Model-Based Systems Engineering: Documentation and Analysis

WEEK 1: What Is MBSE?

The course officially kicks off!

In the first week, you'll take a Pre-Assessment to get a baseline of your understanding of the course material. In Week 1, you'll deep dive into Model-Based Systems Engineering in contrast to traditional Systems Engineering, such as a document based approach. You will learn to identify the core tenets of MBSE and the situations in which it is recommended, and distinguish the differences between MBSE and traditional systems engineering. Finally, you'll overview a set of qualities to look for in MBSE models and how to define the scope and purpose of them.

Pre-Assessment	**15 min**
Get Started	**25 min**
• Welcome	3 min
• Course Schedule	3 min
• Course Collaboration Tools	5 min
• Groups	1 min
• MBSE Survey	2 min
• Who's Teaching the Course	4 min
• Grading and Completion Criteria	1 min
• Certificate Information and CEUs	1 min
• Learning Objectives and Pedagogy	2 min
• Social Media Groups	1 min
• Software Requirements	1 min
What Is MBSE?	**4 hrs**
• Key Ideas	3 min
• Promise of MBSE	25 min
• Overview of MBSE	40 min
• Qualities of Great Models	15 min
• Scoping MBSE	20 min
• Graded Activity	20 min
• Project	1.5 hrs
• Key Takeaways	2 min

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WEEK 2: Building an MBSE Model

In Week 2, you will step into how you might implement an MBSE approach. First, you will look at the perspective of the model as a data repository and what this represents in terms of querying abilities in an MBSE environment. While you do so, note the contrast with traditional document based SE approaches. Secondly, you'll look at SysML as modeling language used in MBSE and examples of syntax and a use case example.

Building an MBSE Model	4-5 hrs
• Webinar with Dr. Bruce Cameron	1 hr
• Key Ideas	10 min
• Models as Data Repositories	45 min
• SysML as an Example Language for MBSE	20 min
• Modeling Behavior and Structure with SysML	50 min
• Graded Activity	20 min
• Project	1.5 hrs
• Action Plan	20 min
• Key Takeaways	2 min

WEEK 3: Critiquing an MBSE Approach

For Week 3, you'll start by looking at the implementation challenges that come with adopting an MBSE approach. The Boeing case study will provide you with an overview of these. This will then pivot to how to analyze an MBSE model. How might you evaluate and analyze a model can be a common and challenging task in an MBSE environment. The structured process for performing a critique will guide you through this process. Finally, industry experts will provide an overview of current trends of MBSE in the community.

Critiquing an MBSE Approach	4-5 hrs
• Ask the Professor a Top 10 Question	5 min
• Key Ideas	5 min
• Implementation Challenges of MBSE	35 min
• Performing an MBSE Critique	25 min
• Graded Activity	20 min
• Current Debates in the MBSE Community	20 min
• Project	1.5 hrs
• Key Takeaways	2 min

WEEK 4: Managing the Model

In Week 4, after reviewing the implementation and analysis of MBSE models, you will dive into managing models throughout their life cycle. Model management will have a great impact in both the MBSE environment and the organization. In this context, the model management plan, model owner, and the model curator are presented. Finally, you'll close with design patterns and a set of lessons learned by industry experts.

Managing the Model	4-5 hrs
• Key Ideas	2 min
• MBSE Lessons Learned	30 min
• Model Management	50 min
• Patterns in MBSE	5 min
• Graded Activity	20 min
• Project	1.5 hrs
• Action Plan	20 min
• Key Takeaways	2 min
• Course Wrap-Up	2 min
• Exit Survey	10 min
Post-Assessment	15 min

After the course ends...

Download your certificate.

Last Day of the Course
- Course ends at 23:30 UTC

Two Days after the Course Ends
- Download your Certificate of Completion from your student dashboard

90 days after Course 4 ends
- Course closes and all content is archived