Systems Thinking

Course Description

This two-day course will use a threaded case study to help participants define and utilise effective mental models to analyse and respond to challenges arising across the project life cycle.

Challenges from the following contexts will be addressed:

- Systems thinking context
- Technical baseline context
- Project management, safety and mission assurance context.

This will be accomplished by immersing participants in strategic and tactical program and project lessons learned spanning systems engineering, project management and safety and mission assurance, as well as technically-detailed topics.

Course Topics

Module 1: Space Systems Engineering and Mission Design:
- Introduction to Applied Space Systems Engineering
- Designing Space Missions

Module 2: Mission Constraints and Enablers:
- Space Environment
- Orbit Design and Applications
- Launch System Services
- Technical Risk Management and TRL
- Digital Engineering Tools and Techniques

Module 3: Spacecraft Design:
- Payloads
- Spacecraft Architecture
- Spaceflight Software

Module 4: Subsystem Design:
- EPS
- ADCS/GNC
- Propulsion
- Communications
- Thermal Control
- Structures and Configuration

Module 5: Mission and System Implementation:
- Quality/Product Assurance and Standards
- Assembly, Integration and Verification (AIV)
- Mission Operations and Ground Systems
- Cost and Schedule Modelling

Threaded case study throughout

Who Should Attend

With over 3,000 alumni, this course is designed for team practitioners/technical engineers, team/subsystem leads, project managers/project systems engineers and program managers/chief engineers.

Course Materials

Each participant will receive:

- A complete electronic set of course notes with copies of the slides used in the presentation

Course Objectives

At the end of this course you will be able to:

- Describe and apply NASA and other organizations' lessons learned resources

- Develop decision-making frameworks for systems engineering and project management challenges and apply them to recommend solutions

- Critically evaluate lessons learned from various programs and projects and describe how they can be applied to your own NASA responsibilities

- Formulate plans for addressing typical problems faced in NASA programs and projects and use them to defend specific courses of action

- Demonstrate systems-thinking in the context of interpreting lessons learned and case studies as they apply to specific program and project challenges

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