

COE CST Fourth Annual Technical Meeting:

Task 257: Commercial Spaceflight Operations Curriculum Development

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October 30th 2014



Overview

- Team Members
- Purpose of Task
- Research Methodology
- Schedule & Milestones
- Next Steps
- Contact Information

Team Members

- **George H. Born** – Director Emeritus, Colorado Center for Astrodynamics Research
- **Bradley Cheetham** – Graduate Research Assistant, CU Boulder, Aerospace Engineering Sciences

- **Ken Davidian** – Program Manager, FAA AST

Industry Partners



Ball Aerospace & Technologies Corp.



LOCKHEED MARTIN



Jet Propulsion Laboratory
California Institute of Technology



COE CST Fourth Annual Technical Meeting (ATM4)
October 29-30, 2014



Recent/Notable Industry Partners



Lab project mentorship/direction



Commercial satellite lecture



Industry guest lecture

Purpose of the Task

To develop graduate level curriculum that will serve as a bridge between academic theory and commercial applications and to prepare students to become real-world problem solvers.

COE Objectives

Research

- Student research projects investigate current constraints and explore potential solutions

Training

- Preparing students to enter industry with commercial perspective

Outreach

- Educating academia about developments in commercial space

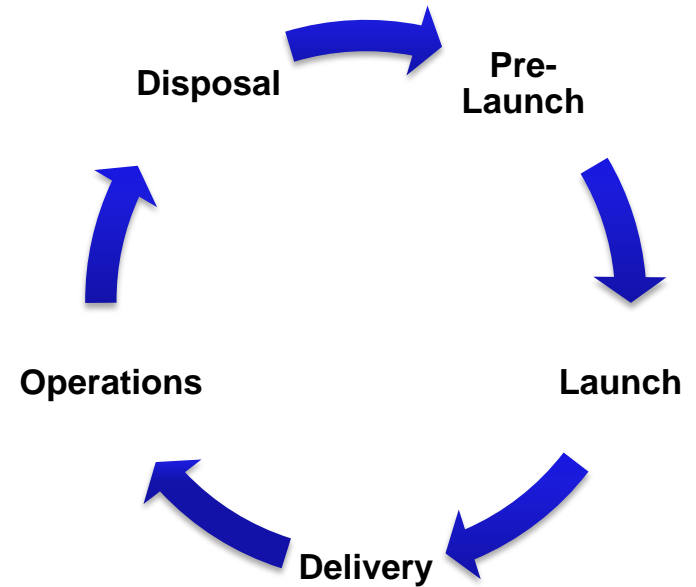
Approach

Objectives:

- Develop one-semester course
- Develop one-semester lab
- Refine content based on student and industry feedback
- Standardize and establish Graduate Certificate
- Increase collaboration between academia and industry

Curriculum Scope

- Full mission lifetime
- Transfer knowledge
 - Industry ↔ Academia
 - Established ↔ Emerging
- Provide context



Operations Lab

Guiding principles:

- Push the state-of-the-art for education
- Extensively involve industry
- Apply theories to real-world challenges
- Assist research
- Enable other courses
- Exhibit research

Entirely constructed with University cost-share

Operations Lab



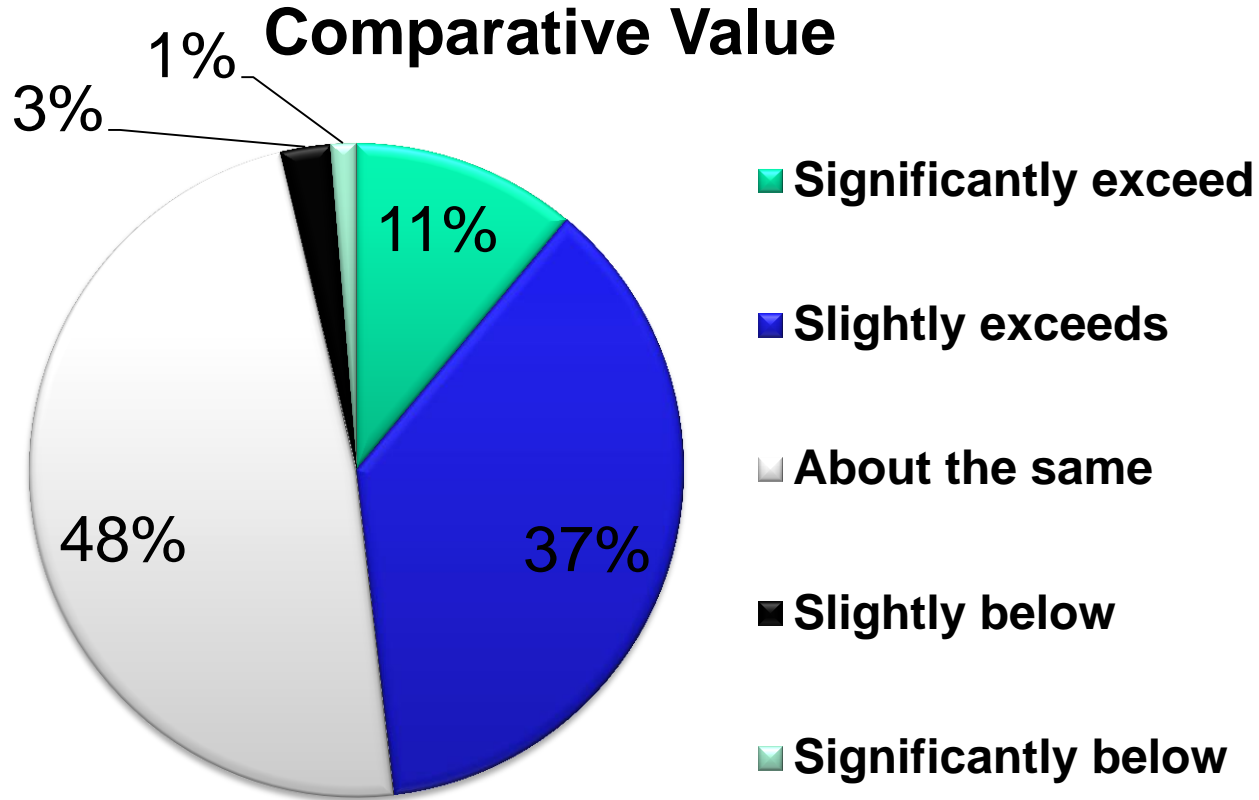
Schedule/Milestones

- Lecture offered: fall 2011, 2012, 2013, 2014
- Lab offered: spring 2013, 2014, 2015
- Total students: 102

- Industry feedback incorporated into all content
- Student feedback incorporated where possible
 - Changes to course lay-out
 - Changes to lab assignments
 - Changes to lab offering

Results

Value proposition to students:



Next Steps

- Spring 2015 – Lab offered with industry partner
- Certificate Development (in progress)
- Broaden impact via distance learning and collaboration

Publications

Cheetham, B.W., J. Feldhacker, J. Herman, and G.H. Born, “Bringing Together Industry and Academia via Graduate Commercial Spaceflight Operations Curriculum,” 2014 Spaceflight Operations Conference.

Cheetham, B.W., J. Feldhacker, J. Herman, E. Heeren, G. Born, “Commercial Spaceflight Operations: Graduate Level Curriculum Development” IAC-12-E1.4.5, 63rd International Astronautical Congress, Naples, Italy.

Contact Information

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