

As Per NEP 2020

University of Mumbai



Syllabus for Minor Vertical 2

Faculty of Engineering

Board of Studies in Information Technology

Second Year Programme in Minor –Information Technology

Semester	IV	
Title of Paper (Theory)	Sem.	Total Credits 4
Introduction to Design	IV	3
Title of Paper (Lab)		Credits
Design Lab	IV	1
From the Academic Year		2025-26

Sem. - IV

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
2514211	Introduction to Design	03	-	-	03	-	-	03

Course Code	Course Name	Theory					Term work	Pract / Oral	Total
		Internal Assessment Test(IAT)			End Sem Exam	Exam Duration (In Hrs.)			
		IAT-I	IAT-II	IAT-I+ IAT-II (Total)					
2514211	Introduction to Design	20	20	40	60	2	--	--	100

Course Objectives-

The course will introduce the fundamentals of design and discuss their applications in various design disciplines. This course will

1. Introduce students to the fundamental concepts, principles, and elements of design.
2. Provide an overview of various design disciplines, including graphic design, product design, interior design, and architecture.
3. Develop students' ability to think creatively and critically in design processes.
4. Familiarize students with historical and contemporary design movements and their significance.
5. Encourage exploration of design thinking methodologies for problem-solving and innovation.
6. Equip students with basic technical skills and tools used in design practice.

Course Outcomes-The learners will be able to:

1. Understand about design and its evolution throughout history.
2. Identify characteristic features of each design movement
3. Apply these learning in their assignments and future projects.
4. Learn about the fundamentals of design
5. Apply them in classroom assignments and their academic projects.
6. Understand fundamentals of design

DETAILED SYLLABUS:

Module. No.	Name of Module	Detailed Content	Hours	CO Mapping
0	Prerequisites	Basic of Programming.	01	--
I	Design and its development – a brief history	Definitions of Design, Design movements: Arts and Crafts Movement, Art Nouveau, Modernism, Art Deco, Futurism, Bauhaus, Surrealism, Streamlining, Organic Design, Scandinavian Modern, Contemporary, Pop Art, Space Age, Minimalism, Postmodernism, Memphis, Deconstructivism.	05	CO1
II	Disciplines in design.	Industrial design - 3 Dimensional Design (Product Design, Ceramic and Glass Design, Furniture Design) Transportation design - Automotive design/Automotive styling. Visual communication - (Graphic Design, Typography, Animation Design, Motion Graphics, New Media Design, Exhibition Design, Packaging Design). Interaction design - (Human-Computer Interaction, Virtual Reality, Artificial Intelligence & Robotics)	06	CO2
III	Fundamentals of design	A brief introduction to the elements of design (point, line, shape, space, form, value, color, and texture) and principles of design (balance, scale/proportion, contrast, pattern, emphasis, movement/rhythm, harmony, and unity). Introduction to Gestalt theory and its principles.	07	CO3

IV	Communication Design	Understanding role of communication in culture Defining and investigating communication, Social communication, Intercultural communication, Technology and culture, Effect of culture in communication, Models of communication, Ethics Communication Theories and Application Communication accommodation theory, Symbolic convergence theory, Relational dialectics, Agenda setting theory, Uncertainty reduction theory, Speech codes theory, Expectancy violation theory, Rhetoric, Cultivation theory etc. Storytelling in communication Speech codes, Interviews, Folk stories, Advertisements, TV shows and films, creating narratives etc.	08	CO4
V	Graphic Design	What is graphics? Types of Graphics, uses of graphics, software used for graphics designing. Photoshop Introduction:Photoshop Interface, Raster graphics & vector graphics, Image formats, Operations on image. Manipulation of Image:The marquee tool, the lasso tool, magic Wand tool, Inverting Selection, Layers, Brush tool, Eraser tool, Fill tool, Blur tool, Smudge tool, Sharpen tool, Dodge tool, Sponge tool, Darken tool. Transformation & Retouching:Free transform, Scaling, rotation, Skew, perspective, Wrap, Distort, Crop, Image size, Canvas size, Clone stamp tool, Healing brush tool, patch tool, red eye tool, history brush tool. Colour Correction:Colour swatch, image modes, color adjustments, color selection. Text:The text tool, editing text, formatting, line & spacing, wrap text, text effects. Effects: Blending modes, styles, filters, liquefy, Vanishing point. Drawing:The pen tool, Drawing shapes, managing paths, converting path to selection Introduction to typography	07	CO5
VI	Introduction to UI/UX Design	Introduction to UI and UX- Definition of UI and UX..Similarities and difference Key Methodologies of UI and UX Design-	05	CO6

		Overview of industry-standard approaches: • Design Thinking (Empathize, Define, Ideate, Prototype, Test). • User-Centered Design (UCD) – designing based on user needs. • Lean UX – rapid iterations and user feedback. Applications of UI and UX Design		
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Text Books:

1. David Raizman.: History of modern design, Pearson Prentice Hall, 2011.
2. Poppy Evans & Mark Thomas.: Exploring the elements of design, Cengage Learning, 2012.
3. Charles H. Flurscheim.: Industrial design in engineering: a marriage of techniques. Design council, 1983.
4. Griffin, E. A first look at communication theory (8 th ed.). New York: McGraw-Hill, 2012
5. Lewis, J., Cultural studies: The basics. London: SAGE Publications, 2002

Reference Books:

1. Wucius Wong.: Principles of two-dimensional design. John Wiley & Sons, 1972. Marjorie Elliott Bevin.: Design Through Discovery: The Element and Principles. Wadsworth Publishing Co Inc. 1993
2. Gail Greet Hannah.: Elements of Design: Rowena Reed Kostellow and the structure of visual relationships. Princeton Architectural Press, 2002.

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in
2.	https://www.coursera.org/courses?query=design
3.	https://www.udemy.com/courses/design/
4.	https://www.edx.org/learn/design
5.	https://www.udacity.com/course/product-design--ud509
6.	https://www.simplilearn.com/

Assessment:

Internal Assessment (IA) for 20 marks each:

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of the syllabus content must be covered in the IAT-I and the remaining 40% to 50% of the syllabus content must be covered in the IAT-II.

End Semester Theory Examination:**➤ Question paper format**

- Question Paper will comprise a total of **six questions each carrying 15 marks** **Q.1** will be **compulsory** and should **cover the maximum contents of the syllabus**
- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)
- A total of **four questions** need to be answered

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Pract.	Tut.	Theory	Pract.	Tut.	Total
2514212	Design Lab	-	2	-	-	1	-	1

Course Code	Course Name	Theory					Term work	Pract / Oral	Total
		Internal Assessment Test (IAT)			End Sem Exam	Exam Duration (inHrs)			
		IAT-I	IAT- II	IAT-I+IAT-II(Total)					
2514212	Design Lab	--	--	--	--	--	25	25	50

Lab Objectives:

1. To develop an understanding of fundamental design principles through hands-on exercises.
2. To enhance visual perception and creativity by exploring different design elements.
3. To improve problem-solving abilities through practical design applications.
4. To explore form, space, and composition using various materials and techniques.
5. To cultivate an experimental approach toward ideation and prototyping.
6. To establish a foundational skill set for advanced design courses.

Lab Outcomes:

1. Demonstrate proficiency in fundamental design principles.
2. Apply design thinking to solve visual and spatial problems.
3. Develop compositions using various design elements.
4. Experiment with form and material to create innovative designs.

5. Present and document design explorations effectively.
6. Evaluate and critique design work based on established principles.

Hardware Requirements:

To effectively learn and practice design principles, students should have access to the following hardware:

- Computer (Laptop/Desktop)
 - a. 16GB RAM (minimum 8GB for basic work, 16GB+ for better performance)
 - b. 256GB SSD (minimum) or 512GB+ SSD for faster performance
 - c. Dedicated GPU for advanced graphic design tasks

Software Requirements

Graphic Design & UI/UX Software:

1. Adobe Creative Cloud (Photoshop, Illustrator, InDesign, XD)
2. Figma (for UI/UX design and prototyping)
3. Sketch (for macOS users)
4. CorelDRAW (alternative to Adobe Illustrator)
5. Blender (free and open-source 3D modeling software)
6. Autodesk SketchBook (for digital sketching)

Prototyping & Wireframing Tools:

1. Figma (browser-based UI/UX design)
2. InVision (for interactive prototypes)
3. Balsamiq (for quick wireframing)

DETAILED SYLLABUS:

Sr. No.	Module No.	Detailed Content	Hours	LO Mapping
1	Elements and Principles of Design	*Understand the elements of design (point, line, shape, form, color, texture, space, and value). *Explore design principles (balance, contrast, emphasis, movement, pattern, rhythm, and unity).	04	LO1

2	Form Exploration and Material Study	* Develop three-dimensional thinking through form studies. *Experiment with different materials like paper, clay, wire, and fabric. *Understand the relationship between form and function.	04	LO2
3	Composition and Visual Communication	*Understand the importance of layout, proportion, and scale. *Experiment with typography and color psychology.	04	LO3
4	Design Thinking and Ideation	*Develop quick sketches and prototypes for design solutions. *Understand problem-solving approaches in design.	04	LO4
5	Design Documentation and Presentation	*Develop presentation skills for design concepts.	05	LO5
6	Mini Project	Create a portfolio of completed exercises.	05	LO6

List of Experiments.

Week No	List of Experiments	Hrs
01	Develop contrast-based compositions using color and texture.	02
02	Create a rhythm-based design using repeating elements.	02
03	Construct abstract 3D forms using paper folding techniques	02
04	Develop a simple form using wire manipulation.	02
05	Develop a typographic composition using a single letterform.	02
06	Create a colour-based mood board representing different emotions.	02
07	Generate 10 rapid concept sketches for an everyday product.	02
08	Create a storyboard showcasing a design solution.	02
09	Prepare a design process book documenting all previous assignments.	02
10	Develop a digital portfolio of selected works.	02

Assessment:

Term Work: Term Work shall consist of at least 10 to 12 practicals based on the above list. Practical to be conducted, providing essential practice needed for mastering design skills.

Internal Practical Exam: Conduct an internal practical exam after completing the first three practicals to assess and ensure the learner's understanding.

Term Work Marks: 25 Marks (Total marks) = 10 Marks (Experiment) + 10 Marks (Internal Practical Exam) + 5 Marks (Attendance)

Practical & Oral Exam: An Oral & Practical exam will be held based on the above syllabus.

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1. David Raizman.: History of modern design, Pearson Prentice Hall, 2011.
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4.	https://www.edx.org/learn/design
5.	https://www.udacity.com/course/product-design--ud509
6.	https://www.simplilearn.com/

Sd/-

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