Integrated Product Team
Program Overview

Bringing the Real World into the Classroom
Aerospace & Defense Workforce Issues

- Aging workforce
  - Average age is 45.8 years
  - During Apollo - 26 years
- 26% of all aerospace workers able to retire
- 60,678 positions are available through 2012
- NRC report outlines need for increased engineering design education in K-12

The Integrated Product Team (IPT) Program was developed to address these issues
Two high schools compete to be payload on Sr. Design Experience spacecraft.

Level 2 project is to design an element of the mission (students selected from “best” of Level 1 project).

- 2 projects per semester
- 3 teams per project
IPT/ Space Missions Program Objectives

- Create world class scientists and engineers capable of transitioning seamlessly into the professional world
  - Application of engineering discipline
  - Communicate effectively
  - Think in a systems context
  - Experience with real-world design engineering
  - Function in a team environment

- Generate interest in Science, Technology, Engineering, and Mathematics (STEM) careers and retain those students
  - Create a STEM pipeline
Science Objectives

• Two target undergraduate student audiences:
  - Lower division: course maintains student science interests beyond general education.
  - Upper division: course counts towards major; provides leadership experience.

Course Objectives:
• To provide students with an opportunity to practice techniques learned in science classes.
• To develop interdisciplinary communication and interaction between scientists and engineers.
• To develop interdisciplinary interaction between scientists (currently astronomers, geologists, physicists, marine biologists, computer scientists).
• To immerse students in the grant writing process.
Science Need

Identification of Planetary Body

Science Goals & Objectives

Science Requirements

Environmental Definition

Instrument Identification

Target Identification

Design Requirements

Mission Functional Analysis

Project/Proposal Requirements

Concept Description Document (CDD)

(SR)^2 Presentation

Science & System Requirements Review (SR)^2

Phase 1 - Requirements Development
Phase 3 - System Definition

- Requirements Allocation
- Functional Analysis
- Identification of Subsystem Trades
- Trade Studies
- Candidate Subsystems
- Systems Analysis
- Recommended Vehicle
- Updated CONOPS
- SDR Report
- SDR Presentation

System Definition Review
And now ...

From the student perspective
Questions?

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