

## Modeling and Simulation Strategy and Support Plans

- 1) Course name: Modeling and Simulation Strategy and Support Plans
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- 3) Course description: This course is designed to educate and introduce acquisition workforce professionals to modeling and simulation (M&S) and its application to M&S planning and the generation of support plan documents. The general focus of this course is to define and identify the benefits of M&S and its application to the understanding, use and evaluation of M&S planning. The general focus of this course includes: development of an integrated Simulation Support Plan (SSP), System Engineering Plan (SEP), and Test and Evaluation Master Plan (TEMP). Specific focus areas include: the M&S planning process and its relationship to life cycle phases of development and acquisition milestone decisions; program cost, schedule and performance considerations; trade-off decisions; and effectiveness assessment.
- 4) ESR's that the course supports and the corresponding level of achievement:  
  
LO 1.0 (G, U, A, M)  
LO 2.1 (G, U, A, M)  
LO 3.0 (G, U, A, M)  
LO 4.0 (G, U, A, M)  
LO 5.0 (G, U, A, M)  
LO 6.0 (G, U, A, M)
- 5) Prerequisites: This course is designed for DoD military and civilian professionals who are determined to be proficient to the apprentice, journeyman or expert level (as applicable) in their current job positions in the areas of program management, systems engineering and/or test and evaluation.
- 6) Course maturity: This is a new course. The M&S University of the MSAIC offers several courses with similar basic content to this one. In particular, the M&S Staff Officers Course and Simulation Support Plan Tutorial are complimentary.
- 7) Number of contact hours and pace contemplated: This 48 hour course will provide 5 CEU's. The class will meet 4 hours per week for 12 weeks. The hour breakdown for each level of competency is provided below:
  - a) General Awareness 4 hours
  - b) Understanding 8 hours
  - c) Application 16 hours (9 hr instruction; 2 hr project, 1 hr exam)

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- d) Mastery 20 hours (9 hr instruction; 5 hr project, 1 hr exam)
- 8) Proposed delivery modality: face-to-face.
- 9) Proposed references and texts:

[1] Acquisition M&S Master Plan, 17Apr06

[http://www.acq.osd.mil/sse/as/docs/AMSMP\\_041706\\_FINAL2.pdf](http://www.acq.osd.mil/sse/as/docs/AMSMP_041706_FINAL2.pdf)

[2], [3], [4] Decision Support Guidebook

<https://akss.dau.mil/dag/GuideBook/PDFs/GBNov2006.pdf>

[3] Defense Acquisition Guidebook

<https://akss.dau.mil/dag/> or

<https://akss.dau.mil/dag/DoD5000.asp?view=document&doc=2>

[4] Systems Engineering Plan Preparation Guide

[http://www.acq.osd.mil/sse/docs/SEP-Prep-Guide-Ver-2-0\\_18Oct07.pdf](http://www.acq.osd.mil/sse/docs/SEP-Prep-Guide-Ver-2-0_18Oct07.pdf)

[5] DoD 5000.59p MODELING AND SIMULATION (M&S) MASTER PLAN  
October 1995

<http://www.simval.org>

[6] DoD 5000.59p DoD Modeling and Simulation (M&S) Management 8Aug07

<http://www.simval.org>

[7] DoD 5000.61 Modeling and Simulation (M&S) Verification, Validation, and  
Accreditation (VV&A) May 13, 2003

<http://www.dtic.mil/whs/directives/corres/pdf/500061p.pdf> [8] DoD 5000.02

Operation of the Defense Acquisition System 8Dec08

[9] Department of the Army Pamphlet 5-11 - Verification, Validation, and  
Accreditation of Army Models and Simulations 30Sept99

[http://www.army.mil/usapa/epubs/pdf/p5\\_11.pdf](http://www.army.mil/usapa/epubs/pdf/p5_11.pdf)

Additional useful references:

[10] DA PAM 5-12, Simulation Support Planning and Plans, 2 March 2005

[http://www.army.mil/usapa/epubs/pdf/p5\\_12.pdf](http://www.army.mil/usapa/epubs/pdf/p5_12.pdf)

[11] Australian DoD Life Cycle Simulation Guide

<http://www.defence.gov.au/capability/adso/docs/Requirements%20Phase%20Guide.pdf>

[12] Integrated Master Plan and Schedule

[http://www.acq.osd.mil/sse/docs/IMP\\_IMS\\_Guide\\_v9.pdf](http://www.acq.osd.mil/sse/docs/IMP_IMS_Guide_v9.pdf)

10) Course learning objectives (Learning Objectives –LO):

1) Course Overview (LO 1.0)

a) Development of a Simulation Support Plan (SSP)

b) Understanding the use and application of the SSP

c) Understanding the relationship between the SSP, SEP and TEMP

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- 2) Identify M&S strategy planning process (LO 2.0)
  - a) Define the contents of the Simulation Support Plan (SSP)
  - b) Understanding of how to perform M&S plan effectiveness assessment
  - c) Understand the use of the SSP across life cycle phases
- 3) M&S Cost models, cost requirements, and their justifications (LO 3.0)
  - a) Understand and define the fundamentals of a M&S scheduling and risk mitigation plan
  - b) Develop an understanding of trade-offs, decisions and rationale related to the development of M&S plans
- 4) Develop M&S approach that supports document generation (LO 4.0)
  - a) Identify and apply M&S planning process to acquisition milestones and decisions points
  - b) Identify and apply a process that supports the development of M&S planning documents and cost considerations
  - c) Identify and apply a process that supports the development of M&S planning techniques
- 5) Develop M&S Assessment Plans (LO 5.0)
  - a) Identify and apply a process that supports the assessment of M&S plan generation
  - b) Identify and apply a process that supports the assessment of how to measure M&S plan effectiveness
  - c) Identify a process that supports the development of measurable, effective M&S assessment plans
- 6) Use of M&S tools to generate documents (SSP,SEP, TEMP) (LO 6.0)
  - a) Identify and show how the SSP is used in the planning and development of a M&S tool set that include cost and scheduling requirements.
  - b) Identify and show how the SEP is used in the planning and development of M&S tool set that include cost and scheduling requirements.
  - c) Identify and show how the TEMP is used in the planning and development of a of a M&S tool set that include cost and scheduling requirements.
  - d) Identify and apply a M&S tool set that supports the development of an integrated SSP, SEP, TEMP
- 11) Course assessment plan:
  1. Week 1 through week 12: Weekly quizzes to test competency at corresponding level of instruction.
  2. Week 7: Class project based on case study to demonstrate students' ability to perform at the application level.
  3. Week 7: Mid term exam to test student competency at the application level.
  4. Weeks 8-12: Class projects based on case studies to demonstrate students' ability to perform analysis and evaluation at the mastery level.
  5. Week 12: Final exam to test student's ability to perform analysis and evaluation at the mastery level.

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### 12) Grading

- a) Attendance = 5%
- b) Mid Term Exam = 15%
- c) Class Project (mid Term) = 20 %
- d) Class Project (Final) = 45%
- e) Final Exam = 15%

### 13) Topic list by hour of instruction and reference:

The 48 hour course is structured such that each hour is based on its required level of competency. This structure allows the course material to be provided as four separate groupings: General Awareness, Understanding, Application, and Mastery.

The Matrix below outlines the 12 modules of the 48 hour course. Each of the 12 modules is a 4 hour self contained instruction block.

| Lvl | Wk | M&S Strategy and Support Plans  | Notes  |
|-----|----|---|--|
| G   | 1  | Course overview and Introductions                                     | text, handouts, grading, case studies, video(s)          |
| U   | 2  | Identify M&S strategy planning process                                | Guest Speaker and how we did it                          |
| U   | 3  | Leverage M&S plans to reduce cost, schedule, risk, etc...             | Examples and case studies on how we did it               |
| A   | 4  | Develop M&S approach that supports document generation                | Step by step process on how we do it                     |
| A   | 5  | Develop M&S assessment plans  | Step by step process on how we do it                     |
| A   | 6  | Use of M&S tools to generate documents (SSP, SEP, TEMP)               | [Instruction] [Instructor Case Study] [Student Project]  |
| A   | 7  | Class Project Presentations and Mid Term Exam                         | Given actual problem statement prepare approach/solution |
| M   | 8  | Analyze and evaluate M&S planning process                             | [Instructor Case Study] [Student Project]                |
| M   | 9  | Analyze and evaluate M&S plans to reduce cost, schedule, risk, etc... | [Instructor Case Study] [Student Project]                |
| M   | 10 | Analysis and evaluation of M&S assessment plans                       | [Instructor Case Study] [Student Project]                |
| M   | 11 | Analysis and evaluation of M&S (SSP, SEP, TEMP) implementation plans  | [Instructor Case Study] [Student Project]                |
| M   | 12 | Portfolio Assessment and Final Exam                                   | Presentations, class evaluation and grading criteria     |

Course Title: M&S Strategy and Support Plans

## Modeling and Simulation Strategy and Support Plans

### **General Awareness Skill Level by hour of instruction:**

#### **Module 1(G) Course Overview and Introductions:**

- 1 Instructor Introduction and program overview
- 2 Overview of the course content for each of the 12 modules
- 3 Selection of project teams, team expectations, testing and grading overview
- 4 Selection of team projects and instructor expectations of project deliverables  
LO:

### **Understanding Skill Level by hour of instruction:**

#### Module 2(U) Identify M&S strategy planning process

- 5 Define the contents of a Simulation Support Plan (SSP) and the relationship to using M&S for acquisition decisions.
- 6 Develop an understanding of how to perform M&S plan effectiveness assessment. This section includes, but is not limited to: metrics, reuse, integration/interoperability, verification/validation, and uncertainty considerations.
- 7 Develop and define performance factors and system design measures that are candidates for simulation. Define the use of an SSP across life cycle phases of development.
- 8 Develop steps and objectives of the M&S planning process. Define details of an SSP, and considerations for its incorporation into an SEP and a TEMP.

#### Module 3(U) Leverage M&S plans to reduce cost, schedule, risk, etc...

- 9 Develop an understanding of M&S cost models, cost requirements and their justifications. Understand and define the fundamentals of a M&S scheduling and risk mitigation plan.
- 10 Develop an understanding of trade-off's, decisions and rationale related to the development of M&S plans.
- 11 Understand and describe efficient use of M&S planning across life cycle phases of development.
- 12 Develop an understanding and illustrate how an integrated SSP, SEP and TEMP can be leveraged to reduce risk, cost, and schedule issues. Define the benefits and use of M&S resource management and related documentation.

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### **Application Skill Level by hour of instruction:**

#### Module 4(A) Develop M&S approach that supports document generation

- 13 Identify and apply a process that supports the development of M&S planning documents and cost considerations.
- 14 Identify and apply the M&S planning process to acquisition milestones and decision points.
- 15 Identify and apply a process that supports the development of M&S planning techniques that include cost requirements and their justification in decision-making.
- 16 Identify and apply a process that supports the development of an integrated SSP, SEP and TEMP document generation plan.

#### Module 5(A) Develop M&S assessment plans

- 17 Identify and apply a process that supports the assessment of M&S plan generation that includes the impact of cost and schedule commitments.
- 18 Identify and apply a process that supports the assessment of how to measure M&S plan effectiveness.
- 19 Define and apply M&S assessment planning processes that illustrates the use of trade-off's, decisions and rationale related to the development a M&S plan
- 20 Identify a process that supports the development of measurable, effective M&S assessment plans - documenting and reporting on program milestone goals, progress, performance factors, decisions made, and achievement of objectives. Identify and apply M&S resource management best practices.

#### Module 6(A) Use of M&S tools to generate documents (SSP, SEP, TEMP)

- 21 Identify and show how the SSP is used in the planning and development of a M&S tool set that include cost and scheduling requirements.
- 22 Identify and show how the SEP is used in the planning and development of a M&S tool set that include cost and scheduling requirements

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- 23 Identify and show how the TEMP is used in the planning and development of a M&S tool set that include cost and scheduling requirements
- 24 Identify and apply a M&S tool set that supports the development of an integrated SSP, SEP and TEMP.

### 7(A) Class Project Presentations and Mid Term Exam

- 25 Instructor Case Study illustrating the application of M&S techniques in the generation of the SSP, SEP and TEMP.
- 26-27 Class team project: Create an M&S development case study encompassing the application of M&S techniques in the generation of the SSP, SEP and TEMP.
- 28 Mid term exam to evaluate student competency at the application level.

### **Mastery Skill Level by hour of instruction:**

Module 8(M) Analyze and evaluate M&S plans related to M&S techniques in the generation of the SSP, SEP and TEMP.

- 29 Instructor case study on the analysis and evaluation of M&S techniques in the generation of the SSP, SEP and TEMP.
- 30 Instructor setup of class project on the analysis and evaluation of M&S techniques in the generation of the SSP, SEP and TEMP.
- 31 Student perform in-class project based on the case study and class instructions
- 32 Instructor evaluation of class project and student self grading of project

Module 9(M) Analyze and evaluate M&S plans to reduce cost, schedule, risk, etc

- 33 Instructor case study on the analysis and evaluation of M&S plans to reduce cost, schedule, risk, etc.
- 34 Instructor setup of class project on the analysis and evaluation of M&S plans to reduce cost, schedule, risk,
- 35 Student perform in-class project based on the case study and class instructions
- 36 Instructor evaluation of class project and student self grading of project

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### Module 10(M) Analysis and evaluation of M&S assessment plans

- 37 Instructor case study on the analysis and evaluation of M&S assessment plans
- 38 Instructor setup of class project on the analysis and evaluation of M&S assessment plans
- 39 Student perform in-class project based on the case study and class instructions
- 40 Instructor evaluation of class project and student self grading of project

### Module 11(M) Analysis and evaluation of M&S SSP, SEP, TEMP implementation plans

- 41 Instructor case study on the analysis and evaluation of M&S SSP, SEP, TEMP implementation plans.
- 42 Instructor setup of class project on the analysis and evaluation of M&S SSP, SEP, TEMP implementation plans.
- 43 Student perform in-class project based on the case study and class instructions.
- 44 Instructor evaluation of class project and student self grading of project.

### Module 12(M) Portfolio Assessment and Final Exam

- 45 Initiate student presentations and student portfolio assessment.
  - 46 Complete student portfolio assessment and initiate final exam
  - 47 Student complete final exam and instructor initiate review and in-class grading
  - 48 Complete in-class self grading and instructor provide final in-class assessments.
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