Training Course on Artificial Intelligence in Robotics

Professional Development Training Course Outline

Category	Artificial Intelligence And Block Chain	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Artificial Intelligence (AI) is revolutionizing the field of **robotics**, creating intelligent machines capable of performing complex tasks with unprecedented autonomy and efficiency. This comprehensive training course delves into the synergistic relationship between **AI and robotics**, equipping participants with the knowledge and skills to design, develop, and deploy cutting-edge intelligent robotic systems. By exploring key concepts such as **machine learning**, **computer vision** , **natural language processing**, and **robot control**, this program empowers individuals and organizations to leverage the transformative power of **intelligent automation**. Participants will gain practical insights into building robots that can perceive their environment, learn from data, make autonomous decisions, and interact seamlessly with humans, ultimately driving innovation across various industries through **advanced robotics** and **intelligent systems**.

This intensive course is designed to provide a robust understanding of the theoretical foundations and practical applications of **artificial intelligence in robotics**. Through a blend of theoretical lectures, hands-on exercises, and real-world case studies, participants will master the essential techniques for developing **smart robots**. The curriculum covers critical areas including **robot perception**, **AI algorithms for robotics**, **human-robot interaction**, and the ethical considerations surrounding **autonomous robots**. By focusing on the latest advancements and **emerging trends in AI and robotics**, this training program aims to cultivate a new generation of experts capable of leading the charge in this rapidly evolving technological landscape and unlocking the full potential of **AI-powered robots**.

Programme Curriculum

Training Course on Artificial Intelligence in Robotics

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Course Duration

5 days

Course Objectives

1. Understand the fundamental principles of **artificial intelligence** and its applications in **robotics**.
2. Explore various **machine learning algorithms** relevant to robot perception and decision-making.
3. Master techniques in **computer vision** for object recognition, scene understanding, and robot navigation.
4. Learn how to implement **natural language processing** for seamless human-robot communication.
5. Gain proficiency in **robot kinematics and dynamics** for effective robot control and manipulation.
6. Develop skills in integrating **AI models** with robotic hardware and software platforms.
7. Analyze and apply different **sensor technologies** for robot environment perception.
8. Design and implement **path planning and navigation algorithms** for autonomous robots.
9. Evaluate the principles of **human-robot interaction** for safe and collaborative robotic systems.
10. Understand the ethical and societal implications of **intelligent and autonomous robots**.
11. Explore the use of **deep learning** techniques for complex robotic tasks.
12. Learn about **reinforcement learning** for robot skill acquisition and adaptation.
13. Investigate real-world **case studies and applications** of AI in diverse robotic domains.

Organizational Benefits

- Develop robotic systems capable of automating complex and repetitive tasks, leading to increased productivity and reduced operational costs.

- Deploy AI-powered robots for tasks requiring high precision and consistency, minimizing errors and improving quality control.
- Utilize robots in hazardous environments, protecting human workers from potential risks and injuries.
- Foster a culture of innovation by equipping your team with the skills to develop and implement cutting-edge robotic solutions.
- Leverage the data collected by intelligent robots to gain valuable insights and optimize processes.
- Implement robotic systems that can be easily scaled and adapted to changing demands and new applications.
- Position your organization as a leader in technology adoption, attracting skilled professionals in the fields of AI and robotics.
- Develop intelligent robotic solutions for intricate challenges across various industries, from manufacturing to healthcare.

Target Audience

1. Robotics Engineers and Technicians
2. Artificial Intelligence and Machine Learning Professionals
3. Automation Specialists and Engineers
4. Research Scientists and Academics
5. Software Developers interested in Robotics
6. Manufacturing and Production Engineers
7. Logistics and Supply Chain Professionals
8. Individuals seeking to enter the field of AI and Robotics

Course Outline

Module 1: Introduction to AI and Robotics

- Fundamentals of Artificial Intelligence: History, Types, and Applications.
- Overview of Robotics: Components, Architectures, and Classifications.
- The Synergy of AI and Robotics: Enabling Intelligent Automation.
- Key Concepts in Intelligent Systems: Perception, Cognition, and Action.
- Current Trends and Future Directions in AI-Powered Robotics.

Module 2: Machine Learning for Robot Perception

- Supervised Learning: Classification and Regression Techniques for Robotics.
- Unsupervised Learning: Clustering and Dimensionality Reduction for Data Analysis.
- Deep Learning Fundamentals: Neural Networks and Convolutional Neural Networks (CNNs).
- Applying Machine Learning for Object Detection and Recognition in Robotics.
- Sensor Data Processing and Fusion using Machine Learning Algorithms.

Module 3: Computer Vision for Robotic Systems

- Image Processing Techniques for Robot Vision.
- Feature Extraction and Matching for Object Tracking and Localization.
- 3D Vision and Depth Sensing Technologies for Robots.
- Visual Servoing and Robot Manipulation using Computer Vision.
- Implementing Real-time Computer Vision Applications on Robotic Platforms.

Module 4: Natural Language Processing for Human-Robot Interaction

- Fundamentals of Natural Language Understanding and Generation.
- Speech Recognition and Synthesis for Robot Communication.
- Dialogue Management and Conversational AI for Robots.
- Developing Natural Language Interfaces for Robot Control and Tasking.
- Understanding Human Intent and Context in Robot Interactions.

Module 5: Robot Kinematics, Dynamics, and Control

- Robot Kinematics: Forward and Inverse Kinematics Analysis.
- Robot Dynamics: Understanding Forces, Torques, and Motion.
- Classical Control Techniques for Robot Joint and End-Effector Control.
- Advanced Control Strategies for Autonomous Robot Navigation.
- Simulation and Modeling Tools for Robot Control System Design.

Module 6: AI-Driven Robot Navigation and Path Planning

- Sensor-Based Navigation: Obstacle Avoidance and Mapping Techniques.
- Graph-Based Search Algorithms for Path Planning (e.g., A*, Dijkstra).
- Sampling-Based Motion Planning Algorithms (e.g., RRT).
- Integrating AI for Intelligent Navigation in Dynamic Environments.
- Developing Autonomous Navigation Systems for Mobile Robots.

Module 7: Human-Robot Interaction and Collaboration

- Principles of Effective Human-Robot Interaction Design.
- Safety Considerations in Collaborative Robotics (Cobots).
- Developing Intuitive Interfaces for Robot Programming and Control.
- Understanding Human Factors in Human-Robot Teams.
- Ethical and Social Implications of Human-Robot Collaboration.

Module 8: Advanced Topics and Applications of AI in Robotics

- Reinforcement Learning for Robot Skill Acquisition and Adaptation.
- Deep Reinforcement Learning for Complex Robotic Tasks.
- AI for Multi-Robot Systems and Swarm Robotics.
- Case Studies: AI in Industrial Robotics, Healthcare Robotics, and Service Robotics.
- Future Trends and Research Challenges in AI and Robotics.

Training Methodology

This course employs a blended learning approach, combining:

- **Interactive Lectures:** Engaging presentations covering theoretical concepts and real-world examples.
- **Hands-on Exercises:** Practical sessions using simulation software and robotic platforms (where applicable).
- **Case Studies:** In-depth analysis of successful AI and robotics implementations.
- **Group Discussions:** Collaborative learning and knowledge sharing among participants.
- **Project-Based Learning:** Application of learned concepts to solve practical robotics challenges.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org **or call** *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

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