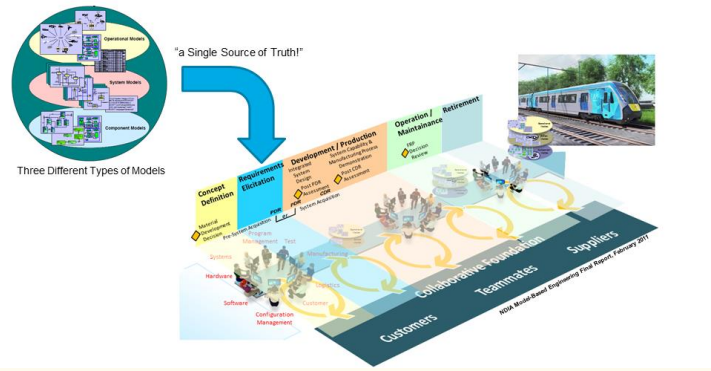
SysEng 6542 Model-Based Systems Engineering

Perspective

The international systems engineering community recognized Model-Based Systems Engineering (MBSE) is the future of systems engineering practice because it introduces new capabilities that provide valuable benefits for complex projects. MBSE provides a structured means to define, design, implement, integrate, sustain and manage numerous interdependencies throughout the Lifecycle of complex systems. It addresses the limitations inherent in describing complex systems across the Lifecycle using documents by providing an information-centric model (often referred to as 'source of truth') to support systems engineering activities such as user needs analysis, system specification, architectural design, risk analysis, trade-studies, and verification and validation.

Therefore, many of the international top companies in defense and commercial sectors are exploring the opportunities and challenges of MBSE. In this course, you will:

- Learn the differences between MBSE and traditional systems engineering, and benefits of MBSE in contrast to document-based systems engineering practice;
- Understand the basic elements of an MBSE Methodology: Process, method, language and tool;
- Gain an understanding and selection of MBSE practices across the system Lifecycle;
- Gain comprehensive understanding of the SysML Systems Engineering modelling language and its application in operational, functional and physical system modelling;
- Understand model integration, translate models and bring together distributed models and resources.



The topics covered in this course are considered to be an essential balance between the underlying theory and practical applications of MBSE across the system Lifecycle. A capstone project will be assigned to learn and develop MBSE models for Conceptual Design, Preliminary Design and Detailed Design.

ENGINEERING MANAGEMENT & SYSTEMS ENGINEERING DEPARTMENT

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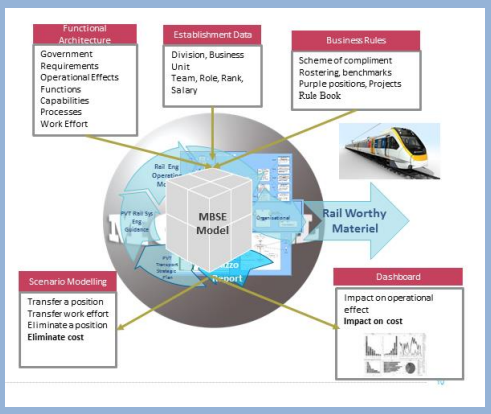

Spring 2020

- **Lectures**
  Monday 4:00-6:30 PM Central Time
- **Grading**
  Two Exams (open book): 40 points
  Technical Paper: 10 points
  Project: 40 points
  Participation/Team work: 10 Points
- **Text**
  A Practical Guide to SysML: The Systems Modeling Language by Friedenthal, Moore, and Steiner. Other materials provided during the course.

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