



Robotics Beginner level

Curriculum

Tabel Of Content

Module 1: Introduction to Robotics

Module 2: Basics of Electronics

Module 3: Motors & Movement

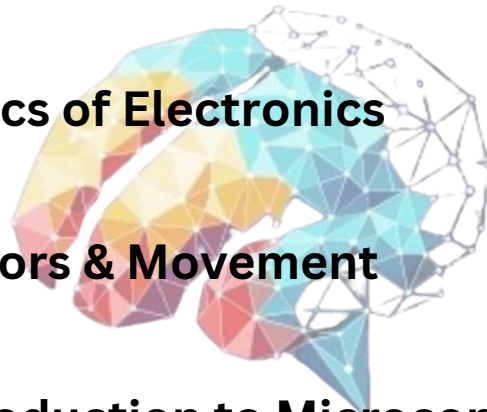
Module 4: Introduction to Microcontroller

Module 5: Basics of Programming

Module 6: Sensors in Robotics

Module 7: Autonomous Robot Behavior

Module 8: Mini Robotics Projects



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Module 1: Introduction to Robotics

- What is a robot?
- Types of robots (industrial, service, mobile)
- Components of a robot
- Real-world robot examples

✓ **Activity: Identify robots around us**

Module 2: Basics of Electronics

- Voltage, current, resistance (simple concepts)
- Using a breadboard
- LEDs, switches, buzzers
- Safety in electronics

✓ **Hands-on: LED & buzzer circuit**

Module 3: Motors & Movement

- What are motors?
- DC motor working
- Motor driver basics
- Forward, backward, left, right movement

✓ **Hands-on: Robot movement control**

Module 4: Introduction to Microcontroller

- **What is Arduino / ESP32?**
- **Pin functions**
- **Uploading first program**
- **Digital input & output**

 **Hands-on: Control LED using code**

Module 5: Basics of Programming

- **Arduino IDE setup**
- **Simple logic & flowcharts**
- **Loops and conditions**
- **Uploading & debugging code**

 **Hands-on: Motor control using code**

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Module 6: Sensors in Robotics

- **What are sensors?**
- **IR obstacle sensor**
- **Line follower sensor**
- **Reading sensor values**

 **Hands-on: Obstacle detection robot**

Module 7: Autonomous Robot Behavior

- **Manual vs autonomous robots**
- **Decision making in robots**
- **Simple algorithms**
- **Real-world examples**

 **Hands-on: Line follower robot**

Module 8: Mini Robotics Projects

Students build beginner-level robots such as:

- **Obstacle Avoiding Robot**
- **Line Following Robot**
- **Light-Following Robot**
- **Basic Remote-Controlled Robot (optional)**


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Core Skills Developed

- Logical & analytical thinking
- Basic electronics understanding
- Introductory programming
- Mechanical assembly skills
- Problem-solving & creativity
- Teamwork & communication

Learning Outcomes

By the end of the program, students will:

- Understand how robots work
- Build and program simple robots
- Use sensors and motors confidently
- Apply logic to real-world problems
- Develop interest in STEM fields

Certification

- BotNest IoT Beginner Program Certificate
- Project-based assessment