A J INSTITUTE OF ENGINEERING AND TECHNOLOGY
NH-66, Kottara Chowki, Mangaluru -575006, Karnataka, INDIA
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Date: 19/03/2026

REPORT ON "Smart IoT Systems Design: Hands-on IoT Prototyping with ESP32"

Name of the Program:	**Smart IoT Systems Design: Hands-on IoT Prototyping with ESP32**		**Program Dates & Timings:**	16/3/2026 to 18/3/2026 9:00 AM to 4:00 PM	
Name & Details of the Resource Person:	**Mr. GopalKrishna Bhat Kakunje, Mr. Akhilesh , Mr. Shaikh Mohammed Aftab, Ms. Sushmitha S** **Kakunje Software Pvt Ltd, Mnagaluru**				
Organized by	CSE(ICB) Dept		**In Association with (clubs/Dept.)**	IoT & Cyber Security Club	
Number of Participants	Students	61	Faculty	-	External participants: Nil
Program Outcome (PO) Mapping	1,2,3,4,5,6,7				
Coordinators	Pragathi Hegde				
Expenditure	Rs 18,538/-	**Social Media Link**	Facebook post link Instagram post link		

About the Program:

The hands-on session on "**Smart IoT System Design: Hands-on IoT Prototyping with ESP32**" was conducted on 16th, 17th & 18th March 2026 at the A-422 lab. The event was coordinated by Mrs. Pragathi Hegde, Coordinator of IoT and Cyber Security Club, organized under the Department of Internet of Things and Cyber Security Including Block Chain Technology. This event was organized for 2nd year ICB students, and AIML, ISE, CSE, and AI&DS students were also included. The resource persons, Mr. Gopalakrishna Bhat Kakunje, CEO & Managing Director, Kakunje Software Private Limited; Mr. Akhilesh Kumar, Head of R&D, Kakunje Software Private Limited; Mr. Shaikh Mohammed Aftab, Embedded System Engineer grade 1, Kakunje Software Private Limited; Ms. Sushmitha S, Embedded system Engineer, Kakunje Software Private Limited; shared valuable knowledge about IoT and its testing tools with the students.

A three-day hands-on workshop on Smart IoT System Design: Hands-on IoT Prototyping with ESP32 was successfully conducted with the objective of providing participants with practical exposure to modern IoT tools and methodologies used in the industry.

Day 1 commenced with an introductory session where the importance and basics of IoT, the ESP32 microcontroller, and the working of various sensors were explained. The resource person introduced the structure and objectives of the workshop, setting a strong foundation for the sessions ahead. Participants were then trained on the basics of ESP32 programming, beginning with the Blink program to understand GPIO control. This was followed by a session on IR sensors, where students learned how to detect objects and observe sensor outputs using serial monitoring.

The day concluded with participants gaining confidence in basic programming, GPIO operations, and sensor integration. These foundational skills provided a clear introduction to IoT and the ESP32 microcontroller, preparing students for more advanced topics such as Bluetooth and Wi-Fi connectivity in the following sessions.

Day 2 focused on advancing participants' skills with connectivity and communication in IoT systems. The session began with Bluetooth programming on ESP32, where students learned how to send and receive data wirelessly, including controlling an LED through Bluetooth commands. This was extended to an IR sensor with Bluetooth integration, allowing sensor data to be transmitted to paired devices.

The workshop then moved to Wi-Fi Station Mode, where participants connected the ESP32 to a local network and hosted a simple web server to display real-time temperature and humidity readings from a DHT11 sensor. Following this, students explored Access Point Mode, configuring the ESP32 to act as a hotspot and serve sensor data through a custom IP-based webpage.

The day concluded with participants gaining practical exposure to wireless communication protocols and web-based IoT applications. These exercises strengthened their understanding of how ESP32 can be used to design smart, connected systems, preparing them for team-based project development on the final day.

Day 3 was dedicated to project showcasing, where participants applied the concepts learned during the previous sessions to design and prototype IoT applications using the ESP32 microcontroller. Working in teams, students presented their projects, demonstrating creativity and practical application of sensors, connectivity, and programming techniques.

The workshop concluded with a valedictory function, during which participants shared their feedback and reflections on the workshop. This final session highlighted the skills gained, the enthusiasm of the students, and the overall success of the program in inspiring interest in IoT system design.

Objectives:

- To introduce students to the fundamentals of Smart IoT using ESP32.
- To create awareness about the importance of efficient IoT system design.
- To familiarize students with various sensors and ESP32 microcontroller.
- To provide hands-on exposure to Smart IoT Designs used in real-world scenarios.
- To enable students to design and prototype simple IoT applications using ESP32.
- To encourage students to apply IoT concepts creatively in team-based projects.

Outcomes: On successful completion of program of this session, the key outcomes are:

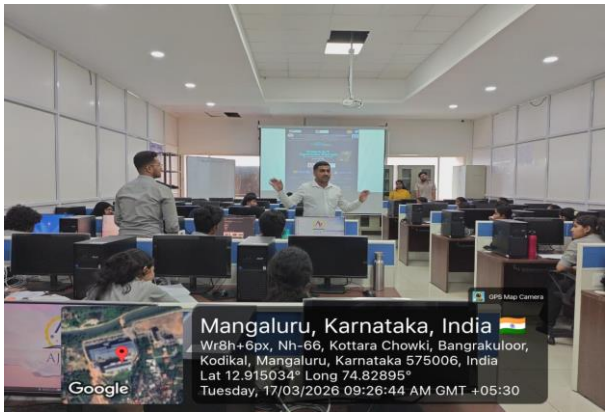
- Students gained a clear understanding of core IoT concepts and challenges.
- Students became familiar with ESP32 microcontroller and various sensors.

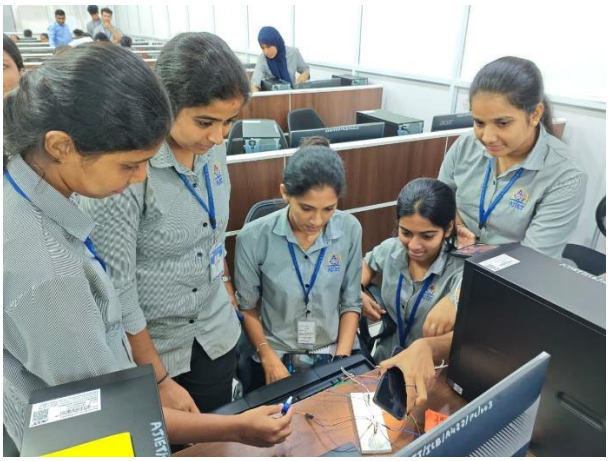
- Participants developed basic skills in IoT prototyping and circuit connections.
- Students understood the practical applications and working principles of ESP32.
- The workshop enhanced students' interest in IoT as a potential career or specialization area.
- Students were able to appreciate the importance of Smart IoT System Design in real world context.

Articulation Matrix:

Course Outcomes	Program Outcomes											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1	3	2	1	-	2	-	-	-	-	-	-	2
2	3	2	2	1	3	-	-	-	-	-	-	1
3	3	2	3	2	3	-	-	-	2	-	-	2
4	2	2	2	2	2	2	2	-	-	-	-	2
5	1	-	-	-	1	-	-	-	-	-	-	3
6	2	2	3	1	2	2	2	1	-	-	-	2
Average	2.3	2	2.2	1.5	2.17	2	2	1	2	-	-	2

Photos:





Coordinator

Pragathi Hegde

HOD **Dean Academics** **Principal**

For Information: Vice President, LMET
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