IOT & ROBOTICS SYLLABUS COPY

Engineered for skill enhancement.

PROGRAM HIGHLIGHTS

Accredited Certificates:
✓ Program approved ISO Certification
Internships:
✓ Industry-relevant opportunities provided
Placement Assistance:
✓ Career guidance from industry experts
Basic to Advanced Level Training:
✓ Learn from experienced IoT and Robotics professionals
Live & Recorded Lectures:
✓ Flexible learning at your convenience
Real-Time Projects:
✓ Hands-on minor & major projects

ABOUT US

- **OUR MISSION :**

NxtSync is a pioneering EdTech company committed to bridging the gap between theoretical learning and practical application. Our mission is to empower students with cutting-edge IoT and robotics skills that enhance employability and prepare them for a technology-driven future.

- **OUR VISION--UPSKILL**: Empowering minds for the future.
- **INNOVATE**: Fostering creativity and breakthroughs .
- **EXCEL**: Preparing industry-ready professionals.

WHY IOT & ROBOTICS?

- High demand for IoT and Robotics skills across industries like manufacturing, healthcare, agriculture, and smart homes.
- IoT devices are revolutionizing automation, energy management, and connectivity
- Robotics is transforming industries like manufacturing, logistics, and healthcare through automation.
- Career opportunities in IoT systems design, robotics engineering, automation, and smart technologies.
- Integration of AI, machine learning, and IoT for smarter, data-driven decision-making.

LEARNING PATH

- Introduction to IoT and Robotics
- IoT Architecture and Communication Protocols
- Embedded Systems and Sensors
- Robotic Process Automation (RPA)
- Robotics Programming (ROS, Python)
- IoT Cloud Platforms & Data Analytics
- Smart Home Automation & Industry Applications
- Advanced Robotics (AI in Robotics)
- IoT Security and Privacy

DETAILED MODULE BREAKDOWN

Module 1: Introduction to IoT and Robotics

- Fundamentals of IoT and Robotics
- Evolution of IoT and Robotics in Industry
- IoT and Robotics in Everyday Life
- Overview of IoT Devices and Robotics Systems

Module 2: IoT Architecture and Communication Protocols

- Layers of IoT Architecture
- Communication Protocols in IoT (MQTT, CoAP, HTTP)
- IoT Network Design and Topologies
- Cloud Integration and Edge Computing

Module 3: Embedded Systems and Sensors

- Introduction to Embedded Systems
- Microcontrollers and Development Platforms (Arduino, Raspberry Pi)
- Sensors and Actuators in IoT
- Interfacing Sensors with Microcontrollers

Module 4: Robotic Process Automation (RPA)

- Introduction to Robotic Process Automation
- Designing Robotic Systems for Industrial Automation
- Industrial Robot Programming
- RPA Tools and Technologies

Module 5: Robotics Programming (ROS, Python)

- Basics of Robot Operating System (ROS)
- Programming Robots Using Python
- Developing Simple Robotics Applications
- Integration of IoT with Robotics

Module 6: IoT Cloud Platforms & Data Analytics

- Overview of IoT Cloud Platforms (AWS IoT, Microsoft Azure, Google Cloud)
- Storing and Processing IoT Data
- Data Analytics and Machine Learning for IoT
- Real-Time Data Visualization and Dashboard Creation

Module 7: Smart Home Automation & Industry Applications

- Smart Home Architecture and Devices
- IoT in Smart Homes: Automation, Control, and Monitoring
- Industry 4.0 and IoT-Driven Automation
- Robotics Applications in Manufacturing, Healthcare, and Logistics

Module 8: Advanced Robotics (AI in Robotics)

- Introduction to AI and Machine Learning in Robotics
- Vision Systems, Sensors, and Perception in Robotics
- Autonomous Mobile Robots (AMRs) and Drones
- Robot Learning and Path Planning

Module 9: IoT Security and Privacy

- Security Challenges in IoT Systems
- IoT Security Protocols and Best Practices
- Privacy Concerns and Data Protection in IoT
- Securing IoT Devices and Networks

Module 10: Capstone Projects & Industry Research

- Hands-on Real-Time IoT and Robotics Projects
- Industry Collaboration & Research-Based Projects
- Robotics and IoT System Prototyping
- IoT and Robotics Portfolio Building

ASSIGNMENT'S &ASSESSMENTS

- Weekly hands-on assignments
- Mid-term IoT/Robotics mini-projects
- Final capstone IoT/Robotics project
- Live presentations & discussions

TOOLS & FRAMEWORKS USED

- **Embedded Systems Tools:**
  Arduino, Raspberry Pi, BeagleBone, ESP8266/ESP32
- **IoT Development Platforms & Cloud Tools:**
  AWS IoT, Google Cloud IoT, Microsoft Azure, Node-RED, MQTT
- **Robotics Software & Frameworks:**
  Robot Operating System (ROS), VEX Robotics, OpenCV, TensorFlow (for AI in Robotics)
- **Programming Languages & IDEs:**
  Python, C++, Java, Visual Studio Code, Eclipse
- **Sensors & Hardware:**
  Temperature, Motion, Pressure, and Proximity Sensors; Servo Motors, Stepper Motors, Cameras, GPS
- **Automation Tools:**
  UiPath, Automation Anywhere, Blue Prism

RECOMMENDED READING

Digital Marketing:

- **"Internet of Things: A Hands-On Approach"** by Arshdeep Bahga & Vijay Madisetti
- **"Robotics: Control, Sensing, Vision, and Intelligence"** by K.S. Fu, R.C. Gonzalez, and C.S.G. Lee
- **"Practical Internet of Things with Azure"** by Rohan Bhamare
- **"Learning ROS for Robotics Programming"** by Aaron Martinez and Enrique Fernández
- **"AI for Robotics"** by Francis X. Govers

WHY CHOOSE NXTSYNC?

- Industry-Aligned IoT and Robotics Curriculum
- Hands-on Real-World Projects
- Expert Mentorship & Career Guidance
- Flexible Learning Schedule
- ISO-Certified IoT and Robotics Training Program

Start Your IOT & Robotics Journey with NxtSync Today!

THANK YOU