

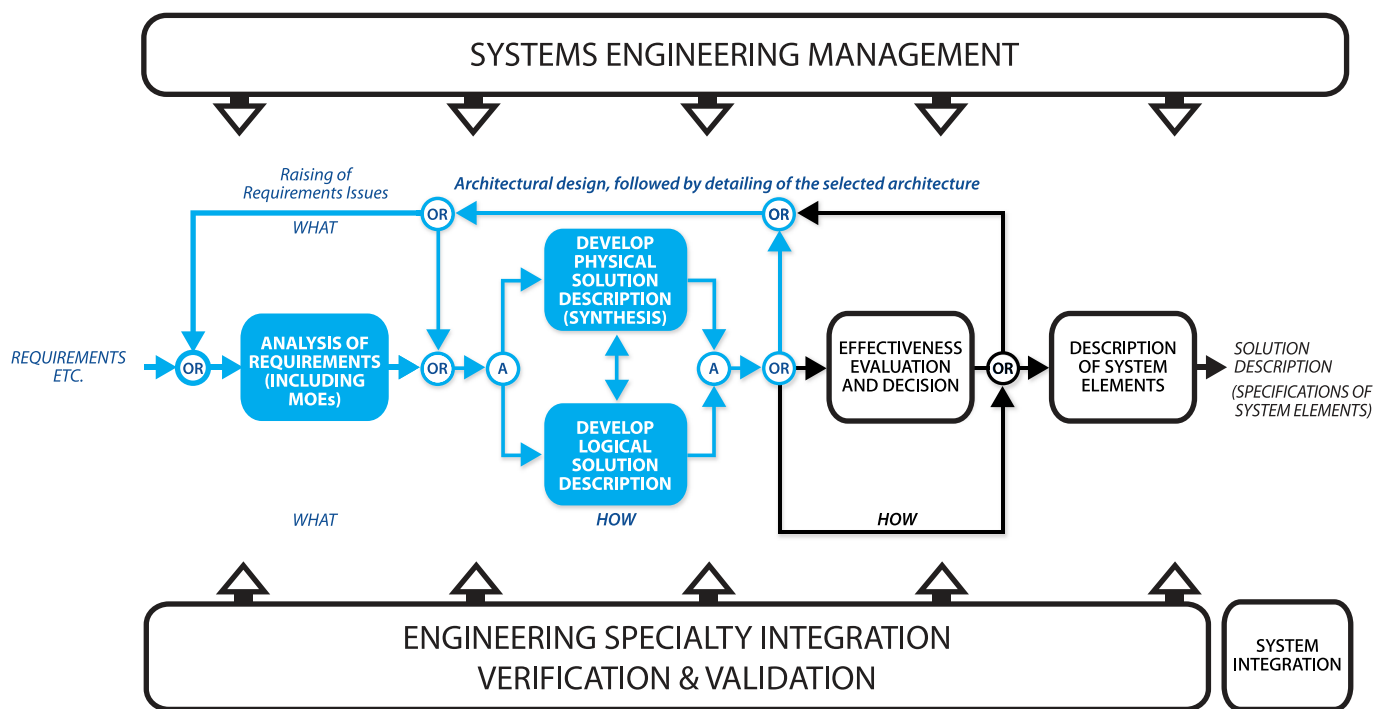
MODEL-BASED SYSTEMS ENGINEERING (MBSE) FOUNDATIONS

2-DAY COURSE

Gain insight into the realities of current modelling languages and tools, and the directions in which model-based design is evolving.

This two-day course places Model-Based Systems Engineering (MBSE) in the context of lifecycle-based system development, explains the benefits of MBSE, and provides learning in the foundation principles, concepts and methods of MBSE support to requirements capture and validation, and to design. In terms of outcomes, this training addresses a critical contributor to project performance, viz. the use of logical modelling:

- as an aid to correct problem definition; and
- to assist designers to work successfully with greater degrees of design complexity, thereby reducing errors and their serious consequences for cost, schedule, and even life and death.



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1. Introduction – MBSE Within Systems Engineering (1.5 hours)

- the business case for MBSE within the system lifecycle
- definition of terms
- requirements capture and design interactive exercise – basic
- MBSE within a systems engineering process model
- Requirements Analysis – context, purpose, inputs, outputs
- Logical Design – context, purpose, inputs, outputs and types of logic – functional and state-based

2. MBSE for Requirements Capture and Validation (5.5 hours)

- MBSE within requirements capture and validation
- **workshop 1 – States and Modes Analysis**
- **workshop 2 – Functional Analysis**

3. Concepts of Architecture and Detailed Design – Physical and Logical (1 hour)

- MBSE within design
- physical architecture (structural view) – basic concepts
- functional form of logical architecture – basic concepts
- functional architecture related to physical architecture
- model-based design in practice – Model-Based Systems Engineering (MBSE)/Model-Based Architecting (MBA)/Model-Based Design (MBD)/Model-Driven Design (MDD)

4. Initial Physical Conceptualization (0.5 hour)

- the role of technology and innovation
- design complexity trade-off
- **interactive exercise – a simple physical design**

5. Functional Design (6.9 hours)

- functional analysis in design – how to do it
 - functional analysis/ architecture process
 - item flow and control flow
 - un-allocatable and allocatable functions
 - pitfalls in defining functions
 - common pitfalls in functional design
 - **interactive exercise – a simple functional design**
 - **workshop 3 – physical and functional design, part A**
 - **workshop 3 – physical and functional design, part B (optional)**
 - coupling, cohesion, connectivity
 - Failure Modes and Effects Analysis (FMEA)/Failure Modes, Effects and Criticality Analysis (FMECA) in design
 - executable functional design
 - performance thread analysis
- allocation of functionality between hardware and software
- MBSE languages – SysML 1, SysML 2, proprietary languages
- constructed simulations

- software tools supporting functional and physical design
- pitfalls in functional design

6. State-Based Design (0.5 hour)

- state-based design – language concepts
- SysML, and alternative languages incorporating state-based modelling
- software tools supporting state-based design
- pitfalls in state-based design

7. Summary and Key Points (0.1 hours)

- action plan

To register visit our website or call our friendly registration team:



PO Box 2385
Ringwood North
Victoria, 3134
Australia



+61 3 9876 7345



enquiries@ppi-int.com



www.ppi-int.com



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