NEW HORIZON
COLLEGE OF ENGINEERING
Autonomous College, Permanently Affiliated to Visvesvaraya Technological University, Belagavi
Approved by AICTE & UGC, Accredited by NAAC with 'A' Grade, Accredited by NBA

A Report

AICTE IDEA Lab – Faculty Development Program

A One day – Faculty Development Program was successfully organized at New Horizon College of Engineering under the initiative of the AICTE IDEA LAB and the Department of Research and Development.

Chief Mentor : Dr. Manjunatha, Principal

Faculty Coordinator : Dr. Revathi V, Dean R&D

Faculty Co Coordinator : Dr. A. Sujin Jose, Associate Professor- R&D/Mech

Date : 22 September 2025 to 27 September 2025

Participants : Faculty members of Mechanical department and Lab Instructor of New Horizon College Of Engineering

Trainers : Mr. Rakesh, Mr. Thanuj Kumar, Mr. Amrit, Mrs. Shweta

Objectives

- Introduce the Fundamentals of Design Thinking, Develop Creative and Critical Thinking Skills, Enhance Problem-Solving and Innovation Capabilities, Promote Human-Centric Teaching Approaches
- The objective of this program is to train the lab instructors to acquainted with Laser printing machine, vinyl cutting machine and PCB Mat machine for making prototype of the visualized products
- Provide hands-on experience with prototyping Machines and Tools

Overview

- The program aimed to enable faculty to adopt design thinking not only as a problem-solving framework but also as a teaching-learning strategy that can inspire students to think critically and innovatively. Through interactive sessions, hands-on activities, and case studies, participants were introduced to the five stages of design thinking—Empathize, Define, Ideate, Prototype, and Test.
- The trainers provided in-depth training on the design and operation of three key prototyping machines: the PCB Mat Machine, the Heavy Duty Laser Cutting Machine, and the Vinyl Cutting Machine. Each session was carefully structured to cover both the theoretical aspects and practical applications of these advanced fabrication tools. The primary aim was to equip lab instructors with the necessary skills and knowledge to effectively operate the equipment available in the AICTE IDEA Lab

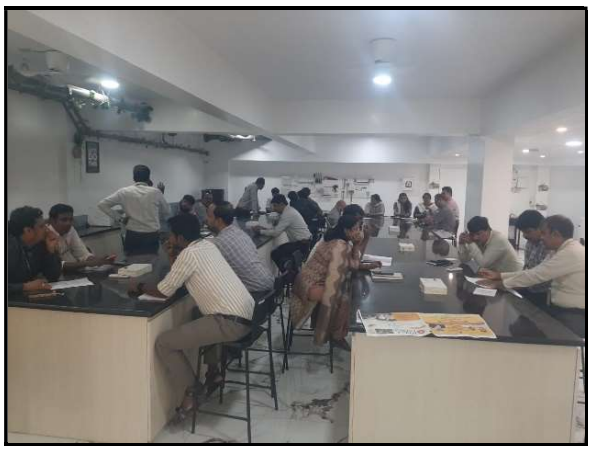
Session 1: Design Thinking

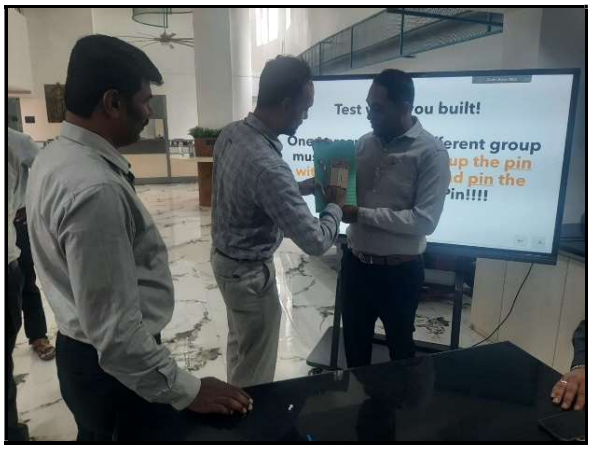
Trainer: Mr. Rakesh

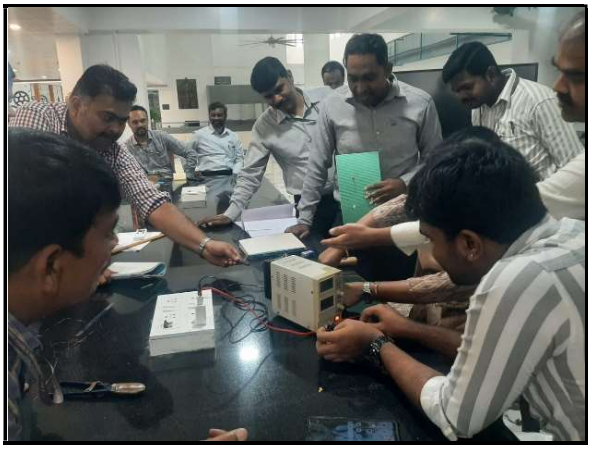
Venue : IDEA Lab

The session began with a detailed introduction to design Thinking. The participants were introduced to the concept of empathy as the starting point for innovation, emphasizing the need to understand user needs and challenges before developing solutions. The Trainer elaborated on the five stages of design thinking—Empathize, Define, Ideate, Prototype, and Test. Trainer discussed how each stage contributes to creative problem-solving and decision-making. Through interactive sessions, hands-on activities, and case studies, participants were introduced to the five stages of design thinking. Participants actively engaged in a series of interactive activities that guided them through all the stages of the Design Thinking process. Beginning with the Empathize stage, they worked in groups to understand user needs and challenges through discussions and brainstorming exercises. Moving to the Define stage, they identified key problem statements and refined them into clear, actionable challenges. In the Ideate phase, participants explored multiple creative solutions using brainstorming and mind-mapping techniques, encouraging out-of-the-box thinking.

Following this, participants moved to the Prototype stage, where they translated their ideas into tangible representations such as sketches, models, or process flows. This hands-on approach enabled them to visualize and communicate their solutions effectively. Finally, during the Test stage, participants presented their prototypes to peer groups, received constructive feedback, and reflected on possible improvements.







Session 2: Introduction and Hands-on Training of Machine

Introduction to PCB Designing and Prototype of PCB

Venue : IDEA Lab

Trainer: Mrs. Shweta

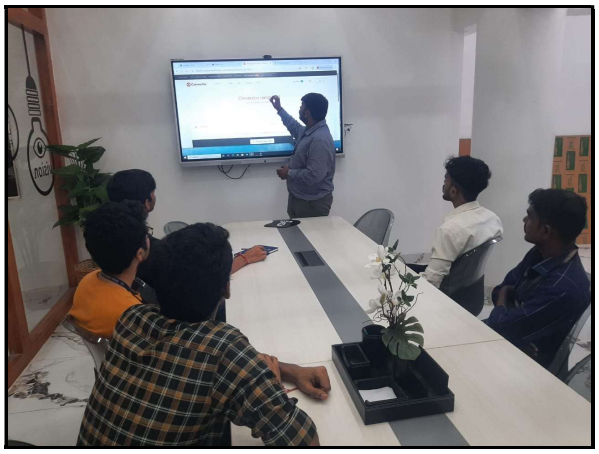
The session began with a detailed introduction to the PCB Mat Machine and its associated software tools, including Eager, Copper Cam, Auto Leveller, and Mach3 Mill. The trainer provided an overview of the machine's components, working principles, and safety guidelines. Following the introduction, participants were guided through the PCB design process using Eager software**,** where they learned how to create schematic layouts and convert them into board designs**.** These designs were then exported and processed through Copper Cam software to generate the corresponding G-Code files, which are essential for driving the milling machine. Once the G-Code was prepared, participants were introduced to the Auto Leveller software, which is used to adjust the depth of the milling tool according to surface variations, ensuring precise engraving. Finally, the Mach3 Mill software was used to operate the PCB Mate Machine and execute the milling process. Under the trainer's supervision, participants successfully created functional PCB prototypes, gaining valuable hands-on experience in every stage of the prototyping workflow—from design to fabrication.

Introduction to Heavy Duty Laser Printing Machine

Venue : IDEA Lab

Trainer : Mr. Thanuj Kumar

The trainers began the session by providing a thorough introduction to the operation of the Heavy Duty Laser Printing Machine along with the RD Works software, which is integral to controlling the laser cutting and engraving process. Participants were familiarized with the machine's hardware components, safety protocols, and maintenance procedures to ensure smooth and safe operation. Following the demonstration, participants were encouraged to create their own unique designs using the RD Works software, applying the skills they had learned to customize shapes, texts, and patterns suited to their projects. Once the designs were finalized, the lab instructors took turns operating the laser machine, learning to correctly position the materials and execute the cutting or engraving processes. Through this hands-on experience, participants successfully produced precise physical models of their digital designs, reinforcing their understanding of the entire workflow from concept to prototype.



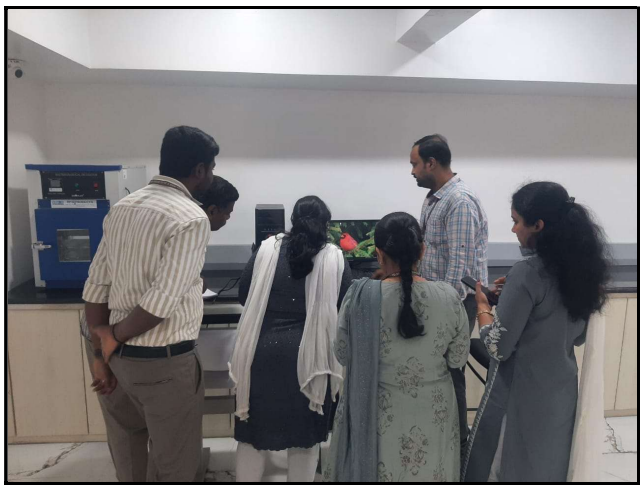
Introduction to Vinyl Cutting Machine

Venue : IDEA Lab

Trainer : Mr. Amrit

This session began with a comprehensive introduction to the Vinyl Cutting Machine and the associated Flexi_10 design software. The trainer explained the technical parameters of the machine, including cutting speed, blade alignment, and material compatibility. A detailed walkthrough of the Flexi_10 software interface was provided, highlighting important toolbars, design features, and file preparation techniques. Participants were shown how to import vector images, create custom designs, and prepare them for cutting using appropriate settings.

Following the software training, the session moved on to the hands-on operation of the vinyl cutting machine. Participants learned the step-by-step process of machine setup, including loading vinyl sheets, setting origin points, and executing cutting commands. Under the guidance of the trainers, each participant created and operated their own design, observing how their digital concepts were translated into precise physical prototypes.



Outcomes

- Enhanced Understanding of Design Thinking Process.
- Practical Application through Hands-on Activities. Improved Problem-Solving and Innovation Skills. Collaboration and Teamwork.
- Development of Prototypes and Implementation Ideas.
- Participants gained hands-on experience in operating advanced prototyping machines such as the PCB Mat Machine, Heavy Duty Laser Cutting Machine, and Vinyl Cutting Machine.
- Lab instructors became familiar with industry-relevant software tools including Eager, Copper Cam, Mach3 Mill, RD Works, and Flexi_10, enhancing their technical proficiency

Conclusion

The Faculty Development Program on Design Thinking proved to be an insightful and enriching experience for all participants. The sessions effectively bridged theoretical understanding with practical application, enabling faculty members to explore innovative problem-solving approaches through empathy, ideation, prototyping, and testing. . It provided valuable technical training to lab instructors, equipping them with the knowledge and skills to operate key prototyping equipment. . Such programs play a vital role in bridging the gap between academic infrastructure and practical application, thereby fostering innovation and technical excellence within the institution.