MAWA EVENTS

Address: No. 857, Block A2. Leisure Commerce Square - No 9., 46150 Petaling Jaya, Selangor, Malaysia

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FUNDAMENTALS OF ROBOTICS

"Exploring the Building Blocks of Intelligent Machines for the Future of Automation"

Schedule

Venue (InHouse)	Fees
At Your Organization Premises	Ask For The Quotation

► **Available delivery methods:** In-House Training

Introduction

Robotics is transforming industries by automating complex tasks, enhancing precision, and improving productivity. From industrial robots in manufacturing to service robots in healthcare and logistics, the robotics field is driving innovation across sectors.

This 5-day training offers a comprehensive introduction to the principles of robotics, covering core mechanical systems, electronics, sensors, actuators, programming, and the integration of artificial intelligence. It is designed to give participants both theoretical understanding and practical knowledge to engage with robotics in real-world applications.

Objectives

By the end of this course, participants will be able to:

- Understand the basic components and subsystems of robots
- Explore mechanical design, kinematics, and mobility in robots
- Identify sensor technologies and feedback mechanisms
- Learn basic programming concepts used in robotics systems
- Understand the role of AI and machine learning in robotic intelligence
- Evaluate robotics applications across different industries

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Why Attend

- Develop foundational knowledge in mechanical and software aspects of robotics
- Understand how robotic systems are designed, assembled, and controlled
- Learn to interpret and interact with robotic technologies used in automation
- Stay ahead of the curve in one of the fastest-growing fields of engineering
- Build practical insights into robotics integration for real-world problems

Target Audience

This program is designed for:

- Engineers and technical professionals
- STEM educators and researchers
- Automation and manufacturing specialists
- IT professionals exploring robotics integration
- Innovators, product designers, and R&D teams
- Anyone with interest in robotics, AI, and automation

Individual Benefits

Key competencies that will be developed include:

- Grasp of robot anatomy, control systems, and mobility
- Familiarity with sensors, actuators, and programming logic
- Understanding of robotics applications in industry and daily life
- Exposure to open-source robotics platforms (e.g., Arduino, Raspberry Pi, ROS)
- Capability to explore future learning in mechatronics, AI, and automation

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Increased innovation in process design and automation
- Enhanced ability to evaluate robotics technologies for integration
- Support for future robotics initiatives and projects
- Cost-effective experimentation with robotics for prototyping or education
- Development of internal capability in emerging technologies

Instructional Methodology

This course follows a blended learning approach combining theory with practice:

- Strategy Briefings – Core concepts of robotics, automation, and control
- Case Studies – Real-world robotics systems in manufacturing, healthcare, and logistics
- Workshops – Hands-on exercises to understand robot design, programming, and simulation
- Peer Exchange – Collaborative sessions to brainstorm robotic solutions to common problems
- Tools – Open-source kits, component lists, and design frameworks

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Course Outline

DETAILED 5-DAY COURSE OUTLINE (CUSTOMIZABLE)

Training Hours: 7:30 AM – 3:30 PM Daily Format: 3–4 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: Introduction to Robotics and Mechanical Systems

- Module 1: History and Scope of Robotics (07:30 – 09:30)
- Evolution of robotics and its current landscape
- Types of robots and applications across industries
- Module 2: Robot Anatomy and Structure (09:45 – 11:15)
- Mechanical design, joints, degrees of freedom
- Module 3: Mobility and Locomotion (11:30 – 01:00)
- Wheels, tracks, legs: motion systems and control
- Module 4: Workshop – Analyze a Robot Design (02:00 – 03:30)

Day 2: Sensors, Actuators, and Perception

- Module 1: Actuator Systems (07:30 – 09:30)
- Motors, servos, pneumatics, and hydraulics
- Module 2: Sensors and Feedback Loops (09:45 – 11:15)
- Ultrasonic, infrared, gyroscope, camera, LiDAR
- Module 3: Sensor Integration and Environmental Awareness (11:30 – 01:00)
- Obstacle detection, SLAM, and path planning basics
- Module 4: Workshop – Build a Simple Sensor Setup (Simulated) (02:00 – 03:30)

Day 3: Control Systems and Programming

- Module 1: Control Architectures (07:30 – 09:30)
- Open-loop vs closed-loop systems
- PID control and real-time adjustments
- Module 2: Introduction to Robotics Programming (09:45 – 11:15)
- Coding with Arduino/Python basics for robotic systems
- Module 3: Simulation Tools and Robot Operating System (ROS) (11:30 – 01:00)
- Overview of Gazebo, ROS, and robotic middleware
- Module 4: Workshop – Simulate a Line-Following Robot (02:00 – 03:30)

Day 4: Artificial Intelligence in Robotics

- Module 1: Intelligent Behavior and AI Techniques (07:30 – 09:30)
- Decision-making, navigation, and autonomy
- Module 2: Machine Learning in Robotics (09:45 – 11:15)
- Basics of supervised learning, computer vision, and NLP
- Module 3: Human-Robot Interaction (HRI) (11:30 – 01:00)
- Collaborative robots (cobots), safety, and UX
- Module 4: Case Study Review – AI-Driven Robotics Projects (02:00 – 03:30)

Day 5: Robotics Applications and Future Trends

- Module 1: Industry Applications of Robotics (07:30 – 09:30)
- Manufacturing, logistics, agriculture, healthcare
- Module 2: Robotics in Education and Research (09:45 – 11:15)
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Robotics kits, learning platforms, academic frameworks

- Module 3: Building a Robotics Development Plan (11:30 – 01:00)
- Prototyping, testing, budgeting, team development
- Module 4: Final Assessment & Project Discussion (02:00 – 03:30)

Certification

Participants will receive a Certificate of Completion in Fundamentals of Robotics, validating their foundational understanding of robot design, sensor integration, control systems, programming, and real-world applications across various sectors.

Why Choose MAWA Events

- **Global Expertise:** More than 17 years of experience in professional training and consulting.
- **Industry-Leading Faculty:** Courses delivered by seasoned professionals with hands-on experience.
- **Practical Insights:** Learn to turn theory into actionable strategies for real-world business impact.
- **Client-Focused Solutions:** Customized programs designed to achieve your organisation's unique goals.

In-House / Customized Training Interested in running this course for your team? Please contact us:	TEL: **+601116373203**	EMAIL: **info@mawaevents.net**