



# **Catalog of Short Course Syllabi**

(The courses are listed by alphabetical order of the instructor's surname.)

October 2009

## ***RMS Partnership Course Syllabus***

### **1. ADMINISTRATIVE INFORMATION:**

<b>INSTRUCTOR:</b> Steve Brown	<b>DATE:</b>
<b>COURSE TITLE: Implementing Performance Based Logistics</b>	
<b>TYPE OF SESSION: classroom presentation</b>	
<b>CLASSROOM TIME: 6 hours</b>	

### **2. PURPOSE:**

Provide logistics management professionals that develop or support defense systems an introduction to principles, policies and practices for implementing Performance Based Logistics.

### **3. ASSUMPTIONS:**

Classroom shall be equipped with computer overhead projector and large white board for instructor. There will be an easel with white paper and markers for each team of 4-6 students. There will be a maximum of 20 students in a class.

### **4. SESSION OUTCOMES:**

You will:

- a) Be able to explain key PBL concepts plus motivation for government & industry to employ PBL as support strategy for weapon systems, subsystems and assemblies.
- b) Be able to determine advantages and challenges for implementing PBL strategies for new systems and legacy sub-systems.
- c) Locate DoD policy and learning resources available through DAU including classroom courses, continuous learning modules and community of practice.

## **5. KEY CONCEPTS:**

- a) Role of Support Integrator and process to develop Performance-Based Agreements.
- b) DoD directives, guidance and practices concerning PBL implementation.
- c) Spectrum of PBL implementation strategies for new and legacy defense systems.
- d) Scope of PBL learning resources including classroom and online education and training.

## **6. MEASUREMENT OF OUTCOMES:**

- a) Participate in class discussion about PBL principles, policies and practices.
- b) Present summary of analysis and recommendations from team-based exercise.
- c) Complete small team-based exercise

## **7. STUDENT ASSIGNMENTS:**

### **Read ahead:**

White Paper titled “The Product Support Integration Function in a Performance Based Logistics Strategy,” an 18-page document that describes frameworks for system support integration, contracting strategies, and incentives key to implementing PBL

### **Classroom:**

Small team-based exercises assigned during class simulate activities to develop a Performance-Based Agreement between a DoD manager and support integrator.

## **8. OTHER USEFUL REFERENCES:**

- a) DoD PBL Guide
- b) DAU PBL Continuous Learning Module
- c) Logistics Community of Practice

## ***RMS Partnership Course Syllabus***

### **1. ADMINISTRATIVE INFORMATION:**

<b>INSTRUCTOR:</b> Lou Gullo	<b>DATE:</b>
<b>COURSE TITLE:</b> Design for Reliability	
<b>TYPE OF SESSION:</b> classroom presentation	
<b>CLASSROOM TIME:</b> 6 hours	

### **2. PURPOSE:**

This session is intended for electrical and mechanical design engineers and managers who desire to understand how to design for reliability. Students will benefit from this training by learning how to reduce product warranty costs, improve customer satisfaction through detailed requirements specifications, develop test plans as part of the Product Development Process (PDP) that minimize risks, and provide accurate budgets with decreased development cycle times meeting program schedule goals and customer commitment dates.

### **3. ASSUMPTIONS:**

Students have a basic understanding of design engineering principles and methodologies.

### **4. SESSION OUTCOMES:**

You will be able to:

- a) Define reliability and when to apply reliability into the design effort;
- b) Translate failure data into basic reliability information;
- c) Explain the various reliability distributions including the Weibull distribution basics
- d) Describe how to make reliability better and the various methods of reliability testing.

**5. KEY CONCEPTS:**

- a) Probability Density Functions and Probability Distributions
- b) Deterministic vs. Probabilistic Methods
- c) Reliability Analysis and Reliability Testing Methods

**6. MEASUREMENT OF OUTCOMES:**

Post-test to determine level of student knowledge and understanding about Design For Reliability session after classroom instruction.

**7. STUDENT ASSIGNMENTS:**

None

**8. OTHER USEFUL REFERENCES:**

None

# RMS Partnership Course SYLLABUS

## 1. ADMINISTRATIVE INFORMATION:

<b>INSTRUCTOR: Edward Herger</b>	<b>DATE:</b>
<b>COURSE TITLE: Performance-Based Logistics (PBL)</b>	
<b>TYPE OF SESSION: Classroom</b>	
<b>CLASSROOM TIME: 3 days</b>	

## 2. PURPOSE:

Course provides a dynamic, real-time learning environment oriented toward developing a range of life cycle logistics and product support competencies. It challenges participants to review what they think about traditional contracting policies and practices versus the new requirements.

## 3. ASSUMPTIONS:

PBL Definition: A packaged of sustainment interfaces and system effects which will provide a level of significant system capability, reliably predicted for a set of operational tasks at a commitment of support funds to the yield budget and to deliver that capability with continuous support and system capability through its planned life.

## 4. SESSION OUTCOMES: You will understand:

- a. Life Cycle Management Framework, Performance Based Life Cycle Sustainment.
- b. Total Ownership Cost, Materiel Availability, Materiel Reliability and Mean Down Time.
- c. System Engineering for PB, 321 July 2008.
- d. Key System Attributes for Product Support
- e. Integration of PBL into Systems Development
- f. DoDD 5000.01 and DoDI 5000.02

## **5. KEY CONCEPTS:**

- a. Life Cycle Position
- b. Fixed Price vs. Cost Plus
- c. Incentives and Withholds

## **6. MEASUREMENT OF OUTCOMES:**

- a. Supply Chain Performance
- b. Maintenance Repair and Overhaul
- c. Life Cycle Systems Engineering

## **7. STUDENT ASSIGNMENTS:**

### **a. Read:**

(1) DODD 5000.02, E1.1.17 Performance Based Logistics and E1.1.29 Total System Approach:

<http://www.dtic.mil/whs/directives/corres/pdf/500001p.pdf>

(2) DODI 5000.02, Ch 8 Operation and Support Phase.

<https://acc.dau.mil/dag> Follow link to DODI 500.02

(3) PBL Guide

<https://acc.dau.mil/CommunityBrowser.aspx?id=32536>

System Design for Operational Effectiveness Sec 2.2 in particular:

<https://acc.dau.mil/CommunityBrowser.aspx?id=32566&lang=en-US>

(4) Product Support Boundaries:

<https://acc.dau.mil/CommunityBrowser.aspx?id=32578>

(5) DoD Guide for Achieving RAM :

<https://acc.dau.mil/CommunityBrowser.aspx?id=31008&lang=en-US>

(6) PBL Tool Kit:

<https://acc.dau.mil/CommunityBrowser.aspx?id=22482>

## **8. OTHER USEFUL REFERENCES:**

(1) 10 USC 2466: Limitations on the Performance of Depot-Level Maintenance of Material: 50/50

(2) 10 USC 2464: Core Logistics

(3) 10 USC 2474: Center of Industrial and Technical Excellence and Public-Private Partnerships

## ***RMS Partnership Course Syllabus***

### **1. ADMINISTRATIVE INFORMATION:**

<b>INSTRUCTOR:</b> Edward Herger	<b>DATE:</b>
<b>Lesson TITLE:</b> Product Support Integration in a Performance Based Logistics Environment	
<b>TYPE OF SESSION:</b> Classroom	
<b>CLASSROOM TIME:</b> 24 hours (3 days)	

### **2. PURPOSE:**

Thorough course integrates principles and practices of Performance Based Logistics (PBL) in the context of the planning responsibilities of the Product Support Integrator (PSI). Highlights key PBL concepts and motivation for government and industry to improve sustainment strategies for defense weapon systems. Summarizes Department of Defense directives and guidance concerning PBL implementation and describes examples from new systems and legacy sub-systems. Includes techniques for meeting requirements for scheduling, prioritization, analysis, and forecasting.

### **3. ASSUMPTIONS:** Maximum 25 students

Classroom equipped with computer overhead projector & large white board for instructor. Easel with paper and markers for each group of 4-6 students.

### **4. SESSION OUTCOMES:** You will:

- a. Be able to explain key PBL concepts plus motivation for government & industry to employ PBL as support strategy for weapon systems, subsystems and assemblies.
- b. Be able to determine advantages and challenges for implementing PBL strategies for new systems and legacy sub-systems.
- c. Explain how to establish priorities, schedules, and analyses for effective PBL-type procurements

### **5. KEY CONCEPTS:**

**Day One – Managing the Process of Selecting a PSI:** Reviews the 12-step PBL process, identifying, evaluating, and selecting a PSI, workload allocation, doing a business case analysis, identifying and complying with statutory requirements, and other appropriate materials

**Day Two – Becoming a PSI:** Addresses both the concept of a “stand alone” PSI or one operating under a partnership agreement. Covers the scope of effort and the span of control necessary for an organization to assume either system or subsystem level PSI status. Competing effectively in a PBL environment and the techniques for partnering between government and industry in either direction is included.

**Day Three – Managing Internal Processes:** Covers contracts, agreements, breakdown of performance outcomes, integration of system support, logistic elements, development of incentives, and supply chain management. Includes exercises relating to implementation and oversight, common problems encountered in executing responsibilities.

## **6. MEASUREMENT OF OUTCOMES:**

- a. Respond to both pre-test and post-test.
- b. Participate in class discussion about PBL principles, policies and practices.
- c. Present summary of analysis and recommendations from team-based exercise.
- d. Complete small team-based exercise

## **7. STUDENT ASSIGNMENTS:**

**Read ahead:** White Paper titled “The Product Support Integration Function in a Performance Based Logistics Strategy”. 18-page document describes frameworks for system support integration, contracting strategies and incentives key to implementing PBL.

**Classroom:** Small team-based exercises assigned during class simulate activities to develop a Performance-Based Agreement between a DoD manager and support integrator.

## **8. OTHER USEFUL REFERENCES:**

- a. DoD PBL Guide
- b. DAU PBL Continuous Learning Module
- c. Logistics Community of Practice

**RMS Partnership  
Course SYLLABUS**

**1. ADMINISTRATIVE INFORMATION:**

<b>INSTRUCTOR: Edward Herger</b>	<b>DATE:</b>
<b>COURSE TITLE: Reliability, Maintainability, and Availability (RM&amp;A)</b>	
<b>TYPE OF SESSION: Classroom</b>	
<b>CLASSROOM TIME: 3 days</b>	

**2. PURPOSE:**

RM&A provides an overview of acquisition policy and its application in the design, development, and deployment of equipment and systems. The goal is to understand and be able to use the concepts of life cycle management, performance-based life-cycle sustainment, emphasizing total ownership cost, materiel availability, materiel reliability, and mean down time.

**3. ASSUMPTIONS:**

Reliability: Mission, and Logistics

Maintainability: Mean Down Time, Mean Time to Restore, Preventive and Corrective Maintenance, Built in Test and Trade offs

Supportability: Design the system for the support processes, incorporate planned use and planned logistics impacts in the system and detailed design performance specifications.

Availability: Inherent Availability, Operational Availability, Materiel Availability. How are each different and which are used when. Pitfall of Mission Availability.

Sustainability: The outcome of the process which: designs the system for RMA, designs the support and supports the design over the long term is sustainability. All the above when placed in the field and given fact of life resources predict how well availability and mission reliability are delivered at ownership cost. Sustainability is the basis for affordability portion of suitability.

#### **4. SESSION OUTCOMES: You will:**

a. Be well-grounded in all of the tools necessary to implement RM&A concepts and principles under modern acquisition rules.

#### **5. KEY CONCEPTS:**

Mission Profiles:

- JCIDS Capability Documents,
- Tactical and Operations Analysis
- Requirements Analysis
- Initial Capabilities Documents

Functional Baselines:

System Level RM&A Allocations and Predictions;

- Functional Analysis
- Functional Baseline and System Performance Specifications
- Life Cycle System Engineering

Capabilities Documents

Maintenance Task Analysis:

- Failure Modes Effects and Criticality Analysis (FMECA),
- Reliability Centered Maintenance, (RCM)
- Conditioned Based Maintenance (CBM),
- Condition Based Maintenance Plus (CBM+)

Detailed R&M Design Predictions;

- Allocated Baseline
- Prime Item and Critical Item Specifications

R&M Verification:

- Design Test and Evaluation
- Reliability Growth Tests
- Logistics Demonstrations (Maintainability)
- Operational Test and Evaluation

Data Collection and Analysis

- Design of Experiment
- Risk Appraisal
- Test Conclusions

COTS RM&A Tasks.

Planned Use

Maintenance Planning

Configuration Control

Managing Sources

## **6. MEASUREMENT OF OUTCOMES:**

The open seminar and practical exercises format of this course allows for maximum information to be presented while allowing for questions, discussions, and in-class examples and exercises to maximize the students' overall learning experience.

## **7. STUDENT ASSIGNMENTS:**

### **a. Read:**

(1) DODD 5000.02, E1.1.17 Performance Based Logistics and E1.1.29 Total System Approach:

<http://www.dtic.mil/whs/directives/corres/pdf/500001p.pdf>

(2) DODI 5000.02, Ch 8 Operation and Support Phase.

<https://acc.dau.mil/dag> Follow link to DODI 500.02

System Design for Operational Effectiveness Sec 2.2 in particular:

<https://acc.dau.mil/CommunityBrowser.aspx?id=32566&lang=en-US>

(3) DoD Guide for Achieving RAM :

<https://acc.dau.mil/CommunityBrowser.aspx?id=31008&lang=en-US>

## **8. OTHER USEFUL REFERENCES: None**

## ***RMS Partnership Course Syllabus***

### **1. ADMINISTRATIVE INFORMATION:**

<b>INSTRUCTOR:</b> Paul McIlvaine	<b>DATE:</b>
<b>COURSE TITLE: A Top-Level, Integrated Approach to Supportability Engineering</b>	
<b>TYPE OF SESSION: Lecture, Guided Discussion and Interactive Analysis</b>	
<b>CLASSROOM TIME:</b> 6 hours	

### **2. PURPOSE:**

Demonstrate, using a real-world, contemporary example, how internal and external logistics supportability integration can be facilitated by using a simple supportability matrix tool in order to efficiently achieve the necessary supportability engineering goals. Students will learn to use this tool by applying it to the real-world, contemporary example in a classroom setting.

### **3. ASSUMPTIONS:**

Supportability Engineering goals are to define the necessary support, design the system with full knowledge of its downstream support implications, reduce the risk by supportability testing prior to deployment, acquire the necessary items to efficiently support the system, and provide the necessary items and information to support the system.

### **4. SESSION OUTCOMES:**

#### **You will:**

- a) Understand the need for integration among the various documents and disciplines in order to achieve the necessary supportability engineering goals efficiently
- b) Understand how each traditional element of logistics needs to be analyzed and evaluated in terms of its contribution to the overall system and role in achieving the necessary supportability engineering goals.
- c) Demonstrate your ability to use the supportability matrix tool to achieve the necessary integration to ensure successful achievement of supportability engineering goals.
- d) Be able to interface with the design engineers, program managers,

budgetary analysts, contract specialists, and testers more effectively in the normal course of the systems acquisition process

## **5. KEY CONCEPTS:**

a) Supportability Analysis (SA) forms the basis for logistics supportability decisions that define the support needed for the system to be sustained in an operational environment.

b) Logistics supportability decisions must be documented and communicated to all team members.

c) Logistics supportability decisions must be translated into defensible design requirements, or all prior planning and efforts simply will not work.

d) Key supportability parameters must be tested as an integral part of the overall system testing in order to reduce risk to acceptable levels.

e) All necessary items of support must be acquired and budgeted for.

f) These same items of support must be provided to the right place at the right time in the right quantity prior to and after deployment.

## **6. MEASUREMENT OF OUTCOMES:**

a) A pre-test will be used to determine level of student knowledge and understanding about supportability engineering prior to classroom instruction.

b) Evaluation will be made as part of the continuing interactive work and discussion during the course of the lesson.

c) A post-test will be used to determine level of student knowledge and understanding about supportability engineering prior to classroom instruction.

## **7. STUDENT ASSIGNMENTS:**

### **a. Read:**

Documents that describe real-world, contemporary examples:

- 1) Acquisition Strategy
- 2) Human Systems Integration Plan
- 3) Life Cycle Cost Analysis
- 4) Mission Need Statement
- 5) Surrogate Test Results
- 6) Test & Evaluation Master Plan
- 7) Logistics Support Plan

### **b. Other:**

Familiarize yourself with the supportability matrix tool to be used in the

classroom.

**8. OTHER USEFUL REFERENCES:** None

**RMS Partnership  
Course SYLLABUS**

1. ADMINISTRATIVE INFORMATION:

<i>INSTRUCTOR: Tony Myers-Burton</i>	DATE:
<b>COURSE TITLE: Program Technical Data Management/Integrated Data Environment</b>	
<i>TYPE OF SESSION: Classroom</i>	
<b>CLASSROOM TIME: 2 Days of 8 hours for a total of 16 hours</b>	

2. *PURPOSE:*

This course describes the steps required to build a data library (technical manuals, drawings, provisioning technical data) for a given program; to cover the life cycle phases one by one; what data is collected and what data is provided.

The course will focus in on the concept of design for sustainment and the Total Lifecycle Cost of Ownership (from initial product design to retirement) and the associated influence of design and quality Product Data Management.

3. *ASSUMPTIONS:*

This course is designed for a new or experienced Program Managers.

The student should understand the basic concepts of Product Lifecycle Management, the Design Chain Operations Model (DCOR) and Supply Chain Operations Model (SCOR)

4. *AGENDA:*

- a. Introductions
- b. Presentation on the course objectives, format & schedule
- c. Short self test to baseline students understanding if the key concepts
- d. Presentation on the concepts
- e. Case Study based exercise
- f. Facilitated Class Discussion / Lesson Learned
- g. Individual Plan of Action for leveraging course concepts.
- h. Short end of course test, marked by Instructor to evaluate course effectiveness with regard to understanding of key concepts.
- i. Course evaluation by students

## **5. SESSION OUTCOMES: You will:**

- a. Fully understand and can practically apply: the concepts of:
  - (i) Total Product Lifecycle Management;
  - (ii) Total Lifecycle Cost of Ownership;
  - (iii) identification of required pertinent data for each phase in the total product lifecycle
  - (iv) the systematic processes for capturing and effectively employing captured PDM data (ref. iii);
  - (v) the significant influence that initial design and strategic sourcing has on the products effective and efficient sustainability.
- b. An individual plan to take the concepts and lesson learned and practically apply for the direct benefit of the warfighter.

## **6. KEY CONCEPTS:**

- a. Total PLM
- b. Total Lifecycle Cost of Ownership
- c. Processes for effective Data capture and utilization throughout the product lifecycle
- d. Significant impacts of initial design and Strategic Source Selection has on effective and efficient weapon system sustainability.

## **7. MEASUREMENT OF OUTCOMES:**

- a. All students will take a short self test at the beginning of the course to baseline their knowledge of the subject matter.
- b. The end of course test will be evaluated
- c. The course and instructor will be evaluated

## **8. STUDENT ASSIGNMENTS:**

### **a. Read:**

- 1) DCOR & SCOR Overviews

## **9. OTHER USEFUL REFERENCES:**

Product Lifecycle Management by Antti Saaksvuori

***RMS Partnership***  
**Course SYLLABUS**

**1. ADMINISTRATIVE INFORMATION:**

<b>INSTRUCTOR:</b> Tony Myers-Burton	<b>DATE:</b>
<b>COURSE TITLE:</b> ERP / Impact to ILS Applications	
<b>TYPE OF SESSION:</b> Classroom	
<b>CLASSROOM TIME:</b> One Day	

## **2. PURPOSE:**

Education of course attendees with regard to the impact of Navy ERP on Integrated Logistics and associated systems.

## **3. ASSUMPTIONS:**

None

## **4. SESSION OUTCOMES: You will:**

a. Have a in-depth understanding of the benefits and impacts of Navy ERP on NAVSEA Integrated Logistics and associated systems

## **5. KEY CONCEPTS:**

a. Understand of what will be delivered with Navy ERP release 1.0 and 1.1

b. Understand critical program timelines

c. Understand the functionality being deployed to NAVSEA through the six key scenarios, and specifically the logistics centric scenarios “Plan to Pay” and “Acquire to Dispose”.

## **6. MEASUREMENT OF OUTCOMES:**

a. A short baseline survey / questionnaire will conducted at the beginning of the course and then repeated at the end of the course to assess increased understanding of Navy ERP@NAVSEA and its potential impact on NAVSEA Integrated Logistics and associated systems.

## **7. STUDENT ASSIGNMENTS:**

### **a. Read:**

1) Navy ERP@NAVSEA “Compelling Case for Change”

2) Navy ERP@NAVSEA Command Implementation Guide (CIG)

## **8. OTHER USEFUL REFERENCES: None**

## **RMS Partnership Course Syllabus**

### **1. ADMINISTRATIVE INFORMATION:**

<b>INSTRUCTOR:</b> Dev Raheja or Lou Gullo	<b>DATE:</b>
<b>COURSE TITLE:</b> Managing Design for Reliability (with workshop)	
<b>TYPE OF SESSION:</b> classroom with workshop	
<b>CLASSROOM TIME:</b> 12 hours (two days)	

### **2. PURPOSE:**

To manage the design process which aims at writing clear system specifications to ensure reliability of the total system including the integration with maintainability, system safety, human factors, and logistics.

### **3. ASSUMPTIONS:**

This workshop is intended for engineering managers, program managers, chief engineers and all technical managers. Others interested in enhancing their management skills can attend.

### **4. SESSION OUTCOMES:** You will learn:

- a. To distinguish between wrong engineering and right engineering
- b. How to reduce test time by 70%
- c. Understand the power of analyses techniques in reducing the life cycle costs dramatically
- d. To predict product life
- e. To use prognostics to avoid mission ending failures

## **5. KEY CONCEPTS:**

- a. Difference between Reliability and Durability
- b. Causes of Unreliability
- c. Methods of Improving Reliability
- d. System FMEA
- e, Process FMEA
- f. Fault Tree Analysis
- g. Accelerated Life Testing
- h. Weibull Analysis of Data
- j. Environmental Stress Screening
- h. Software Reliability

## **6. MEASUREMENT OF OUTCOMES:**

- a. Pre-and post-test to determine level of student knowledge and understanding about test and evaluation prior to and after classroom instruction.
- b. Successful completion of workshops.
- c. Understanding that high reliability reduces costs

## **7. STUDENT ASSIGNMENTS:**

### **a. Read:**

1) Students will receive the copy of the text “Assurance Technologies Principles and Practices” (Wiley, 2006). They will read chapters on Reliability, Maintainability, and Human Factors. They will benefit by reading other chapters also such as System Safety and Logistics Engineering

2) They will also get a copy of the 1990 article “Death of a Reliability Engineer” and be prepared to comment on the progress since then.

## **8. OTHER USEFUL REFERENCES: None**

## ***RMS Partnership Course Syllabus***

### **1. ADMINISTRATIVE INFORMATION:**

<b>INSTRUCTOR:</b> Dev Raheja	<b>DATE:</b>
<b>COURSE TITLE:</b> System Safety: Principles and Best Practices	
<b>TYPE OF SESSION:</b> classroom/ workshop presentation	
<b>CLASSROOM TIME:</b> 12 hours (two days)	

### **2. PURPOSE:**

To implement system safety principles proactively and efficiently

### **3. ASSUMPTIONS:**

This combination of lectures and workshops is intended for beginning level engineers and intermediate level practitioners in design and safety. Technical managers in all engineering fields will find it a good overview of system safety.

### **4. SESSION OUTCOMES:** You will learn:

- a. Fundamentals of system safety engineering and management
- b. How to know at least 80% risks during early design
- c. The difference between good and bad hazard analysis
- d. To design for robustness
- e. To use prognostics to avoid mishaps

## **5. KEY CONCEPTS:**

- a. System Safety Theory
- b. Theory of Accidents
- c. System Safety Management
- d. Developing Safety Specification
- e. Requirements Analysis
- f. Preliminary Hazard Analysis
- g. Fault Tree Analysis
- h. Subsystem Hazard Analysis
- j. System Hazard Analysis
- k. User Interface Analysis
- k. Software Hazard Analysis
- l. Maintenance Engineering Safety Analysis
- m. Safety in Logistics

## **6. MEASUREMENT OF OUTCOMES:**

- a. Pre-and post-test to determine level of student knowledge and understanding about test and evaluation prior to and after classroom instruction.
- b. Successful completion of workshops.
- c. Understanding that safety is a good investment

## **7. STUDENT ASSIGNMENTS:**

### **a. Read:**

1) Students will receive the copy of the text “Assurance Technologies Principles and Practices” (Wiley, 2006). They will read chapters on System Safety, Statistics, Human Factors, and Software Performance Assurance.

## **8. OTHER USEFUL REFERENCES: None**

# RMS Partnership Course Syllabus

## 1. ADMINISTRATIVE INFORMATION:

<b>INSTRUCTOR:</b> James Rodenkirch	<b>DATE:</b> October 2006
<b>COURSE TITLE:</b> Reliability for Systems of Systems	
<b>TYPE OF SESSION:</b> Classroom	
<b>CLASSROOM TIME:</b> 6 to 8 hours	

## 2. PURPOSE:

To introduce students to the current concepts of Systems of Systems as they are being used in evolving DoD programs and the requirements for implementing these concepts, as they are needed.

## 3. ASSUMPTIONS:

Students will interact with the instructor in a maximum class setting of 20 that will be equipped with both computer projection and white board; students will be provided handouts of the classroom presentation.

## 4. SESSION OUTCOMES: Government and industry attendees will be able to:

a. Explain key concepts associated with the relationships between a FoS and a SoS and understand the motivations linked to a suggested Federated System of Systems environment

b. Discuss capably the requirements for developing DoD Architecture Framework Products that account for more than the material solution, as well as SoS solutions that consider the user and stakeholder in addition to the policies and procedures, e.g. Doctrine, Organization, Training, Materiel, Leadership, Personnel, and Facilities (DOTMLPF).

c. Address the practical, physics and physical, and human system functional requirements necessary to ensure the adequacy of reliability considerations when developing the requisite architectural products for the DoN NCDP and JCIDS.

## 5. KEY CONCEPTS:

a. The role systems engineers and architects play in ensuring adequate reliability considerations for Systems of Systems.

b. JCIDS and NCDP directives, guidance and practices affecting reliability

considerations for Systems of Systems.

**c.** The role heuristics play in ensuring a simplistic yet adequate systems engineering approach towards realizing reliable Systems of Systems.

**d.** The scope of learning resources, including classroom and online education and training, for practitioners in the design and calculations associated with reliable Systems of Systems.

#### **6. MEASUREMENT OF OUTCOMES:**

**a.** Participation in class discussions regarding SoS architectures and reliability considerations;

**b.** Completion of classroom exercises that center on the considerations for and resulting calculations of SoS reliability.

#### **7. STUDENT READING ASSIGNMENTS:**

**1)** Maier, M. W., "Architecting Principles for Systems of Systems," Proceedings of the 6th International Symposium, INCOSE, 1996

**2)** Keating, Charles et al, "System of Systems Engineering," Engineering Management Journal, Vol. 15, No. 3, September 2003

#### **8. OTHER USEFUL REFERENCES:**

**1)** Department of Defense Architecture Framework (DoDAF), Vol. 1 and 2

**2)** Gladwell, Malcolm, "The Tipping Point: How Little Things Make a Big Difference," Little Brown and Company, 2002. ISBN: 0-316-31696-2

**3)** Katzenbach, John, "The Wisdom of Teams; Creating the High-Performance Organization," Harvard Business School Press, 2003. ISBN: 0-06-052200-3