Publication date : 08/07/2024

Course : Dependability and software risks, software FMECA and AEEL

Practical course - 3d - 21h00 - Ref. SUF
Price : 1930 € E.T.

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This course will show you how to implement risk analysis and software reliability/availability techniques. Through practical case studies, you will learn how to use the main standards and conceptual tools in the field: IEC 61508, ISO 26262, STD 882E, FMECA, AEEL, COTS.

Teaching objectives

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

- Understand the principles and approach of risk analysis and software reliability
- Understand the stages and components of a software dependability system
- Analyze a program to check coding rules and ensure software reliability
- Perform a Software Error Effects Analysis (SEEA), using a phase-by-phase approach

Intended audience

Developers, project managers, validation managers faced with the development of critical systems with a strong software component.

Prerequisites

Knowledge of computer development methods and tools. Knowledge of programmed systems development processes.

Practical details

Exercise

Case studies to illustrate the concepts of software reliability and AEEL.

Teaching methods

Lessons and practical exercises and case studies. Exercises are representative of problems encountered in the field.

Course schedule

PARTICIPANTS

Developers, project managers, validation managers faced with the development of critical systems with a strong software component.

PREREQUISITES

Knowledge of computer development methods and tools. Knowledge of programmed systems development processes.

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 Software SoTL concepts and principles

- The scope and challenges of SoF.
- Defining risk.
- Key features.
- Nature of software requirements.

Hands-on work
Identify the software's main dependability requirements.

2 Software SoTL issues and challenges

- Software SoF construction and terminology.
- SdF insurance.
- The SoTL Plan. Components.

Hands-on work
Construction of software dependability.

3 System survey

- Safety and security.
- SIL level assignment (according to IEC 61508).
- Notion of independence (according to IEC 61508, ISO 26262).
- SdF requirement. Reliability requirement.

Hands-on work
Specification of a safety function according to IEC 61508.

4 Software reliability

- Definition. Triggers and inputs to software reliability (standards and repositories). Metrology.
- The different types of software.
- Why and when to assess reliability? Here are some examples.
- Experimental reliability, its implementation.

Hands-on work
Estimating software reliability.

5 Software safety

- Safety barrier.
- IEC 61508 approach.
- STD 882E approach.

Hands-on work
Safety program in accordance with STD 882E.

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 FMECA

- Theory of software FMEA: analysis of failure modes, their effects and criticality.
- Phase-by-phase analysis.
- Analysis of failure mechanisms.
- Criticality assessment.
- Proposals for corrective action.
- Presentation and interpretation of results.
- Software FMEA.
- Difference with AEEL (Analysis of the Effects of Software Errors).

Hands-on work

Performing an AEEL analysis.

7 COTS

- Integration of COTS components.
- COTS for safety-critical systems.
- Example of a safety study process incorporating COTS.
- Architectural features.

8 Conclusion

- Normative aspects. Industrial practices.
- The main limitations of the FMECA method.

Dates and locations

REMOTE CLASS
2026 : 18 May, 14 Sep.

PARIS LA DÉFENSE
2026 : 18 May, 14 Sep.