



Mission Design Workshop



Course Description

The Mission Design Exercise is a completely hands-on workshop that provides a unique opportunity to design a real-world space mission from scratch. Course participants are given a set of mission objectives in the form of a Request for Proposal (RFP) or Announcement of Opportunity (AO) and divided into teams to conceptually design a viable mission that meets the customer expectations with an acceptable life cycle cost and risk.

The teams are guided through a structured space system engineering approach to define a mission concept and supporting space mission architecture, and perform detailed analysis. Participants are given a comprehensive mission design and analysis tool along with a full copy of Systems Tool Kit (STK) software to analyze trade-offs and complete their design. A minimum of in-class lecture provides "just-in-time" learning and concrete examples to keep participants on track.

The product of the design exercise is a Mission Concept Review presentation where the participants are given the opportunity to outline and defend their design decisions.

The Space Mission Design Exercise provides a practical opportunity to apply space system engineering techniques in a non-threatening, real-world environment.

Course Topics

Foundations

- Course Introduction
- Mission Operations Overview
- Project Scenario Introduction
- Systems Engineering Overview
- Agile Concepts and Methods
- Project Approach
- Introduction to Model-based Systems Engineering (MBSE)
- Space Mission Analysis and Design
- FireSAT Case Study and Architecture

Tools & Techniques

- SMAD Worksheet
- System Tool Kit
- Innoslate Quickstart

Application Workshop Final Presentation



Who Should Attend

Systems engineers, payload principle investigators, subsystem engineers or project managers who are responsible for the detailed design and operation of space systems.

Course Materials

Each participant will receive:

- An e-copy of the course text Understanding Space: An Introduction to Astronautics
- A comprehensive electronic course handout with copies of all slides used in the presentations
- Access to design and analysis tools and software

Course Objectives

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

- Understand the overall space mission design process
- Apply systems engineering tools and techniques to a real-world space project
- Apply agile approaches to enhance teamwork and collaboration
- Apply project engineering skills:
 - System engineering management
 - Technical integrity
 - Technical leadership
- Integrate all elements of a successful mission
- Establish a process to refine requirements
- Define parameters to meet mission objectives at acceptable cost and risk



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