PRACTICAL AERONAUTICS

Short Course Offering

Introduction to Aeronautics -- A Practical Perspective

- **WHEN and WHERE**: 16 – 19 September 2013 (8:00 – 4:30) at the National Institute of Aerospace (NIA) in Hampton, Virginia

- **COURSE DESCRIPTION and MATERIALS:** After taking this course, you will never look at an airplane the same again! Using design as a common thread, this course answers questions like: High wing placement or low -- swept or unswept? One vertical stabilizer or two? Canard or conventional configuration? Turbofan or turbojet? Packed full of examples, you will graduate with a solid understanding of the basics of aeronautics and the give-and-take inherent to aircraft design. You'll also gain an appreciation for the aircraft as a collection of subsystems … a "collection" that must be successfully integrated for the aircraft to accomplish its mission. A "field trip" to the Virginia Air and Space Center will hit the concepts home! With clear lesson objectives, the key aspects of aeronautics are presented:

  - Low and High-Speed Aerodynamics ⇨ Lift -- Sources of Drag -- Stall -- Mach Number Effects … Designing for Speed
  - Stability and Control ⇨ Ailerons, Elevator, and Rudder -- Designing for Roll, Pitch, and Yaw Stability
  - Structures ⇨ Ribs, Spars, and Pressure Bulkheads -- G-Loading -- Landing Gear -- Flight "Envelope"
  - Propulsion Systems ⇨ Propellers to SCRAMjets -- Piston and Gas Turbine Engines -- Airframe and Engine(s) Integration
  - Aircraft Performance ⇨ Thrust Curves, Range and Endurance, Glides, Climbs, Takeoffs and Landings, and Turns

  Although the focus is clearly on conventional airplanes, discussion will "stray" to other air vehicles, including airships, helicopters, RPVs, and stealth, hypersonic, and micro-air vehicles. You will be given a set of course notes and a copy of Aerodynamics for Naval Aviators, one of the best references available. 3.2 Continuing Education Units (CEUs) are awarded.

- **WHO SHOULD ATTEND:** Anyone working directly or indirectly in the field of aviation -- program managers, engineers, scientists, analysts, and technicians -- aircraft operational, test, logistical, and maintenance personnel. A building-block approach is used -- no prior knowledge is assumed. Since 2002, we've taught thousands of "students" from audiences across the Air Force, Navy, NASA, FAA, and industry. Our instructors have earned a tremendous reputation for teaching fundamental aeronautics and propulsion -- in our classroom, theory and practical application come alive! Here's what a few graduates have said:

  - *"Without a doubt, the best course of any type held here at Edwards AFB"* Edwards AFB, California
  - *"Keep coming back to PAX!!! Excellent course! Would be very beneficial for lots of people! Excellent instructors – I liked the examples and detail of explanation – caring/patient!"* NAS Patuxent River, Maryland
  - *"Exceeded expectations! It was exactly what I was looking for. After 23 years in the propulsion area, I found I knew very little about the rest of the plane."* Wright-Patterson AFB, Ohio
  - *"Perfect balance of technical and practical information -- best class I've taken since I've been with NASA (17 years) – spoke at a level where everyone could understand."* NASA Marshall, Alabama
  - *"Best airplane/flying/aero course I've taken! Furthermore, quite possibly the best teaching technique I've ever seen. Am going to add this class to our engineer's required curriculum."* Robins AFB, Georgia

- **PRIMARY INSTRUCTOR:** Dr. Wayne F. Hallgren is a 1975 graduate of West Point, retired Air Force Colonel, and Vice President of Practical Aeronautics. Wayne taught for ten years in the Air Force Academy's Department of Aeronautics, including two years as Deputy Department Head -- on his departure, the cadets rated him the best instructor in the department. For five years, he was adjunct faculty to the Air Force Test Pilot School, where he twice won their "Outstanding Academic Instructor Award." Wayne is a member of the Experimental Aircraft Association's Speakers Bureau, an Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA), and co-author of an Introduction to Aircraft Flight Mechanics, winner of AIAA's 2006 Summerfield Book Award.

- **COST, REGISTRATION, and CANCELLATION POLICY:** $1650. $1485 for Federal Government and NIA employees, NIA partners, and AIAA members. Group discounts are also available. For more information and to register visit www.PracticalAero.com, contact CHallgren@PracticalAero.com, or call (970) 887-3155. Substitutions may be made at any time. Cancellations must be received two weeks prior to course start date and is subject to a $50 fee. If you must cancel within the two-week period, and do not have a substitute, you may forfeit the entire fee. A total refund will be issued if the course is canceled.