

The Systems Modeling Language (SysML®) Using Enterprise Architect 15.x or 16.x

Advanced level (Three -day course syllabus)

Introduction to Enterprise Architect

User Interface

Desktop layout

Overview, Start Page, Visual Style, Portals

Ribbons

Perspectives, Workspace Layouts, and ribbon configuration

Managing Projects

Creating and opening Projects

Creating Root Nodes and Packages

Browser features

Organizing models

Managing Diagrams

Toolbox

Creation techniques

Options in ribbons, context menu, properties dialog and window

Navigation between diagrams

Floating diagrams

Copy/paste across diagrams

Inline Specification Manager

Managing Elements

Creation techniques

Editing properties

Drag and drop

Diagram only elements

Customizing Diagram Element Appearance

Background color, font, image

Layering

Feature visibility

Sizing and alignment

Deleting Model Elements

Diagram level deletions

Repository level deletions

Managing Connectors

Creation (toolbox and Quick Linker)

Redirection

Line bends and styles

Managing Packages

Package Navigation

Identifying and selecting favorite Packages

Package Browser/List View (overview)

Tool Configuration

Defining general types

Personal and global configuration options

COURSE LEADER

Frank Truyen

is a principal consultant and trainer, with 20+ years of experience in the IT industry as a developer, architect, consultant and manager.

Strong expertise in key modeling notations (UML®, SysML®, ArchiMate®, and BPMN™), as well as architectural frameworks (UPDM™, UAF®, SABSA®), allied with his extensive experience in using the Enterprise Architect modeling tool, allows Frank to successfully provide training and consulting services to a broad variety of customers across many industries.

SysML 1.4 / 1.5

Background

Introduction to MBSE
Introduction to SysML
Relationship between UML and SysML
The four pillars of SysML
SysML specific tool configuration

Diagrams overview

Frames
Kinds

Package diagram

Purpose and examples
Views and Viewpoints

Requirements diagram

Requirement definition
Relationships and how to best use them
How to create Requirements
 Using the Specification Manager
Auto-numbering
Adding custom properties
Organizing Requirements
Example models
Import and export using Excel

Exercises – Create a Requirements model, manually and via Excel import

Structural Diagrams

Block Definition Diagram (BDD)

Block definition
Contents and compartments
Examples
Block definition in BDD versus usage in IBD

Exercises – Create a BDD

Interface Block

Examples

Internal Block Diagram (IBD)

Creating an IBD
Automatic Property creation
Adding Properties manually
 Binding Properties to Connector Ends
Examples

Exercise – Create an IBD and auto-create its Parts

Association Blocks

Definition and examples
Connector Property
Participant Property

Exercise – Create a BDD and IBD using Association Blocks

Signals

Definition and examples

Value Types

Definition and examples

Classification hierarchies and generalization

Definition and examples

Block Behavioral Features

Operations, and Signal Receptions
Directed Features
Classifier Behavior

Block Properties

Part
Reference
Value
Connector
Participant
Classifier Behavior
Bound Reference
End Path Multiplicity
Distributed

Exercise – Create an Interface Block with Operations, Value properties, and Directed Features

Redefining Properties

Definition and examples

Subsetting Properties

Definition and examples

Exercise – Create a BDD with redefined Block properties

Relationships review

Part Association
Reference Association
Other BDD relationships
Typing Connectors with Associations
IBD relationships

Ports

Definition and usage

Full Port

Proxy Port

Port Conjugation

Port redefinition

Port multiplicities

Exercise – Add Proxy Ports to a BDD and set conjugation, then add an IBD

Flow Property

Definition and examples

Flow Property redefinition

Port decomposition using Association Blocks

Item Flow

Definition and examples

Exercise – Create an IBD connecting Proxy Ports and add Item Flows

Parametric Diagram

Constraint Block

Definition and examples

Parametric Expression Editor

Exercise – Create a BDD with Constraint Blocks, then add a Parametric diagram

Behavioral Diagrams

Activity diagram

Definition and examples

Core UML/SysML notation

Advanced UML/SysML Notation

SysML extensions

Probability Edges

Control Operator

Optional Activity Parameters

Continuous and Discrete Rate of Flow

No Buffer Object Node

Overwrite Object Node

Mapping Activity Parameters to Ports

Mapping Receptions to Accept Events

Mapping Signal Event Actions to Receptions

Exercise – Create an Activity diagram with Call Behaviors, Discrete & Continuous Rate Flow

Sequence diagram

Core UML/SysML notation

Examples

Exercise – Create a Sequence diagram sequencing Block Operations

State Machine diagram

Core UML/SysML notation

Examples

Exercise – Create a State Machine diagram with Triggers, Signals, and Operation invocations

Optional exercise – Create an executable (C++) State Machine

Use Case diagram

Basic UML/SysML notation

Optional: creating structured scenarios

Exercise – Create a Use Case diagram with constraints defined

Appendix A – Advanced Block Properties

Adjunct Property

Appendix B – Allocations (cross-cutting constructs)

Overview

Allocate Dependency

Allocations report

Appendix C– Measures of Effectiveness

Definition and examples

Q & A

Optional half-day extensions to the above training course

1. Workshop: SysML end-to-end Modeling Exercise

The air compressor model, or a User defined model

2. Additional tool features

Traceability Features

Overview

The Relationships window

The Relationship Matrix

The Traceability window

Other traceability features

Documentation Generation

RTF/DOCX/PDF generator

Diagram, Package, and Element options

Linking generated documents into Microsoft Word

Model Document

Report Package

Generating HTML

Other features

Document Artifacts

Creating

Linked Documents

External document links

Document window

Model Searches

Initiating

Configuring

Viewing results

Custom searches

Other features

Managing Baselines and comparing models

Creating baselines

Administering baselines

Package comparisons

Diagram comparisons