Safely deploy autonomous robots and help improve manufacturing processes

Autonomy training for industrial automation engineers responsible for safety and design of modern machinery and robotics

Course overview

This 2.5-day training course highlights modern day autonomous robotics, industrial automation, sensors, and semi-automated technologies and how they can be developed for safety. Participants will learn how current safety standards, including UL 3100, the Standard for Automated Mobile Platforms (AMPs), ISO 10218, the standard for robots and robotic devices – safety requirements for industrial robots, and UL 1740, the Standard for Robots and Robotic Equipment provide a current path to compliance. UL 4600, the Standard for Safety for the Evaluation of Autonomous Products, will also be taught as a future safety framework for industrial robotics. Key themes include autonomy safety and functional safety for electronic controls and how they apply to robotics in automated warehouse settings as society advances towards digital factories and Industry 4.0.

Training topics

- Introduction to industrial automation: How do robots consider safety of autonomous operations?
- Autonomous robotics in the industrial landscape
- Autonomy and the associated technology
- Introduction to robotic and autonomy safety frameworks
- Introduction to UL 3100, ISO 10218, and UL 1740
- How functional safety works in robotics
- ISO 12100:2010, the standard for safety of machinery – general principles for design – risk assessment and risk reduction, with safeguarding and industrial safety
- Autonomous robotics safety: What changes?
- UL 4600 scope and definitions
- Why safety is critical to success
- Risk assessment
- Interaction with humans and road users (and how to adapt for industrial use cases)
- Autonomy functions and support
- Software and system engineering processes
- Dependability
- Data and networking
- Verification, validation, and test
- Tool qualification, commercial off-the-shelf (COTS) and legacy components
- Safety life cycle concerns
- Maintenance
- Metrics and safety performance indicators (SPIs)
- Safety assessment
- Other relevant autonomy safety standards
- Wrap-up and discussion topic

Optional UL Certified Autonomy Safety Professional Exam
Participants who complete all 2.5-days of training are eligible to take a two-hour certification exam in the afternoon of the third day. Those who pass the exam are individually certified as a UL Certified Autonomy Safety Professional (UL-CASP) in Industrial Automation.

Upon the successful completion of the *UL-CASP* exam, participants will receive a certificate and badge that they can use to demonstrate their competence in industrial autonomy safety. The certification is good for three years, after which individuals may recertify.

Objectives
Upon successful completion of this workshop, you will be able to:
- Understand autonomous vehicles (AV) and robotics development considerations for safety
- Develop a verification and validation strategy for autonomous robotics
- Understand existing safety methodologies for industrial robotics
- Build a methodology for a safety case with respect to industrial robots

Target audience
- AV and robotics hardware and software developers
- Simulation engineers working with partially automated and autonomous robotics
- Robotic safety verification and validation engineers
- Project and product leaders
- Compliance engineers

Why choose UL?

From materials testing to supply chain management, new energy options to security and interoperability solutions, leverage our expertise and insights to navigate the global regulatory landscape and bring your products to market.

UL's global network of technical experts and state-of-the-art facilities, along with our longstanding relationships with regulatory authorities, partner laboratories and industry technical leaders, helps manufacturers gain the compliance credentials they need to compete in a more complex global supply chain.

Knowledge you can trust – Our experienced staff will support you from the initial design stage of product development through testing and production. Our experts can assist you in understanding the certification requirements for your specific markets.

Speed and efficiency – Our cost-effective systems and state-of-the-art facilities cut through the red tape and help accelerate your time to market.

Single-source provider – UL meets all of your compliance needs and, by bundling safety, performance and interoperability services, also helps save you valuable time and money.

Global reach and access – Our global network of expert engineers helps you understand the various national and global requirements for your specific market application.

**For more information, call 1.864.630.5373,
email: kvasales@UL.com or visit kvausa.com.**

Empowering Trust®