RASPBERRY PI MODEL B OR RASPBERRY PI PICO

15-Week Syllabus: Raspberry Pi Model B or Raspberry Pi Pico

Week 1: Introduction and Setup

- Overview of Raspberry Pi Model B and Raspberry Pi Pico.

- Programming the memory card: Installing Raspberry Pi OS and MicroPython.

- Connecting peripherals: keyboard, mouse, and display.

- Initial boot and basic setup of Raspberry Pi.

Week 2: Getting Started with Python

- Introduction to Python programming on Raspberry Pi.

- Writing and running simple Python scripts.

- Understanding variables, loops, and conditionals in Python.

- Basic file management using Python.

Week 3: GPIO Basics and Controlling LEDs

- Introduction to GPIO pins on Raspberry Pi.

- Understanding pin numbering and basic electronics.

- Writing Python scripts to control LEDs.

- Implementing simple LED patterns using loops and conditions.

Week 4: Interfacing with Sensors

- Introduction to using sensors with Raspberry Pi.

- Connecting and reading data from sensors (e.g., temperature, humidity).

- Writing Python code to process sensor data.

- Displaying sensor readings on the terminal.

Week 5: Motor Control and Automation

- Introduction to motors and their control mechanisms.

- Interfacing DC motors and servos with Raspberry Pi.

- Writing Python scripts for motor control using GPIO.

- Building a basic automation project (e.g., automated door).

Week 6: Solenoid Lock and Security Systems

- Understanding solenoid locks and their applications.

- Interfacing a solenoid lock with Raspberry Pi.

- Writing Python scripts to control the solenoid lock.

- Implementing a basic security system with an alarm.

Week 7: Weather Management System

- Introduction to weather management systems.

- Interfacing weather sensors (e.g., DHT11 for temperature and humidity).

- Writing Python scripts to collect and display weather data.

- Storing and logging weather data for analysis.

Week 8: Introduction to Advanced Projects

- Overview of 10+ project ideas using Raspberry Pi.

- Discussion on selecting a suitable project for each student.

- Basic planning and design of selected projects.

- Introduction to project management and documentation.

Week 9: Advanced Sensor Integration

- Integrating multiple sensors into a single system.

- Writing Python code to handle multiple sensor inputs.

- Building a complex system that uses data from various sensors.

- Implementing a weather station or similar project.

+91-8971279127

sirintel.tec@gmail.com

SIRINTEL TECHNOLOGIES PVT LTD
Address: 2696, Tanvi's, 2nd floor, Mama's Joint Road,
2nd Main 3rd Cross Rd, above Peter England showroom,
MCC B Block, Davanagere, Karnataka 577004
AICTE ID: COPRPORATE6123bb416b86f1629731649
ISO:9001:2015

www.sirintel.com

Week 10: Home Automation Projects

- Introduction to home automation concepts.

- Building a smart home project (e.g., controlling lights and appliances).

- Using Raspberry Pi for remote control and monitoring.

- Integrating with mobile apps for remote access.

Week 11: Security and Surveillance Projects

- Building an alarm system using motion sensors.

- Writing Python scripts for real-time monitoring.

- Integrating cameras for surveillance (Raspberry Pi Model B).

- Implementing a security system with alerts and notifications.

Week 12: Internet of Things (IoT) Projects

- Introduction to IoT and its applications.

- Connecting Raspberry Pi to the internet.

- Sending and receiving data over the internet using Python.

- Building IoT-based projects like remote monitoring and control.

Week 13: Advanced Automation and Control

- Implementing advanced control systems (e.g., automated irrigation).

- Writing Python scripts for real-time control and feedback.

- Using Raspberry Pi for complex decision-making tasks.

- Implementing machine learning models on Raspberry Pi (optional).

Week 14: Project Development

- Focusing on the development of the selected advanced projects.

- Writing, testing, and debugging Python code.

- Integrating all components and finalizing the project.

- Preparing project documentation and presentation.

Week 15: Final Project Presentation and Evaluation

- Presenting the completed projects.

- Demonstrating the functionality and features of the projects.

- Peer and instructor evaluation of the projects.

- Discussing potential improvements and future enhancements.