

# Foundations of the System Engineering and Architecture Frameworks

**Duration:** 2 Days

## Description

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This two days course allows participants to acquire a common terminology of the System Engineering, familiarize themselves with the system vision, principles and state-of-the-art procedures according to ISO / IEC 15288 and ISO / IEC / IEEE 42010 standards as well as architectural frameworks of System Engineering such as ( DoDAF, MoDAF and NAF...) and how to align their viewpoints using the Enterprise Architecture Frameworks Methodologies such as the Open Group's TOGAF's ADM (Architecture Development Method).

## Audience

Any actor involved in the System Engineering domain : System Architects, System Analysts, System Engineers,

Managers having the responsibility to let all SE actors adhere to a corporate approach.

## Outline

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### Introduction

Objectives of this training/mentoring module,

Issues in the System Engineering and Model Typol

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- Objectives of this training/mentoring module,
- Issues in the System Engineering and Model Typologies (AFIS, Incose),
- The System Vision: definitions and characteristics,
- Notions of the System Engineering : view and viewpoint of the standard ISO/IEC/IEEE 42010, principles, process and activities
- Typology of Requirements : business requirements, functional and non functional requirements, user requirements, design and exploitation level requirements

## Project Management in the field of System Engineering

- Processes and phases, integrated and simultaneous engineering,,
- System development : generic process, engineering and integration, iteration et recursivity,
- Organisation in the System Engineering Discipline: a collaborative management of the information, language and data

## **The Engineering Process and Modeling**

- Description of the dynamic and static context of the system: entities, flows exchanged, external constraints,
- Modeling in system engineering: Semantic, functional, dynamic, temporal, organic modeling,
- Panorama of representations in SysML,
- Positioning the System Development Cycle in the various state-of-the-art approaches according to ISO / IEC 15288: Harmony, OOSEM, RUP-SE, State Analysis MBSE, Vitech MBSE Initiative,
- Basic process for engineering: requirements gathering- definition of technical requirements analysis, design of functional and organic / physical architectures,
- Verification of the constituents of the system against technical requirements,
- Validation against the allocated requirements and initial requirements for the complete system,
- Evaluation and optimization of architectures

## **Architecture Frameworks for System Engineering**

- DoDAF, MoDAF, NAF
- Aligning the Architecture with Changes
- Tools for the System Engineering
- Expected Functionnalities from the tools ,
- Complementary tools for engineering,
- Presentation of a System Engineering tool,

## **Conclusion**

- Phases of requirements gathering, analysis and design in the system engineering,
- Ensuring traceability between requirements and components of the system,
- Integration and Acceptance tests of the Requiements upon the system architecture

## **Prerequisites**

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There are no prerequisites for this course