

System Engineering using SysML and MBSE standards

Duration: 3 Days

Description

This 3 days training aims at assisting system analysts to express efficiently their needs and designers to make the appropriate architectural design of the system on the basis of these needs.

The resulting system architecture provides a good level of agility to the system in face of changes as it allows a coherent traceability of the business requirements encapsulated in system functions toward the software implementation level.

Delegates will learn

- Helping Analysts and Designers of the System Engineering domain understand how to efficiently gather requirements then go through the system analysis and design using Model Based System Engineering (MBSE) methodologies and the OMG's SysML - System Engineering Modeling Language.

Audience

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

Prerequisites

Previous experience in System Engineering or at least having already acquired concepts of the "System Engineering Fundamentals" course.

Outline

Introduction

- What is System Engineering ?
- Issues in the System Engineering and the Model Based System Engineering (MBSE) Standards

- A panorama of MBSE Methodologies : ViTech, State Analysis, RUP SE, Harmony Process (IBM/Telelogic)
- A Method based Framework for gathering requirements, system analysis and design
- Overview of the UML/SysML diagrams used in requirements gathering, system analysis and design of the System Engineering domain

Gathering Requirements and Transforming them into System Specifications

- Making business and system requirements traceable using the SysML requirement diagram
- Define the scope of the system composed of functions and use cases that invoke these functions
- Model the Life Cycle of the System that orchestrates transitions between its states where functions are triggered
- Prepare test cases using scenarios that realize Use Cases and System Functions
- Case Study : Model the System Scope and the usage of the system functions on the basis of requirements

Transforming System Specifications into Design Level Components

- Model the Block Diagram of the system and refine it using internal blocks
- Elaborate the Communication Architecture between Sub-System using Parts, Ports and Interfaces
- Case Study : Elaborate the block and Internal Block diagrams on the basis of system specifications and by considering design level choices
- Model the description of white box Interactions at the design level
- Case Study : Model interactions between blocks and Internal Blocks on the basis of design level choices
- Mapping of Operations on the Components (Parts) of Blocks
- Elaborate the Parametric Diagram of the System Functions
- Case Study : Update the Block and Internal Block Diagrams on the basis of design level scenarios

Conclusion

- Steps of requirement analysis and system specifications in system engineering
- Traceability between requirements and the software
- System Integration and Acceptance Tests of the requirements

Prerequisites

Having already acquired concepts of the "System Engineering Fundamentals" course.