

# Fundamentals of COTS-Based Systems Engineering

Leveraging Commercial-off-the-Shelf Technology for System Success

## Summary

- Three-day course (customizable)
- Provides a systemic overview of how to use Systems Engineering to plan, manage, and execute projects that have significant Commercial-off-the-Shelf (COTS) content (hardware, software, and services)
- Focuses on adjustments to the fundamental principles of Systems Engineering necessary when dealing with the unique aspects of COTS-based development efforts
- Follows the basic outline and conventions of the INCOSE Systems Engineering Handbook, ISO/IEC/IEEE 15288, and the Guide to the Systems Engineering Body of Knowledge (SEBoK)
- Practical information and tools are provided
- Includes several in-class exercises to solidify the concepts being presented
- Each student will receive a complete set of lecture notes and an annotated bibliography

## What You Will Learn

- The key characteristics of COTS components
- How to effectively plan and manage a COTS development effort
- How using COTS affects your requirements and design
- How to effectively integrate COTS into your systems
- Effective verification and validation of COTS-based systems
- How to manage your COTS suppliers
- The latest COTS lessons learned

## Instructor – David D. Walden, ESEP

- An internationally recognized expert in the field of Systems Engineering
- Over 30 years of industry experience
- Taught over 100 courses to over 1600 students since 2006
- INCOSE Expert Systems Engineering Professional (ESEP)
- Senior Member of the IEEE
- Lead Editor of the INCOSE SE Handbook Fourth Edition
- Education
  - MS in MOT, University of Minnesota
  - MS in EE & CS, Washington University in St. Louis
  - BS in EE, Valparaiso University



## Course Outline & Topics

**1. COTS Concepts and Principles.** Key COTS and COTS-Based Systems Engineering (CBSE) Concepts. CBSE Compared and Contrasted with Traditional Systems Engineering. Key Challenges and Expected Benefits of CBSE. COTS lessons learned.

**2. COTS Influences on Requirements Development.** Tailored and New Approaches to Requirements. Stakeholder Requirements and Measures of Effectiveness. System Requirements and Measures of Performance. Flow Down of Requirements to COTS Components.

**3. COTS Influences on Architecture and Design.** Architecting Principles. Make vs. Buy Decisions. Architectural and Design Strategies for CBSE. Dealing with the Unique Interdependencies of Overlapping COTS and System Lifecycles. Support for Ongoing Change and Evolution of the COTS Components.

**4. COTS Life Cycle Considerations.** Reliability, Maintainability, Availability. Supportability/Logistics. Usability/Human Factors. Training. System Safety. Security/Survivability. Producibility/Manufacturability. Changeability. Commonality. Interoperability. Affordability. Disposability/Sustainability.

**5. COTS Influences on Integration and Test.** Integration, Verification, and Validation Approaches in a COTS Environment. Strategies for Dealing with the Dynamic and Independent Nature of the COTS Components. Acceptance of COTS Components.

**6. COTS Influences on Technical Management.** Planning, Monitoring, and Control. Risk and Decision Management, Configuration and Information Management. Supplier Identification, Selection, Agreements, Oversight, and Control. Supplier Technical Reviews. COTS Integrator Role. Course Wrap-up.

**Typical Course Duration - 3 Days**  
**Typical Schedule 8:30am-4:00pm**

**Earn up to 18 INCOSE PDUs!**

Please contact Sysnovation for availability, customization, and pricing.