Robotics Beginner level

Curriculum

Tabel Of Content

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

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)

🧠 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