

Raspberry Pi Development with Python: A Practical Training Program (Raspberry Pi) Module 1

| | |
|---|--|
| <p style="text-align: center;">Day 1 (Online Class) (10.00am-4.30pm)</p> | <p><u>Exploring Raspberry Pi</u></p> <ul style="list-style-type: none"> – Get introduced to the Raspberry Pi. – Familiarize yourself with the layout of the Raspberry Pi board. – Learn the intricacies of Raspbian booting. – Dive into the world of kit components and types associated with Raspberry Pi Zero 2W. – Delve into the Python programming language. |
| <p style="text-align: center;">Day 2 (Online Class) (10.00am-4.30pm)</p> | <p><u>IoT Basics: Understanding and Applications</u></p> <ul style="list-style-type: none"> – Introduction to IoT, explaining what it is and how it shapes our connected world. – Get hands-on with IoT equipment, gaining practical experience to bridge theory with application. – Learn about the enabling technologies behind IoT, making the complex simple. – Understand communication protocols in a straightforward manner, ensuring effective data exchange. |
| <p style="text-align: center;">Day 3 (Online Class) (10.00am-4.30pm)</p> | <p><u>Raspberry Pi Zero 2W Basics and Practical Tasks</u></p> <ul style="list-style-type: none"> – Introduction to the Raspberry Pi Zero 2W. – Hands-on activity: <ol style="list-style-type: none"> i) Task 1: Modify the code to customize the LED behavior. ii) Task 2: Make the LED blink every time you press the button. iii) Task 3: Reading Analog Inputs with Raspberry Pi. iv) Task 4: Run a servo motor. v) Task 5: Reading Humidity and Temperature with IoT. |

Hands-On Electronics: Arduino and Node-RED for Makers (Arduino) Module 2

| | |
|---|---|
| <p>Day 1 (Online Class) (10.00am-4.30pm)</p> | <p><u>Introduction on Arduino Basics</u></p> <ul style="list-style-type: none"> — Explore the various types of Arduino and their applications. — Understand the essence of Arduino, its software types, capabilities, and versatile applications. — Delve into hands-on activities: <ul style="list-style-type: none"> i) Blink LED ii) Utilize a Push Button iii) Experiment with a Potentiometer iv) Control a Servomotor v) Read data from a Humidity and Temperature Sensor vi) Work with a Light Sensor |
| <p>Day 2 (Online Class) (10.00am-4.30pm)</p> | <p><u>Hardware and Software Setup</u></p> <ul style="list-style-type: none"> — Gain an overview of Arduino and Raspberry Pi hardware. — Experience hands-on hardware set-up for practical applications. — Install and configure Arduino IDE on Raspberry Pi. — Introduction to Node-Red on Windows. — Explore Nodes and Core Nodes, followed by creating the first flow. |
| <p>Day 3 (Online Class) (10.00am-4.30pm)</p> | <p><u>Node-RED (Basic):</u></p> <ul style="list-style-type: none"> — Install modules and explore the features of Node-RED. — Introduction to Node-RED Dashboard and an overview of its capabilities. — Explore Dashboard Tabs and Group functionalities. <p><u>Node-RED (Intermediate):</u></p> <ul style="list-style-type: none"> — Dive into Serial Communication within Node-RED. — Utilize Gauges and Charts for data visualization. — Learn to implement Notifications for enhanced user interaction. |

Mastering Predictive Analytics: Unlock the Power of Machine Learning for Data Analysis
(Machine Learning)
Module 3

| | |
|---|--|
| <p style="text-align: center;">Day 1 (Online Class) (10.00am-4.30pm)</p> | <p><u>Definition and Significance</u></p> <ul style="list-style-type: none"> – Definition of predictive analysis in logistics with AI. – Importance of predictive analysis in optimizing logistics and supply chain operations. – Introduction to python with AI – Installation of the software |
| <p style="text-align: center;">Day 2 (Online Class) (10.00am-4.30pm)</p> | <p><u>Machine Learning Algorithms</u></p> <ul style="list-style-type: none"> – Introduction to popular algorithms for predictive analysis, such as regression. – Selection of appropriate algorithms based on the specific logistics use case. <p><u>Model Training and Evaluation</u></p> <ul style="list-style-type: none"> – Training the predictive models using historical data. – Evaluating model performance through metrics like accuracy, precision, recall. – Techniques for model optimization and fine-tuning. |
| <p style="text-align: center;">Day 3 (Online Class) (10.00am-4.30pm)</p> | <p><u>Prediction using Arima Model</u></p> <ul style="list-style-type: none"> – Explore the application of the ARIMA (Auto Regressive Integrated Moving Average) model for predictive analysis. – Understand the principles of time-series forecasting using the ARIMA model. – Gain hands-on experience in implementing ARIMA for making predictions based on historical data. – Learn how to assess and interpret the results of ARIMA predictions. |

Advanced Robotics Programming with ROS: A Comprehensive Course
 (Robotic Operating System - ROS)
Module 4

| | |
|---|---|
| <p style="text-align: center;">Day 1 (Online Class)</p> <p style="text-align: center;">(10.00am-4.30pm)</p> | <p><u>Overview and ROS Installation</u></p> <ul style="list-style-type: none"> — Gain an understanding of ROS (Robot Operating System) for industrial applications. — Walk through the step-by-step process of installing ROS and Gazebo. |
| <p style="text-align: center;">Day 2 (Online Class)</p> <p style="text-align: center;">(10.00am-4.30pm)</p> | <p><u>Robot Simulation and Control</u></p> <ul style="list-style-type: none"> — Engage in robot simulation exercises to apply theoretical knowledge. — Learn how to control a robot using ROS Node, exploring practical aspects of robotics. — Acquire the skill of cloning a robot model for further experimentation. |
| <p style="text-align: center;">Day 3 (Online Class)</p> <p style="text-align: center;">(10.00am-4.30pm)</p> | <p><u>GitHub Integration and Advanced Simulation</u></p> <ul style="list-style-type: none"> — Dive into GitHub with a hands-on session on repository cloning. — Simulate scenarios in the Gazebo 3D world, emphasizing practical applications. — Explore visualization techniques and master control of movement within Gazebo. — Learn to teleoperate the robot, facilitating remote control. — Navigate the robot in a simulated world and create a URDF robot model. — Gain proficiency in controlling the robot using RVIZ, enhancing your command over robotic simulations. |

Mastering Robotics: From Basics to Advanced Automation
(Robotic Training)
Module 5

| | |
|--|---|
| <p style="text-align: center;">Day 1 (Online Class) 19 February 2024 (10.00am-5.00pm)</p> | <p><u>Introduction to Industrial 4.0 and Industrial Robots</u></p> <p>Begin with an overview of Industrial 4.0, which delves into the innovations that define the fourth industrial revolution. Introduce the essential concepts of Mechatronics and its applications in the field of robotics. Cover the key principle of the Teaching Pendant application.</p> <p><u>Our Company's Robot Series - Linear Robot</u></p> <ul style="list-style-type: none"> — In-depth look at Linear Robot — Applications across industries — Understanding the functions of a Linear Robot — Safety precautions specific to Linear Robots — Manual procedures for Linear Robot |
| <p style="text-align: center;">Day 2 (Online Class) 20 February 2024 (10.00am-5.00pm)</p> | <p><u>Our Company's Robot Series - Planar and Scara Robots</u></p> <ul style="list-style-type: none"> — Overview of Planar and Scara Robots — Applications in various industries — Functions of Planar and Scara Robots — Safety precautions when working with these robots — Manual procedures for Planar and Scara Robots |
| <p style="text-align: center;">Day 3 (Online Class) 21 February 2024 (10.00am-5.00pm)</p> | <p><u>Our Company's Robot Series - 6-Axis Arm Robot</u></p> <ul style="list-style-type: none"> — In-depth look at 6-Axis Arm Robot — Applications across industries — Understanding the functions of a 6-Axis Arm Robot — Safety precautions specific to 6-Axis Arm Robots — Manual procedures for 6-Axis Arm Robot |

Hands-On Robotics: A Journey through Mechatronics
(Robotic Training)
Module 6

| | |
|--|---|
| <p style="text-align: center;">Day 1 (Physical Class) Expected in March (10.00am-5.00pm)</p> | <p><u>Hands-On Linear Robot Training</u></p> <ul style="list-style-type: none"> — Explore Linear Robots. — Understand how Linear Robots function. — Prioritize safety with specific precautions tailored to the unique characteristics of Linear Robots. — Practice manual procedures for Linear Robots. <p><u>Benefits</u></p> <ul style="list-style-type: none"> — Covering Linear Robot design, components, and applications in different industries. — Learning about their precise movements and synchronized operations for enhanced efficiency. — Ensuring a secure operating environment. — Gaining essential skills for effective operation and troubleshooting. |
| <p style="text-align: center;">Day 2 (Physical Class) Expected in March (10.00am-5.00pm)</p> | <p><u>Hands-On Planar Robot Training</u></p> <ul style="list-style-type: none"> — Explore Planar Robots. — Understand how Linear Robots function. — Prioritize safety with specific precautions tailored to the unique characteristics of Linear Robots. — Practice manual procedures for Linear Robots. <p><u>Benefits</u></p> <ul style="list-style-type: none"> — Covering Planar Robot design, components, and applications in different industries. — Learning about their precise movements and synchronized operations for enhanced efficiency. — Ensuring a secure operating environment. — Gaining essential skills for effective operation and troubleshooting. |
| <p style="text-align: center;">Day 3 (Physical Class) Expected in March (10.00am-5.00pm)</p> | <p><u>Hands-On Scara Robot Training</u></p> <ul style="list-style-type: none"> — Explore Scara Robots. — Understand how Linear Robots function. — Prioritize safety with specific precautions tailored to the unique characteristics of Linear Robots. — Practice manual procedures for Linear Robots. <p><u>Benefits</u></p> <ul style="list-style-type: none"> — Covering Scara Robot design, components, and applications in different industries. — Learning about their precise movements and synchronized operations for enhanced efficiency. — Ensuring a secure operating environment. — Gaining essential skills for effective operation and troubleshooting. |

| | |
|---|---|
| <p>Day 4 (Physical Class) Expected in March (10.00am-5.00pm)</p> | <p><u>Hands-On 6-Axis Arm Robot Training</u></p> <ul style="list-style-type: none">— Explore 6-Axis Arm Robots.— Understand how Linear Robots function.— Prioritize safety with specific precautions tailored to the unique characteristics of Linear Robots.— Practice manual procedures for Linear Robots. <p><u>Benefits</u></p> <ul style="list-style-type: none">— Covering 6-Axis Arm Robot design, components, and applications in different industries.— Learning about their precise movements and synchronized operations for enhanced efficiency.— Ensuring a secure operating environment.— Gaining essential skills for effective operation and troubleshooting. |
|---|---|