

SYSTEM ENGINEERING TOOLBOX & SPECIAL ANALYSIS

“Mastering Practical Tools and Analytical Techniques for Complex System Design and Evaluation”

Schedule

Date	Venue	Fees (Face-to-Face)
05 – 06 Mar 2026	Dubai, UAE	USD 1995 per delegate

Introduction

System engineering is essential for managing complexity in the design, integration, and operation of modern systems across industries. As systems grow in scale and sophistication, professionals must apply a variety of structured tools and analytical techniques to ensure functionality, efficiency, reliability, and alignment with user needs.

This 2-day course delivers a compact and practical overview of essential systems engineering tools and methods used throughout the system lifecycle. From requirement analysis to risk assessment and trade-off analysis, participants will gain hands-on experience with the techniques that guide successful system development and decision-making.

Objectives

By the end of this course, participants will be able to:

- Apply core systems engineering tools and models to system design and evaluation
- Perform requirement analysis, functional decomposition, and interface definition
- Use analytical tools for trade-off analysis, risk analysis, and performance assessment
- Document systems using standard modeling and architecture techniques
- Support cross-functional collaboration and systems thinking

Why Attend

- To gain working knowledge of high-impact systems engineering tools
- To enhance your ability to evaluate technical trade-offs and system risks
- To improve collaboration across engineering, operations, and project functions
- To reduce rework and improve traceability of engineering decisions
- To apply structured thinking to complex technical problems

Target Audience

This program is designed for:

- Systems engineers and project engineers
- Design and integration engineers
- Technical project managers and analysts
- Operations, QA, and R&D professionals
- Anyone involved in multidisciplinary system development or decision-making

Individual Benefits

Key competencies that will be developed include:

- Requirements analysis and functional modeling
- System architecture and interface identification
- Trade-off analysis and decision documentation
- Risk analysis and failure assessment
- Use of systems engineering frameworks and diagrams

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- More effective and efficient system development processes
- Improved traceability and design validation
- Better cross-functional communication and stakeholder alignment
- Reduced development risk and design failure rates
- Enhanced ability to manage complexity and lifecycle considerations

Instructional Methodology

The course follows a blended learning approach combining theory with practice:

- Strategy Briefings - Core systems engineering methods, principles, and models
- Case Studies - Engineering scenarios that illustrate tool applications
- Workshops - Hands-on exercises using system models, trade-off matrices, and risk tools
- Peer Exchange - Group discussion of system lifecycle challenges
- Tools - Templates and frameworks for requirement capture, FMEA, decision matrices, and system diagrams

Course Outline

Detailed 2-Day Course Outline

Training Hours: 7:30 AM - 3:30 PM Daily Format: 3-4 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 - 02:00

Day 1: Systems Thinking and Engineering Tools

- Module 1: Introduction to Systems Engineering (07:30 - 09:30) • System lifecycle and V-model overview • Role of systems engineering in modern projects • System thinking vs. component thinking
- Module 2: Requirements Engineering (09:45 - 11:15) • Defining and managing system requirements • Requirement traceability matrix (RTM) • Quality characteristics of effective requirements
- Module 3: Functional Decomposition and Modeling (11:30 - 01:00) • Functional breakdown structures • Use of IDEF0 and functional flow block diagrams (FFBDs) • Interface identification and control
- Module 4: Workshop - Functional Model Creation (02:00 - 03:30) • Hands-on task: Decompose and model a sample system

Day 2: Analytical Tools for Systems Engineering

- Module 1: Trade-Off Analysis and Decision Tools (07:30 - 09:30) • Decision matrices and utility functions • Weighting criteria and ranking alternatives • Sensitivity analysis
- Module 2: System Risk and Reliability Analysis (09:45 - 11:15) • FMEA, FTA, and hazard analysis techniques • Risk prioritization and control strategies • System-level vs. component-level risks
- Module 3: System Architecture and Integration (11:30 - 01:00) • Defining and documenting system architecture • Block diagrams, interface models, and SysML basics • System integration planning
- Module 4: Final Case Study & Action Plan (02:00 - 03:30) • Group activity: Apply tools to solve a real-world systems problem • Wrap-up and personal application planning

Certification

Participants will receive a Certificate of Completion in System Engineering Toolbox & Special Analysis, validating their capability to apply structured tools and analysis methods across the system lifecycle for improved decision-making and performance.

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