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AICTE IDEA LAB

REPORT ON THREE DAY STAFF TRAINING PROGRAM

(04.03.2026-06.03.2026)

INTRODUCTION

A three-day training program was conducted in the AICTE IDEA Lab from 04.03.2026 to 06.03.2026 for staff and students. The training was organized by Enthutech, the company that supplied the machines installed in the IDEA Lab. The main purpose of the program was to provide an overview, demonstration, and hands-on training on the operation and usage of the machines available in the lab. During the training, the experts from Enthutech introduced various machines such as the Vinyl Printer, CO_2 Laser Machine Cutting Machine, PCB Milling Machine, and CNC Wood Router. The sessions included explanations of the machine components, working principles, safety precautions, and practical demonstrations on how to operate the equipment. The program helped participants understand the applications of these machines and how they can be effectively used for academic projects, prototyping, and innovation activities in the AICTE IDEA Lab.

Objectives of the Training Program:

- To provide an overview of the machines installed in the AICTE IDEA Lab.
- To train staff and students on the operation and usage of machines supplied by Enthutech.
- To demonstrate the working of machines such as Vinyl Printer, CO_2 Laser Machine, Cutting Machine, PCB Milling Machine, and CNC Wood Router.
- To develop practical skills in handling and operating the machines safely.
- To help participants understand the applications of these machines in project development and prototyping.
- To encourage innovation, design, and fabrication activities using the facilities available in the IDEA Lab.

TRAINING ACTIVITIES

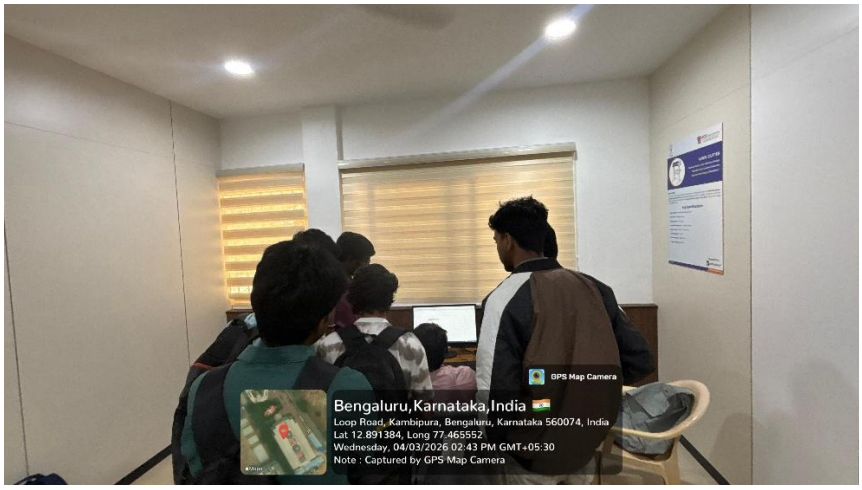
DAY 1(04.03.2026):

On the first day of the training program, the experts from Enthutech introduced the participants to the basic operation and applications of the Vinyl Printer and the CO_2 Laser Machine installed in the AICTE IDEA Lab. The session began with an overview of the machines, their components, and safety precautions to be followed while operating them.

The trainers explained the software used for operating these machines. For the Vinyl Printer, the software FlexiCorp was used to design and process the cutting of stickers. Participants were shown how to create designs and send them to the machine for printing and cutting. During the demonstration, various stickers were designed and cut using the vinyl printer.

For the CO_2 Laser Machine, the software RD Works was used to prepare the design files. The trainers demonstrated how pictures and text can be engraved and cut using the laser machine. Practical demonstrations were carried out where images and text designs were engraved and cut on suitable materials.

The session helped participants understand the design process, software usage, and practical operation of the Vinyl Printer and CO_2 Laser Machine. Staff and students actively observed the demonstrations and gained basic knowledge about using these machines for design and fabrication purposes in the IDEA Lab.



DAY 2(05.03.2026):

The second day of the training program began with a recall and review of the topics covered on the first day. The trainers briefly revised the operation and applications of the Vinyl Printer and CO_2 Laser Machine, along with the software used for designing and processing. Participants were given an opportunity to clarify their doubts regarding the previous day's demonstrations.

After the recap session, the training focused on the CNC Wood Router machine. The experts from Enthutech explained the working principle, components, and safety precautions required while operating the CNC machine. The trainers demonstrated how designs can be prepared and converted into machine instructions for cutting and shaping materials.

A practical demonstration was conducted to show how the CNC machine can be used for cutting and carving designs on wood and other materials. The participants observed the complete process, including machine setup, design execution, and finishing of the workpiece.

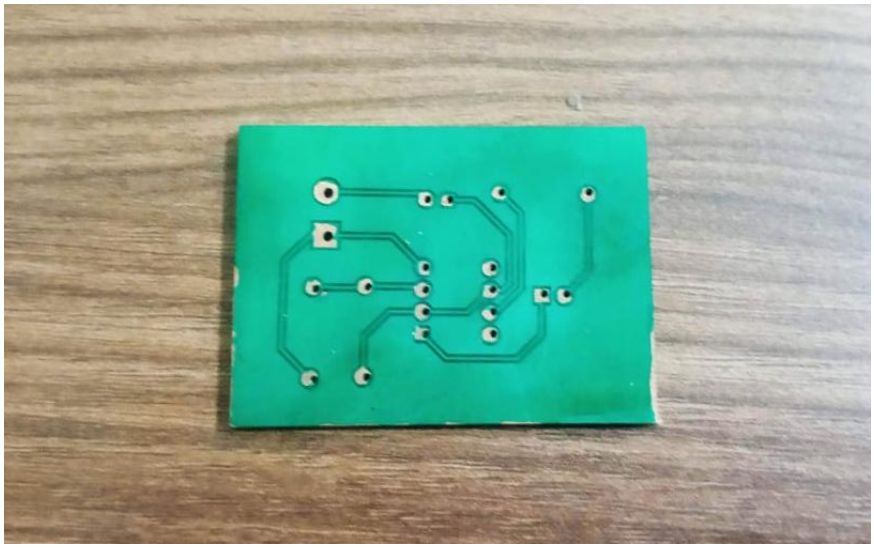
The session helped staff and students understand the basic operation, applications, and importance of CNC machines in fabrication, prototyping, and product development within the AICTE IDEA Lab. Participants actively engaged in the training and gained valuable practical knowledge.

DAY 3(06.03.2026):

The third day of the training program focused on the PCB Milling Machine and its use in electronic prototyping. The session began with an overview of the PCB development workflow, highlighting the role of software in the process. CopperCAM was used to prepare PCB design files and convert them into G-code for the milling machine. AutoLeveller ensured a perfectly leveled PCB surface, while Mach3Mill managed communication between the software and machine, allowing participants to understand how digital designs are translated into precise physical movements.

The practical session started with engraving the circuit pattern onto a copper board. Trainers demonstrated proper machine setup, PCB placement, and execution of engraving. After engraving, the board was cured using UV light to strengthen the circuit pattern and maintain durability. Participants observed each step carefully, gaining hands-on insight into precision handling and the importance of following proper operational procedures, especially for double-layer boards.

Finally, the board underwent milling and cutting to remove excess material and complete the prototype. Trainers explained finishing techniques to ensure proper connections and functional circuits. By the end of the session, participants had a clear understanding of the entire PCB prototyping process, from design and G-code generation to machine operation and finishing. This practical knowledge equips staff and students to create functional electronic circuits for academic projects and innovation activities in the AICTE IDEA Lab.



Key Outcomes / Learning

- **Hands-on Machine Operation:**
  - Gained practical experience with Vinyl Printer, CO_2 Laser Machine, CNC Wood Router, Cutting Machine, and PCB Milling Machine.
  - Learned operational techniques, safety precautions, basic maintenance, and troubleshooting methods.
  - Understood practical applications in design, fabrication, and prototyping.
- **Software Proficiency:**
  - Learned to design and prepare files using FlexiCorp, RD Works, CopperCAM, AutoLeveller, and Mach3Mill.
  - Converted digital designs into machine-ready outputs.
  - Produced stickers, engraved/cut designs, wooden prototypes, and double-layer LED PCBs.
  - Strengthened technical and problem-solving skills through practical exercises.
- **Innovation and Creativity:**
  - Encouraged exploration of design possibilities and workflow sequences.
  - Promoted teamwork and collaborative problem-solving in hands-on exercises.
- **Application in Academic and Research Activities:**

- Equipped to independently operate lab machines for projects and prototyping.
- Able to leverage IDEA Lab facilities for practical learning, innovation, and research initiatives.

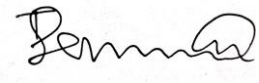
- **Overall Skill Development:**
  - Built a strong foundation in both technical and creative competencies.
  - Enhanced confidence in translating theoretical knowledge into tangible results.

CONCLUSION

The three-day training program was a comprehensive and highly productive initiative that successfully enhanced the technical knowledge, practical skills, and creative capabilities of both staff and students. Participants not only learned the theoretical principles behind the operation of advanced machinery in the AICTE IDEA Lab but also gained extensive hands-on experience with the Vinyl Printer, CO_2 Laser Machine, CNC Wood Router, Cutting Machine, and PCB Milling Machine. They developed a strong understanding of operational techniques, safety protocols, routine maintenance, and troubleshooting methods.

In addition to machine operation, the program emphasized proficiency in essential software tools such as FlexiCorp, RD Works, CopperCAM, AutoLeveller, and Mach3Mill. Participants were guided through designing and preparing digital files, converting them into machine-ready formats, and creating practical outputs such as stickers, engraved and cut designs, wooden prototypes, and double-layer LED PCBs.

By the end of the program, participants were fully equipped to independently operate IDEA Lab machines, apply them in academic projects, innovation activities, and research, and maximize the lab's potential as a platform for practical learning and prototyping. Overall, the training served as a solid foundation for skill development, empowering participants with the knowledge, confidence, and creative abilities required to translate ideas into tangible results, thereby enhancing the overall capacity and effectiveness of the IDEA La



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