



Moogambigai Charitable and Educational Trust
Dr. ACS COLLEGE OF ENGINEERING

An Autonomous Institution

Under VTU Belagavi, Approved by AICTE, UGC & GoK
No. 207, Kambipura, Mysore Road, Bengaluru – 560 074



Dr.ACSCE IDEA LAB TRAINING PROGRAM REPORT

(15 April 2026 – 31 May 2026)

Submitted By

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Executive Summary

The AICTE IDEA Lab Awareness and Training Programme was successfully conducted at Dr.ACS College of Engineering from 15 April 2026 to 31 May 2026 with the objective of promoting innovation, creativity, experiential learning, and hands-on technical skills among undergraduate engineering students. The programme was organized under the AICTE IDEA Lab initiative to familiarize students with the laboratory's advanced prototyping facilities and to encourage the effective utilization of these resources for academic projects, product development, and entrepreneurial activities.

Students from various departments, including Computer Science and Engineering (CSE), Electronics and Communication Engineering (ECE), Internet of Things (IoT), Biomedical Engineering (BME), and other engineering disciplines, participated in the programme according to a structured departmental training schedule. Each student batch attended a dedicated training session comprising theoretical presentations, interactive discussions, equipment demonstrations, and practical exposure to advanced manufacturing technologies.

The primary focus of the programme was to introduce students to the AICTE IDEA Lab ecosystem and provide comprehensive training on the CO₂ Laser Cutting Machine, one of the key digital fabrication facilities available in the laboratory. The sessions covered the fundamentals of laser cutting technology, machine components, operating principles, design preparation, parameter selection, safety procedures, maintenance practices, and various engineering applications. Live demonstrations enabled students to observe the complete workflow from digital design to finished prototype, providing valuable insight into modern manufacturing processes.

In addition to machine-specific training, participants were introduced to the objectives of the AICTE IDEA Lab, design thinking principles, innovation methodologies, rapid prototyping concepts, and opportunities for interdisciplinary collaboration. Students were encouraged to utilize the laboratory for mini projects, major projects, research activities, hackathons, product development, and startup initiatives, thereby fostering a culture of innovation and entrepreneurship within the institution.





The programme significantly enhanced students' awareness of advanced fabrication technologies and improved their understanding of prototype development processes. It strengthened practical learning by integrating theoretical concepts with real-world applications and provided students with the confidence to explore innovative engineering solutions using modern manufacturing tools.

Overall, the AICTE IDEA Lab Awareness and Training Programme successfully achieved its intended objectives by creating an innovation-oriented learning environment, promoting experiential education, and motivating students to actively engage in technology-driven project development. The initiative aligns with the vision of the All India Council for Technical Education (AICTE) and the objectives of the National Education Policy (NEP 2020) in developing skilled, innovative, and industry-ready engineering graduates capable of contributing to technological advancement and sustainable development.

About Dr.ACS College of Engineering AICTE IDEA Lab

The **AICTE IDEA (Idea Development, Evaluation and Application) Lab** at **Dr.ACS College of Engineering (Dr.ACSCE), Bengaluru**, has been established under the AICTE IDEA Lab Scheme to promote innovation, creativity, experiential learning, and entrepreneurship among students. The lab provides a multidisciplinary platform where students can transform innovative ideas into functional prototypes through hands-on learning and project-based activities.

Aligned with the objectives of **AICTE** and the **National Education Policy (NEP) 2020**, the **Dr.ACSCE IDEA Lab** encourages design thinking, STEM-based education, rapid prototyping, and collaborative problem-solving. The facility supports academic projects, research, product development, hackathons, and startup initiatives, helping students bridge the gap between theoretical knowledge and practical application.

Vision

To transform engineering education from a theory-oriented model into an innovation-driven, practice-centric, industry-aligned ecosystem empowering students to become creators, innovators, and entrepreneurs.

Mission

- Cultivate creativity, analytical skills, and entrepreneurial mindset.





- Foster a vibrant start-up culture through team-based innovation.
- Establish collaborative networks with incubators and IDEA Labs.
- Support Dr.ACSCE students in solving real-world challenges.
- Enhance employability through technical and professional skill-building.
- Collaborate with industries and social organizations.

Objectives :

- Promote hands-on learning and strengthen application of STEM concepts.
- Encourage students to ideate and convert innovative concepts into functional prototypes.
- Support multidisciplinary teamwork and collaborative problem-solving.
- Create an ecosystem that nurtures early-stage innovation and entrepreneurship.
- Facilitate industry partnerships for mentoring and technical guidance.
- Integrate design thinking and project-based learning into academics.

The key facilities available in the IDEA Lab include:

- **Makerspace** equipped with CNC milling and drilling machines for precision manufacturing and prototype fabrication.
- **Robotics Laboratory** with programmable robotic platforms, automation kits, and embedded systems for robotics and automation projects.
- **Electronics & IoT Laboratory** featuring sensors, microcontrollers, communication modules, and IoT development kits for smart system design.
- **Centre of Excellence (CoE) Laboratories** providing access to advanced research facilities and interdisciplinary project development.
- **Design and Ideation Rooms** to facilitate brainstorming, mentoring, design thinking, and collaborative innovation activities.
- **Seminar Hall** with modern audiovisual facilities for workshops, technical talks, and knowledge-sharing sessions.
- **Training Room** equipped with computer systems, CAD/CAM software, and high-speed internet to support programming, digital design, simulation, and technical training.





Training Activities Conducted

1. Introduction to the AICTE IDEA Lab

Each training session commenced with an orientation on the **AICTE IDEA (Idea Development, Evaluation and Application) Lab**, highlighting its role in promoting innovation, design thinking, experiential learning, and interdisciplinary collaboration. Students were introduced to the objectives of the IDEA Lab and encouraged to utilize its facilities for academic projects, research, prototype development, and entrepreneurial activities.

The orientation covered the following topics:

- Vision and objectives of the AICTE IDEA Lab.
- Importance of experiential and project-based learning.
- Facilities and resources available for student innovation.
- Opportunities for prototype development and product design.
- Guidelines and procedures for utilizing IDEA Lab facilities.

2. Introduction to Machines and Equipment

Students were provided with an overview of the advanced equipment and fabrication facilities available in the IDEA Lab. The session emphasized the significance of modern manufacturing technologies in engineering education and product development.

The following aspects were discussed:

- Purpose and capabilities of each machine.
- Engineering and industrial applications.
- Standard operating procedures.
- Safety precautions and maintenance practices.





- Utilization of laboratory facilities for mini projects, major projects, research activities, and innovation challenges.

The session encouraged students to integrate these facilities into their academic and multidisciplinary projects.

3. CO₂ Laser Cutting Machine Training

The primary focus of the training programme was the **CO₂ Laser Cutting Machine**, one of the key digital fabrication facilities available in the AICTE IDEA Lab. Students received both theoretical knowledge and practical exposure to the machine's operation, applications, and safety procedures.

3.1 Principle of Operation

Students were introduced to the fundamental principles of laser cutting technology, including:

- Generation of the laser beam.
- Focusing of laser energy.
- Material cutting and engraving processes.
- Advantages of laser-based manufacturing over conventional machining techniques.

3.2 Machine Components

A detailed explanation of the major components of the CO₂ Laser Cutting Machine was provided, including:

- Laser tube
- Power supply unit
- Mirror and lens assembly
- Working bed
- Control panel
- Cooling system
- Air assist system





- Exhaust system

The function of each component and its role in ensuring efficient and accurate machining were explained.

3.3 Machine Operation Procedure

Students were guided through the complete operational workflow of the laser cutting machine, which included:

1. Machine start-up and system initialization.
2. Preparation and loading of the design file.
3. Material placement and alignment.
4. Selection of laser parameters based on material properties.
5. Focusing and calibration of the laser beam.
6. Execution of cutting and engraving operations.
7. Monitoring the machining process.
8. Safe shutdown and post-operation procedures.

3.4 Safety Practices

Special emphasis was placed on safe operation of the equipment. Students were trained in:

- Safe machine handling procedures.
- Electrical safety measures.
- Fire prevention and emergency response.
- Proper use of Personal Protective Equipment (PPE).
- Laboratory safety protocols and emergency shutdown procedures.

3.5 Applications of the CO₂ Laser Cutting Machine

Students were introduced to the diverse applications of laser cutting technology in engineering and manufacturing, including:

- Acrylic cutting and engraving





- Wood engraving
- MDF sheet cutting
- Architectural and engineering model making
- Educational and academic projects
- Rapid prototype development
- Signboard fabrication
- Customized product design and manufacturing

4. Live Demonstration Session

A live demonstration of the CO₂ Laser Cutting Machine was conducted during each training session. Students observed the complete workflow, beginning with digital design preparation and concluding with the fabrication of finished components.

The demonstration enabled participants to gain practical understanding of:

- Machine functionality and workflow
- Cutting precision and dimensional accuracy
- Processing speed and operational efficiency
- Material compatibility
- Industrial applications of laser cutting technology





Figure 1.1: Demonstration of the CO₂ Laser Cutting Machine to CSE-C Students.

Student Participation

The AICTE IDEA Lab Awareness and Training Programme witnessed enthusiastic participation from students across various engineering departments. Training sessions were conducted according to a structured departmental schedule, ensuring that every student batch received comprehensive exposure to the facilities and technologies available in the IDEA Lab.

Students actively participated in interactive discussions, live demonstrations, and question-and-answer sessions, gaining valuable insights into modern prototyping technologies and their applications in engineering education.





Figure 1.2: Participation of Second-Year ECE Students during the AICTE IDEA Lab Training Programme.

Programme Outcomes

The training programme successfully achieved its intended objectives and contributed significantly to enhancing students' technical knowledge and innovation capabilities. The key outcomes include:

- Increased awareness of the AICTE IDEA Lab and its facilities.
- Improved understanding of advanced manufacturing and rapid prototyping technologies.
- Enhanced knowledge of the operating principles and applications of the CO₂ Laser Cutting Machine.
- Familiarization with standard operating procedures and laboratory safety practices.
- Development of practical skills in digital fabrication and prototype development.
- Encouragement to utilize the IDEA Lab for academic projects, interdisciplinary research, innovation challenges, and entrepreneurial initiatives.
- Strengthened experiential learning in alignment with AICTE guidelines and the National Education Policy (NEP) 2020.

Conclusion





The **AICTE IDEA Lab Awareness and CO₂ Laser Cutting Machine Training Programme**, conducted from **15 April 2026 to 31 May 2026**, successfully introduced students to the advanced facilities and opportunities available at the Dr.ACS College of Engineering AICTE IDEA Lab. The programme provided participants with valuable theoretical knowledge and practical exposure to modern digital fabrication technologies, particularly laser cutting and rapid prototyping.

Through structured training sessions, live demonstrations, and interactive discussions, students developed a better understanding of innovation-driven engineering practices, prototype development methodologies, and safe operation of advanced manufacturing equipment. The programme also encouraged students to actively utilize the IDEA Lab for academic projects, multidisciplinary research, product development, hackathons, and entrepreneurial initiatives.

Overall, the training programme has strengthened the culture of innovation, experiential learning, and design thinking within the institution, contributing to the development of technically competent, industry-ready, and innovation-oriented engineering graduates in line with the vision of **AICTE IDEA Lab** and the objectives of **NEP 2020**.

Table 1: AICTE IDEA Lab Awareness and Training Programme Schedule

Training Period: 15 April 2026 – 31 May 2026

Day	08:30 – 09:25	09:25 – 10:20	10:20 – 10:40	10:40– 11:35	11:35 – 12:30	12:30 – 01:15	01:15– 02:10	02:10 – 03:05	03:05 – 04:00
Monday	—	—	Tea Break	—	—	Lunch Break	—	CSE–J	CSE–B
Tuesday	—	—	Tea Break	—	—	Lunch Break	—	CSE–H	CSE–D
Wednesday	—	—	Tea Break	IV Semester – IoT	II Year – BME	Lunch Break	VI Semester – IoT	CSE–K	CSE–G
Thursday	—	II Year – ECE	Tea Break	CSE–F	—	Lunch Break	—	CSE–L	CSE–A

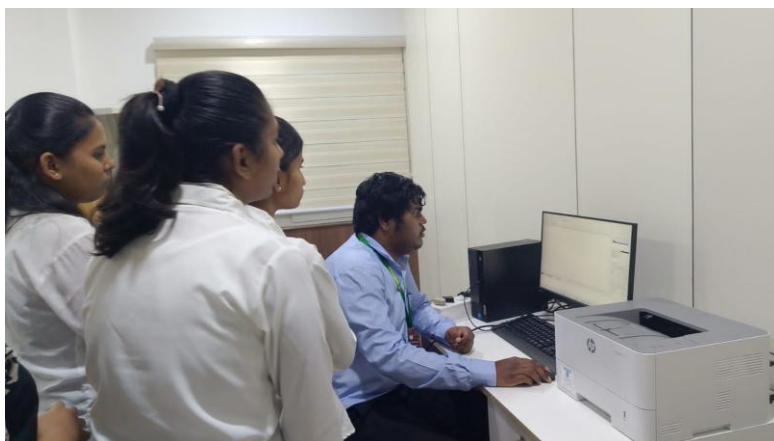




Day	08:30 — 09:25	09:25 — 10:20	10:20 — 10:40	10:40— 11:35	11:35 — 12:30	12:30 — 01:15	01:15— 02:10	02:10 — 03:05	03:05 — 04:00
Friday	—	—	Tea Break	CSE–C	—	Lunch Break	—	CSE– M	CSE– E
Saturday	—	—	—	—	—	—	—	—	—

Annexure – Photographs of AICTE IDEA Lab Awareness and Training Programme

The following photographs provide a visual record of the AICTE IDEA Lab Awareness and Training Programme conducted at Dr.ACS College of Engineering during the period **15 April 2026 to 31 May 2026**. The sessions included an introduction to the AICTE IDEA Lab, orientation on laboratory facilities, CO₂ Laser Cutting Machine training, live demonstrations, and interactive discussions with students from various departments.





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Figure 1.3: AICTE IDEA Lab training session conducted for VI Semester Internet of Things (IoT) students, demonstrating the operation and applications of the CO₂ Laser Cutting Machine.



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Figure 1.4: AICTE IDEA Lab awareness and hands-on training session conducted for CSE-C students, introducing advanced prototyping facilities and digital fabrication technologies.



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Figure 1.5: AICTE IDEA Lab training session conducted for **Second Year Electronics and Communication Engineering (ECE)** students, highlighting machine operation, safety procedures, and practical applications of laser cutting technology.

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