MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE
(Deemed to be University)
Affiliated to JNTUA, Ananthapuramu & Approved by AICTE, New Delhi
NAAC Accredited with A+ Grade, NIRF India Rankings 2024 - Band: 201-300 (Engg.)
NBA Accredited - B.Tech. (CIVIL, CSE, ECE, EEE, MECH, CST), MBA & MCA

A Report on Three-Day Hands-on Workshop on
"Embedded Systems and IoT"
Organized by Department of EEE
in association with MITS ISTE Student Chapter
from 16.02.2026 to 18.02.2026

Report submitted by: Dr. Vineet Kumar, Assistant Professor, Department of Electrical & Electronics Engineering.
Resource Person Details: Mr. Siva Sankar Reddy – Sr. Technical Embedded & R&D; Mr. Charan R. S – Sr. Technical & Project Lead
Attendees: 50 members (offline) and 04 (online)
Venue: Seminar Hall C
Time: 9:30 AM to 5 PM

Background:
The Department of Electrical and Electronics Engineering at Madanapalle Institute of Technology & Science organized a **three-day hands-on workshop on "Embedded Systems and IoT"** from **16 February to 18 February 2026** in Seminar Hall-C. The workshop was conducted in association with the **MITS ISTE Student Chapter** with the objective of providing students with practical exposure to **embedded system design, microcontroller programming, and IoT applications**. Embedded systems play a crucial role in modern technology, enabling intelligent functionality in devices ranging from consumer electronics to industrial automation systems. The workshop aimed to bridge the gap between theoretical learning and practical implementation by providing students with hands-on experience using **Arduino platforms, sensors, and embedded programming tools**. The sessions were delivered by industry experts who shared their practical knowledge and guided students through various real-time embedded system projects.

Speaker Details:
Mr. Siva Sankar Reddy:
Mr. Siva Sankar Reddy is an Embedded Systems Specialist with a strong background in engineering and corporate training. He holds an engineering degree from Aditya College of Engineering and has over four years of experience in embedded systems and IoT development. He previously worked as an **IoT Embedded Developer (R&D) at Silicon Touch Technologies**, where he contributed to the design and development of embedded solutions for industrial applications.
Mr. Charan R. S:
Mr. Charan R. S is a Senior Project Technical Lead with more than five years of experience in embedded systems development. He completed his engineering degree from Anna University and has worked extensively in the development of embedded applications using tools such as **SimulIDE, GDB, and hardware debugging instruments**. His expertise includes microcontroller programming, embedded hardware integration, and IoT-based system design.

Detailed Summary of the Workshop:
Day 1 – Introduction to Embedded Systems and Arduino Programming:
The first day of the workshop focused on introducing students to the fundamentals of embedded systems and microcontroller-based system design. The resource persons explained the concept of embedded systems, highlighting their importance in modern electronic devices and industrial automation. The session covered the **basic architecture of embedded systems**, including sensors, analog-to-digital converters, processors, memory units, and actuators. Participants were introduced to **microcontrollers and the Sense–Think–Act principle**, which forms the basis of embedded system operation. The trainers also explained the features of popular Arduino boards such as **Arduino Nano, Arduino Uno, and Arduino Mega**, along with their hardware components and capabilities. The afternoon session focused on installing and configuring the **Arduino IDE**, followed by basic programming concepts using Embedded C. Students learned how to write and upload programs to Arduino boards and executed their first practical task of controlling an onboard LED.

Hands-on activities included:

- Blinking LED using Arduino
- Traffic light simulation using LEDs
- Basic digital output programming

These exercises helped students understand microcontroller programming and hardware interfacing fundamentals.

Day 2 – Sensor Interfacing and Hardware Integration:

The second day concentrated on sensor interfacing techniques and real-time data acquisition using Arduino. The session began with an explanation of **infrared (IR) sensors**, including their working principles and applications in object detection, motion sensing, and robotics. Participants learned how IR sensors detect infrared radiation emitted or reflected by objects to identify their presence or movement. Students were then introduced to **Light Dependent Resistors (LDR)** and their application in automatic lighting systems and environmental sensing. The working principle of LDR sensors was explained based on photoconductivity, where resistance varies according to light intensity. Hands-on experiments included:

- Interfacing IR sensors with Arduino for obstacle detection

- Interfacing LDR sensors for automatic light control

- Reading analog sensor values using Arduino IDE

Participants implemented simple automation tasks such as **light-controlled switching systems and object detection circuits**.

Day 3 – IoT Concepts and Mini Projects:

The third day focused on applying the learned concepts to real-time embedded applications and IoT systems. The trainers introduced the fundamentals of **Internet of Things (IoT)** and discussed how embedded systems are integrated with communication technologies to enable smart devices. Students were guided through practical demonstrations of combining sensors, microcontrollers, and software to create intelligent systems. Participants worked on mini-projects that integrated multiple components such as LEDs, sensors, and Arduino boards to develop basic automation systems. These projects demonstrated how embedded systems can be used in applications like **smart lighting, security monitoring, and environmental sensing**. The workshop concluded with interactive discussions where participants shared their project outcomes and clarified technical doubts with the resource persons.

SDG Mapping:

The three-day hands-on workshop on **"Embedded Systems and IoT"** aligns with several **United Nations Sustainable Development Goals (SDGs)** by promoting technological innovation, practical skill development, and sustainable engineering solutions. The workshop contributes significantly to **SDG 4 – Quality Education** by providing students with experiential learning opportunities in embedded systems, microcontroller programming, and sensor interfacing. Through hands-on training and practical demonstrations, participants enhanced their technical knowledge and problem-solving abilities in modern embedded technologies. The workshop also supports **SDG 9 – Industry, Innovation and Infrastructure**, as embedded systems and IoT technologies are fundamental to the development of smart infrastructure, industrial automation, and intelligent electronic devices. The exposure to real- time applications and mini-project development encouraged students to explore innovative technological solutions. Additionally, the event contributes to **SDG 7 – Affordable and Clean Energy** and **SDG 11 – Sustainable Cities and Communities**, as embedded and IoT systems play an essential role in smart energy management, automated lighting systems, environmental monitoring, and intelligent urban infrastructure.

POs Mapping:

The workshop significantly contributed to several **NBA Program Outcomes (POs)** of the Electrical and Electronics Engineering program. The sessions enhanced students' **engineering knowledge (PO1)** by introducing them to the fundamentals of embedded systems, microcontrollers, sensors, and IoT technologies. Through hands-on programming and circuit implementation, students applied theoretical concepts to practical embedded applications. The practical experiments and sensor interfacing activities strengthened **problem analysis (PO2)** and **design/development of solutions (PO3)** by encouraging participants to design simple embedded systems such as traffic light control, object detection systems, and automatic lighting systems. The workshop also promoted **modern tool usage (PO5)** through the use of Arduino development boards, Arduino IDE, and sensor modules for building real-time embedded applications. Furthermore, discussions on automation, smart systems, and IoT-based technologies highlighted the importance of **environment and sustainability (PO7)** by demonstrating how embedded systems can contribute to energy-efficient and smart infrastructure solutions. The interactive nature of the workshop encouraged **effective communication (PO10)** and **lifelong learning (PO12)**, as participants actively engaged with resource persons, asked technical questions, and explored new technological domains beyond their regular curriculum.

Outcome of the Event:

The event witnessed enthusiastic participation from students, faculty members.

- Participants gained a clear understanding of **embedded systems, Arduino programming, and sensor interfacing**, along with practical experience in developing simple hardware-based applications.
- The hands-on sessions helped students strengthen their **technical skills in microcontroller programming, hardware integration, and basic IoT system development**, enhancing their ability to implement real-time embedded projects.
- As an extension of the workshop learning, students proposed **innovative IoT-based project ideas** which will be further developed in the coming weeks and showcased as working prototypes during the **Institute Project Expo event**, promoting innovation and practical application of embedded technologies.
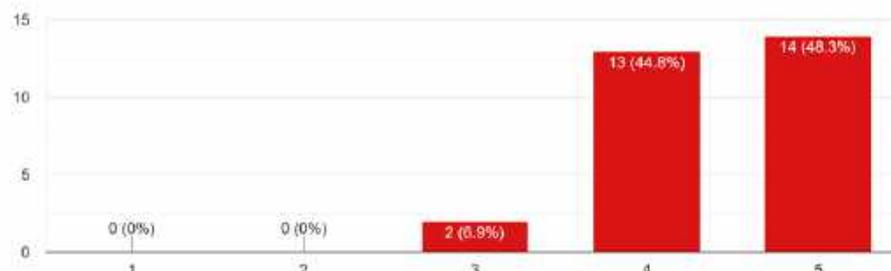
Feedback:

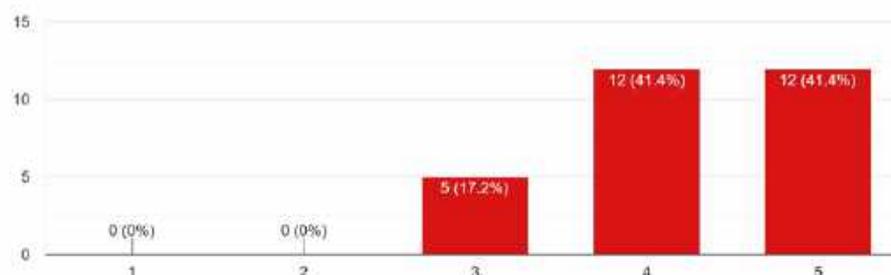1. The interactive session was scheduled at a suitable time
29 responses
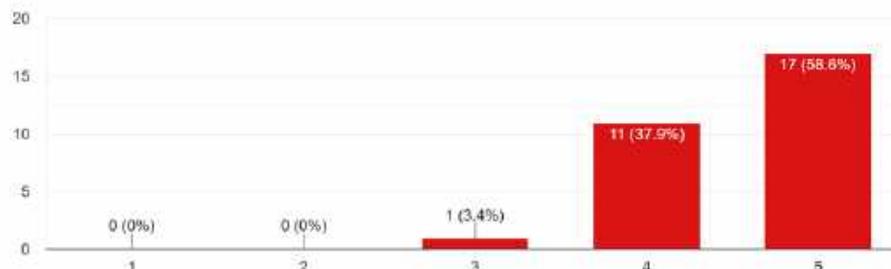
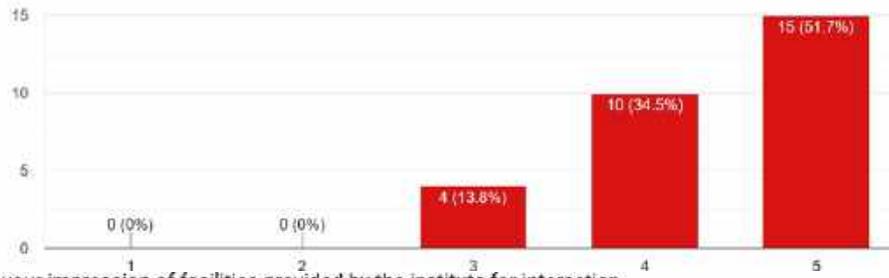2. The interaction was useful and resource person explanation.
29 responses

3. The information in the interaction was presented in a clear and organized manner.
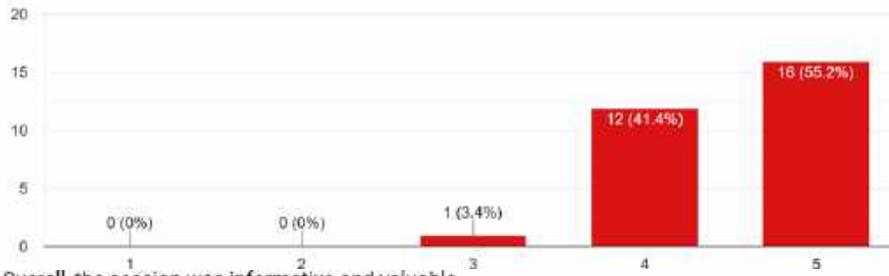29 responses

4. The presenter responded to questions an informative, appropriate and satisfactory manner.

29 responses

5. your impression of facilities provided by the institute for interaction.

29 responses

6. Overall, the session was informative and valuable.

29 responses