



## MBSE for Architecture Frameworks

After an introduction revisiting the key concepts of MBSE this one-day workshop provides an introduction to architectural frameworks (AFs) and enabling patterns, giving delegates a model-based toolkit, the Framework for Architectural Frameworks (FAF), which can be used to aid in the definition of an AF or pattern. It 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.

**Duration: 1 day**

### Model-Based Systems Engineering - A Recap

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

This introductory module provides a recap of the need for MBSE, discusses the **MBSE Mantra** of People, Process & Tools, gives an overview of **MBSE in One Slide** and discusses the evolution of MBSE in an organisation.

### 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.

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





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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 Exercises

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

### 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.

### Benefits

The benefits of this course are as follows:

- Understanding of the importance of Architecture Frameworks
- Understanding the characteristics of an Architecture Framework and their role in the creation of Architectures
- Knowing what questions to ask when considering the adoption of an Architecture Framework
- Learning how to tailor existing Architecture Frameworks or how to create your own

### Prerequisites

Attendance on our 3-day Model-Based Approach to Systems Engineering course is a prerequisite for attending this course; attendance on our 1-day MBSE for Beginners course **does not give the necessary background required**.



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### Material

#### **Face-to-Face Courses**

Delegates receive PDF copies of the course notes, summary sheets and the book '*Foundations for Model-Based Systems Engineering: From Patterns to Models*' written by the course tutors and published by the IET.

Where the course is delivered in-house, then a *mixture* of physical books is given. For a course with 12 delegates the mix is:

- 2x 'SysML for Systems Engineering'
- 6x 'Don't Panic! The Absolute Beginner's Guide to MBSE'
- 4x 'Foundations for Model-Based Systems Engineering'

These numbers will be prorated for courses with fewer or more delegates.

#### **Remote Courses**

Delegates receive PDF copies of course notes and summary sheets, along with an eBook version of '*Don't Panic! The Absolute Beginner's Guide to Model-Based Systems Engineering*' written by the course tutors and published by INCOSE UK.

### More Information

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