

5 days (35 hours) within a three-week time span

Fees : from 2000 € HT to 3500 € HT

ONLINE TRAINING

Dates and detailed fees on aste.asso.fr

Target Audience

The course is for professional engineers with responsibilities in new product design, planning, and development or current product quality management who wish to develop advanced knowledge and skills on applied aspect of reliability and risk engineering in support of robust data-based decision-making.

Prerequisites

- Attendance of "Statistics for engineering" (SAFI-M1) module would be advantageous but brief introduction is incorporated.
- Some experience with failure data analysis would be beneficial but not necessary.
- No previous coding experience required but some experience would be beneficial.

Instructor

Professor Felician CAMPEAN, Professor in Automotive Reliability Engineering and Director of the Automotive Research Centre of the University of Bradford.

Training Delivery Methodology

The delivery is designed as a workshop style with an approximate 50/50 split between technical sessions and hands-on exercises, designed to explain the concepts by leveraging relevant industrial case studies.

Delivered online. Package to include reading, and training material with Python Programming tutorials at Introductory level will be delivered prior to the module start.

Technical equipment

The training is delivered as a virtual classroom, using Microsoft Teams.

Login information sent at the latest 2 days before the training.

Modes of Assessment

- Attendance sheet signed each half day by the participants and co-signed by ASTE.
- Learning assessment based on:
 - * individual or group presentation with argument on a mini-project
 - * individual plan for application around a specific project in the workplace of the participant (plan based on the methods and tools from the course).
- Training performance: qualitative assessment of the training by attendants at the end of the session.
- Delivery of a training certificate.

Access Deadline

Open training: registration at the latest 7 days before the training | In-house training: organisation within 4 weeks minimum.

Accessibility to Disabled people

Contact our Disability Officer : info@aste.asso.fr

LEARNING OUTCOMES

Upon completion of this module, the participant will be able to:

- Identify and analyse the concepts and principals of reliability engineering and their potential applications to different engineering problems,
- Identify the failure modes of components and characterise the associated service life distributions,
- Assess and analyse appropriate approaches to quantify the reliability of components based on the available data (feedback, tests, calculations),
- Design component reliability validation plans (accelerated tests, reliability forecast by numerical simulation, etc.),
- Demonstrate robustness in relation to the environment and an operating reliability level,
- Improve reliability engineering methods by using feedback,
- Evaluate and select appropriate techniques and tools to propose an approach in response to reliability questions asked by design offices (risk quantification).

PROGRAMME

This course will introduce participants to fundamental reliability concepts and models and their application to product development at different phases of the systems life cycle. The concepts covered are of interest to most engineers as industry increasingly shifts toward risk-oriented approaches and understanding reliability is a key factor in identifying and in mitigating the risk.

The course is organised as follows:

Reliability Fundamentals

- Key concepts (failure and survival probability; failure and hazard rate etc.).
- Models of reliability functions
- Weibull distribution and its engineering application.
- Other distributions and application of theory of confidence interval..

Experimental Reliability

- Introduction to the concept of censoring in relation to both field data and planned tests.
- Time in service analysis
- Standard reliability tests and parameter estimation.
- Accelerated life testing and explain use of regression with life data.

- Models of cumulative damage and use of such models to derive life models.
- Introduction to Bayesian reliability analysis.

Operational Reliability

- Random censoring on field data.
- Introduction to Kaplan-Meier nonparametric estimator.
- Warranty data analysis.
- Mileage based field data analysis.

Mini-Project

Contact : Patrycja PERRIN

pperrin@aste.asso.fr // 01 61 38 96 32