

**Internet of Things
(Winter Training Program)
6 Weeks/45 Days**

“PRESENTED BY”



Explore > Innovate > Enjoy — Technologies Pvt. Ltd.

An ISO 9001 : 2008 Certified Company

Accredited by:



**INTERNATIONAL
ACCREDITATION
ORGANIZATION
HOUSTON U.S.A.**

RoboSpecies Technologies Pvt. Ltd.

Office: W-53g, Sec- 11, Noida, UP

Contact us:

Email: stp@robospecies.com

Website: www.robospecies.com

Office: +91-120-4245860

8510044806

WINTER TRAINING PROGRAM

Internet of Things

Course Name	: Robotics & Embedded Systems
Certification	: By RoboSpecies Technologies Pvt. Ltd. Accredited by International Accreditation Organization, Houston, U.S.A.
Study Material	: Books & CDs Free to each participant
Robotics Toolkit	: Free to Each Participant

Projects: 60 Projects Covered in 45 Days

Fees & Duration

1. For Internet of Things (**Advance**)
Fees : ₹ 9990/- per candidate
Duration : 45 Days/6 Weeks

ADVANCE MODULE – Internet of Things	
DAYS	TOPICS
Day 1	Theory Introduction to Internet of Things <ul style="list-style-type: none">• What is internet?• The technology “Internet of Things”.• Usefulness of IoT.• Professional benefits.• Applications of IoT.• New and Upcoming Technologies.
Day 2	Theory The “Things” explanation. <ul style="list-style-type: none">• Embedded systems• Input and Output devices.• Analog and Digital sensors.• Actuators. Practical <ul style="list-style-type: none">• To Figure out input and output devices.• Which device is analog and which one is digital?• Sensor and actuator applications.

WINTER TRAINING PROGRAM

Internet of Things

Day 3	Theory <ul style="list-style-type: none">• Introduction to embedded system• Components of embedded systems.• The controlling unit “Microcontroller”.• Hardware parts.
Day 4	Theory <ul style="list-style-type: none">• Sensors, Demystified.• Sensors specification.• How to use sensors.• Types of sensors. Practical <ul style="list-style-type: none">• Calibration of sensors.
Day 5	Theory <ul style="list-style-type: none">• Integrating peripherals.• Peripherals explanation.• Understanding communication protocols.• Serial and parallel communication.• UART, SPI, I2C communication. Practical <ul style="list-style-type: none">• Receiving data from sensors serially.
Day 6	Theory <p>Interfacing arduino and sensors</p> <ul style="list-style-type: none">• Explanation of software and hardware.• The Arduino IDE.• Programming the sensors. Practical <ul style="list-style-type: none">• Reading the values from sensors.
Day 7	PROJECT

WINTER TRAINING PROGRAM

Internet of Things

DAYS	TOPICS
Day 8	Theory Introduction to internet protocols <ul style="list-style-type: none">• Transmission control/ Internet Protocol.• Used datagram protocol.• Network topologies.• Understanding IPv4 & IPv6.
Day 9	Theory <ul style="list-style-type: none">• Welcoming SMART HOME CONCEPT.• Motors• IR Sensors• Temperature sensor• LDR• Relay• Water level indicator. Practical <ul style="list-style-type: none">• Interface Motor Driver with IR sensor.• Calibration of IR sensors<ul style="list-style-type: none">• What is it?• Why is it Required?
Day 10	Theory Creating web page using arduino programming with basic HTTP <ul style="list-style-type: none">• Preface to Hyper Text Markup Language coding• Elements of HTML.• HTTP. Practical <ul style="list-style-type: none">• Creating the web page
Day 11	Video sessions

WINTER TRAINING PROGRAM

Internet of Things

DAYS	TOPICS
Day 12	<p>Theory</p> <ul style="list-style-type: none"> • Introduction to Basic Shield. • What is the requirement of Basic Shield? • Operation of Analog and Digital Signals. • 8 Bit and 10 Bit Concept. <p>Practical</p> <ul style="list-style-type: none"> • Interfacing Basic Shield with Arduino. • Lighting up several LED's in a Wishful Pattern. • Working on Switch, BUZZER and implementing with Arduino for better grasping of concepts. Interfacing Motors through sensors via Arduino.
Day 13	Completion of led blink over internet.
Day 14	Competition, Doubts & Practical Session
Day 15	PROJECT
Day 16	<p>Theory</p> <ul style="list-style-type: none"> • Serial and Parallel Communication. • Hello to Analog I/P and O/P. • Introduction to ADC. <p>Practical</p> <ul style="list-style-type: none"> • Interfacing Potentiometer and LDR with ARDUINO. • Interfacing Motor Driver with ARDUINO. • Speed Control of Motors using PWM.
Day 17	<p>Theory</p> <ul style="list-style-type: none"> • Introduction to Temperature sensor. • Applications of temperature sensor. <p>Practical</p> <ul style="list-style-type: none"> • Testing of temperature sensor. • Integrating of temperature sensor with microcontroller. • Temperature control over the internet.
Day 18	<p>Theory</p> <ul style="list-style-type: none"> • Introduction to LDR. • Advanced applications of LDR. <p>Practical</p> <ul style="list-style-type: none"> • Testing of LDR. • Integrating LDR with microcontroller. • Light control over internet.
Day 19	<p>Theory</p> <ul style="list-style-type: none"> • Introduction to RELAYS. • Pin description of various relays. • How to check relays? <p>Practical</p> <ul style="list-style-type: none"> • Integration of relays with microcontroller. • Integrating Digital Signals. • Switching of relays to control temperature and light over the internet.

WINTER TRAINING PROGRAM

Internet of Things

DAYS	TOPICS
Day 20	<p>Theory</p> <ul style="list-style-type: none">• Introduction to Water level indicator.• Application of water level indicator. <p>Practical</p> <ul style="list-style-type: none">• Integration with microcontroller.• Getting water levels onto internet.
Day 21	PROJECT
Day 22	PROJECT
Day 23	<p>Theory</p> <ul style="list-style-type: none">• IoT Health Care• Temperature measurement.• Pulse detection.• Axis control.• Display.
Day 24	<p>Theory</p> <ul style="list-style-type: none">• LCD (Liquid Crystal Display). <p>Practical</p> <ul style="list-style-type: none">• Making Connections of LCD with Arduino.• Generating name and number pattern.• Generating custom characters.
Day 25	<p>Theory & Practical</p> <ul style="list-style-type: none">• Temperature measurement using temperature sensor.• Getting AID for temperature variations.• Feeding temperature over the internet.• Displaying the temperature on the LCD.
Day 26	<p>Theory & Practical</p> <ul style="list-style-type: none">• Introduction to PULSE SENSOR.• Pulse measurement.• Introduction to Processing Command Window.• Generating graph of pulse on processing window.

WINTER TRAINING PROGRAM

Internet of Things

DAYS	TOPICS
Day 27	<p>Theory</p> <ul style="list-style-type: none"> ● ULTRASONIC SENSOR ● Application of Ultrasonic Sensor. <p>Practical</p> <ul style="list-style-type: none"> ● Integrating with microcontroller ● Distance measurement using Ultrasonic Sensor ● Feeding data of distance over the internet.
Day 28	PROJECT
Day 29	Competition, Doubts & Practical Session
Day 30	<p>Theory</p> <p>Industry usage IoT.</p> <ul style="list-style-type: none"> ● RFID tags ● IR control ● Humidity monitoring ● Relay switching ● Load calculation ● Light intensity measurement
DAYS 31	<p>Theory & Practical</p> <ul style="list-style-type: none"> ● Introduction to Accelerometer ● Applications of Accelerometer ● Integrating with Arduino ● Making Axis data available to web server
Day 32	<p>Theory & Practical</p> <ul style="list-style-type: none"> ● Introduction to humidity sensor ● Calibration of sensor ● Nature of sensor ● Application of humidity sensor ● Making of humidity control system.
Day 33	<p>Theory & Practical</p> <ul style="list-style-type: none"> ● Making of temperature control environment ● Integrating Temperature sensor and relay ● Smart temperature control
Day 34	<p>Theory & Practical</p> <ul style="list-style-type: none"> ● Introduction to PIR Sensor ● Calibration of PIR Sensor ● Integrating with arduino. ● Feeding the data on web.

WINTER TRAINING PROGRAM

Internet of Things

DAYS	TOPICS
Day 35	Theory & Practical <ul style="list-style-type: none"> • Automatic Light activation system • Making of Light control device • Getting info through web to control lights
Day 36	projects
Day 37	Competition, Doubts & Practical Session
Day 38	Theory Agricultural usage of IoT. <ul style="list-style-type: none"> • Temp • Humidity • Moisture • Light calculation • Water level indicator for irrigation
DAYS 39	Theory & Practical <ul style="list-style-type: none"> • Introduction to Moisture sensor • Sensor calibration • Integrating with arduino • Making moisture content data available to web server
Day 40	Theory & Practical <ul style="list-style-type: none"> • Introduction to humidity sensor • Calibration of sensor • Nature of sensor • Application of humidity sensor • Making of humidity control system.
Day 41	Theory & Practical <ul style="list-style-type: none"> • Making of temperature control environment • Integrating Temperature sensor and relay • Smart temperature control
Day 42	Theory & Practical Integration with arduino <ul style="list-style-type: none"> • Temperature sensor • Moisture sensor • Humidity sensor • Light control sensor • Relay
Day 43	PROJECT
Day 44	Competition, Doubts & Practical Session
Day 45	Certificate distribution and farewell.

WINTER TRAINING PROGRAM

Internet of Things

Number of Projects Covered in ADVANCE MODULE

1. Blink a LED using a switch
2. Glowing LEDs in pattern of your own choice.
3. Designing of RGB color pattern
4. Automatic light control system
5. Transistor as a touch switch
6. Transistor as a NOT Gate
7. Transistor as an amplifier
8. Daily alarm clock
9. Flood control alarm system
10. Generation of MIDI tones
11. Intelligent blind stick
12. Manual robotic car
13. Automatic line follower Robot
14. Automatic obstacle detection System
15. LDR based Darkness activation system
16. LDR based Light activation system
18. Pulse generation using 555
19. Automatic blinking of light
20. Automatic blowing of buzzer
21. Dc motor speed control using PWM
22. Automatic speed controlled BOT
23. Edge avoider BOT
24. Wall Follower BOT
25. Obstacle avoider BOT
26. Traffic control system
27. Visitor counting application
28. Scroll strings on LCD
29. Line follower BOT displaying the directions
30. Controlling buzzers and LED using serial communication
31. LED Blinking using Accelerometer
32. Gesture Recognition using Accelerometer
33. Motor Control using Accelerometer
34. Getting real world temperature using arduino
35. Controlling motors using temperature sensor.
36. Controlling gateways using temperature sensor.
37. Feeding data over the internet of temperature sensor.
38. Reading the humidity level of environment for smart home.

WINTER TRAINING PROGRAM

Internet of Things

39. Adjusting Air conditions for the smart home
40. Feeding the above information from internet.
41. Getting light levels of environment.
42. Adjusting brightness using light sensor
43. Reading the values of light sensor from internet
44. Getting online status of lights.
45. Working on different relays
46. Controlling motors using relays
47. Controlling home appliances using relays
48. Feeding and reading the data of different home appliances over the internet.
49. Security control using RFID and internet
50. Working with load cell.
51. Getting live update of moisture content in soil using moisture sensor.
52. Smart irrigation system
53. Controlling motors using moisture sensor over the internet.
54. Working with pulse sensor
55. Generating graph of heart beat using pulse sensor
56. Online update of heart rate.
57. Working with water level indicator
58. Making of water level indicator and calculating the moisture
59. Working with accelerometer sensor
60. Gesture control robot using accelerometer.

WINTER TRAINING PROGRAM

Internet of Things

ADVANCE Module IoT Kit Content

- Arduino Uno Board (1)
- Wifi Board ESP8266 (1)
- Basic Shield (1)
- RoboSpecies Chassis (1)
- BO Motors (2)
- IR Sensor (1)
- Electronica Kit (1)
- Wheels (2)
- Caster Wheel (1)
- Screw driver (1)
- Screw packet (1)
- Single Strand Wires
- LCD Shield (1)
- Motor Driver board (1)
- Temperature Sensor (1)
- Light Control Sensor (1)
- Relay (1)
- Pulse Sensor (1)
- Ultrasonic Sensor (1)
- Humidity Sensor (1)
- Accelerometer (1)
- PIR Sensor (1)
- Robotics Made Easy-Robotic eBook (1)
- CD (1)
- Study Material.

WINTER TRAINING PROGRAM

Internet of Things

Why Internet of Things Training from RoboSpecies Technologies?

1. **Lot of Major Projects** will be covered in this training.
 - 20+20 Projects are covered in BASIC Module
 - 20+20+20 Project are covered in ADVANCE Module
 - 9 optional major projects.
2. Our syllabus is professionally designed to cover **Basic** as well as **Advance** aspects of Embedded Systems & Robotics
3. Each day of our training is well planned to provide you the **Theoretical** as well as **Practical** Knowledge of the module
4. Each day will come up with **New Practical's & Projects** which makes the training interesting and exciting.
5. Time to time **Practical Assignments** will be provided to the students, which will help them in doing practice at home.
6. **Revision Time & Query Sessions** are provided to the students which help them in clearing their all previous doubts.
7. **Exam** will be conducted at the end of **basic** as well as **Advance** module to test the knowledge level of the students.
8. Time for **Project Work** will be provided to the students, in which students will develop a project of their own choice. This will encourage **Innovative Ideas** among students.

Pre-Requisites

1. Basic knowledge of C\C++ Programming.
2. Basics of Electronics.
3. Eagerness to learn new innovative things.

Who Could Attend this Training?

- Students from B.E/B.Tech/M.Tech/Diploma (ECE/EEE/CSE/IT/MECH) can join this training.
- Anyone who have interest in this field and have pre-requisite knowledge