Anil Neerukonda Institute of Technology & Sciences (Autonomous)
(Permanent Affiliation by Andhra University &Approved by AICTE
Accredited by NBA (ECE,EEE,CSE,IT, Mech. Civil & Chemical) & NAAC)
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Report on "A Two-Day workshop on Idea to Prototype"

Date: 24-02-2023 to 25-02-2023

Resource Persons: Dr. P. Murugapandiyan, Associate Professor, ECE, ANITS.

Dr.G.Prasanna, Assistant Professor, ECE, ANITS.

Target Audience:I/IV and II/IV B. Tech Students

Total no of Participants: 60 Nos.

Objective of the workshop:

- To expose the students to the prototype development using Arduino.
- To Learn programming concepts using C along with Arduino specific programming.
- To Understand best practice concepts for programming and build own innovative project with Arduino prototyping.

Outcome of workshop:

By attending this workshop, the students can be able to do develop a porotype using Arduino for various societal applications. Further, the students will gain knowledge on hardware design that enables them to build own innovative project with Arduino prototyping.

Description / Report on Event:

The Department of Electronics and Communication Engineering in association with Institution's Innovation Council (IIC), ANITS organized a Two-day workshop on A Two-Day workshop on Idea to Prototype on 24th-25th Feb 2023. A Two-day workshop began with inaugural address by Prof. K. Sri Rama Krishna, Principal, Anil Neerukonda Institute of Technology and Sciences, who highlighted the need for getting exposed to latest advancements. The students were told that **Institution innovation Council (IIC)** is organizing various events periodically for exposing the students to latest trends. It was mentioned that either for completing mini or major projects as well as for developing prototype for societal applications, the students should always get themselves get equipped with latest trends. Even after the completion of the B. Tech programme, the need to deliberate their innovation on various platforms. It was also suggested not to

restrict their projects to simulation levels but to develop working models using hardware. All the students are advised to actively participate in such events and enhance their skills.

In the Day 1 morning session (10 AM to 12.30 PM), resourceperson Dr. P. Murugapandiyanpresented the need for getting exposed to Arduino Platform and asked the students to involve and practice the basic interfacing concepts such us LED, LDR, Servo motor, DC motor, Ultrasonic sensor, and Temperature/humidity sensors interfacing with Arduino. All the students were explained about the basics of embedded systems and its role in solving the real time problems. It was told that with the advent of Internet of things, more areas have under the umbrella of providing solutions to real time issues. This was followed by explaining the students about the differences between a microprocessor and micro controller. Later the basics of Arduino were explained to students.

In the Day 1 afternoon session (1.30 PM to 3.30 PM), resource person Dr. P. Murugapandiyan presented the boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models were explained.It was told that Arduino is an open-source hardware and software platform to develop kits for digital devices. Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards ('shields') or breadboards (for prototyping) and other circuits.

In the Day 2 morning session (10 AM to 12.30 PM), resource person Dr. G. Prasanna explained the importance of short-range wireless connectivity in Arduino applications to the students. Specific focus was given to Bluetooth® wireless connectivity between Arduino based embedded systems and Android® mobile apps. Initially, the students were taught how to configure a commercial-off-the-shelf Bluetooth module-the HC-05, by using the AT-mode commands. The AT-mode allows the designer to configure the data communication speed, password authentication and naming of the device. Later, the students were introduced to the technique of programming Android mobile Apps using the free online development platform- The MIT App Inventor. The students were trained to develop beginner level Apps to acquaint themselves with the workflow of MIT App Inventor. The session concluded with a design and demonstration of simple communication application by the students, whereby a single byte data from mobile app is used to control digital I/O pins of Arduino.

The Day 2 afternoon session (1.30 PM to 3.30 PM), focused on design of Internet of Things (IoT) enabled applications. Resource person Dr. G. Prasanna trained students to develop advanced level apps featuring real time data display

(Scrolling graphs) and IoT cloud-based data saving features. The students were trained to upload the data received by the mobile app over the short-range Bluetooth link to the IoT cloud storage platform- The Thingspeak. The data communication to cloud was done using long-range mobile data link. To enable this design students were trained to configure and use the Thingspeak IoT-Cloud Platform. At the end of this session students successfully demonstrated Arduino applications which gather local data from analog sensors like MQ2 gas sensor, LDR sensor and upload it to remote IoT cloud usingweb-enabled Android mobile apps.

The workshop was beneficial to the students in various aspects. They learnt and interacted to resource persons to know the basics of Arduino board and its programming logic. Students interacted through questions and answer sessions. In group of three, Arduino kit was provided which is going to be useful to the students in their innovative project work. It was a very successful workshop appreciated by the participants. The participants got various inputs regarding the importance of Arduino Programming and IOT applications using MIT App Inventor. On the last day of Workshop student's feedback was also collected for further improvements of this kind of workshop.

The valedictory session was held on Day 2 at 3.30 PM. Prof.B.Jagadeesh, Head of the Department, ECE, ANITS welcomed all the faculty and students. He appreciated the workshop coordinators and student's participants. Then the certificates were given to the student participants.Finally, the valedictory session ended with vote of thanks by Dr.P. Murugapandiyan.

Coordinators:

Dr. P. Murugapandiyan, Associate Professor, ECE, ANITS.

Dr. G. Prasanna, Assistant Professor, ECE, ANITS.

Head of the Department, ECE:

Prof. B. Jagadeesh

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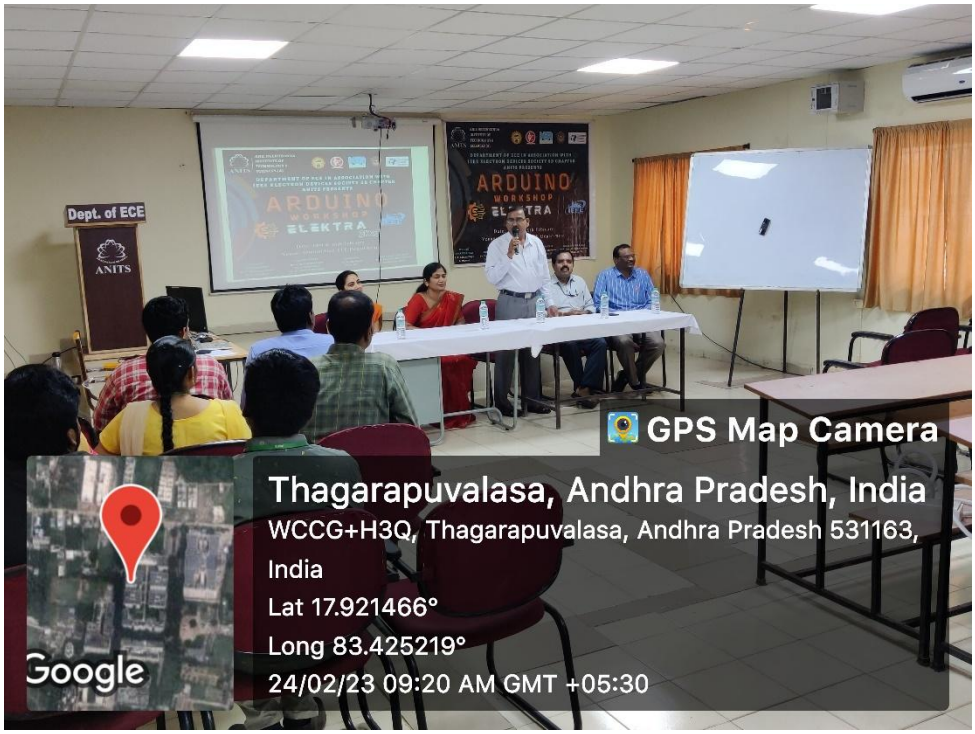
Program Schedule of "A Two-Day workshop on Prototype Development using Arduino"

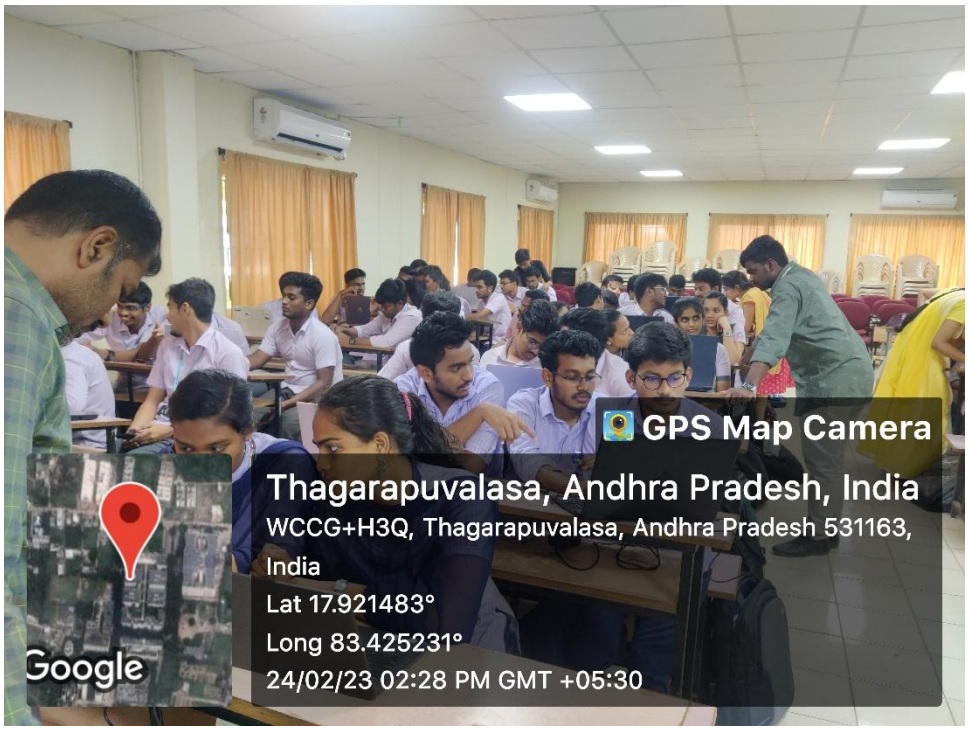
Day 1 (24-02-2023), Venue: ECE Seminar Hall		
S.No	**Programme**	**Timing**
1	Reporting of the students and faculty coordinators	8.45 AM to 9 AM
2	Arrival of Dignitaries & Seating	9 AM to 9.30 AM
3	**Inaugural Session:** Introduction of the workshop and inaugural speech by **Dr.P.Murugapandiyan** Words of wisdom and blessings by **Prof. K. Sri Rama Krishna, Principal,** Anil Neerukonda Institute of Technology and Sciences	9.30 AM to 10 AM
4	**Workshop Session - I** (Introduction to Arduino Hardware & Programming) 1. Introduction to Microcontroller and Arduino Integrated Development Environment (IDE) 2. Introduction to Arduino Hardware 3. Programming Arduino- Basic Input and Output 4. Programming LED as Output Device and Switches as Input Device along with Hardware Implementation 5. 5. Introduction, Programming and Hardware Implementation of Relays to control AC and DC Appliances	10 AM to 12.30PM
LUNCH TIME (12.30 PM to 1.30 PM)		
5	**Workshop Session - II** 1. Serial communications interfaces. 2. Introduction to various Arduino shields and its applications.	12.30 PM to 3.30PM
Day 2 (25-02-2023), Venue: ECE Seminar Hall		
S.No	**Programme**	**Timing**
1.	Bluetooth Interfacing with Arduino	9.30 AM to 10.30 AM
2.	Introduction to MIT App inventor and developing simple mobile app.	10.30 AM to 12.30 AM

LUNCHTIME (12.30 PM to 1.30 PM)		
3.	Building IoT applications using Bluetooth/Arduino/MIT app inventor	1.30 PM to 2.30 PM
4.	Project Assignment to participant in IoT applications.	2.30 AM to 3.30 AM
5.	Valedictory sessions	3.30 AM to 4.10PM

Glimpse of "A Two-Day workshop on Idea to Prototype"



Inaugural address by Prof.K.Sri Rama Krishna, Principal, ANITS.



Dr.G.Prasanna giving demo for participants.

Valedictory session: Certificate Distribution to participants by Prof.K.Sri Rama Krishna, Principal, ANITS.

Valedictory session: Certificate Distribution to participants by Prof.B.Jagadeesh, HOD, ECE, ANITS.