Systems Modeling with SysML

Course Background:

As a natural extension to the Unified Modeling Language (UML) for software modeling and specification, the Object Management Group (OMG), together with its industrial partners, has set a standard for the systems modeling language SysML. This language supports the integral modeling and specification of software intensive systems and helps to improve system-architecting practices by enabling systematic model-based systems engineering (MBSE).

Typically, SysML offers a number of graphical modeling techniques. It supports the integrated construction of graphical models from requirements down to detailed structural and behavioral system descriptions. The models form a basis for sound systems engineering resulting in well-motivated and well-documented system architectures.

Course Benefits:

Our course Systems Modeling with SysML aims to provide a basic working knowledge of the various modeling techniques offered in the SysML. The approach is case-based, so that participants will be able to appreciate how these techniques can be applied in practice.

Participants will learn:
- The general approach to model based systems engineering with SysML.
- The various modeling techniques in the SysML.
- To capture functional requirements using use cases.
- To model dependencies between functional as well as non-functional requirements.
- To make models of system structure using block diagrams with parts and ports.
- To model physical as well as logical constraints and studying trade-offs.
- To distribute the functionality described by the use cases over the system parts.
- To describe behavior using state machine diagrams.
- To describe behavior using activity diagrams.
- To address allocation of behavior, e.g. to software or hardware parts.
- Some heuristics and evaluation techniques to obtain high quality models.

Who will benefit from this course?

- System analysts
- System architects
- Systems engineers
- Software architects and engineers who want to move into system-level engineering and managers who are responsible for the delivery of software intensive systems

Pre-requisites:

The participants will need to have working knowledge of UML and an initial understanding of generic systems engineering processes.

Course Format:

Teaching Method: Lectures, small exercises and workshop
Language: English or Dutch

During every half day session, the lectures will be followed by small exercises to practice. The workshop aims at providing a good understanding of the relationships between the various steps in the process.

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Course Contents:

This course consists of four blocks of one day:

Day 1:
- SysML approach and overview.
- Capturing functional requirements using use cases
- Requirements modeling in SysML
- System hierarchy and interconnection: Block diagrams
- Case Study

Day 2:
- System hierarchy and interconnection: Internal Block diagrams
- Structuring a SysML model (packaging)
- System behavior analysis: Use Case analysis and Sequence diagrams
- Case Study

Day 3:
- System functional behavior: Activity diagrams
- System state-based behavior: State Machine diagrams
- Case Study

Day 4:
- System design constraints: Parametric diagrams
- Trade studies on non-functional constraints (performance, reliability etc.)
- Integrating SysML into a development environment
- Case study

During every half day session the lectures will be followed by small exercises to practice modeling with SysML and get a working knowledge of basic notations. A case study of a system to be modeled by participants aims at providing a good understanding of the relationships between the various models as well as a feeling for heuristics to obtain an effective system description.

Additional Options:

In order to further enhance the outcome of this course, so the course will better meet your specific requirements, please indicate any desired options when discussing this course, or contact your account manager.

Complementary Courses:

The course curriculum offered by Mithun includes:

Requirements Engineering basics	Requirements Management Foundations
	RM&E Aware for Managers
Requirements Engineering advanced	The Risk of Words – Writing and Documenting Requirements
	Interviewing Techniques & Guidelines
	Elicitation Workshop Techniques & Guidelines
Scrum	Applying Scrum
Object Oriented Analysis & Design	Object Oriented Analysis & Design using UML 2.x
	Design Patterns and Emerging Architecture
	Specification of Component Interfaces
	API Design
Model Based Systems Engineering	Systems Modeling with SysML
	Introduction to SysML
Real-time & Embedded Analysis & Design	Real-time Software Design
	Advanced Real-Time Analysis & Design
OMG Programs	OMG Certified UMP Professional
	Preparation training OCRES Intermediate Certification

Terms and conditions:

The standard terms and conditions of Mithun Training & Consulting will be sent on request.

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