: An Introduction to Development, Materials and Manufacturing”, 2013, Laurence King Publishing
2	Julius Panero & Martin Zelnik, “Human Dimension and Interior Space: A Source Book of Design Reference Standards”, 1979, Watson-Guptill
3	R. Bruce Hoadley, “Understanding Wood: A Craftsman’s Guide to Wood Technology”, 2000, Taunton Press
4	Christophe Pourny, “The Furniture Bible: Everything You Need to Know to Identify, Restore & Care for Furniture”, 2014, Artisan Books
5	Jim Postell, “Furniture Design”, 2012, Wiley
6	Albert Jackson, David Day & Simon Jennings, “The Complete Manual of Woodworking: A Detailed Guide to Design, Techniques, and Tools for the Beginner and Expert”, 1996, Knopf

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Understand fundamental principles of furniture design through the analysis of iconic furniture designs.	Understand
CO2	Identify tools, materials, and machinery used in furniture design and manufacturing.	Understand
CO3	Apply systematic furniture design processes to develop functional design solutions.	Apply
CO4	Develop furniture design concepts and translate them into scale models and working prototypes.	Create
CO5	Prepare technical drawings and estimate the costing of furniture designs for practical implementation.	Apply



VERTICAL II: DIGITAL EXPERIENCE (DE)

S. No.	Course Code	Course Title	Semester	Periods Per Week			Total Contact Periods	Credits
				L	T	S		
1.	U24DSDE01	Design with AR and VR	IV	1	0	3	4	4
2.	U24DSDE02	UI/UX Design	V	1	0	3	4	4
3.	U24DSDE03	Game Design	VI	1	0	3	4	4

U24DSDE01	DESIGN WITH AR AND VR	L	T	P	C
		1	0	3	4

Course Objective:

- To broaden and deepen students' understanding through the latest advancements in virtual and augmented reality technologies.
- Improving the probability of project acceptance from clients.
- Learning simple communication language of clients instead of technical language.
- To stay unique from competitors after they graduate.
- To improvise their presentation skills and design using VR and AR as design tools.

UNIT 1 : INTRODUCTION AND TYPES OF AR AND VR **3**

Definition and Introduction of VR and AR, Difference between VR and AR. Classifications of VR and AR. Applications of VR and AR in Architecture and Interior design. Sample videos and lecture with examples.

UNIT 2: STATIC VR : VIRTUAL + MIXED REALITY **3**

Definition of static VR. How the immersive experience works behind static VR. Backstage process to do it. Enhancing and post production of backstage processes. Virtually creating a static VR using software. Recording a real-world static VR on campus. Adding and editing elements in Real world static VR for Mixed reality.

UNIT 3: INTERACTIVE VR & WALKTHROUGH VR **3**

Definition of interactive VR. Possibilities and applications of Interactive VR in Architecture and interior design. Backstage process of interactive VR. Offline and online mode for creating interactive VR. Exploring online platforms for creating interactive VR. Definition and applications of walkthrough VR. Backstage process of walkthrough VR. Hands-on experience of both interactive VR and walkthrough VR. 360o video creation and 3D projection on physical surfaces. Application in tourism, heritage and storytelling.

UNIT 4: TRIGERLESS AR & IMAGE TRACKING AR **3**

Definition and difference between Triggerless AR and Image tracking AR. Applications of triggerless AR and Image tracking AR in Architecture and interior design. Hands-on process to create a triggerless AR and image tracking AR. Immersive experience of Triggerless AR in an open site. Immersive experience of image tracking AR in a construction site.

UNIT 5: OBJECT TRACKING AR & VIRTUAL HOLOGRAM **3**

What is an object tracking AR. Applications of object tracking AR in construction sites and heritage conservation. Backstage process of object tracking AR. Hands-on experience of object tracking AR. Definition of Virtual hologram. Hands-on process of virtual hologram. Immersive experience of virtual hologram.

Total: 15 Periods

List of Exercises

Sl. No	List of Exercises
1	Creating a Virtual static VR.
2	Recording a real-world static VR.
3	Creating a mixed reality static VR.
4	Hands-on exercise of interactive VR.
5	Hands-on exercise of walkthrough VR.
6	Creating a Triggerless AR.
7	Creating an image tracking AR.
8	Creating a virtual hologram.
	Total: 45 Periods

Learning Resources

1	Sherman, W. R., & Craig, A. B. Understanding Virtual Reality: Interface, Application, and Design. Morgan Kaufmann / Elsevier. A comprehensive guide to VR systems, interface design, and applications for research and industry. (2018)
2	Burdea, G. C., & Coiffet, P. Virtual Reality Technology. Wiley. Covers the technical foundations, hardware, and software components of virtual reality systems. (2003)
3	Jerald, J. The VR Book: Human-Centered Design for Virtual Reality. Association for Computing Machinery (ACM) / Morgan & Claypool. Focuses on VR design principles, interaction, and user experience. (2015)
4	Aukstakalnis, S. Practical Augmented Reality: A Guide to the Technologies, Applications, and Human Factors for AR and VR. Addison-Wesley Professional. Explores practical applications, human factors, and design challenges for AR and VR. (2016)
5	Miller, M. Virtual & Augmented Reality for Dummies. For Dummies / Wiley. A beginner-friendly guide covering VR and AR technologies, trends, and use cases. (2020)
6	Rheingold, H. Virtual Reality. Summit Books. One of the early explorations of VR concepts, applications, and societal implications. (1991)
7	LaValle, S. M. Virtual Reality. Cambridge University Press. Provides a technical and theoretical overview of VR systems, applications, and algorithms. (2017)
8	van Krevelen, D. W. F., & Poelman, R. Augmented Reality: Concepts, Methodologies, Tools, and Applications. IGI Global. Covers the principles, technologies, and applications of AR across industries. (2010)
9	Kim, S., & Bailenson, J. Experience on Demand: What Virtual Reality Is, How It Works, and What It Can Do. W. W. Norton & Company. Discusses VR's psychological, social, and practical impact on human experience. (2018)
10	Luckey, P., & Carmack, J. VR / AR Enterprise Insider: Guidebook for Virtual Reality and XR. Apress. A practical guide for implementing VR and AR technologies in enterprise contexts. (2021)
11	Zhang, Y., & Zhu, Q. Augmented Reality and Its Application. Springer. Explores the fundamentals, techniques, and applications of AR in multiple domains. (2018)
12	Earnshaw, R. A. Virtual Reality Systems. Academic Press. Covers VR hardware, software, simulation, and system integration for research and design. (2014)



Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statements	Knowledge Level
CO1	Demonstrate complete understanding of the working systems of both VR and AR technologies.	Understand
CO2	Create static VR, interactive VR, triggerless AR, image-tracking AR, and virtual hologram experiences for design communication.	Create
CO3	Apply VR and AR tools, platforms, and workflows to develop functional immersive environments.	Apply
CO4	Evaluate the suitability of VR and AR solutions for specific design problems and presentation contexts.	Evaluate
CO5	Present immersive design outcomes effectively to jurors and clients using VR and AR resources.	Create

U24DSDE02	UI / UX DESIGN	L	T	S	C
		1	0	3	4

Course Objective:

- To design for the Age of AI: Chatbots, Conversational UI, and AI Agents.
- To master Information Architecture (OOUX) for complex data systems.
- To use UI tools for advanced prototyping, variables, and design systems.
- To utilize AI content generation to populate prototypes with realistic data.

Detailed Syllabus

UNIT I: DESIGNING CONVERSATIONAL UI	**3**
Moving beyond buttons: Designing Chat Interfaces and AI Agents -- Principles of Prompt Design as a UI element -- Error handling in AI: How to design the "I don't understand" response -- Voice UI basics: Scripting conversations for Voice Assistants.	
UNIT II: ADVANCED INFORMATION ARCHITECTURE	**3**
UI vs UX, UX Lifecycle, Object-Oriented UX (OOUX): Organizing complex systems (e.g., dash boards) -- Designing for Search and Filtering. & conversational UX -- AI Content Strategy: Generate realistic copy, titles, and datasets for prototypes (avoiding "Lorem Ipsum").	
UNIT III: DESIGN SYSTEMS	**3**
Building a Scalable Design System: Atoms, Molecules, Organisms -- Creating Variables and Components -- Auto-layout mastery. Documentation: Annotating design files for developer handoff (Redlining).	
UNIT IV: ADAPTIVE INTERFACES	**3**
Designing for Dark Mode and Light Mode (using variables) -- Responsive Design: Adapting layouts from Desktop to Mobile Web -- Accessibility (a11y): Using free plugins to check contrast ratios and simulate color blindness.	
UNIT V: TESTING & VALIDATION	**3**
Usability Testing: Writing test scripts and conducting "Think Aloud" sessions -- AI Analysis: Feeding user feedback notes into an LLM to summarize top pain points --Iterating design based on data.	
Total: 15 Periods	

List of Experiments

Sl. No	List of Experiments
1	**Chatbot Flow**: Design the UI and logic flow for a Customer Support Bot**.**
2	**OOUX Mapping:** Map out objects and relationships for a Music Streaming App**.**
3	**Figma Components:** Build a responsive "Card Component" with 3 variants (Default, Hover, Active).
4	**Capstone:** Design a "Smart Dashboard" (e.g., Smart Home Control) using AI-generated data for realistic graphs/alerts using a design system.
Total Periods: 45	

Learning Resources

1	Brad Frost, “Atomic Design”, 2016, Brad Frost
2	Steve Krug, “Don’t Make Me Think, Revisited: A Common Sense Approach to Web Usability”, 2014, New Riders
3	Alan Cooper, Robert Reimann, David Cronin & Christopher Noessel, “About Face: The Essentials of Interaction Design”, 2014, Wiley
4	Cathy Pearl, “Designing Voice User Interfaces: Principles of Conversational Experiences”, 2016, O’Reilly Media



5	Louis Rosenfeld, Peter Morville & Jorge Arango, “Information Architecture: For the Web and Beyond”, 2015, O’Reilly Media
6	Jeff Gothelf & Josh Seiden, “Lean UX: Designing Great Products with Agile Teams”, 2013, O’Reilly Media

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Design conversational interfaces and AI-driven user flows.	Create
CO2	Structure complex information systems using Object-Oriented UX principles.	Apply
CO3	Build scalable, variable-based Design Systems in Figma.	Create
CO4	Ensure digital designs meet global accessibility (WCAG) standards.	Apply
CO5	Validate design decisions through usability testing and AI-assisted data analysis.	Evaluate

U24DSDE03	GAME DESIGN	L	T	S	C
		1	0	3	4

Course Objective:

- To introduce students to the fundamentals and principles of game design.
- To understand the cultural, psychological, and interactive aspects of games.
- To explore mechanics, systems, narratives, and player experience in games.
- To analyze and design engaging game concepts across digital and physical platforms.

Detailed Syllabus

Unit I: FUNDAMENTALS OF GAME DESIGN	**3**
Introduction to games and play -- Definition and types of games: digital, analog, board games, card games, and serious games -- Core components of games: rules, goals, feedback systems, challenges, and outcomes -- Player roles and agency -- Game genres and platforms overview.	
Unit II: GAME MECHANICS AND SYSTEMS	**3**
Game mechanics: actions, resources, rewards, penalties, progression systems -- Dynamics and emergent gameplay -- Game balance and difficulty curves -- Chance vs skill-based mechanics -- Core loop, secondary loop, and meta systems in games	
Unit III: PLAYER EXPERIENCE AND PSYCHOLOGY	**3**
Player motivation and engagement -- Types of players and play styles -- Flow theory and immersion -- Emotions in gameplay: fun, tension, curiosity, frustration, and satisfaction -- Usability, accessibility, and inclusive game design	
Unit IV: NARRATIVE AND LEVEL DESIGN	**3**
Storytelling in games: linear, non-linear, and emergent narratives -- World-building and character design fundamentals -- Level design principles: pacing, challenges, rewards, and exploration -- Environmental storytelling -- Balancing narrative and gameplay.	
Unit V: PROTOTYPING, TESTING, AND ITERATION	**3**
Game concept development and documentation -- Paper prototyping and digital prototyping -- Playtesting methods and feedback collection -- Iteration and refinement based on user experience -- Introduction to Game Design Documents (GDD).	
	Total:15 Periods

List of Experiments

Sl. No	List of Experiments
1	Create a modular game concept framework to explore variations in rules, goals, player roles, and feedback systems within a repeatable structure.
2	Design a dynamic core gameplay loop system integrating actions, rewards, progression mechanics, and balanced difficulty curves.
3	Develop a player experience model mapping motivation, flow state, emotional engagement, and accessibility considerations within a selected game.
4	Create a structured narrative and level design prototype integrating story progression, environmental storytelling, spatial layout, and challenge pacing.
5	Design and iterate a playable game prototype using paper or digital methods, incorporating structured playtesting and refinement cycles.
	Total Periods: 45

Learning Resources

1	Jesse Schell, “The Art of Game Design: A Book of Lenses”, 2019, CRC Press
2	Katie Salen & Eric Zimmerman, “Rules of Play: Game Design Fundamentals”, 2004, MIT Press
3	Tracy Fullerton, “Game Design Workshop”, 2018, CRC Press
4	Raph Koster, “A Theory of Fun for Game Design”, 2013, O’Reilly Media
5	Scott Rogers, “Level Up! The Guide to Great Video Game Design”, 2014, Wiley
6	Ernest Adams, “Fundamentals of Game Design”, 2018, Pearson
7	Jane McGonigal, “Reality Is Broken: Why Games Make Us Better and How They Can Change the World”, 2011, Penguin Press

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Understand core principles and components of game design	Understand
CO2	Analyze game mechanics, systems, and player interaction	Understand
CO3	Apply player psychology and experience principles in game concepts	Understand
CO4	Develop basic game concepts, prototypes, and documentation	Understand

VERTICAL III: SPATIAL EXPERIENCE (SE)

S. No.	Course Code	Course Title	Semester	Periods Per Week			Total Contact Periods	Credits
				L	T	S		
1.	U24DSSE01	Parametric Modelling	IV	1	0	3	4	4
2.	U24DSSE02	Retail Design	V	1	0	3	4	4
3.	U24DSSE03	Set Design and Art Direction	VI	1	0	3	4	4

U24DSSE01	PARAMETRIC MODELLING	L	T	P	C
		1	0	3	4

Course Objective:

- Learn parametric thinking and generative design for product development.
- Explore how Rhino and Grasshopper can be used for computational modeling.
- Build skills in visual programming and data-driven modeling.
- Create designs that can improve through testing and performance feedback.
- Get ready for real-world design work using digital prototyping, material limits, and industry projects

Detailed Syllabus

UNIT 1: INTRODUCTION TO PARAMETRIC MODELLING **3**

Definition of parametric modeling, Understanding of 3D, Components of 3D model - Line, splines, NURBS, surface, mesh, 3D & SubD, Difference between rule based & intuitive design, Generative design and methodologies, parametric logic as a method for generating variation, performance, and customization in product, iterative modelling process, Introduction to Rhino - Interface, Creating geometry & Precision modelling

UNIT 2: SOLID MODELLING & EDITING **3**

Modelling with solids, Advanced modelling using Rhino, Editing objects - Twisting, superposition, triangulation, repetition & scaling, creating surface, mesh and subD, Creating deformable shapes, importing and exporting model, Free-form & Organic modelling, Boolean tool set, Panelling tools, other modelling aids

UNIT 3: INTRODUCTION TO VISUAL CODING **3**

Introduction to Grasshopper - Interface & components of visual coding, constructing polysurfaces, NURBS, Brep & meshes, Data types, Simple operations, Array, Vectors, planes & Intersections. Iterative modelling workflow, Variables and constraints, Modifiers & Manipulators.

UNIT 4: ADVANCED PARAMETRIC MODELLING **3**

Data tree, List & Domain, Mesh operation, NURBS operations, SubD operations, Point & Line attractor, Graph mapper

UNIT 5: GENERATIVE & PERFORMATIVE MODEL **3**

Introduction to computational & rule based modelling techniques - Voronoi, Aggregations & tessellations, L-System, Fractals, Shape grammar, Mesh relaxation & Genetic algorithm, Simulation & Analysis

Total: 15 Periods

List of Exercises

Sl. No	List of Exercises
1	Create a 3D modular unit to explore formal variations within a repeatable system using various geometry types such as NURBS, surfaces, and meshes.
2	Model a small scale product using surface / SubD manipulation techniques.
3	Develop a parametric screen or panel system in Grasshopper using slider-controlled input variables to manipulate pattern, scale, or density across a surface.
4	Design a customizable wall partition using attractor points and graph mapper controls to generate spatial variations across a surface.
5	Create a generative lighting system using a combination of Voronoi and mesh relaxation techniques.
	Total: 45 Periods

Learning Resources

1	Arturo Tedeschi, Parametric Architecture with Grasshopper: Primer for Professional Use in Architecture, Le Penseur, (2021).
2	Christopher Reilly, Design Modeling with Rhino and Grasshopper for the Built Environment, Routledge, (2022).
3	Michael Kling & Holger Krieg, Inside Rhinoceros 5, mitp-Verlag, (2017).
4	Karam Zubin, Mastering Grasshopper: Beginner to Advanced, Self-published, (2016).
5	Michael E. Schwartz, Rhino 5 for Designers, SDC Publications, (2013).
6	Kostas Terzidis, Algorithmic Architecture, Architectural Press, (2006).
7	Robert Woodbury, Elements of Parametric Design, Routledge, (2010).
8	Andrew Payne & Rajaa Issa, The Grasshopper Primer (2nd ed.), Self-published, (2010).
9	Robert Woodbury, Sean Williamson & Philip Beesley, Parametric Modelling as a Design Representation in Architecture: A Process Account, Proceedings of the Canadian Engineering Education Association (CEEA), (2006).
10	William J. Mitchell, The Logic of Architecture: Design, Computation & Cognition, MIT Press, (1995).
11	Gary William Flake, The Computational Beauty of Nature: Computer Explorations of Fractals, Chaos, Complex Systems, and Adaptation, MIT Press, (1998).

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Understand the principles of parametric logic and generative design for product development.	Understanding
CO2	Use Rhino and Grasshopper to create dynamic, responsive design systems and computational models.	Applying
CO3	Build technical skills in visual programming and data-driven modeling workflows.	Creating
CO4	Develop iterative, performance-based design solutions using computational approaches.	Creating
CO5	Apply industry-relevant practices by integrating digital prototyping, material constraints, and real-world design briefs.	Applying

U24DSSE02	RETAIL DESIGN	L	T	S	C
		1	0	3	4

Course Objective:

- Learn about Retail Design.
- Explore how Retail Design Works.
- Build skills in creating a Retail Brand, Store Planning & Retail Identity .
- Create designs that can improve through Customer Journey and feedback.
- Get ready for real-world retail design using real life brand brief, Market Analysis and customer/ consumer studies.

Detailed Syllabus

UNIT 1: INTRODUCTION TO RETAIL DESIGN	**3**
Retail Design - Introduction to Retail Branding & Store Planning - Evolution of Retail Design -- Retailing to Retail Design -- Retail Sustainability - Understanding the customer / Consumer -- Types of Retail Sectors (Fashion, F&B, Home, Leisure, Entertainment) -- Types of Retail Locations (High Street, Malls, SIS, etc)	
UNIT 2: BRANDING & RETAIL IDENTITY	**3**
Branding & Retail Identity - Principles of Branding - Developing a Brand, Branding System - Market Analysis - Market Positioning - Selling a Brand - Understanding the role of Physical Store - Branding the interior - Customer Journey & Feedbacks - Adaptation to Market change - Customer Recognition/ Recall - Customer Loyalty & Intellectual Property.	
UNIT 3: STORE DESIGN & VISUAL MERCHANDISING	**3**
Types of Retail Environment (Sustainability, Materials, Lighting , Climate and Sound) - Store Layout - Store Planning - Customer Journey through store - Store Signage - Lighting Design - Functional/ Services space planning - Visual Merchandising - Window display - Seasonal display	
UNIT 4: EXPERIENTIAL RETAIL DESIGN	**3**
Store Atmosphere - Communicating using senses (Touch, Music , and Smell) - Shopping Experiences - Store Themes - Staff experience - Retail innovations - Lifestyle Trends - Role of Technology - **Online Retail Context.**	
UNIT 5: DESIGN DETAIL	**3**
Store Facade - Interior Architecture (Walls, Ceiling & Floor Design) - Material Specifications- Instore wall Communication - Visual Merchandising - Props - Fixtures & Fittings - Furniture - Lighting Fixtures - Integration of Senses	
Total: 15 Periods	

List of Exercises

Sl. No	List of Exercises
1	Create a Brand Identity for a Fashion Outlet
2	Create a retail design for a Fashion outlet.
3	Create a Brand Identity for a F&B Outlet
4	Create a retail design for a F&B outlet.
5	Rebrand, Redesign a Store for an existing Brand.
Total: 45 Periods	

Learning Resources

1	Ann Petermans & Anthony Kent, “Retail Design: Theoretical Perspectives”, 2017, Routledge
2	Lynne Mesher, “Basics Interior Design 01: Retail Design”, 2010, AVA Publishing
3	Jean-Pierre Bobbaers, “The Pro’s Guide to Mastering Retail Store Design”, 2023, Promopress
4	John Fernie, Suzanne Fernie, Christopher Moore & Alexander Fernie, “Principles of Retailing”, 2003, Butterworth-Heinemann
5	Katelijn Quartier, “The Big Book of Retail Design: Everything You Need to Know About Designing a Store”, 2023, BIS Publishers
6	Marko Sarstedt, Monika Imschloss & Susanne Adler, “Multisensory Design of Retail Environments: Vision, Sound, and Scent”, 2024, Routledge
7	John S. Moreland, “Retail Architecture: Principles of Designing Shopping Spaces”, 2018, Routledge
8	Claus Ebster & Marion Garaus, “Store Design and Visual Merchandising: Creating Store Space That Encourages Buying”, 2011, Business Expert Press

Course Outcomes

CO	At the end of the course, the students will be able to	Knowledge Level
CO1	Understand the retail design and how it works.	Understand
CO2	Understand Store Branding and Store Identity	Understand
CO3	Build strategies in Branding , Customer Analysis, Market Study	Create
CO4	Develop technical skills in creating a Brand, Store Planning, Customer flows, Retail Experiences	Create
CO5	Apply industry-relevant practices by integrating retail design principles, Understand real-world brand briefs.	Apply

U24DSSE03	SET DESIGN AND ART DIRECTION	L	T	S	C
		1	0	3	4

Course Objective:

- Equips students with the creative and technical skills to craft visual environments for film, television, theatre, and digital media.
- Understand how temporary film sets differ from permanent architecture.
- Learn to communicate your design clearly so that carpenters, directors, and cinematographers understand your vision.
- Ability to design spaces that enhance cinematography.
- Learn on how to balance creativity with financial and time constraints.

Detailed Syllabus

UNIT 1: FUNDAMENTALS OF ART DIRECTION, SET DESIGN & TECHNICAL DRAWING 3 Visual language of storytelling, Especially importance of Colour theory, Composition & balance, Texture & materials, Historical styles. Knowledge required to communicate design clearly through concept sketching, technical drafting (plans, sections, elevations), scale drawings, 3D visualization techniques, blueprints and 3D visualization.
UNIT 2: PRODUCTION DESIGN, SCENOGRAPHY, SET CONSTRUCTION & MATERIALS 3 Script breakdown: Translating scripts into physical environments, scene breakdown, and storyboarding; Location Recce: Identifying location requirements; Mood boards and concept boards; Storyboarding scenes; Creating spatial atmosphere. Set Construction & Materials: Knowledge of materials (wood, foam), structural integrity, building techniques, and set dressing.
UNIT 3: LIGHTING, CAMERA INTEGRATION, DIGITAL TOOLS & VISUALIZATION 3 Designing spaces that complement lighting design and camera angles. How lighting changes colour perception; Designing for camera angles and movement; Depth creation for cinematic effect. Using software tools for 3D modelling and pre-visualization; Pre-visualization techniques; Rendering basics; Virtual walkthroughs; Digital set planning
UNIT 4: BUDGETING AND PROJECT MANAGEMENT 3 Managing props, sourcing materials, and supervising construction teams. Understand the Cost estimation, Material sourcing, Vendor coordination, Team supervision and Time management.
UNIT 5: INDUSTRY PRACTICE AND SAFETY 3 Health and safety protocols, on-set management, and scheduling. Film sets are professional environments that require discipline. Study on On-set hierarchy (Director, Production Designer, Art Director, etc.), Safety standards, Handling tools and materials safely, Scheduling workflows and Professional ethics.
Total: 15 Periods

List of Exercises

Sl. No	List of Exercises
1	Creating a set design for a Theatrical play
2	Lighting as a design that impacts the mood of a story or theme
3	Team / individual physical model making of set that is made out of limited materials availability, structural integrity, building techniques, and set dressing
4	To create a set for a temporary film sets which differs or replicate / inspire from a permanent architecture.
5	Designing a set for product photography, props designs
Total: 45 Periods	



Learning Resources

1	Jane Barnwell, “Production Design for Screen: Visual Storytelling in Film and Television”, 2024, Bloomsbury Academic
2	Jane Barnwell, “Production Design: Architects of the Screen”, 2019, Wallflower Press
3	Robert Edmond Jones, “The Dramatic Imagination: Reflections and Speculations on the Art of the Theatre”, 1941, Theatre Arts Books
4	Patti Bellantoni, “If It’s Purple, Someone’s Gonna Die: The Power of Color in Visual Storytelling”, 2005, Routledge
5	Peg McClellan, “Production Design: Visual Design for Film and Television”, 2020, Routledge
6	John Alton, “Painting with Light”, 2013, University of California Press
7	S. Todd Muffatti, “Creative and Successful Set Designs: How to Make Imaginative Stage Sets with Limited Resources”, 2018, Atlantic Publishing Group
8	Michael Rizzo, “The Art Direction Handbook for Film & Television”, 2014, Routledge
9	Fred S. Kleiner, “Gardner’s Art Through the Ages: A Global History”, 2019, Cengage Learning
10	Cathy Whitlock, “Designs on Film: A Century of Hollywood Art Direction”, 2010, Harper Design
11	Wang Shaoqiang, “Set Design for Printed Matter: A New Approach to Graphic Design”, 2018, Promo press
12	Colin Winslow, “Handbook of Set Design”, 2006, Cordwood Press
13	J. Mirella Affron, “Sets in Motion”, 1995, Rutgers University Press

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statements	Knowledge Level
CO1	Understand how temporary film sets differ from permanent architecture.	Understand
CO2	Improves efficiency and professional presentation on how to balance creativity with financial and time constraints.	Analyze
CO3	Learn to communicate your design clearly so that carpenters, directors, and cinematographers understand your vision.	Apply
CO4	Equips students with the creative and technical skills to craft visual environments for film, television, theatre, and digital media.	Create
CO5	Understanding visual language, colour theory, and historical styles	Understand
CO6	Knowledge about Scenography which focuses on how space, movement, and actors interact within a set.	Apply

MANDATORY COURSES

SL. NO.	COURSE CODE	COURSE TITLE	CATE - GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	ASSESSMENT	
				L	T	P			CIA	ESE
1	U24MC11	Disaster Risk Reduction and Management	MC	3	0	0	3	0	100	-
2	U24MC21	Environmental Science	MC	3	0	0	3	0	100	-
3	U24MC31	History of Science and Technology in India	MC	3	0	0	3	0	100	-
4	U24MC41	Personal Finance	MC	3	0	0	3	0	100	-
5	U24MC51	Well-Being with Traditional Practices- Yoga, Ayurveda and Siddha	MC	3	0	0	3	0	100	-

U24MC11	DISASTER RISK REDUCTION AND MANAGEMENT	L	T	P	C
		3	0	0	0

Course Objective:

- To introduce the basic concepts of disasters, hazards, vulnerability, and disaster risks.
- To understand different types of disasters and their impacts on society and the environment.
- To study the principles and strategies of disaster risk reduction (DRR).
- To learn the disaster management framework, policies, and institutional mechanisms in India.
- To understand the use of modern tools, technology, and case studies in disaster management.

Detailed Syllabus

UNIT I: HAZRADS, VULNERABILITY AND DISASTER RISKS **9**

Definition: Disaster, Hazard, Vulnerability, Resilience, Risks – Types of Disasters: Natural, Human induced, Climate change induced –Earthquake, Landslide, Flood, Drought, Fire etc – Technological disasters- Structural collapse, Industrial accidents, oil spills -Causes, Impacts including social, Economic, political, environmental, health, psychosocial, etc.- Disaster vulnerability profile of India and Tamil Nadu - Global trends in disasters: urban disasters, pandemics, Complex emergencies, Inter relations between Disasters and Sustainable development Goals.

UNIT II: DISASTER RISK REDUCTION (DRR) **9**

Sendai Framework for Disaster Risk Reduction, Disaster cycle - Phases, Culture of safety, prevention, mitigation and preparedness community Based DRR, Structural- nonstructural measures, Roles and responsibilities of- community, Panchayati Raj Institutions / Urban Local Bodies (PRIs/ULBs), States, Centre, and other stakeholders- Early Warning System – Advisories from Appropriate Agencies. - Relevance of indigenous Knowledge, appropriate technology and Local resources.

UNIT III: DISASTER MANAGEMENT **9**

Components of Disaster Management – Preparedness of rescue and relief, mitigation, rehabilitation and reconstruction- Disaster Risk Management and post disaster management – Compensation and Insurance- Disaster Management Act (2005) and Policy - Other related policies, plans, programmers and legislation - Institutional Processes and Framework at State and Central Level- (NDMA –SDMA-DDMA-NRDF- Civic Volunteers)

UNIT IV: TOOLS AND TECHNOLOGY FOR DISASTER MANAGEMENT	**9**
Early warning systems -Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management, Institutional arrangements (Mitigation, Response and Preparedness, – Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster – Disaster Damage Assessment. - Elements of Climate Resilient Development –Standard operation Procedure for disaster response – Financial planning for disaster Management.	
UNIT V: DISASTER MANAGEMENT: CASE STUDIES	**9**
Discussion on selected case studies to analyse the potential impacts and actions in the contest of disasters-Landslide Hazard Zonation: Earthquake Vulnerability Assessment of Buildings and Infrastructure: Case Studies, Drought Assessment: Case Studies, Coastal Flooding: Storm Surge Assessment, Floods: Fluvial and Pluvial Flooding: Case Studies; Forest Fire: Case Studies, Man Made disasters: Case Studies, Space Based Inputs for Disaster Mitigation and Management and field work related to disaster management. - Field Work-Mock drill.	
	Total: 45 Periods

Learning Recourses

1	Taimpo (2016), Disaster Management and Preparedness, CRC Publications
2	Singh R (2017), Disaster Management Guidelines for earthquakes, Landslides, Avalanches and tsunami, Horizon Press Publications
3	Singhal J.P. “Disaster Management”, Laxmi Publications, 2010. ISBN-10: 9380386427 ISBN13:978-9380386423
4	Govt. of India: Disaster Management Act, Government of India, New Delhi, 2005

Course Outcomes

At the end of the course, the students will be able to		
CO	**Course Outcome Statement**	**Knowledge Level**
CO1	Explain the concepts of disasters, hazards, vulnerability, and disaster risks.	Understand
CO2	Describe different types of disasters and their impacts on society and the environment.	Understand
CO3	Explain the principles and strategies of disaster risk reduction.	Understand
CO4	Discuss disaster management policies, institutions, and frameworks in India.	Understand
CO5	Describe the disaster management tools, technologies, and case study knowledge to disaster situations.	Understand

U24MC21	ENVIRONMENTAL SCIENCE	L	T	P	C
		3	0	0	0

Course Objective:

- To introduce the basic concepts and importance of Environmental Science and natural resources.
- To understand ecosystem structure, energy flow, and the importance of biodiversity.
- To study different types of environmental pollution and their control measures.
- To understand major environmental issues and the concept of sustainable development.
- To understand environmental laws, policies, and the role of public participation in environmental protection.

Detailed Syllabus

UNIT I: INTRODUCTION TO ENVIRONMENT AND NATURAL RESOURCES **8**

Definition, scope, and importance of Environmental Science. Components of the environment: lithosphere, hydrosphere, atmosphere, and biosphere. Structure and functions of the environment. Natural resources: renewable and non-renewable resources. Resource distribution and utilization. Resource depletion and conservation strategies. Sustainable use of natural resources and the concept of equitable resource sharing. Importance of environmental awareness and responsibility.

UNIT II: ECOSYSTEMS AND BIODIVERSITY **10**

Concept, structure, and functions of ecosystems. Types of ecosystems: terrestrial and aquatic ecosystems. Food chains, food webs, and ecological pyramids. Energy flow in ecosystems. Biogeochemical cycles: water cycle, carbon cycle, and nitrogen cycle. Biodiversity: definition, types (genetic, species, and ecosystem diversity), values of biodiversity. Threats to biodiversity such as habitat destruction, overexploitation, pollution, and climate change. Biodiversity conservation methods: in-situ and ex-situ conservation strategies.

UNIT III: ENVIRONMENTAL POLLUTION **10**

Definition and types of environmental pollution: air pollution, water pollution, soil pollution, noise pollution, thermal pollution, and radioactive pollution. Sources, causes, effects, and control measures for different types of pollution. Solid waste management: types of waste, waste segregation, recycling, and disposal methods. Management of e-waste and plastic waste. Importance of pollution prevention and environmental protection practices.

UNIT IV: ENVIRONMENTAL ISSUES AND SUSTAINABLE DEVELOPMENT **9**

Major environmental issues: climate change, global warming, ozone layer depletion, acid rain, deforestation, land degradation, urbanization, and population growth. Impact of environmental issues on ecosystems and human health. Concept of sustainable development and sustainable lifestyles. Sustainable Development Goals (SDGs). Sustainable agriculture, renewable energy sources, and green buildings. Carbon footprint, life cycle assessment (LCA), environmental ethics, and green campus initiatives.

UNIT V: ENVIRONMENTAL POLICIES, LEGISLATION AND FIELDWORK **8**

Environmental policies and legislation in India: Environmental (Protection) Act, 1986; Air (Prevention and Control of Pollution) Act; Water (Prevention and Control of Pollution) Act; Forest Conservation Act; Biological Diversity Act. Role of National Green Tribunal (NGT). Environmental Impact Assessment (EIA). Role of government agencies, NGOs, and public participation in

environmental protection. Fieldwork/Project component: campus environmental audit, biodiversity survey, waste segregation activity, case study analysis, or visit to a pollution control facility.
Total: 45 Periods

Learning Recourses

1	Anubha Kaushik and C. P. Kaushik's "Perspectives in Environmental Studies", 6th Edition, New Age International Publishers ,2018.
2	Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, 2016.
3	R.K. Trivedi, 'Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards', Vol. I and II, Enviro Media. 38 . Edition 2010.
4	Gilbert M.Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education, 2004.
5	Govt. of India: Disaster Management Act, Government of India, New Delhi, 2005
6	https://moef.gov.in — Ministry of Environment, Forest and Climate Change, India
7	https://sdgs.un.org/goals — UN Sustainable Development Goals
8	https://niti.gov.in — NITI Aayog's SDG India Index

Course Outcomes

At the end of the course, the students will be able to		
CO	**Course Outcome Statement**	**Knowledge Level**
CO1	Explain the basic concepts of environment and natural resources.	Understand
CO2	Describe ecosystem structure, functions, and biodiversity conservation.	Understand
CO3	Describe different types of environmental pollution and their control methods.	Understand
CO4	Discuss major environmental issues and principles of sustainable development.	Understand
CO5	Explain environmental policies, legislation, and apply environmental practices through field activities.	Understand

U24MC31	HISTORY OF SCIENCE AND TECHNOLOGY IN INDIA	L	T	P	C
		3	0	0	0

Course Objective:

- To introduce the basic concepts and perspectives of the history of science and technology.
- To understand the contributions of important scholars in the study of science and technology in India.
- To study the development of science and technology in ancient and medieval India.
- To understand the influence of colonial rule on science and technology in India.
- To understand the growth and impact of science and technology in post-independent India.

Detailed Syllabus

UNIT I: CONCEPTS AND PERSPECTIVES

Meaning and Nature of History Objectivity, Determinism, Relativism, Causation, Generalization in History; Moral judgment in history Extent of subjectivity, contrast with physical sciences, interpretation and speculation, causation verses evidence, concept of historical inevitability, Historical Positivism. Science and Technology-Meaning, Scope and Importance, Interaction between science, technology & society, Sources for the history of science and technology in India.

UNIT II: HISTORIOGRAPHY OF SCIENCE AND TECHNOLOGY IN INDIA

Introduction to the Major Historians and their works of D.D. Kosambi, Dharmpal, Debiprasad Chattopadhyay, Rehman, S. Irfan Habib, Deepak Kumar, Dhruv Raina, and others; Approaches to the study of science and technology in Indian Historiography

UNIT III: SCIENCE AND TECHNOLOGY IN ANCIENT AND MEDIEVAL INDIA

Technology in pre-historic period- Origin of agriculture and its technological impact – Science and Technology during Vedic and Later Vedic periods – Development from 1st century AD to 1200 CE – Technological legacy of Medieval India – Interaction with Arab world and knowledge exchange – Medical traditions: Ayurvedic and Unani – Alchemy and early chemistry – Developments in Astronomy and Mathematics – Science and Technology on the eve of British conquest.

UNIT IV: SCIENCE AND TECHNOLOGY IN COLONIAL INDIA

Science under colonial rule: Science and the Empire – Introduction to Western science in India – Indian responses to modern science – Growth of techno-scientific and educational development – Role of colonial policies in shaping scientific development.

UNIT V: SCIENCE AND TECHNOLOGY IN A POST-INDEPENDENT INDIA

Science, Technology and Development discourse- Evolution of science and Technology policies in India – Growth of scientific institutions and research – Advances in modern fields: Space, information technology, biotechnology – Science and technology in a globalized India – Social implications of emerging technologies.

Total: 45 Periods

Learning Recourses

1	Deepak Kumar, Science and the Raj: A Study of British India, Oxford University Press, New Delhi, 1995.
2	S. Irfan Habib and Dhruv Raina, Social History of Science in Colonial India, Oxford University Press, New Delhi, 2007.

3	D. D. Kosambi, The Culture and Civilization of Ancient India in Historical Outline, Vikas Publishing House, New Delhi, 1997.
4	Dhruv Raina, Images and Contexts: The Historiography of Science and Modernity in India, Oxford University Press, 2003.

Course Outcomes

At the end of the course, the students will be able to		
CO	**Course Outcome Statement**	**Knowledge Level**
CO1	Explain the basic concepts and sources of the history of science and technology.	Understand
CO2	Discuss the contributions of major scholars in the historiography of science and technology in India.	Understand
CO3	Describe the development of science and technology in ancient and medieval India.	Understand
CO4	Discuss the impact of colonial rule on scientific development in India.	Understand
CO5	Explain the role of science and technology in post-independent India.	Understand

U24MC41	PERSONAL FINANCE	L	T	P	C
		3	0	0	0

Course Objective:

- To introduce students to the principles and importance of financial planning, goal setting, risk–return relationship, and informed financial decision-making.
- To develop the ability to apply time value of money concepts, compounding principles, and asset allocation strategies in evaluating savings and investment alternatives.
- To familiarize students with various financial assets and investment avenues such as bank deposits, mutual funds, equity, bonds, gold, real estate, and small savings instruments.
- To create awareness about responsible borrowing, credit management, loan evaluation, and debt control strategies.
- To enable students to design a comprehensive personal financial plan incorporating insurance, retirement planning, tax planning, and periodic review mechanisms for long-term financial security.

Detailed Syllabus

UNIT I: FINANCIAL PLANNING **9**

Importance of Financial Planning – Steps involved in Financial Planning – SMART Goals – Achieving Goals – Risk & Returns – Savings & Investment – Loans & Investment.

UNIT II: ANALYZING SAVING & INVESTMENT **9**

Time value of money – Power of Compounding – Rule of 72 and other rules like 69, 70, 144 – Personal Balance sheet and net worth – Inflation effect on Investment – Asset Allocation – Systematic Investment Planning.

UNIT III: FINANCIAL ASSETS **9**

Investment avenues , Small Savings – Post Office Savings Schemes – Company Fixed Deposits – Bank Deposits –Gold – Gold ETF – Mutual Funds – ELSS – Investing in Equity - Investment in Commodities – Government and Corporate Bonds – Collecting Antiques and artifacts – Real Estate – Chit Funds.

UNIT IV: MANAGING LOANS **9**

Personal Loan – Housing Loan – Reverse Mortgage – Education Loan – Gold Pledging – Basics & dangers of Credit Card Debts –CIBIL Score – Steps to avoid excess debt.

UNIT V: PROTECTION RELATED PRODUCTS **9**

Insurance – Life Insurance – Importance of Term Life Insurance – Pension Schemes – Health Insurance - start early and peaceful retirement – Tracking and reviewing financial plan – Danger of Dipping your retirement savings, Basic of tax planning income tax.

Total: 45 Periods

Learning Resources

1	Tyco Press (2014), “Personal Finance Simplified”, Callisto Publishing, 20th Edition
2	Robert Kiyosaki, Rich Dad Poor Dad (2017), Plata Publishing , New Delhi
3	Madura, Jeff. (2013), ‘Personal Finance’, Pearson Education, 5th Edition
4	Jack Kapoor, Les Dlabay, Rober J. Huges, (2010), ‘Personal Finance ’, McGraw Hill



Course Outcomes

At the end of the course, the students will be able to		
CO	**Course Outcome Statement**	**Knowledge Level**
CO1	Explain the importance of financial planning, goal setting, risk-return relationship, and the role of savings and investment in personal finance.	Understand
CO2	Apply time value of money concepts, compounding principles, and asset allocation strategies to evaluate personal financial decisions.	Apply
CO3	Analyze various financial assets and investment avenues (bank deposits, mutual funds, equity, bonds, gold, real estate, etc.) to select suitable options based on risk profile and financial goals.	Analyze
CO4	Evaluate loan options, credit management practices, and debt risks to make responsible borrowing decisions and maintain financial stability.	Evaluate
CO5	Develop a comprehensive personal financial plan incorporating insurance, retirement planning, tax planning, and periodic review mechanisms.	Create

U24MC51	WELL-BEING WITH TRADITIONAL PRACTICES-YOGA, AYURVEDA AND SIDDHA	L	T	P	C
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Course Objective:

- To enjoy life happily with fun filled new style activities that help to maintain health also
- To adapt a few lifestyle changes that will prevent many health disorders
- To be cool and handbill every emotion very smoothly in every walk of life
- To learn to eat cost effective but healthy foods that are rich in essential nutrients
- To develop immunity naturally that will improve resistance against many health disorders

Detailed Syllabus

UNIT I: HEALTH AND ITS IMPORTANCE **6**

Health: Definition - Importance of maintaining health - More importance on prevention than treatment Ten types of health one has to maintain - Physical health - Mental health - Social health - Financial health - Emotional health - Spiritual health - Intellectual health - Relationship health - Environmental health - Occupational/Professional heath. **Present health status -** The life expectancy-present status - mortality rate - dreadful diseases - non-communicable diseases (NCDs) the leading cause of death - 60% - heart disease – cancer – diabetes - chronic pulmonary diseases - risk factors – tobacco – alcohol - unhealthy diet - lack of physical activities. **Types of diseases and disorders -** Lifestyle disorders – Obesity – Diabetes - cardiovascular diseases – Cancer – Strokes – COPD - Arthritis - Mental health issues. **Causes of the above diseases / disorders -** Importance of prevention of illness - Takes care of health - Improves quality of life - Reduces absenteeism - Increase satisfaction - Saves time. **Simple lifestyle modifications to maintain health -** Healthy Eating habits (Balanced diet according to age) Physical Activities (Stretching exercise, aerobics, resisting exercise) – Maintaining BMI-Importance and actions to be taken.

UNIT II: DIET **10**

Role of diet in maintaining health - energy one needs to keep active throughout the day - nutrients one needs for growth and repair - helps one to stay strong and healthy - helps to prevent diet-related illness, such as some cancers - keeps active and - helps one to maintain a healthy weight - helps to reduce risk of developing lifestyle disorders like diabetes – arthritis – hypertension – PCOD – infertility – ADHD – sleeplessness -helps to reduce the risk of heart diseases - keeps the teeth and bones strong. **Balanced Diet and its 7 Components -** Carbohydrates – Proteins – Fats – Vitamins – Minerals - Fibre and Water. **Food additives and their merits & demerits -** Effects of food additives - Types of food additives - Food additives and processed foods - Food additives and their reactions. **Definition of BMI and maintaining it with diet** - Importance - Consequences of not maintaining BMI - different steps to maintain optimal BM. **Common cooking mistakes -** Different cooking methods, merits and demerits of each method.

UNIT III: ROLE OF AYURVEDA & SIDDHA SYSTEMS IN MAINTAINING HEALTH **8**

AYUSH systems and their role in maintaining health - preventive aspect of AYUSH - AYUSH as a soft therapy. **Secrets of traditional healthy living -** Traditional Diet and Nutrition - Regimen of Personal and Social Hygiene - Daily routine (Dinacharya) - Seasonal regimens (Ritucharya) - basic sanitation and healthy living environment - Sadvritta (good conduct) - for conducive social life. **Principles of Siddha & Ayurveda systems -** Macrocosm and Microcosm theory - Pancheekarana Theory / (Five Element Theory) 96 fundamental Principles - Uyir Thathukkal (TriDosha Theory) -Udal Thathukkal **Prevention of illness with our traditional system of medicine -** Primary Prevention - To decrease the number of new cases of a disorder or illness - Health promotion/education, and - Specific protective measures - Secondary Prevention - To lower the rate of established cases of a disorder or illness in the population (prevalence) - Tertiary Prevention - To decrease the amount of disability associated with an existing disorder.



UNIT IV: MENTAL WELLNESS	**7**
Emotional health - Definition and types - Three key elements: the subjective experience - the physiological response - the behavioral response - Importance of maintaining emotional health - Role of emotions in daily life -short term and long-term effects of emotional disturbances - Leading a healthy life with emotions - Practices for emotional health - Recognize how thoughts influence emotions - Cultivate positive thoughts - Practice self-compassion - Expressing a full range of emotions. **Stress management -** Stress definition - Stress in daily life - How stress affects one's life - Identifying the cause of stress - Symptoms of stress - Managing stress (habits, tools, training, professional help) - Complications of stress mismanagement. **Sleep -** Sleep and its importance for mental wellness - Sleep and digestion. **Immunity -** Types and importance - Ways to develop immunity	
UNIT V: YOGA	**2+12**
Definition and importance of yoga - Types of yoga - How to Choose the Right Kind for individuals according to their age - The Eight Limbs of Yoga - Simple yogasanas for cure and prevention of health disorders - What yoga can bring to our life.	
	Total: 45 Periods

Learning Recourses

1	Nutrition and Dietetics - Ashley Martin, Published by White Word Publications, New York, NY 10001, USA
2	Yoga for Beginners_ 35 Simple Yoga Poses to Calm Your Mind and Strengthen Your Body, by Cory Martin, Copyright © 2015 by Althea Press, Berkeley, California
3	WHAT WE KNOW ABOUT EMOTIONAL INTELLIGENCE How It Affects Learning, Work, Relationships, and Our Mental Health, by Moshe Zeidner, Gerald Matthews, and Richard D. Roberts, A Bradford Book, The MIT Press, Cambridge, Massachusetts, London, England
4	The Mindful Self-Compassion Workbook, Kristin Neff, Ph.D Christopher Germer, Ph.D, Published by The Guilford Press A Division of Guilford Publications, Inc.370 Seventh Avenue, Suite 1200, New York, NY 10001
5	Read more: https://www.legit.ng/1163909-classes-food-examples-functions.html
6	https://www.yaclass.in/p/science-state-board/class-9/nutrition-and-health-5926
7	Benefits of healthy eating https://www.cdc.gov/nutrition/resources-publications/benefitsof-healthy-eating.html

Course Outcomes

At the end of the course, the students will be able to

CO	Course Outcome Statement	Knowledge Level
CO1	Explain the meaning of health, its types, and common lifestyle diseases.	Understand
CO2	Describe the importance of diet, balanced nutrition, and BMI for maintaining good health.	Understand
CO3	Explain the basic principles of Ayurveda and Siddha systems for disease prevention.	Understand
CO4	Discuss the importance of mental wellness, stress management, sleep, and immunity.	Understand
CO5	Describe the importance of yoga and practice simple yogasanas for a healthy life.	Understand