

CHHOTUBHAI GOPALBHAI PATEL INSTITUTE OF TECHNOLOGY

Department of Electrical Engineering

A REPORT

ON

Three Days Training Program on “Hands On: Electrical Engineering Applications using Arduino and MATLAB”

Title of the Workshop	Hands On: Electrical Engineering Applications using Arduino and MATLAB
Organizing Department	Department of Electrical Engineering
Chief Patron	Dr. D. R. Shah, Provost, UTU.
Patron	Dr. N. C. Shah, Director, CGPIT.
Convener	Prof. Rakesh S. Gajre (Head of EC/Electrical Dept.)
Organizing Secretary	Asst. Prof. Priyanka Patel Asst. Prof. Unnati Mali Asst. Prof. Ashish Chaudhari
Organising Committee	Asst. Prof. Jay Patel Asst. Prof. Umang Wani
Target Audience	Research Scholars and Final Year Engineering students.
Total Number of Participants	52
Date of Programme	4 th - 6 th August, 2016
Invited Speakers	Mr. Nilesh V. Shah, Associate Professor & Head of Electrical Engineering Department, SCET. Mr. Umang Wani, Assistant Professor, Electrical Engineering Department, CGPIT. Mr. Vishvajit Bakrola, Assistant Professor, CO/IT Department, CGPIT.

Schedule of Workshop

Thursday (4/08/2016)	Friday (5/08/2016)	Saturday (6/08/2016)
Registration & High Tea (8.30 AM – 9.00 AM)	High Tea (8.30 AM – 8.45 AM)	High Tea (8.30 AM – 8.45 AM)
Arduino Basics (Prof. Vishvajit Bakrola) (9.00 AM - 11.00 AM)(B-102)	Interfacing of Motor with Arduino (Prof. Vishvajit Bakrola) (8:45 AM-10.45 AM)(D-204)	Arduino interfacing with MATLAB (Prof. Vishvajit Bakrola) (8.45 PM – 10.45 P.M.)(D-204)
Lunch break (11.00 P.M.-11.45 P.M.)	Lunch break (10.45 P.M.-11.30 P.M.)	Lunch break (10.45 P.M.-11.30 P.M.)
Arduino Programming (Prof. Vishvajit Bakrola) (11.45 AM – 1.45 P.M.)(B-102)	D.C Voltmeter using Arduino (Prof. Vishvajit Bakrola) (11.30 AM – 1.15 P.M.)(D-204)	MATLAB Simulink (Prof. Umang Wani & Prof. Unnati Mali) (11.30 P.M. - 1.30 P.M.)(D-204)
Tea break (1.45 PM – 2.00 PM)	Tea break (1.15 PM – 1.30 PM)	Tea break (1.30 PM – 1.45 PM)
LCD, LED, Buzzer Interfacing with Arduino (Prof. Vishvajit Bakrola) (2.00 PM-3:30 PM) (D-204)	MATLAB Programming (Prof. Nilesh V. Shah) (1.30 AM-3.30 AM)(D-204)	Valedictory and Certificate Distribution (1.45 PM - 2.00PM)

Details of the Workshop:

Preamble:

Department of Electrical Engineering, CGPIT has organized Three Days Training Program on “Hands On: Electrical Engineering Applications using Arduino and MATLAB” 4 - 6 August, 2016 sponsored by Uka Tarsadia University. Total 52 participants participated in this Training Program, which includes B.tech and M.tech students from CGPIT. Out of which 42 students were from B.Tech final year and 10 students from M.tech final year participated.

As per tradition of CGPIT, all the dignitaries were given a warm welcome and were felicitated to express respect and gratitude towards them for devoting their valuable time and gracing the workshop. The dignitaries that graced the inauguration ceremony of workshop were Dr. N. C. Shah (Director, CGPIT), Dr. Chinmay Desai (Head of Mech/Auto Department, CGPIT), Mr. Devendra Thakor (H.O.D., CO/IT Department). Along with the dignitaries and experts were felicitated by the coordinators of the workshop. The training programme was initiated by a small welcome address to the participants.

Asst. Prof. Umang Wani gave a brief introduction about the training programme. He introduced the experts and expressed his views about the importance of Arduino and MATLAB.

The Honourable Director of CGPIT, Dr. N.C. Shah gave the welcome speech. He motivated the students and faculties for participating in technical events like short term training program, workshop, expert talk, etc. As this training programme consisted of hands on session, he emphasised the importance of teaching methodology i.e. “learning while doing”. He also congratulated and appreciated the efforts made by the Electrical department for organizing such workshop.

Session Detail:

All the sessions were very interactive and laid a very good impact on the audience.

Session-1: Arduino Basics

Session-2: Arduino Programming

Session-3: LCD, LED Interfacing with Arduino

Session-4: Buzzer Interfacing with Arduino

Session-5: Interfacing of Motor with Arduino

Session-6: MATLAB Programming

Session-7: Interfacing of Motor with Arduino

Session-8: MATLAB Simulink

- **Arduino Basics**

In this session, Mr. Vishwajit Bakrola discussed about the basics of Arduino. He discussed regarding controller and what is Arduino, how it can be easy. In which he discussed and introduced **ARDUINO** as an **open-source prototyping platform** based on easy to use hardware and software and thus easy for beginners, yet flexible enough for advance users. Thus he compared it as a tiny computer system that can be programmed with our instructions to interact with various forms of input and output. He also discussed about Arduino Integrated Development Environment (IDE) which resembles a simple word processor and using Arduino programming language various project can be executed.

- **Arduino Programming**

In this session, Mr. Vishwajit Bakrola discussed about the basics of Arduino Programming Language which is fairly a simple basic structure runs in at least two parts

i.e, setup() and loop(), preparation and execution respectively. He discussed in detail regarding how declaration of any variable at the very beginning of the program should be done in setup function and about the core of all Arduino program i.e., loop function which include the code to be executed continuously – reading inputs, triggering outputs.

- **LCD and LED Configuration**

In this session, Mr. Vishwajit Bakrola discussed about how LCD can be configured with Arduino and can use it to display any notification in the hardware implementation. Also he taught how the LED can be light by programming as per the application. He made students to implement the LED connection by giving the command by Arduino to turn them “ON” and “OFF” and also made them display any comment on to LCD.

- **Buzzer Interfacing with Arduino**

In this session, Mr Vishwajit Bakrola taught them how buzzer can be added to the LED and LCD implementation.

- **Interfacing of Motor with Arduino**

In this session, Mr Vishwajit Bakrola taught servo motor and stepper motor interfacing with Arduino. He also explained how steps or angles of rotation are given using arduino in stepper motor and also how motor is rotated clockwise or anticlockwise.

- **MATLAB Programming**

In this lab session, Prof. Nilesh Shah gave the brief introduction regarding MATLAB. In that he made the students understand the concepts by making them to do simple fundamental problems. Thus he also cleared the concepts of logical operators, arithmetical operators and plotting. He also discussed the simulation of PV cell and thus focused on the use of renewable energy sources.

- **MATLAB Simulink and GUI**

In this session, Mr. Umang Wani and Ms. Unnati Mali have explained about MATLAB simulink model editor, block library and different solvers available in Simulink. Also they have explained how mathematical modelling can be implemented in simulink. Graphical User Interface Development Environment (GUIDE) in MATLAB also explained by Ms. Unnati Mali.

Glimpse of the Workshop:



The Venue



High Tea



Dignitaries on the dais



Welcoming Dignitaries



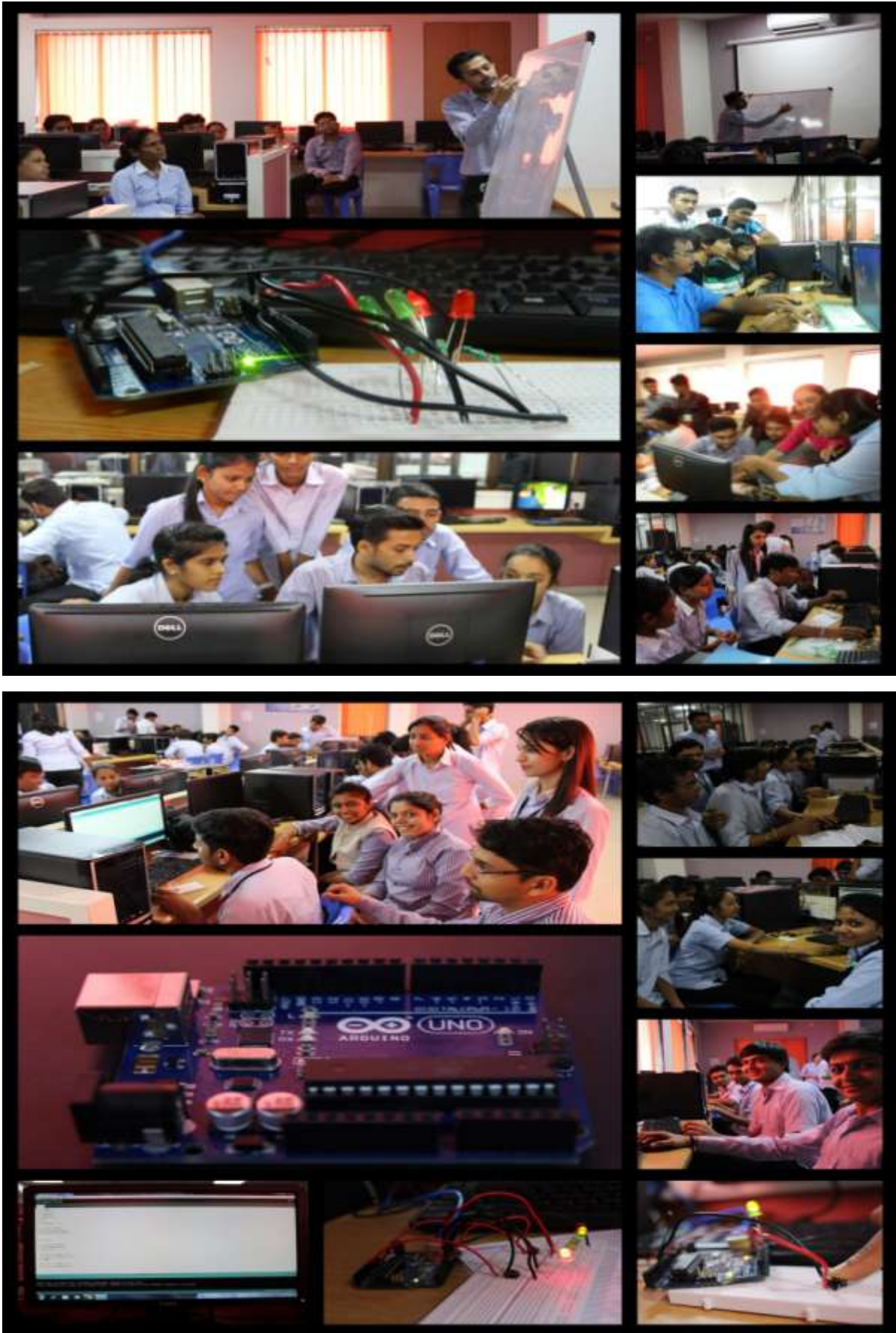
Speech by Dignitaries



Workshop Coordinators with Dignitaries



Technical Session by Expert



Lab Session



Thanking to experts

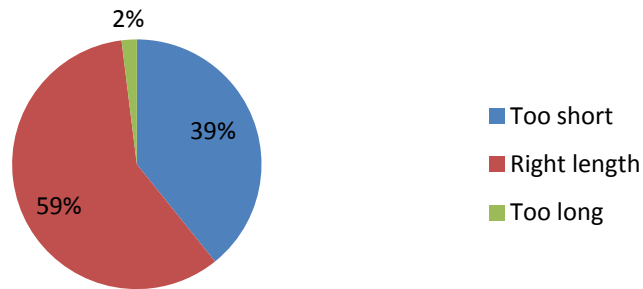
Committee members of the Workshop:

Sr. no	Committee	Members	Tasks to be performed
1	Certificate	Prof. Jignasha Ahir Prof. Nitiksha Pancholi	Printing Certificate & Certificate Writing
2	Registration, Kit	Prof. Yashvi Parmar Prof. Hiren Sidhapuria	Handling participation entries, Collection of registration fees, Handling cancellation of any participation, Preparation of registration kit
3	Report writing and Photography	Prof. Nidhi Shah Prof. Chand Thakor	Summarizing each session, Complete report writing with photos and feedback, Clicking good photographs, Storing good photographs for report making.
4	Class and Lab arrangement, Food	Prof. Ranjit Rajak	Arranging the venue as per schedule, Software installation, Infrastructure arrangement (mike, speaker, white board, marker, water, chair, etc.), Arrangements for food including breakfast and tea.
5	Feedback & Distribute the final material	Prof. Arjun Jariwala Prof. Zalak Vyas	Take feedback, Analyse the feedback, Generate graph, Send the final PPT or any material

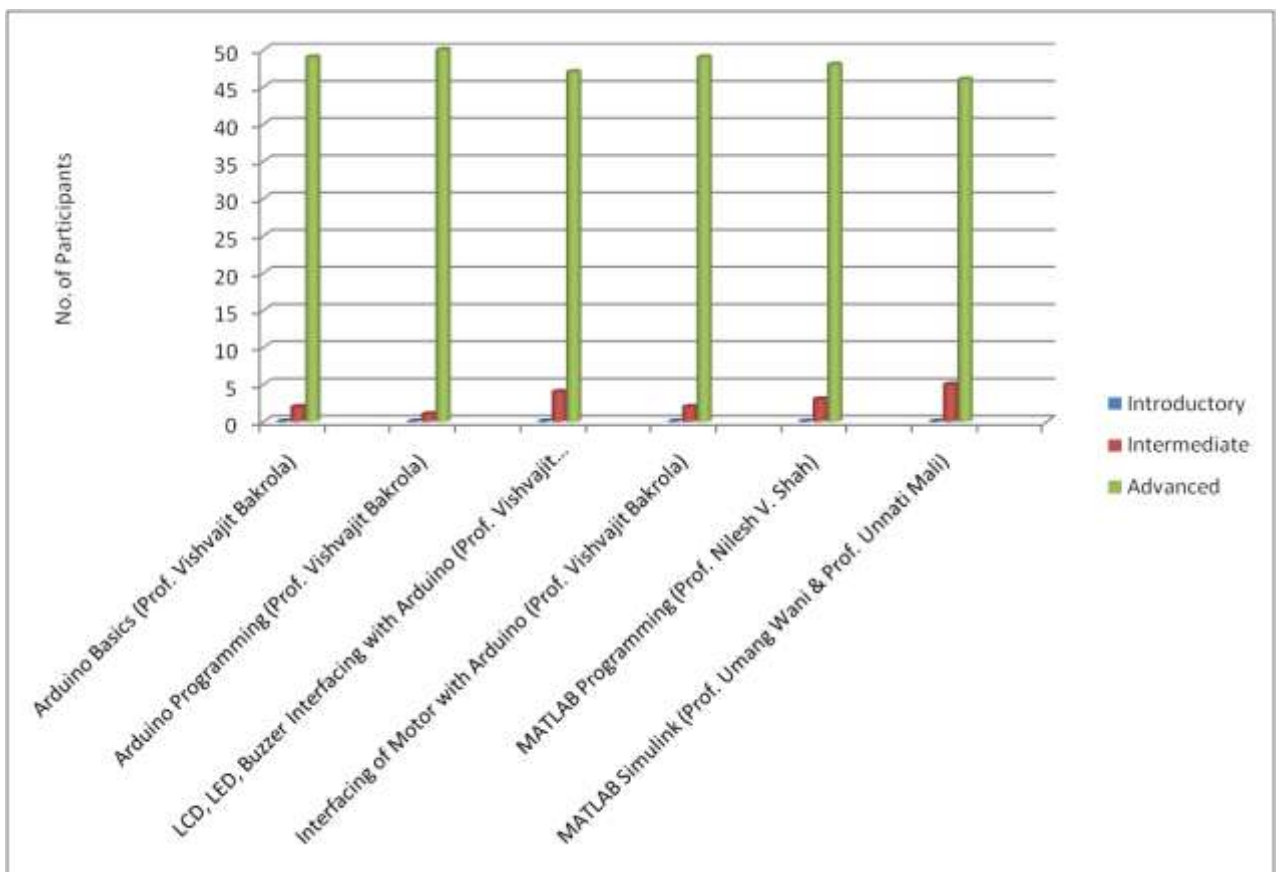
Feedback Analysis:

Feedback was collected from the participants in last session of the Workshop. The overall feedback of the Workshop was very positive. Here are some of the feedbacks, which were given by participants.

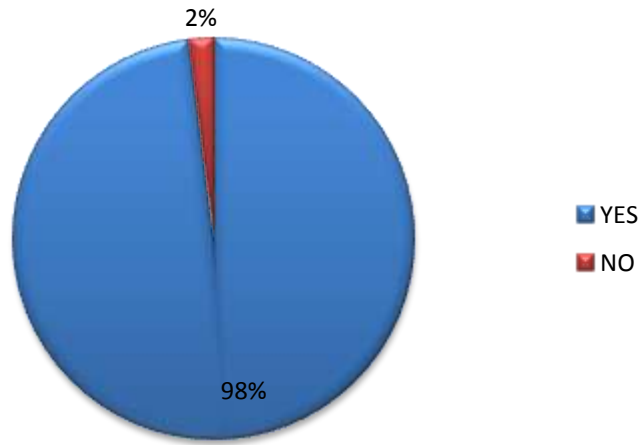
1) For the given topic, This Training Program was



2) Topics covered during Training Program



3) Were Practical sessions conducted during Training Program well organized?



4) Were practical sessions were relevant to other sessions of the STTP?

