Functional Safety Engineering Training Course

Professional Development Training Course Outline

Category	General Training	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Functional Safety Engineering is a critical discipline that ensures systems operate safely even in the presence of failures, particularly in high-risk industries such as automotive, oil & gas, railways, industrial automation, and aerospace. Functional Safety Engineering Training Course is designed to build deep expertise in IEC 61508, ISO 26262, and other global functional safety standards, enabling engineers to design, assess, and validate safety-critical systems with confidence. Participants will gain hands-on knowledge of risk assessment, hazard analysis, safety lifecycle management, and SIL (Safety Integrity Level) determination, which are essential for modern safety-driven engineering environments.

With the rapid rise of AI-driven automation, autonomous systems, IoT safety architectures, and Industry 4.0, the demand for certified Functional Safety Engineers is increasing globally. This course integrates theoretical foundations with real-world applications, enabling professionals to reduce system failures, ensure compliance, and enhance operational reliability. By mastering safety lifecycle processes, fault tolerance design, and verification techniques, learners will be equipped to deliver robust safety solutions aligned with international compliance requirements.

Programme Curriculum

Functional Safety Engineering Training Course

Introduction

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Course Duration

5 days

Course Objectives

1. Master IEC 61508 & ISO 26262 Functional Safety Standards
2. Understand Hazard and Risk Analysis (HARA) techniques
3. Perform Safety Integrity Level (SIL) & ASIL determination
4. Apply Safety Lifecycle Management principles
5. Design fail-safe and fault-tolerant systems
6. Conduct FTA (Fault Tree Analysis) and FMEA
7. Develop Safety Requirements Specifications (SRS)
8. Implement Verification & Validation (V&V) strategies
9. Analyze system reliability and failure modes
10. Apply functional safety in embedded systems & PLCs
11. Integrate safety in autonomous and AI-driven systems
12. Ensure regulatory compliance and certification readiness
13. Develop real-world safety case documentation

Target Audience

1. Functional Safety Engineers
2. Embedded Systems Engineers
3. Automotive Safety Engineers
4. Industrial Automation Engineers
5. Electrical & Electronics Engineers
6. Risk & Reliability Engineers
7. Software Developers in Safety-Critical Systems
8. QA / Compliance & Certification Professionals

Course Modules

Module 1: Introduction to Functional Safety Systems

- Overview of functional safety concepts and lifecycle
- Safety vs reliability vs security distinction
- Key international standards overview
- Safety culture in engineering organizations
- Case Study: Toyota unintended acceleration safety recall analysis

Module 2: Hazard Identification & Risk Assessment (HIRA)

- Hazard identification techniques
- Risk matrix development
- Operational risk evaluation methods
- Preliminary Hazard Analysis (PHA)
- Case Study: Oil refinery explosion risk modeling

Module 3: Safety Integrity Level (SIL) & ASIL Classification

- SIL determination process
- ASIL classification in automotive systems
- Risk reduction factor calculation
- Safety goals definition
- Case Study: Autonomous braking system SIL allocation

Module 4: Failure Modes & Effects Analysis (FMEA)

- Design FMEA vs Process FMEA
- Failure mode identification techniques
- Severity, occurrence, detection ranking
- RPN (Risk Priority Number) optimization
- Case Study: Aircraft control system failure analysis

Module 5: Fault Tree Analysis (FTA) & Reliability Engineering

- Boolean logic in fault tree construction
- Top-down failure analysis approach
- Quantitative probability modeling
- Reliability block diagrams
- Case Study: Nuclear plant cooling system failure prevention

Module 6: Functional Safety Design & Architecture

- Fail-safe and fail-operational design principles
- Redundancy and diversity strategies
- Hardware/software safety partitioning
- Embedded safety architecture design
- Case Study: Railway signaling system safety design

Module 7: Verification, Validation & Safety Testing

- Safety validation lifecycle
- Simulation-based testing approaches
- Hardware-in-the-loop (HIL) testing
- Software safety testing techniques
- Case Study: Airbag deployment system validation

Module 8: Safety Case Development & Certification

- Safety case structuring and documentation
- Regulatory compliance mapping
- Audit preparation strategies
- Certification process overview

- Case Study: ISO 26262 automotive certification success story

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

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

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

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

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