



Systems engineering Fundamentals

Benefits of this training

This three-days training course offers participants the opportunity to experience the entire system development cycle, from requirements analysis to validation. It enables participants to master the fundamental principles of systems engineering. Participants practice applying systems engineering methods and best practices through collaborative work as part of an engineering team on a project.

Learning objectives

To ensure that participants understand and effectively implement system engineering as a collective skill that supports the company's performance and competitiveness:

- Develop a comprehensive understanding of the lifecycle of a complex system development program, including the integration of multiple V-model development cycles
- Apply the fundamental principles of Systems Engineering, prepare and conduct trade-off analyses to identify optimal solutions, and coordinate activities throughout the development lifecycle.
- Appropriately implement the methods and tools required to support Systems Engineering processes
- Practice the roles and responsibilities of key stakeholders to ensure effective Systems Engineering performance in support of project objectives.

Teaching approaches

The training combines theoretical sessions (25%) with extensive hands-on application (75%) based on a representative case study of a complex development programme for a Client Organization (Project Owner), using a dedicated Hardware and Software simulation platform

Target audience

This course is designed for anyone involved in the application of Systems Engineering, ranging from newly appointed Systems Engineers to Systems Engineering managers, including System Architects and other engineering professionals contributing to complex system development.

In-house training

Duration: 3 Days

Presential or Remote learning
Customization possible

Language: English or French

Prerequisites: none

Recommendations:
none

Access timeframe: 2 weeks

Implementation timelines:
Based on the analysis of the client's needs

Evaluation:
Self-assessment of prior knowledge at the start of the training program
Self-Assessment form upon completion of Training

Methods used for the workshop:
In full-group and sub-groups, role-playing based on a central case study

8 to 12 participants

Accessibility for disabled people:
Yes, please contact us to discuss options

Prices: Please, contact us



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Program

Engineering principles and key definitions

- Fundamentals of Systems Engineering
- Development lifecycle principles
- Systems Engineering reviews

Understanding the Project Environment and Challenges of Complex Programmes

Project Initiation

- Project framing: objectives and constraints

Functional System Architecture

- Fundamental principles of functional design
- Product Breakdown Structure (PBS)
- Functional allocation and interface management

Requirements Engineering

- Defining a requirement
- Requirements analysis and specification
- Functional requirements specification
- Requirements traceability

Preliminary Design of the Primary System and Contributing Systems

- Architecture trade-off and selection
- Allocation of requirements to subsystems and contributing systems (functional, non-functional, interfaces, industrial, etc.)
- Anticipation of the Integration, Verification and Validation (IV&V) process
- Risk management
- Supplier selection and supplier relationship management

System Qualification Process

- Qualification principles and definitions (Integration, Verification and Validation)
- Early planning and preparation for qualification activities
- Reviews associated with qualification processes

System Configuration Management

- Fundamentals and benefits of Configuration Management
- Functional, Allocated and Product Baselines
- Configuration Items (CIs)
- Documentation and data associated with Configuration Items
- Configuration Management processes
- Functional and Physical Configuration Audits (FCA/PCA)

Overview of Systems Engineering Supporting Tools

- Requirements Management tools
- Model-Based Systems Engineering (MBSE) tools and approaches
- Product Line Engineering (PLE)
- Configuration Management tools
- Other Systems Engineering enabling tools



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Key Figures

More than **20,000 participants** worldwide over nearly **20 years**.

For **90%** of participants (*), the pedagogical progression of our training programs is tailored to their needs.

97% of participants (*) agree that our trainers are able to effectively convey their knowledge and expertise thanks to their professional backgrounds.

Our training programs meet the objectives (**) of **93%** of participants (*)

(*) Period from January 2025 – December 2025

(**) usefulness of the content for professional development and overall satisfaction of the training