TRAINING REPORT ON

RASPBERRY PI PROGRAMMING WITH PYTHON and PHP

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Submitted by

KRISHNA KUMAR SAH

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Submitted to:

COSMOS COLLEGE

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**Background:**

Cosmos College of Management and Technology intended to run a training program for its it/computer/electronics students on one of the most recent and useful utility in their sector that helps to grow their career and enhance project building potential. Hence, as per the requirement of the students, and as agreed from Research, Training, Innovation and Liaison Department of Cosmos College of Management and Technology, this training program has been carried out.

**Objective of the Training:**

Learning raspberry-pi, python basic to advance, server setup, HTML and PHP programming, remote accessing and controlling raspberry-pi.

**Agreed Course Outline**

Day 1:

* Introduction to raspberry pi
* Installation of Raspbian on raspberry pi
* Remote Access with SSH and Remote Desktop
* Terminal Commands and Navigation

Day 2:

* Python basics
* GPIO pinouts details
* GPIO Basics with LED light using Python
* GPIO Basics push buttons using Python

Day 3:

* Pulling and cloning library and projects from github
* Printing “Hello World” on 16x2 Character LCD
* Pi clock using 16x2 LCD display
* Distance Sensor GPIO (ULTRASONIC SENSOR HC-SR04)
* Simple Application using LED and Distance Sensor

Day 4:

* Simple Graphical User Interface using Python and Tkinter
* LED control using GUI

Day 5:

* Apache webserver
* HTML basics
* PHP basics

Day 6:

* Using pi camera module
* Simple Application using camera module, LED and distance sensor
* Live stream using pi camera
* Door bell

Day 7:

* LED control using webpage from another computer in the same network
* Q&A

**Participants**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sn. | College Roll | Name | Department / Semester | Present Days |
| 1 | 150328 | Atit Acharya |  | 2/7 |
| 2 | 150205 | Barshat Khanal |  | 1/7 |
| 3 | 160308 | Bibek Kumar Sah |  | 4/7 |
| 4 | 150203 | Bijay Pandeya |  | 5/7 |
| 5 | 150327 | Bishal Poudel |  | 2/7 |
| 6 | 150206 | Charitra Prajapati |  | 7/7 |
| 7 | 150331 | Chudamani Pandit |  | 2/7 |
| 8 | 150325 | Deepak Bdr. Kathayat |  | 2/7 |
| 9 | 160210 | Deepak raj. Bhatta |  | 7/7 |
| 10 | 150334 | Dinesh Budhathoki |  | 5/7 |
| 11 | 160204 | Dinesh Chaudhari Kewat |  | 7/7 |
| 12 | 150207 | Jeevan Shrestha |  | 7/7 |
| 13 | 160206 | Manoj Gayak |  | 7/7 |
| 14 | 150202 | Nitu Yadav |  | 7/7 |
| 15 | 150319 | Pallabi Mallik |  | 5/7 |
| 16 | 160211 | Raghbesh Kumar Raut |  | 7/7 |
| 17 | 140203 | Rahul Kumar Shah |  | 5/7 |
| 18 | 140247 | Raja Babu Yadav |  | 5/7 |
| 19 | 150332 | Sabin Shrestha |  | 2/7 |
| 20 | 160212 | Shree Ram Thakur |  | 7/7 |
| 21 | 150247 | Sujan Sharks Pokhrel |  | 0/7 |
| 22 | 160340 | Sukhchandra Sharma |  | 6/7 |
| 23 | 150305 | Suraj Maharjan |  | 7/7 |
| 24 | 160213 | Uttam Khadaka |  | 7/7 |
| 25 | 140205 | Sonam Yadav |  | 5/7 |
| 26 | 150323 | Prakash rana |  | 5/7 |
| 27 | - | Bishal Singh |  | - |

**Resource Person:**

KRISHNA KUMAR SAH,

FIRMWARE ENGINEER,

REAL TIME SOLUTIONS,

9843108024, 9804540929

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I, Krishna Kumar Sah, am currently working on the embedded system. My projects include Wireless calling system, Wireless Audio Device, Wireless radio, Ip-clock, communication module (GSM, CDMA, Satellite), sd card webserver for embedded device and others. My primary responsibility is to develop firmware program for custom design and build drivers and library. The core field of my proficiency is manly related with IOT.

**Actual Course Structure**

**Day 1:**

**• Introduction to raspberry pi**

**• Installation of Raspbian on raspberry pi**

**• Remote Access with SSH and Remote Desktop**

**Day 2:**

**• Python basics**

**• Terminal Commands and Navigation**

**• GPIO pinouts details**

**Day 3:**

**• Adding on screen keyboard for touch display**

**• GPIO pins control Input/output**

**Day 4:**

**• JHD162A character display Interfacing**

**• JHD162 Digital Clock**

**• Ultrasonic distance sensor Interfacing and distance measurement**

**• Distance Sensor: Near distance warning led**

**• Interfacing DHT sensor**

**Day 5: Raspberry pi: Webserver (Apache, HTML, PHP)**

**• Installing Apache2 webserver, php5 and mysql**

**• HTML:**

**o Creating basic page**

**o Adding links, Images, Button, Style, Comments and Border**

**o CSS (Cascading Style Sheets)**

**o Table**

**• PHP:**

**o Creating basic page**

**o Variables, Array, Class**

**o String and String Concatenation**

**o if else, switch case, while loop, for loop**

**o Function and Function return**

**o Form handling, Superglobals**

**o Running Python Script from PHP**

**Day 6:**

**• GPIO controlling from webpage**

**• Home Light Control with button Layout**

**• Live Streaming using Python (socket) and Pi-Camera**

**• Live Streaming using: RPi\_Cam\_Web\_Interface**

**Day 7:**

**• Running application on Background and AutoStart when raspberry-pi starts**

**• Threading, Semaphore and exception handling**

**• Q&A and Evaluation**

**Bonus Episodes:**

**• NFC/RFID Interfacing**

**• GPIO control using GUI (Tkinter)**

**Comments and Recommendations on Expected Quality of Participants:**

1. On expected pre-knowledge: some students were with very good concepts of programming and some were very little.
2. On punctuality: Some interested trainees missed starting 2 days. Some students missed middle sessions and continued latter. Some trainee missed middle sessions and continued latter sessions (could be their personal importance). Due to lack of tools some trainees were discouraged and discontinued.
3. On discipline and sincerity: it was very good
4. On Enthusiasm: I felt good to see many trainees doing hands-on and doing queries.
5. Other:
6. Any Recommendations: Tools availability is highly recommended.

**Post Test Score:**

A post-test was carried out to test, to what extent, the objective was met. The post-test score are as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sn. | College Roll | Name | Test Score | Recommendation to this Person |
| 1 | 150328 | Atit Acharya | - | - |
| 2 | 150205 | Barshat Khanal | - | - |
| 3 | 160308 | Bibek Kumar Sah | 4/10 | Needs to learn hard. Low knowledge about electronics seen. |
| 4 | 150203 | Bijay Pandeya | - | - |
| 5 | 150327 | Bishal Poudel | - | - |
| 6 | 150206 | Charitra Prajapati | 7/10 | - |
| 7 | 150331 | Chudamani Pandit | - | - |
| 8 | 150325 | Deepak Bdr. Kathayat | - | - |
| 9 | 160210 | Deepak raj. Bhatta | 7/10 | - |
| 10 | 150334 | Dinesh Budhathoki | - | - |
| 11 | 160204 | Dinesh Chaudhari Kewat | 7/10 | - |
| 12 | 150207 | Jeevan Shrestha | 8/10 | Seen curious but should have some patience. |
| 13 | 160206 | Manoj Gayak | 8/10 | - |
| 14 | 150202 | Nitu Yadav | 8/10 | - |
| 15 | 150319 | Pallabi Mallik | - | - |
| 16 | 160211 | Raghbesh Kumar Raut | 9/10 | Good understanding. |
| 17 | 140203 | Rahul Kumar Shah | 9/10 | Writing and testing the code by his own was good. |
| 18 | 140247 | Raja Babu Yadav | 9/10 | Seen curious and good understanding. |
| 19 | 150332 | Sabin Shrestha | - | - |
| 20 | 160212 | Shree Ram Thakur | 6/10 | Very less knowledge but seen curious. |
| 21 | 150247 | Sujan Sharks Pokhrel | - | - |
| 22 | 160340 | Sukhchandra Sharma | 7/10 | Should learn some manners. Should not laugh while asking questions (every time). |
| 23 | 150305 | Suraj Maharjan | 9/10 | With good concepts of programming and understanding. |
| 24 | 160213 | Uttam Khadaka | 7/10 | - |
| 25 | 140205 | Sonam Yadav | 9/10 | Good understanding level. |
| 26 | 150323 | Prakash rana | 8/10 | - |
| 27 | - | Bishal Singh | - | - |

**Budget:**

NRS 30000/-

**Conclusion and Recommendation:**

The workshop was completed successfully. Students have learned raspberry-pi to use effectively and efficiently. This course helped students to build their projects more reliable and advance. For more effectiveness of the workshop students should have tools. College management should think about it.