



# STRUCTURAL TEST DESIGN AND INTERPRETATION FOR AEROSPACE PROGRAMS

## Course Overview

This 3-day course provides a rigorous look at structural testing and its roles in product development and verification for aerospace programs. The course starts with a broad view of structural verification throughout product development and the roles of testing. The course then covers planning, designing, performing, interpreting, and documenting a test.

The course emphasizes static loads testing and vibration testing on a shaker. Several case studies are presented after first breaking the class into teams and tasking them with brainstorming how they would design effective tests.

*The objectives of this course are to improve your understanding of how to ...*

- identify and clearly state test objectives
- design (or recognize) a test that satisfies the identified objectives while minimizing risk
- establish pass/fail criteria
- design the instrumentation
- interpret test data
- write a good test plan and a good test report

### Target Audience

All engineers and managers involved in ensuring that launch vehicles and their payloads are structurally safe and ready to fly. This course is intended to be an effective follow-up to Instar's course "Space-Mission Structures: From Concept to Launch" (SMS), although that course is not a prerequisite.

### Course Developer & Teacher



**Tom Sarafin** is President and Chief Engineer of Instar Engineering and Consulting, Inc. He has worked full time in the space industry since 1979 as a structural engineer, a mechanical systems engineer, a project manager, and a consultant. Since founding Instar in 1993, he's consulted for NASA, DARPA, the DOD Space Test Program, Lockheed Martin, DigitalGlobe, Space Systems/Loral, Spaceflight Industries, and other organizations. He was a key member of the team that developed NASA-STD-5020, "Requirements for Threaded Fastening Systems in Spaceflight Hardware" (March 2012). He is the editor and principal author of *Spacecraft Structures and Mechanisms: From Concept to Launch* and is a contributing author to *Space Mission Analysis and Design*. He's also the principal author of a series of papers titled "Vibration Testing of Small Satellites." Since 1995, he has taught over 250 courses to more than 5000 engineers and managers in the aerospace industry.

### Testimonials:

"The entire course was useful to me."

"This is a great course."

"Good job, Tom. These courses are a big help and give us a lot of great fundamental information."

"Great [instructor] with courses where you can take the information learned and material presented and directly apply it to your everyday work."

"Tom Sarafin's courses never disappoint. This class offers a well-balanced blend of fundamentals, examples, and lessons learned that any aerospace engineer involved in structural test design and interpretation would benefit from."

"Incredibly useful course for anyone concerned with product testing, vibe or otherwise."

"Very good course for practical design of structural tests. Tom's breadth of experience and excellent communication skills only add to the value."

Instar also offers the following courses: "Ten Principles for Successful Space Programs" (TenP), "Engineering for Success in the Space Industry" (ESSI), "Space Mission Structures, From Concept to Launch" (SMS), "Design and Analysis of Bolted Joints" (DABJ), "Vibration Testing of Small Satellites" (VTSS), and "Vibration Testing on an Electrodynamical Shaker" (VTES). Go to [instarengineering.com/available\\_courses.html](http://instarengineering.com/available_courses.html) for details.

