# Product Track Syllabus

**Prerequisites: Basic electronic and programming knowledge required.**

**The Product track program is designed for those who are Inquisitive in Robotics Technologies for becoming Embedded systems and Robotics developer. Here, you can explore, learn, build and innovate your idea in Robotics, IOT, VR and AI in Robotics.**

## Design Thinking:

- A creative process that helps you design meaningful solutions in the classroom, at your home, and in your community. Only Design Thinkers know the technique to solve it. Be a Design Thinker.

## Robotics:

- Introduction to Robotics, Different types of robot, Locomotion, Programmable developer devices, IoT in robotics, Drone building and racing.

## Programmable developer devices:

- **Arduino -** Introduction to Arduino, Generation of Arduino and types of Arduino, Arduino vs Raspberry Pi, Arduino Schematic Diagram, Arduino IDE and Language, Program Structure, Powering and Connecting Your Arduino UNO, "Hello world" your first example, Digital & Analog Pin I/O's, Using Variables, Serial communication,

Data Types, Loop systems, "If " statement," While" loop, " For " loop, "Switch" cases, Using Maths & Creating Functions, Array.

**Exercise** - Blink, Digital Read Serial, Fade, Analog Read serial, Button, Debounce button, Digital Pull up, Smoothing, Serial Graph.

**Sensors -** IR sensor, LDR, Moisture sensor, LM35 Temperature sensor, Rain detector, PIR sensor, Ultrasonic sensor, Pressure sensor, Flame sensor

**Interfacing Peripherals -** LCD, 7- segment display, DC motor, Servo, Relay, Buzzers, Matrix keyboards, Motor Shield, TFT LCD shield.

**IOT  Programmable developer devices:**

- **IOT** - Introduction to IoT, Introduction to IoT devices, Layers of IoT, Application of IoT, Python programming for IoT, NODE JS programming for IoT, Science Fiction & IoT - Future, Introduction to ThingWorx, ThingWorx Development Process, The APP you will Build, The Experience, Model and Analyze, Build Exercise. Experience & Model & Analyze session in detail with an application on thingworx.

- **Node MCU (Esp8266)** - Introduction to Node MCU, About ESP-12E chip, ESP8266 Schematic Diagram, Node(arduino) IDE and Language, Program Structure, Powering and Connecting Your Node MCU.
  **Exercise:** Controlling LED over Web - IDE,Node - Node communication, Tinker & Mobile App, sinric and IFTTT, Blink, Digital Read Serial, Fade, Analog Read serial, Button, Debounce button,

Digital Pull up, Smoothing, Serial Graph, IR sensor, LDR, Moisture sensor, LM35 Temperature sensor, Rain detector, PIR sensor, Ultrasonic sensor, Pressure sensor, Flame sensor.

- **Raspberry PI** - Introduction to Raspberry pi, Generation of Raspberry pi and types of Raspberry pi devices, Particle Schematic Diagram, Python IDE and Language, Program Structure, Powering and Connecting Your Raspberry pi, Raspberry setup, Connecting to internet, Final setup, Browsing the web, "Hello world" your first example, Digital & Analog Pin I/O's, Using Variables, Serial communication, Data Types, Loop systems, "If " statement," While" loop, " For " loop, "Switch" cases, Using Maths & Creating Functions, Array.

    **Exercise:** Blink, Digital Read Serial, Fade, Analog Read serial, Button, Debounce button, Digital Pull up, Smoothing, Serial Graph, IR sensor, LDR, Moisture sensor, LM35 Temperature sensor, Rain detector, PIR sensor, Ultrasonic sensor, Pressure sensor, Flame sensor. Raspberry pi projects in the ThingWorx Platform.

# Product Track Syllabus

**Robot and Drones:**

   We Provide special training courses for the International & National Technical Competitions. Here we train you on how to design, build, code and execute your Product.

- Drone building
- RoboRace
- RoboSumo
- RoboWar
- Robot Soccer
- Line Follower, etc..

**Engineering Project Guidance:**

- We provide you with full guidance on Industrial engineering projects and Master- thesis on all technologies. We help you to learn, build and innovate your own idea in a project from the scratch level.

**Course Objectives:** The Main goal of this Product track program is for you to learn and explore the Real Robotic technology with practical sessions and we provide you a complete source code of the real time projects. By the end of this course, you will have a depth and clear knowledge about how to design, Build and code your own project on all the above Technologies.

**Length of Program*:** 3 months

**Textbooks required:** None

**Hardware Required:** Medium-end Laptop with Windows or MAC or Linux.

# Product Track Syllabus

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*\* Lets step into the world of Upcoming Technologies with  our Experienced staff to become a professional Certified Roboteer*