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| **WORKSHOP TITLE: RASPBERRY PI PROGRAMMING** |
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| **PRIMARY CONTACT PERSON:**  KRISHNA KUMAR SAH  FIRMWARE PROGRAMMER  @[rts.com.np](https://rts.com.np/)  BE Elec. And Elex. (Communication)  [krishna.sah@rts.com.np](mailto:krishna.sah@rts.com.np)  [krriss.shah@gmail.com](mailto:krriss.shah@gmail.com) |
| **WORKSHOP DURATION:**  7 days (3 hours a day) |
| **WORKSHOP RELEVANCE AND NEEDS:**  BASIC IDEA OF PYTHON, PHP and HTML PROGRAMMING |
| **WORKSHOP PREREQUISITES:**  BASIC PROGRAMMING IN PYTHON (GOOD TO HAVE, NOT MANDATORY)  BASIC IDEA OF LINUX (GOOD TO HAVE, NOT MANDATORY)  BASIC IDEA OF HTML (GOOD TO HAVE NOT MANDATORY)  BASIC IDEA OF PHP (GOOD TO HAVE NOT MANDATORY) |
| **WORKSHOP REQUIREMENTS:**   1. Projector 2. RASPBERRY PI - 3 3. HDMI Monitor 4. Mouse 5. Keyboard 6. WIFI OR ETHERNET IN THE CLASSROOM 7. Micro USB Cable 8. Raspberry pi power supply (2 Amp mobile charger) 9. MICRO-SD CARD (16GB OR MORE) 10. Breadboard 11. RESISTORS 1K 10 PIECES 12. LED (BLUE, GREEN, RED) – 10 Pieces in total 13. ULTRASONIC SENSOR HC-SR04 (1 PIECE) 14. RASPBERRY PI CAMERA MODULE 15. NFC reader and writer 16. 16x2 Character LCD 17. Push button (3 pieces) 18. Male-Female jumpers (20 pieces) 19. Female-Female Jumpers (20 pieces) |
| **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:   + Creating basic page   + Adding links, Images, Button, Style, Comments and Border   + CSS (Cascading Style Sheets)   + Table * PHP:   + Creating basic page   + Variables, Array, Class   + String and String Concatenation   + if else, switch case, while loop, for loop   + Function and Function return   + Form handling, Superglobals   + 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) |
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