



SMART INDIA HACKATHON TEAM IN ASSOCIATION WITH IEEE MAGNETIC SOCIETY

REPORT ON “EMBEDDED & IoT INNOVATION BOOTCAMP: FROM IDEA TO PROTOTYPE”

Introduction

The Smart India Hackathon (SIH) Team in association with IEEE magnetic society of Sri Sairam College of Engineering organized a two-day “Embedded & IoT Innovation Bootcamp: From Idea to Prototype” on 1st and 2nd September 2026. The programme was conducted from 9.00 AM to 4.00 PM on both days at the CSE Lab. The bootcamp was designed to provide students from all departments with practical exposure to embedded systems and Internet of Things (IoT) technologies, with emphasis on transforming ideas into functional prototypes and developing solutions for real-world problems.

Resource Person

The sessions were handled by Mr. Vishal S A, Trainer, Innovate Engineering Products, Hosur. The resource person provided practical guidance on embedded system development, IoT connectivity, sensor interfacing, cloud integration and prototype development.

Objectives of the Bootcamp

- To introduce participants to the fundamentals and design principles of embedded systems.
- To familiarize students with IoT architecture, communication protocols, sensors and actuators.
- To develop practical skills in microcontroller programming and hardware interfacing.
- To demonstrate connectivity using Wi-Fi, Bluetooth and MQTT-based communication.
- To introduce cloud integration and dashboard-based IoT monitoring.
- To encourage students to convert innovative ideas into working prototypes and prepare for Smart India Hackathon (SIH).

Topics and Knowledge Shared

The bootcamp covered an introduction to embedded systems, IoT architecture and protocols, sensors and actuators, microcontroller programming, connectivity technologies including Wi-Fi, Bluetooth and MQTT, cloud integration and dashboards, and prototype development. Hands-on activities and project-oriented challenges were included to help participants connect conceptual learning with practical implementation.

Hands-on Learning and Activities

Participants were encouraged to work with embedded hardware and IoT components and to explore the complete progression from an initial idea to a prototype. The sessions emphasized sensor and actuator interfacing, microcontroller-based control, device connectivity, cloud-based monitoring and the development of application-oriented solutions. The hands-on approach helped students gain confidence in building and demonstrating IoT prototypes.

Learning Outcomes

- Developed a practical understanding of embedded system design principles.
- Gained exposure to IoT architecture, protocols, sensors, actuators and microcontrollers.

- Acquired knowledge of connecting embedded hardware to cloud platforms and dashboards.
- Enhanced the ability to develop working prototypes for real-world applications.
- Improved readiness to participate in innovation activities and Smart India Hackathon challenges.

Benefits to Participants

The bootcamp provided students with an opportunity to strengthen their practical and problem-solving skills through application-oriented learning. It helped bridge the gap between theoretical knowledge and prototype development while encouraging interdisciplinary participation, innovation and hands-on experimentation. The exposure is expected to support students in academic projects, hackathons, entrepreneurial initiatives and future technology-oriented careers.

Conclusion

The two-day Embedded & IoT Innovation Bootcamp successfully provided participants with practical exposure to embedded and IoT technologies, from basic concepts through prototype development. Around 126 participants were participated from all departments..The programme promoted innovation, hands-on learning and solution-oriented thinking, while motivating students to develop technology-based solutions for real-world challenges and participate effectively in Smart India Hackathon activities.



Dr. A. Arivarasi
Dr. A. Arivarasi
Coordinator, AP/ ECE

Prof. P. Deepika
Prof. P. Deepika
Coordinator, AP/ECE

Dr. C. Valarmathi
Dr. C. Valarmathi
SPOC – SIH

18/09/2026