



**BR23-II YEAR II SEMESTER SYLLABUS**

II Year II Semester

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**DESIGN THINKING & INNOVATION (23ES4L01)**

Common to CSE, INF, CSE-(AI & DS), AI & ML branches of Engineering

**Course Objectives:** The objectives of the course are to

- Bring awareness on innovative design and new product development.
- Explain the basics of design thinking.
- Familiarize the role of reverse engineering in product development.
- Train how to identify the needs of society and convert into demand.
- Introduce product planning and product development process.

**UNIT – I Introduction to Design Thinking**

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.

**UNIT - II Design Thinking Process**

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

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|   |   |  |  | H. L. Haritha  |   |
| Dr.N.Rama Krishnaiah, Professor of CSE,UCEK & Control of Examination JNTUK, kakinada. | Dr.C.Krishna Mohan, Professor of CSE,IIT, Kandi, Hyderabad. | Dr.P.Radha Krishna, Professor of CSE,NIT, Warangal | Mr.Rajesh Bobburi Chief Operating Officer, HighQ Labs Private Limited, Rajahmundry | Dr.Lakshmi Haritha Medida, Associate Professor, R.M.K.Engineering College,Kavaraipettai ,Tamilnadu | Dr.K.Srinivas, Professor & HoD Department of CSE, B.V.C.I.T.S, Batlapalem |



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AFFILIATED TO JNTUK-KAKINADA, ACCREDITED BY NAAC 'A' GRADE,  
2 PROGRAMMES (CSE,EEE) ACCREDITED BY NBA ( For A.Y 2023-24 to 2025-26)  
Post Box: 26, Amalapuram 533201, Dr.B R Ambedkar Konaseema Dt., A.P.

**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.

### UNIT - III Innovation

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.

### UNIT - IV Product Design

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

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

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### UNIT – V Design Thinking in Business Processes

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.

**Textbooks:**

1. Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
2. Idris Mootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.

**Reference Books:**

1. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
2. Shrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
3. William Lidwell, Kritinaholden, & Jill butter, Universal principles of design, 2/e, Rockport Publishers, 2010.
4. Chesbrough.H, The era of open innovation, 2003.

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**Online Learning Resources:**

- <https://cpe-iitg.vlabs.ac.in/>
- <https://nptel.ac.in/courses/110/106/110106124/>
- <https://nptel.ac.in/courses/109/104/109104109/>
- [https://swayam.gov.in/nd1\\_noc19\\_mg60/preview](https://swayam.gov.in/nd1_noc19_mg60/preview)
- [https://onlinecourses.nptel.ac.in/noc22\\_de16/preview](https://onlinecourses.nptel.ac.in/noc22_de16/preview)

**Course Outcomes:**

| COs | Statement<br>s  | Bloom<br>s<br>Level |
|-----|---|---------------------|
| CO1 | Define the concepts related to design thinking.                               | L1                  |
| CO2 | Explain the fundamentals of Design Thinking and innovation.                   | L2                  |
| CO3 | Apply the design thinking techniques for solving problems in various sectors. | L3                  |
| CO4 | Analyse to work in a multidisciplinary environment.                           | L4                  |
| CO5 | Evaluate the value of creativity.   | L5                  |

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