NARAYANA ENGINEERING COLLEGE: NELLORE								
23A99401	**DESIGN THINKING & INNOVATION**							**R2023**
Semester	Hours / Week			Total hrs	Credit	Max Marks		
	L	T	P		C	CIE	SEE	TOTAL
IV	1	0	2	30	2	30	70	100

Pre-requisite: Should have a foundational understanding **o**f basic design principles**,** human-centered design**,** creativity techniques.

Course Objectives:

The objective of this course is

1. To familiarize students with design thinking process as a tool for breakthrough innovation.
2. To equip students with design thinking skills and ignite the minds
3. To create innovative ideas,
4. To develop solutions for real-time problems.

Course Outcomes: After successful completion of the course, the student will be able to:

CO 1	Interpret concepts related to design thinking
CO 2	Address the challenges faced by customer and Specify customer needs
CO 3	Sketch the product by innovative techniques for satisfying the specific needs as identified
CO 4	Design a product/prototype for satisfying specific need
CO 5	Applying Design Thinking principles to drive business development

CO-PO Mapping

CO	PO												PSO	
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1														
CO2														
CO3														
CO4														
CO5														

1: Low, 2-Medium, 3- High

COURSE CONTENT

MODULE-1	Introduction to Design Thinking	05 hours

Introduction to elements and principles of Design, basics of design-dot, line, shape, form as fundamental design components. Principles of design. Introduction to design thinking, history of Design Thinking, New materials in Industry.

At the end of the Module 1, students will be able to:

1. Explain the Principles of Design (BL-2).
2. Explain fundamental design components. (BL-2).
3. Describe of Design thinking flow .(BL- 2)
4. Compare the new materials in industry(BL-2).

MODULE-2	Design Thinking Process	06 hours

Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brainstorming, product development

Activity: Every student presents their idea in three minutes, Every student can present design process in the form of flow diagram or flow chart etc. Every student should explain about product development.

At the end of the Module 2, students will be able to:

1. Interpret process of Design Thinking (BL-1).
2. Explain the Implementation process in driving inventions. (BL-3).
3. Explain the use of design thinking in social innovations.(BL-2)
4. Compare the tools of Design Thinking. (BL-3).

MODULE-3	Innovation	06 hours

Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations- Creativity to Innovation- Teams for innovation- Measuring the impact and value of creativity.

Activity: Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation

At the end of the Module 3, students will be able to:

1. Explain the Art of innovation . (BL-2)
2. Compare innovation and creativity. (BL-2)
3. Explain the role of creativity and innovation in design thinking(BL-2)
4. Interpret value of creativity and the impact. (BL-2)

MODULE-4	Product Design	06 hours

Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications- Innovation towards product design- Case studies

Activity: Importance of modelling, how to set specifications, Explaining their own product design.

At the end of the Module 4, students will be able to:

1.Explain the introduction to product design.(BL-2)
2.Compare Product startegies.(BL-3)
3.Explore the Project Planning. (BL-2).
4.Design the case studies. (BL-2)

MODULE-5	Design Thinking in Business Processes	07 hours

Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business – Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme competition, Standardization. Design thinking to meet corporate needs- Design thinking for Startups- Defining and testing Business Models and Business Cases- Developing & testing prototypes.

Activity: How to market our own product, About maintenance, Reliability and plan for startup.

At the end of the Module 5, students will be able to:

1. Explain the Design thinking principles to redefine business. (BL-2).
2. Describe business challenges.(BL-2).
3. Implement the Design thinking for Startups.(BL-3)
4.Design market product and prepare plan for start up.(BL-3)

Total hours:	**30 hours**

Content beyond syllabus:

Group Workshop: Design a Sustainable Product Prototype.

Self-Study: Contents to promote self-Learning:

SNO	Module	Reference
1	Introduction to Design Thinking	https://www.ideou.com/ https://dschool.stanford.edu/resources https://www.khanacademy.org/
2	Design Thinking Process	https://www.ideou.com/ **Miro: Customer Journey Mapping Templates**
3	Innovation	innovation hubs like **MIT Innovation Lab** or **Harvard Business Review**
4	Product Design	https://hbr.org/
5	Design Thinking in Business Processes	https://neilpatel.com/ https://sloan.mit.edu/

Textbooks:

1. Tim Brown,Change by design, Harper Bollins (2009)
2. Idris Mootee, Design Thinking for Strategic Innovation, 2013, John Wiley & Sons.

References:

1. David Lee, Design Thinking in the Classroom, Ulysses press
2. Shrutin N Shetty, Design the Future, Norton Press
3. William Lidwell,Universal Principles of Design- Kritinaholden, Jill Butter
4. Chesbrough.H, The Era of Open Innovation – 2013.

Online Learning Resources:

https://nptel.ac.in/courses/110/106/110106124/
https://nptel.ac.in/courses/109/104/109104109/
https://swayam.gov.in/nd1_noc19_mg60/preview