

A Model-based Approach to Systems Engineering (MBSE): Duration 3 days

Introduction to Model-Based Systems Engineering

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.

Modelling

An essential and obvious enabler for MBSE is, of course, modelling. In this course we consider the need for modelling, the requirements for modelling and we introduce the SysML as a language that can satisfy these requirements.

The structural and behavioural aspects of any model are discussed through two of the SysML diagrams which are covered in some detail. An overview of the remaining diagrams is given and this part of the course emphasises how to model, rather than attempting to teach all of the syntax of the language (as this is an MBSE course and not a SysML course). By focusing on the use of modelling and consistency, we will demonstrate how to build up a true, consistent collection of views that make up a model, rather than just a collection of pictures.

MBSE Concepts - the MBSE Ontology

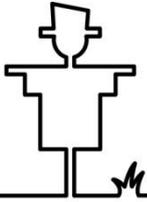
A key part of any systems engineering endeavour is for all of your teams to share a common language. This is a great idea in principle, but the practice is somewhat more difficult to attain. When considering common language, it is essential that we think about both the spoken language and the domain-specific language. In real life we cannot assume that adopting a common spoken language, such as English will result in efficient communication as we need also consider the domain specific language, perhaps based on: the discipline (for example: electrical, mechanical, software, etc.), the industry (for example: automotive, aerospace, IT, etc.) or, indeed, the organisation. In this course we introduce the Systems Modelling Language (SysML) as the spoken language and the use of an ontology (defined using SysML) to capture the domain-specific language.

This MBSE ontology captures all of the key concepts associated with MBSE, defines them and, very importantly, defines the relationships between the concepts. This MBSE ontology, derived from over 40 different best-practice models including standards, guidelines and techniques, is built up during this part of the course.

MBSE Topics

During this module a number of the concepts introduced in the previous MBSE Concepts module are discussed in more detail. The number of topics covered, and the depth of coverage can be tailored during the course. The topics available are:

- Systems and Interfaces
- Structure and Decomposition
- Needs (requirements)



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- Processes and Life Cycles
- Frameworks
- Competence

The Workshop

In order to put all of the pieces together and see how the modelling works, a team-based tutor-guided exercise is conducted where the participants get to use the modelling techniques on an example.

Implementing MBSE

This section of the course addresses the question of how to implement MBSE into your business. This will cover how to sell MBSE to different stakeholders within the business, as people in different roles will see different benefits of MBSE. This is an essential part of making the business case for MBSE.

Once the business case has been made, it is then possible to look at the three crucial enablers for MBSE which are people, process and tools. By 'people' here, we mean competent people with the right skills for their role. By 'process' we mean the underlying MBSE approach, including ontologies, frameworks and their associated process descriptions. By 'tools' here we mean the use of modelling tools, how to assess and select tools and to ensure that your approach drives the tool and not the other way around.

Target Audience

This course is aimed at systems engineers and managers, software engineers and managers, quality personnel and anyone involved with business or enterprise modelling.

All course delegates receive a full set of notes, summary sheets and a copy of the book 'SysML for Systems Engineering: A model-based approach; 3rd ed.' by Jon Holt and Simon Perry.

Benefits

The benefits of this course are as follows:

- Improved systems engineering through use of MBSE.
- How to achieve improved communication, enhanced understanding and how to minimise complexity through use of modelling.
- How to demonstrate benefits of MBSE and their associated value to stakeholders within the business.
- How to implement MBSE into a business.
- Above all, improved confidence for you, your teams, your business and your clients.

Prerequisites

None

More Information

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

