Publication date : 08/06/2024

Course : Robotics, state of the art

Seminar - 2d - 14h00 - Ref. ROB
Price : 1850 € E.T.

Robotics has become a veritable convergence point for hardware, software, embedded systems and Artificial Intelligence. From its history to current and future applications, this seminar will enable you to grasp all the challenges and opportunities of this booming world.

Teaching objectives

At the end of the training, the participant will be able to:

- A better definition of the field of robotics
- Identify its uses: service, industrial, medical, civil, military, home automation, cobotics, augmented human, IoT...
- Discover its ecosystem, architectures, possibilities and limits
- Define the resources required for your robotics project
- Better identify markets, challenges and future developments in robotics

Intended audience

Business and new technology decision-makers looking for an overview of robotics and project opportunities.

Prerequisites

No special knowledge required.

Course schedule

PARTICIPANTS

Business and new technology decision-makers looking for an overview of robotics and project opportunities.

PREREQUISITES

No special knowledge required.

TRAINER QUALIFICATIONS

The experts leading the training are specialists in the covered subjects. They have been approved by our instructional teams for both their professional knowledge and their teaching ability, for each course they teach. They have at least five to ten years of experience in their field and hold (or have held) decision-making positions in companies.

ASSESSMENT TERMS

The trainer evaluates each participant's academic progress throughout the training using multiple choice, scenarios, hands-on work and more.
Participants also complete a placement test before and after the course to measure the skills they've developed.

1 Culture, history and definitions

- Myths, cultures and legends linked to robotics.
- The evolution of robotics from the first tool to the electronic age.
- Industrial Revolution: invention of the steam engine.
- Automata, animal-machine, Pascaline, Babbage machine...
- Military creations: Cold War, spy and combat robots.
- Video games: culture "mechas", simulators and Serious Game robotics.
- Systemic, scientific, mathematical and IT approach.
- Definitions influenced by history, culture, usage and marketing.
- Definitions by sector, environment, composition...
- Beliefs and perceptions of the world of robotics.

2 Markets, jobs and uses

- Global, European and French markets.
- Robotics market for small and medium-sized businesses.
- Market projections: Smart City, industry of the future...
- Market by sector: Internet of Things, industrial robotics, service, leisure...
- Robotization of the job market: new jobs in digital technology and robotics.
- Job change: robotization versus unemployment.
- Robotics applications: service, industry, Internet of Things (IoT), home automation, cobotics...
- Robotics in the world of entertainment, cinema and leisure.

3 Equipment and materials

- The mechanics, physics and structure of a robot.
- Materials: PLA, ABS, PVC, steel, nylon, kevlar, natural...
- Study the best ratio: weight, price, resistance/life expectancy...
- Electronic and electrical composition.
- Sensors: brightness, gyroscope, RFID, camera...
- Motors: servomotors, DC motors, stepper motors...
- Microcontrollers and processors
- Power supply: mains, batteries, green energy

4 Software and Artificial Intelligence

- Programming languages and robotics.
- Software environment: frameworks and APIs.
- Artificial Intelligence, Machine Learning and Big Data in robotics.
- Optical illusions for robots.
- Example of BeepAI.
- Voice recognition: natural language, chatbot, voice to action.
- Motion and object detection (face, posture, emotions, QR-Codes...).
- 2D/3D/4D cartography and spatialization: finding your bearings in space.
- Programming examples and demonstrations.

5 Design and toolbox

- Hardware and software toolbox for robotics projects.
- From idea to prototyping: drawings, 2D/3D diagrams.
- From classic tools to the latest prototyping tools.
- Rapid prototyping, 3D printing, laser cutting, milling machines...
- Tests: performance, wear, safety...
- Virtual robotics: prototyping, electronics and virtual robots.
- Maintenance, modularity and rapid repairs.
- Resources and examples of Open Source projects.

TEACHING AIDS AND TECHNICAL RESOURCES

• The main teaching aids and instructional methods used in the training are audiovisual aids, documentation and course material, hands-on application exercises and corrected exercises for practical training courses, case studies and coverage of real cases for training seminars.
• At the end of each course or seminar, ORSYS provides participants with a course evaluation questionnaire that is analysed by our instructional teams.
• A check-in sheet for each half-day of attendance is provided at the end of the training, along with a course completion certificate if the trainee attended the entire session.

TERMS AND DEADLINES

Registration must be completed 24 hours before the start of the training.

ACCESSIBILITY FOR PEOPLE WITH DISABILITIES

Do you need special accessibility accommodations? Contact Mrs. Fosse, Disability Manager, at psh-accueil@orsys.fr to review your request and its feasibility.

6 Architecture, ecosystem and communication

- Means of communication: Bluetooth, WiFi, LiFi, infrared...
- Cellular robotics: 3G/4G/5G.
- Internet communication protocols and standards.
- Robotics standards: operating systems, communication...
- Example of robotic and home automation architecture.

7 Legislation, standards, ethics and safety

- Autonomous cars, drones, quadcopters and regulations.
- Data, Big Data, RGPD and CNIL.
- Copyrights, patents and robotic creations.
- Ethical issues: accidents, moral dilemmas.
- Digital sovereignty and robotics.
- Legislation, directives, standards "robotics".
- Artificial intelligence, robotics and ethical and moral issues.
- Electrical safety: beware of electrocution!
- Computer security and robotic hacking.
- Special case of cobotics: synergy between man and machine.

8 The place of man and the future of robotics

- Human brain versus Artificial Intelligence.
- Famous artificial adversaries: Deep Blue, AlphaGo, AlphaZero...
- Anthropomorphism and [[Uncanny valley]].
- Robotics, emotions and psychology: from surveillance robot to therapy robot.
- From replaced man to assisted or augmented man.
- Implants: cochlear, retinal, cerebral.
- Industry of the future, Smart Cities, autonomous transport.
- Tomorrow's materials, equipment and processors.
- Quantum Artificial Intelligence and robotics of the future.

Dates and locations

REMOTE CLASS
2026 : 12 Mar., 18 June, 1 Oct., 17 Dec.

PARIS LA DÉFENSE
2026 : 18 June, 1 Oct., 17 Dec.