

Short Course Announcement

Aircraft System Identification – Theory and Practice

Dr. Eugene A. Morelli, SunFlyte Enterprises

November 15 – 17, 2016

National Institute of Aerospace

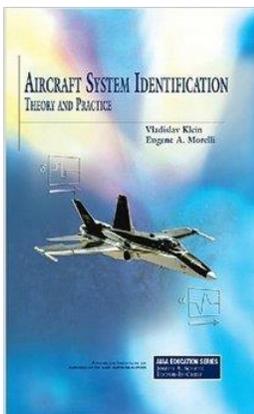
100 Exploration Way, Hampton, VA 23666

This course teaches the theory and practice of building mathematical models for aircraft based on measured data, a topic also known as Aircraft System Identification. The methods are useful for flight simulation development, aircraft stability and control flight testing, comparisons with computational fluid dynamics and wind tunnel results, flight envelope expansion, control system design and refinement, flying qualities assessment, accident investigation, and more. The course includes relevant theory and background, but focuses mainly on practical approaches and solutions. All aspects of aircraft system identification are included: experiment design, instrumentation, data handling, model formulation, model parameter estimation, model validation, and applications. The course includes instruction in the use of a MATLAB™ software toolbox called *SIDPAC* (System Identification Programs for AirCraft), which is composed of a wide variety of tools used at NASA Langley for aircraft system identification problems. The course also includes practical hands-on experience, allowing students to become familiar with the use of the *SIDPAC* software on real flight data and to interpret the results.



Outline: Introduction, Aircraft dynamic models, Estimation theory and equation-error, Model structure determination, Estimated parameter error measures, Output-error, Frequency-domain methods, Experiment design and instrumentation, Data compatibility analysis and data handling, Real-time dynamic modeling, Real-world case studies.

Who Should Attend: Flight test and simulation engineers, aircraft and control system designers, applied aerodynamicists, flying qualities engineers, engineering managers, and mod-sim specialists.



Cost of Course: \$1,000.00 (fee includes refreshments and lunches for all three days)

More Information/Registration: If you are interesting in obtaining more information and/or registering for this course please contact Mary Catherine Bunde at mary.bunde@nianet.org or by phone at (757) 325-6731

Instructor: Dr. Gene Morelli has 30 years' experience at NASA Langley Research Center, conducting research and teaching in the areas of aircraft dynamic modeling, flight test data analysis, experiment design, flight simulation development, time series analysis, aircraft accident investigation, applied mathematics, and flight dynamics. Dr. Morelli has published over 100 technical papers and reports and is co-author of the textbook entitled Aircraft

System Identification – Theory and Practice, and is the author of the *SIDPAC* software package.