



Continuous Learning Module

“Modeling & Simulation for Systems Engineering”

SAIC Support
DUSD (A&T)
Systems and Software Engineering
Developmental Test & Evaluation

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Purpose

Modeling and simulation is recognized as an important tool to assist in the systems engineering process.

With the advent of acquiring Joint capabilities, modeling and simulation takes on a more important role.

Testing systems in a system-of-systems will necessitate greater augmentation of models and simulations.

There was a recognized need to better educate the workforce in the proper application of models and simulations.

Background

One year in the making

Resources included approximately 15 subject matter experts

- **Input**
- **Review**
- **Critique**
- **Beta Testing**

Incorporates:

- **Audio**
- **Text**
- **Graphics**
- **Animated Graphics**
- **Video**
- **SCORM Compliance**

Developed in coordination with the Defense Acquisition University

Available On-Line at: <http://www.dau.mil/>

Targeted Career Fields

Systems Planning, Research, Development and Engineering (SPRDE)

Program Management

Test and Evaluation

Available to Anyone

Scope of the CLM

Self-Paced

Approximately 3 hour duration

A level above an Introductory modeling & simulation course

- **A link to an Air Force introductory course on M&S is provided for those that want it**
- **Adding an additional link to “Essentials of Modeling and Simulation” developed by the Defense Modeling and Simulation Office**

Can be taken for credit (3 continuous learning points)

Can be taken for no credit (self edification)

Suggested Prerequisites

Knowledge of the Systems Planning, Research, Development and Engineering (SPRDE) Process

Basic knowledge of the acquisition process

Basic knowledge of Modeling & Simulation

CLM Content

- 1. Overview: Modeling & Simulation in Systems Engineering**
- 2. The New Acquisition Process**
- 3. Current DoD Acquisition Policy and Guidance**
- 4. M&S Role in Systems Engineering and Capability Based Acquisition**
- 5. Sharing Modeling & Simulation Resources**
- 6. Modeling & Simulation: Verification, Validation and Accreditation**
- 7. How to Plan for Effective Modeling & Simulation**
- 8. Contracting Associated with Modeling & Simulation**

CLM Content (cont.)

1. Overview: Modeling & Simulation in Systems Engineering

This lesson presents how the Continuous Learning Module (CLM) is organized and what you'll learn in the other lessons. It provides:

- Definitions (Also available through a “Quick Reference” Tab)
- Target Audience
- Links to more basic courses
(Modification added for a link to “Essentials for M&S”)
- Gives examples of M&S value

CLM Content (cont.)

2. The New Acquisition Process

Discusses:

- How the acquisition process has evolved over the years,
- Capabilities Based Acquisition (CBA),
- Lessons learned from studying acquisition history.

Goals at the end of this lesson are to identify:

- Implications of the new acquisition process on systems engineering,
- Barriers to change for implementing the new process,
- The three types of architectural views,
- Ways M&S contributes to the new acquisition process.

CLM Content (cont.)

3. Current DoD Acquisition Policy and Guidance

Discusses:

- The documents that support the way the Government acquires new products and services.
- Where to find valuable M&S and acquisition policy and guidance information needed to formulate future acquisition plans.

Goal at the end of this lesson:

- Ability to locate key items of acquisition policy and guidance information in the documents you're presented.

CLM Content (cont.)

4. M&S Role in Systems Engineering and Capability Based Acquisition

Discusses:

- How M&S is an integral part of the Systems Engineering (SE) process at all phases in the process.

Goals at the end of this lesson are to identify:

- How M&S supports SE processes across the acquisition phases,
- Benefits of robust M&S to enable acquisition,
- Expected impact of applying M&S to program versus not applying M&S within another program,
- How M&S can facilitate systems-of-systems engineering to achieve joint mission capabilities.
- The value of M&S application in systems acquisition.

CLM Content (cont.)

5. Sharing Modeling & Simulation Resources

Discusses:

- Why different systems need M&S and other data that can be shared across systems.

Goals at the end of this lesson are to identify:

- The roles of interoperability and standards for integrated architectures,
- Resources for obtaining advice and assistance in developing an M&S strategy that promotes reuse and sharing,
- How to incorporate/develop M&S in a cost-effective manner by sharing data,
- The benefits of sharing credible data and using it responsibly and major obstacles to effective sharing and reuse of M&S data.

CLM Content (cont.)

6. Modeling & Simulation: Verification, Validation and Accreditation

Discusses:

- The importance of an effective Verification, Validation & Accreditation (VV&A) process.

Goals at the end of this lesson are to identify:

- What is meant by VV&A
- The benefits, importance, and responsibilities for developing and using trustworthy M&S,
- Lessons learned regarding VV&A.

CLM Content (cont.)

7. How to Plan for Effective Modeling & Simulation

Discusses:

- The importance of planning in advance to incorporate M&S in programs so it will be most effective, both in the current program and reusable in the future among other programs.
- A notional flow for M&S planning.

Goals at the end of this lesson are to identify:

- How to plan for M&S as a tool to support SE.

CLM Content (cont.)

8. Contracting Associated with Modeling & Simulation

Discusses:

- How the Government should pay for M&S when contracting for SE services.

Goals at the end of this lesson are to identify:

- Appropriate M&S roles for government and industry,
- Source selection criteria when contracting for M&S,
- Contracting language for M&S

Of Note

A level above an introductory course

Provides step-by-step guidance on how to plan for M&S use in a program

Provides contracting suggestions on how to best procure M&S

DAU Professor of Systems Engineering is working to incorporate the CLM as a prerequisite to some of the Systems Engineering Courses

Effective October 1, 2006 the CLM is a Level I certification requirement in the T&E Career Field.

Some portions of the course have been used in a Caltech Systems Engineering class.

Starting a CLM for “M&S in Test and Evaluation”

CLM Statistics

- The course went online June 6, 2006
- As of the end of September there have been 201 graduates from the course.
- Not known how many have browsed the course (taken the course for no credit)

How to Access the CLM

<http://www.dau.mil/>

Back Up



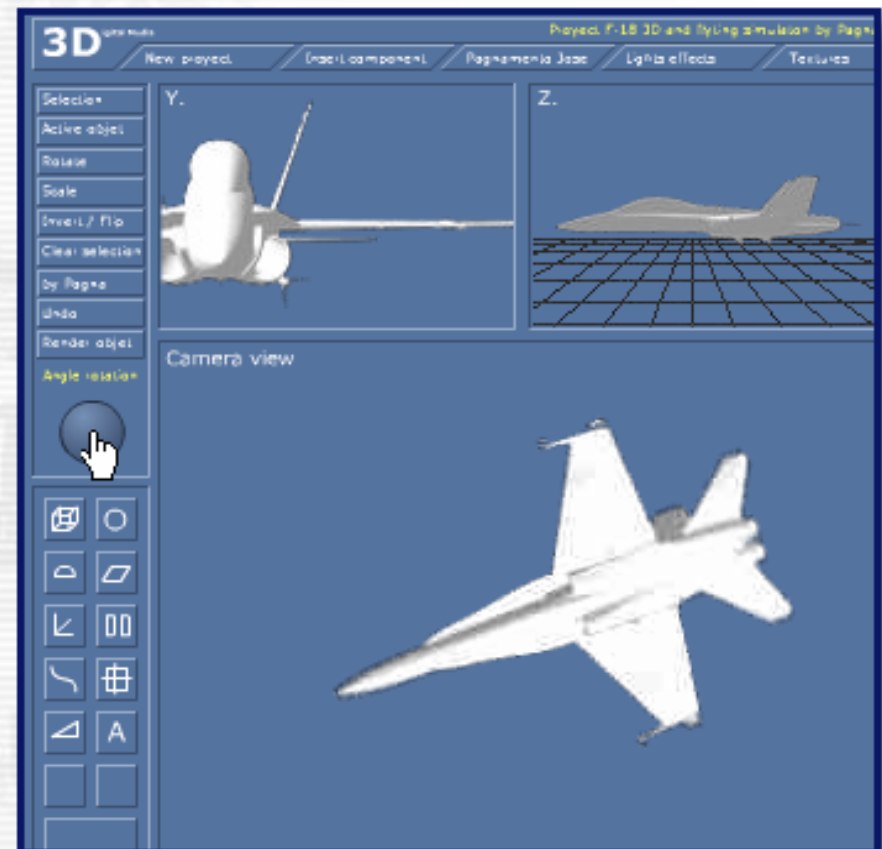
Course Overview

Welcome to the course Modeling and Simulation (M&S) in Systems Engineering. This course will present you information about how M&S:

- Can be a benefit over the entire life cycle of a project
- Supports Systems Engineering
- Needs to be credible
- Can be planned and shared along with their data and results

You will learn about this and more over the next two to three hours of instruction.

Select [NEXT](#) to continue.



[D](#)