

## *Cycle Analysis of Gas Turbine Engines*

- **WHEN and WHERE:** Mon-Fri, 23-27 March 2020 at Beavercreek Office Suites, 4031 Colonel Glenn Highway (Signal Hill Complex), Beavercreek, Ohio 45431. Class runs 0800-1630 Mon-Th and concludes around noon on Fri.
- **COURSE DESCRIPTION and MATERIALS:** This 4-½ day course is for engineers with a fundamental knowledge of thermodynamics who desire a practical understanding of aircraft gas turbine engine cycle performance including design, analysis, and test. Attendees will gain a *foundational understanding* of the interplay between basic engine design choices and aircraft-engine system performance. The course is presented in a workshop style and includes a hands-on design project and an engine “lab data experience” featuring engine performance calculations from measured test data with comparison to performance estimates from cycle analysis software.

Course highlights include:

- Overview of Aircraft-Engine System Fundamentals
- Fundamentals of Parametric Cycle Analysis
- Fundamentals of Engine Performance Analysis
- Design Team Competition using Dr. Mattingly’s AEDsys engine system software
- Engine Lab Data Experience

Course attendees receive a copy of *Elements of Propulsion, Second Edition*, by Mattingly & Boyer, latest version of the AEDsys software, as well as course notes. The textbook is the 2019 winner of the AIAA Summerfield Book Award for best book published in the last five years. 3.6 Continuing Education Units (CEUs) are awarded.

- **WHO SHOULD ATTEND:** Both new and experienced engineers working in the aircraft and/or engine technology area will benefit from this course. Attendees will return to their work with an improved understanding of aircraft gas turbine engine cycle analysis as well as the entire engine enterprise.
  - *“This week got me excited about my career choice again... Overall, this is the most useful training I’ve had since my career in propulsion began.”* Colorado Springs, Colorado
  - *“Gives the ability to ask the right questions, or at least know what questions to ask.”* Tullahoma, Tennessee
  - *“Practical aspect is key... software to evaluate engine parameter effect was invaluable.”* Patuxent River, Maryland
  - *“I liked that you tied this not only together with the aircraft and mission, but also that you pull this back to the Air Force and our overall mission...I think your class really recharges us and reiterates our real purpose in this job.”* Dayton, Ohio
- **COURSE LEAD:** Dr. Jack Mattingly is a graduate of the University of Notre Dame (BS and MS in Mechanical Engineering) and the University of Washington (PhD in Aeronautics and Astronautics). His 20-year Air Force career included 7 years each on the faculties of the Air Force Academy and the Air Force Institute of Technology. He retired from the Air Force in 1989 and joined the Mechanical Engineering Department at Seattle University. Jack was previously at the Aero Propulsion Laboratory in Ohio, where he directed exploratory and advanced development programs aimed at improving advanced propulsion systems. He retired from the university in June 2000 as Professor Emeritus to write new editions of “Aircraft Engine Design” and “Elements of Propulsion,” teach professional short courses, do expert witness work, and consult. He is a recognized expert in gas turbine propulsion.
- **COURSE LEAD:** Dr. Keith M. Boyer is the Vice-President for Propulsion for Practical Aeronautics. He retired from the Air Force as a Colonel in 2012 after serving as Associate Dean for Students at the Air Force Institute of Technology. He started his Air Force career in 1979 as an enlisted electronic warfare maintainer on B-52 aircraft and instructor. His aircraft-engine experience includes maintenance & sustainment at the flight line, intermediate and depot levels, research & development, test and analysis, systems engineering, sustainment, logistics & supply chain management, and multinational requirements management. Keith taught for ten years in the Air Force Academy’s Department of Aeronautics and served in numerous leadership positions. For seven years, he was adjunct faculty to the Air Force Test Pilot School, where he twice earned the Flight Test Instructor of the Quarter award.
- **COST, REGISTRATION, and CANCELLATION POLICY:** \$2050 (\$1950 if registered by Feb. 28), \$1850 for Federal Government employees. We have very limited open enrollment seats for this offering – register early! For more information and to register, visit [PracticalAero.com](http://PracticalAero.com), contact [Jellsworth@PracticalAero.com](mailto:Jellsworth@PracticalAero.com), or call (719) 659-7319. Substitutions may be made at any time. Cancellations must be received two weeks prior to course start date and are 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. Refunds of the registration fee (only) are issued if the course is canceled.