

## **Space Vehicle Mechanisms: Elements of Successful Design**

### **Date and Time**

September 15-17, 2009  
9:00 am - 5:00 pm daily

### **Location**

Launchspace Training  
Bethesda, MD

### **Instructor**

[Bill Purdy](#)

### **Course Description**

This course explores the technologies required for the successful design of moving mechanical assemblies in the space environment and offers a detailed look at many of the key components common to most mechanisms, such as ball bearings, motors and feedback devices. With this background, the high-performance materials required for operation in space are reviewed, emphasizing compatibility with the space environment and offering some background in the metallurgy, chemistry, and fabrication of those materials. Examples of some of the many types of mechanism will be included for illustration.

In addition, the mechanisms relationship and interface with other vehicle systems will be explored, as a mechanism usually becomes an important part of the vehicles structural, thermal, contamination, survivability, and pointing subsystems. The course includes design and analysis examples to demonstrate the principles involved in understanding how mechanisms should work, and how design margins should be evaluated during the evolution of a program. Finally, some important underlying techniques, such as reliability analysis and digital simulation, are covered.

### **Objectives**

Understanding a mechanism requires a working knowledge of dozens of specialties, such as motors, lubrication, structural metals, and feedback devices. You will acquire this knowledge and become conversant with the many components, materials, and technologies that go into a successful design. In addition, successful application of a mechanism requires a familiarity with the various vehicle subsystems of which a mechanism is an often crucial part, such as the pointing, contamination, or structural system. The design and analysis of these subsystems, and their interface with the mechanism, will be introduced.

### **Who Should Attend**

This course is intended both for mechanisms engineers who wish to expand their knowledge and for system engineers and program managers who need a working knowledge of mechanism design and application.

### **Course Outline**

- Introduction.
- Motors.
- Feedback Devices.
- Bearings and Gears.
- Structural Metals.
- Composite Materials.
- Lubrication Fundamentals Wet and Dry Lubricants.
- Release Systems and Deployment Systems.
- Rotating Signal and Power Transfer Systems.
- Pointing Subsystems.
- Electrical Interfaces.
- Reliability and Simulation Techniques.

- Structural Dynamics.
- Contamination.
- Radiation and Survivability.

**Course materials**

Include the text Space Vehicle Mechanisms: Elements of Successful Design, edited by P.L. Conley, plus notes and reference materials.

**Fee/Registration**

Registration fee is US\$1,395 per student

Payment in advance via check, VISA or MasterCard preferred credit cards or bank transfer (ask for transfer details).

Click [HERE](#) to register