MAR BASELIOS CHRISTIAN
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KUTTIKKANAM, PEERMADE

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AZTECS

ELECTRONICS & COMMUNICATION ENGINEERING

DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING

RP2040 - EMBEDDED SYSTEMS BOOTCAMP

5-DAY ADD-ON COURSE FOR
SECOND YEAR & THIRD YEAR ECE STUDENTS

ABIN ANTONY
R & D ENGINEER
VI MICROSYSTEMS PVT LTD

JOHN BENARJIN
TECHNICAL ENGINEER
VI MICROSYSTEMS PVT LTD

1st - 5th DECEMBER 2025 | MONDAY - FRIDAY

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"Add-On Course for " RP2040-Embedded Systems Bootcamp"

PROGRAM DETAILS:

Date: 1st December 2025 to 5th December 2025

Venue: Central Computing Facility (CCF)

Speakers:

Abin Antony (R&D Engineer), VI Microsystems Pvt. Ltd.

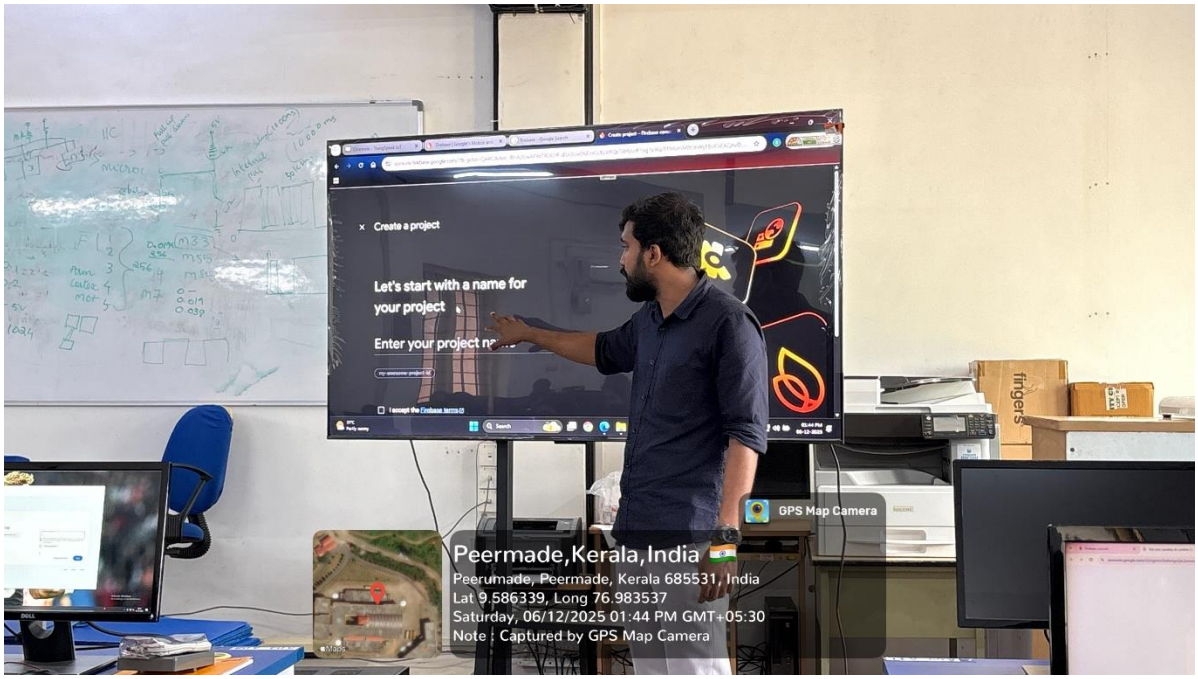
John Benarjin (Technical Engineer), VI Microsystems Pvt. Ltd.

An add-on course titled **"RP2040 Embedded Systems Bootcamp"** was successfully conducted by the **Department of Electronics and Communication Engineering** for second and third year students from **1st to 5th December 2025**. The program aimed to provide hands-on knowledge and practical exposure to embedded systems using the RP2040 microcontroller.

The sessions were handled by **Abin Antony** and **John Benarjin**, who brought strong industry experience and guided the students through both theoretical concepts and practical implementations.

The bootcamp began with an introduction to embedded systems, covering their applications and the role of firmware in real-world devices. Students were then introduced to microcontroller architecture, with a focus on the RP2040, including its internal components such as CPU, GPIO, ADC, timers, and memory.

Subsequent sessions focused on interfacing sensors and electronic components such as switches, PIR sensors, potentiometers, LM35 temperature sensors, and ultrasonic sensors. Students gained foundational knowledge of digital and analog signals and how to work with them effectively.



A simulation environment using Wokwi was introduced, allowing students to practice LED control, switch interfacing, and basic logic design virtually. This was followed by hands-on hardware sessions where students implemented LED blinking, switch interfacing, and debouncing techniques using the RP2040 kit.

The course also covered display systems, including seven-segment and LCD displays, enabling students to visualize sensor data. Motor control using PWM and servo motors was demonstrated through both simulation and practical sessions.

Further sessions explored analog data acquisition using the RP2040 ADC, including techniques for reading sensor values and handling noise through basic filtering methods. An introduction to IoT concepts was provided, where students learned about communication protocols and demonstrated cloud integration using platforms like ThingSpeak and Blynk.

The bootcamp concluded with an evaluation session consisting of a test and hands-on coding assessment, followed by a feedback session and project discussions.

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