

**Report on**  
**5 Days Workshop on**  
**"Embedded System and IoT Using Arduino and Node MCU"**

**Date: 24th - 28th April 2019**

**Time: 10:00 A.M. - 5:00 P.M.**

**Venue: B0 Hall, GTU, Ahmedabad**

Gujarat Technological University has established Design Innovation Centre (DIC - HUB) at GTU's Ahmedabad Campus, Shed No. 2, Chandkheda Campus, Ahmedabad to promote innovation and to provide a facility for the students/Innovators/ Start-ups, where they can develop products and test new ideas. GTU regularly organizes workshops and seminars to upgrade knowledge and build advanced skills among the students of Engineering.

GTU organized Five Day Workshop on "Embedded System and IOT Using Arduino and Node MCU " during 24th - 28th April 2019 at C-i-C3, Design Innovation Centre GTU, Ahmedabad. 54 participants had participated in this workshop which included 3 Faculties member and 2 post graduate students. The participants were from diverse fields like Computer Engineering, Electronics, Biomedical , Mechatronics, Electrical Engineering and Information Technology.

The workshop commenced with welcome address and introduction of CiC3 Centre and OSTC Club to student by Ms. Dhwani Sanghavi (Research Assistant - IT) and Introduction of DIC Centres and about GIC by Ms. Kavita Kripalani (Deputy Director).

**About Resource Person:**

**Day 1 & 2 : (24th - 25th April 2019)**

Raj Hakani was a academic expert who shared his insights, real life scenarios, practical use cases and their solutions on Arduino and Hands on Development using various Sensors, Arduino Boards, and Actuators.

## Day 3, 4 & 5: (26th - 28th April 2019)

Jaydeep Bhadani and Akash Patel were an industry experts from ACDC and shared their insights, real life scenarios, practical use cases and their solutions on Internet of Things and Hands on Development using various IoT kits.

## Detail of Workshop

### Day – 1 (24 April 2019)

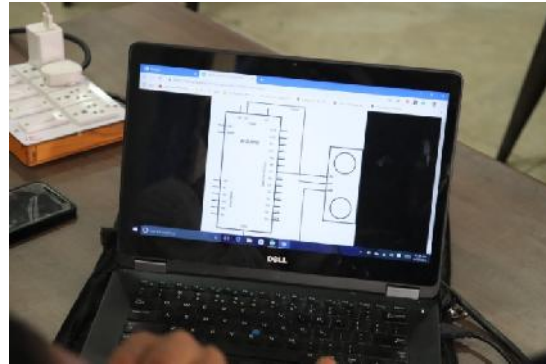
First session was started at 10:30 AM by ARDUINO by expert Asst. Prof Raj Hakani from CiC3 Section of GTU. By this session students were acquired knowledge of ARDUINO. He has given introduction of different open source boards and briefed about open source Community. The journey of Microprocessor and Microcontroller was explained to students with different examples of application and assembling of programs of processors and controllers. Also, he explained various application of present technological era.



In next session he introduced Arduino board to students, which included different components of Arduino and different Types of Arduino boards. Demonstrating the Arduino software installation and described how the software worked with Arduino board. Pin Description and Pin Command for an Arduino board.



In the afternoon session Arduino boards were provided to students for hands-on practical. In this session Prof Raj Hakani taught basic Arduino programming and its modification of program, understanding of the digital & analog functions, and serial interface to students. Student performed programming over the Arduino circuit for LED connection, LED Pattern, Seven Segment, LED Matrix and interface with LCD.



## Day -2 (25th April 2019)

Day 2 started with interfacing of LCD, Making Counter on LED, Interfacing serial data with a LCD, and Digital Clock on simulation. Student also play with various command of LCD Scrolling, blinking etc.



In the afternoon session Sensor and actuators were provided to students for hands-on practical. In this session Prof Raj Hakani explained about the sensors, its need with type of sensor working principal of sensors like Temperature measurement, distance measurement, magnetic sensor. Student interfaced with LM35, Ultrasonic sensor, flex sensor, IR sensor whose display received data on serial monitor as well as on LCD display Screen. Student has also learnt various motor driver IC and type of motors along with interface DC Gear motor with an Arduino.

## Day -3 & 4 (26th - 27th April 2019)

Session started by expert Jaydeep Bhadani from ACDC. Through this session students had in depth knowledge of IOT and NODE MCU, MQTT Protocol, webpage creation and upload data on cloud and its retrieval.

Following Topic were considered during Third and Fourth day of workshop

- The basic usage of the Arduino & NodeMCU environment for creating your own embedded project at low cost.
- Use of Arduino in IoT
- How to sent data to the internet and talk to the cloud.
- How to update sensor reading on Social networking sites.
- How to control any devices from anywhere across the cloud.
- How to connect to cloud ready IoT server using MQTT.



## Day -5 (28th April 2019)

Last Day of Workshop Participant developed and wrote Code for Mini Project by using Arduino and IOT

Following Mini Projects were developed in Last Days of Workshop

- Smart Irrigation System
- Smart Traffic Light System
- Smart Weather Monitoring System

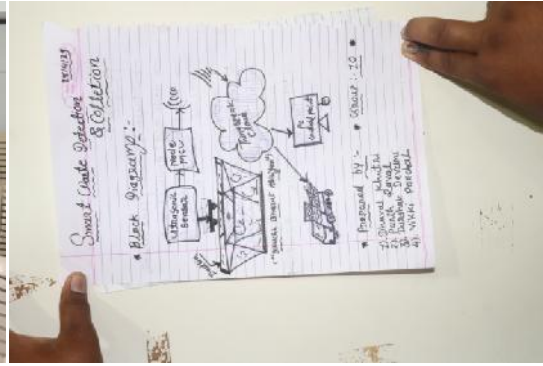


- Smart Mall
- Smart Parking System
- Smart Waste detection and Collection



### Project Demonstration and Explanation





### Certificate & Award Distribution :



### Feedback:

- The workshop is organized in a very clean and good way so that all branch student can understand this workshop - **Vandan joshi, BE - EC Branch, GEC Modasa,**
- We find this useful and informative that we attended this workshop. We can better understand the concepts and coding and how we can make an idea work.  
- **Alex Rameshbhai Pateliya, Computer Branch HGCE, VAHELAL**
- I especially enjoyed Mentors (specially Raj Sir's & Jaydeepbhai) training, he communicated very clearly and was easily able to solve all our doubts.  
**Zeel Rajuaat Pathak, BE - IT, GEC - Gandhinagar**

- Excellent management and fully attribute to Faculty Mentor.  
- **Er. Vishal Gadhavi, M.E. - Electrical - Swaminarayan College of Engg.**
- Excellent workshop and it should be extended to Phase-2 (Model based hands on)  
**Dr. Ujjaval Patel, Faculty - Electrical Branch, Adani Institute**



**For more details:**

Community Innovation & Co-Creation (CiC3)

Shed No. 2, GTU Chandkheda Campus

Ahmedabad 382424

Write us on: [cic3@gtu.edu.in](mailto:cic3@gtu.edu.in), [ap\\_raj@gtu.edu.in](mailto:ap_raj@gtu.edu.in)

Contact us: 079 23267531

**Report Prepared by: Raj Hakani, Asst. Prof**

**sd/-  
I/C Registrar**