

MBSE for Architectures & Architecture Frameworks – 3 Days

Course Outline

Introduction to Model-Based Systems Engineering

- The need for MBSE
- The MBSE Mantra
- MBSE in One Slide
- The evolution of MBSE in your organisation

This introductory module establishes the need for MBSE, introduces the **MBSE Mantra** of People, Process & Tools, gives an overview of **MBSE in One Slide** and discusses the evolution of MBSE in your organisation. Throughout, this introductory module discusses how to move from a model-enhanced organisation, through a model-centric one to a true model-based organisation.

Modelling

- The importance of modelling
- Recap of SysML: Structural & behavioural modelling with SysML

An essential enabler for MBSE is modelling. In this course we consider what we mean by a model, why, what, where, when and how we model in an MBSE approach. The Systems Modelling Language, SysML, is recapped, giving an overview of its use in structural and behavioural modelling and discussing the relationships between the nine SysML diagrams.

Overview of MBSE Concepts

The key concepts associated with MBSE are described and, very importantly, the relationships between the concepts are explored, building up the MBSE Ontology.

Architecture & Architecture Framework Concepts

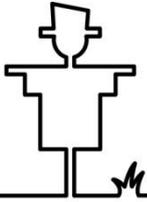
- Concepts
- Enabling Patterns

This module discusses what is meant by an architecture, architecture framework (AF) and a pattern, sets the history of patterns in systems engineering in context and discusses the relationship between AFs and patterns. It introduces the key concepts behind AFs and patterns, establishing the language that is used (the ontology) throughout the rest of the course.

The Framework for Architectural Frameworks (FAF)

- The Problem with the Existing Approach To AFs
- The Framework for Architectural Frameworks (FAF)
- Realising the FAF with SysML
- The FAF in Use

Beginning with a look at some of the problems encountered with the existing approach to AFs, this module discusses the six key questions that must be answered when choosing or creating an AF.



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The Framework for Architectural Frameworks is then introduced as a robust, model-based way of answering these six questions. The FAF ontology is discussed and the six viewpoints that make up the FAF are described. A discussion of how the various FAF viewpoints can be realised using SysML leads into an example of the FAF in use.

Using the FAF

- Creating a new pattern
- Creating an AF from existing frameworks and patterns

This module presents an in-depth example of how the FAF is used, with an example that builds an enabling pattern from first concepts to a full FAF definition. The example considers the issues that must be considered when using the FAF and gives practical guidance in its application. The module concludes with a discussion of how the FAF, together with existing published frameworks and patterns, can be used to grow an AF in a piecemeal fashion as a project progresses.

The Workshop

In order to put all of the pieces together, a paper-based workshop is carried out in which the delegates, working in small groups, use the FAF to define a small architecture framework.

Implementing MBSE

- The Business Case for MBSE
- The MBSE Mantra revisited: People, Process & Tools

This concluding section discusses the business case for MBSE and how to sell MBSE to different stakeholders within the business, as people in different roles will see different benefits of MBSE.

The three crucial enablers for MBSE are discussed in more detail: competent People with the right skills for their role, carrying out the Processes embodied in the underlying MBSE approach and using modelling Tools driven by the Process.

Target Audience

This course is aimed at systems and software engineers that have a working knowledge of Model-based Systems Engineering (MBSE) and SysML (or UML) and who want to develop their MBSE skills by learning how to develop architectural frameworks and patterns in a robust, consistent, model-based way. All course delegates receive a full set of notes, summary sheets and a copy of the book 'Foundations for Model-Based Systems Engineering: From Patterns to Models' by Jon Holt and Simon Perry.

Course Tutors

All courses are delivered by Prof Jon Holt and Simon Perry. Jon and Simon are internationally-recognised authors, tutors and public speakers in the world of requirements engineering. They have authored 15 books covering many aspects of systems modelling, including process modelling, competence, architectures and, of course, model-based systems engineering.

More Information

For more information on this course, or any of our other offerings, please contact Scarecrow Consultants Limited using the details above.

