AEROSPACE
SHORT COURSES

2018 CATALOG

PUBLIC COURSES COMING TO:

Seattle
April 23–27

Denver
June 4–8

San Diego
September 10-21

Orlando
November 5-9

KU THE UNIVERSITY OF KANSAS
Professional & Continuing Education

YOUR WORLD
OUR TRAINING
NEW HEIGHTS

LET OUR TEAM TRAIN YOUR TEAM IN 2018

We serve the worldwide aerospace industry

As the professional training choice of the global aerospace community, the KU Aerospace Short Course Program has built our reputation over 40 years by offering specialized courses taught by industry experts. Our instructors translate theory into practical application, so you can return to work and solve real-world problems immediately.

For a comprehensive look at our 2018 course schedule see pages 4-5. For course details see pages 10-58.

New in 2018

New Short Courses

Aircraft Propulsion Systems: Principles and Practices, *see page 17*

Fundamentals of V/STOL Rotorcraft, *see page 41*

New Webinars, *see page 8*

New Registration System, *see page 62*

Did you know you can bring an Aerospace Short Course to your workplace?

On-site delivery is ideal for organizations that need to train 10 or more employees on a specific topic. With nearly 50 available short courses, your company can choose the specialized training that will benefit your employees the most.

Advantages of on-site training

- Train more people for less
- Reduce employee time away from work
- Train when it fits your company's schedule
- Get the training you need

To find out more about on-site course delivery, please see page 2.

CONTENTS

FOUR WAYS TO LEARN

Public (open enrollment) courses

Each year, the KU Aerospace Short Course Program offers groups of short courses at specific locations in the U.S. Individual courses range from 1–5 days in length, and are delivered in a traditional classroom setting. Participants learn face-to-face from industry expert instructors, enhanced by group discussions and networking opportunities.

2018 Aerospace Short Course locations

- Seattle, Washington (April)
- Denver, Colorado (June)
- San Diego, California (September)
- Orlando, Florida (November)

See the complete course schedule by locations on pages 4–5.

Webinars

Throughout the year, the KU Aerospace Short Course Program offers free live webinars, presented by our industry expert instructors. Topics vary, and the recorded webinars are typically made available on our website following each presentation. Registration is required. Visit our website to register, and to access our archive of recorded webinar topics.

We also offer specialized webinars, for which a fee is charged. See pages 8–9 or visit our website for the latest details.

On-site courses

Your company can realize substantial savings by bringing an aerospace short course to your workplace. On-site delivery is ideal for organizations that need to train 10 or more employees in a specific topic.

- Train more people for less – on-site courses cost less per participant, and eliminate employee travel expenses.
- Reduce the time employees are away from work – training on-site allows employees to remain in close contact with their offices.
- Train when it fits your company's schedule, and maintain company confidentiality.
- Train on the topics you need most – course content, length and mode of delivery can be tailored to meet your specific training needs.

For a no-cost, no-obligation proposal, email us at ProfessionalPrograms@ku.edu or give us a call at 913-897-8782.

Online courses

Learn where it is convenient to you while getting the training and development you need to be successful through KU's aerospace online short courses.

For the most current information on our courses, please visit aeroshortcourses.ku.edu.

COURSES BY TITLE

OPEN ENROLLMENT COURSES BY DATE AND LOCATION

SEATTLE, WASHINGTON | APRIL 23–27, 2018

DoubleTree Suites by Hilton Hotel Seattle Airport Southcenter

MONDAY 4/23	TUESDAY 4/24	WEDNESDAY 4/25	THURSDAY 4/26	FRIDAY 4/27
Aerodynamic Design of Transport Aircraft p. 13				
Aircraft Structural Loads: Requirements, Analysis, Testing and Certification p. 18				
Electrical Wiring Interconnection System (EWIS) Safety Assessment – 25.1709 p. 32				
Flight Test Principles and Practices p. 37				
Introduction to 25.981 – Fuel Tank Safety and Ignition Prevention p. 44				
	Advanced Avionics p. 10			
	FAA Certification Procedures and Airworthiness Requirements as Applied to Military Procurement of Commercial Derivative Aircraft/Systems p. 34			
	Instructions for Continued Airworthiness Using Enhanced Zonal Analysis Procedure (EZAP) p. 42			

DENVER, COLORADO | JUNE 6–8, 2018

Crowne Plaza Denver Downdown

MONDAY 6/4	TUESDAY 6/5	WEDNESDAY 6/6	THURSDAY 6/7	FRIDAY 6/8
Aerospace Applications of Systems Engineering p. 14				
Aircraft Lightning: Requirements, Component Testing, Aircraft Testing and Certification p. 16				
Commercial Aircraft Safety Assessment and 1309 Design Analysis p. 27				
Electrical Wiring Interconnection System (EWIS) and FAA Requirements p. 31				
Fundamental Avionics p. 39				
	Dynamics for Aerospace Structures p. 30			

SAN DIEGO, CALIFORNIA | SEPTEMBER 10–14, 2018 | WEEK ONE

San Diego Marriott Mission Valley

MONDAY 9/10	TUESDAY 9/11	WEDNESDAY 9/12	THURSDAY 9/13	FRIDAY 9/14
Conceptual Design of Unmanned Aircraft Systems p. 29				
Introduction to Electromagnetic Effects (EME) p. 45				
Principles of Aeroelasticity p. 51				
Principles of Aerospace Engineering p. 52				
Propulsion Systems for UAVs and General Aviation Aircraft p. 54				
Introduction to RTCA DO-160 Qualification: Purpose, Testing and Design Considerations p. 47				
	Application of Human Factors Engineering to the Life Cycle Management of Aeronautical Products and Systems p. 23			
	Software Safety Certification and DO-178C p. 55			
	FAA Functions and Requirements Leading to Airworthiness Approval p. 35			
	Fundamentals of V/STOL Rotorcraft NEW p. 41			

SAN DIEGO, CALIFORNIA | SEPTEMBER 17–21, 2018 | WEEK TWO

San Diego Marriott Mission Valley

MONDAY 9/17	TUESDAY 9/18	WEDNESDAY 9/19	THURSDAY 9/20	FRIDAY 9/21
Advanced Flight Tests p. 11				
Aerodynamic Design Improvements: High-Lift and Cruise p. 12				
Cabin Safety and Crashworthiness of Aircraft Cabin Interiors p. 25				
Civil and Military Certification of Propulsion Systems to Support Aircraft and Helicopter Operations p. 26				
Electromagnetic Effects Aircraft Level Testing and FAA Requirements p. 33				
Stress Analysis for Aerospace Structures p. 56				
	Aircraft Icing: Meteorology, Protective Systems, Instrumentation and Certification p. 15			
	MIL-STD Qualification: Purpose, Testing and Design Considerations p. 49			
	Unmanned Aircraft System Software Airworthiness p. 58			
Integrated Modular Avionics (IMA)* p. 43	Complex Electronic Hardware Development and DO-254* p. 28			

***SAVE $:** Combine Integrated Modular Avionics (IMA) and DO-297 (Monday) with Complex Electronic Hardware Development and DO-254 (Tuesday-Thursday) and save up to $595 on course registration fees.

ORLANDO, FLORIDA | NOVEMBER 5–9, 2018

DoubleTree by Hilton at the Entrance to Universal Orlando

MONDAY 11/5	TUESDAY 11/6	WEDNESDAY 11/7	THURSDAY 11/8	FRIDAY 11/9
Aircraft Structures: Analysis and Design p. 19				
Airplane Flight Dynamics p. 20				
Commercial Aircraft Safety Assessment and 1309 Design Analysis p. 27				
Electrical Wiring Interconnections System (EWIS) and FAA Requirements p. 31				
Flight Control and Hydraulic Systems p. 36				
Introduction to High Intensity Radiated Fields (HIRF) p. 46				
Structural Composites p. 57				
	Advanced Avionics p. 10			
	Cabin Electronics: Management, Entertainment and Connectivity Systems p. 24			
	Fundamentals of Project Management for Aerospace Professionals p. 40			
	Flight Testing Unmanned Aircraft Systems – Unique Challenges p. 38			

CERTIFICATES OF SPECIALIZATION

Enhance Your Knowledge—Advance Your Career

The Certificate of Specialization is for those who desire concentrated study in a specific area of interest. Achieving a Certificate of Specialization demonstrates to employers, coworkers and the aerospace industry that you are qualified, competent and current in your field. It distinguishes you as a professional who is committed to your career and cares to be the best. You can earn a Certificate of Specialization by completing four courses within one of the nine specializations. Please visit our website to learn more.

AIRCRAFT DESIGN

- p. 12 Aerodynamic Design Improvements: High-Lift and Cruise
- p. 13 Aerodynamic Design of Transport Aircraft
- p. 17 Aircraft Propulsion Systems: Principles and Practices **NEW COURSE**
- p. 18 Aircraft Structural Loads: Requirements, Analysis Testing and Certification
- p. 19 Aircraft Structures: Analysis and Design
- p. 20 Airplane Flight Dynamics
- p. 21 Airplane Preliminary Design
- p. 22 Airplane Sizing (online course)
- p. 29 Conceptual Design of Unmanned Aircraft Systems
- p. 30 Dynamics for Aerospace Structures
- p. 36 Flight Control and Hydraulic Systems
- p. 41 Fundamentals of V/STOL Rotorcraft **NEW COURSE**
- p. 51 Principles of Aeroelasticity
- p. 52 Principles of Aerospace Engineering
- p. 54 Propulsion Systems for UAVs and General Aviation Aircraft
- p. 56 Stress Analysis for Aerospace Structures

Airplane Aerodynamic Design and Subsonic Wind Tunnel Testing (retired)*

Digital Flight Control Systems: Analysis and Design (retired)*

Helicopter Performance, Stability and Control (retired)*

Either one of these courses will satisfy the certificate requirement.

FLIGHT TESTS AND AIRCRAFT PERFORMANCE

- p. 11 Advanced Flight Tests
- p. 17 Aircraft Propulsion Systems: Principles and Practices
- p. 20 Airplane Flight Dynamics
- p. 37 Flight Test Principles and Practices
- p. 38 Flight Testing Unmanned Aircraft Systems–Unique Challenges
- p. 41 Fundamentals of V/STOL Rotorcraft **NEW COURSE**
- p. 50 Operational Aircraft Performance and Flight Test Practices
- p. 51 Principles of Aeroelasticity

Aircraft Engine Vibration Analysis, Turbine and Reciprocating Engines: FAA Item 28489 (retired)*

Airplane Performance: Theory, Applications and Certifications (retired)*

Helicopter Performance, Stability and Control (retired)*

Rotorcraft Vibration: Analysis and Practical Reduction Methods (retired)*

AVIONICS AND AVIONIC COMPONENTS

- p. 10 Advanced Avionics
- p. 16 Aircraft Lightning: Requirements, Component Testing, Aircraft Testing and Certification
- p. 24 Cabin Electronics: Management, Entertainment and Connectivity Systems
- p. 27 Commercial Aircraft Safety Assessment and 1309 Design Analysis
- p. 28 Complex Electronic Hardware Development and DO-254
- p. 31 Electrical Wiring Interconnection System (EWIS) and FAA Requirements
- p. 32 Electrical Wiring Interconnection System (EWIS) Safety Assessment 25.1709
- p. 33 Electromagnetic Effects Aircraft Level Testing and FAA Requirements
- p. 39 Fundamental Avionics
- p. 43 Integrated Modular Avionics (IMA) and DO-297
- p. 45 Introduction to Electromagnetic Effects (EME)
- p. 46 Introduction to High Intensity Radiated Fields (HIRF)
- p. 47 Introduction to RTCA DO-160 Qualification: Purpose, Testing and Design Considerations (classroom-based course)
- p. 48 Introduction to RTCA DO-160 Qualification: Purpose, Testing and Design Considerations (online course)
- p. 49 MIL-STD Qualification: Purpose, Testing and Design Considerations
- p. 55 Software Safety, Certification and DO-178C (or DO-178B)
- p. 58 Unmanned Aircraft System Software Airworthiness

Introduction to Performance-Based Navigation (PBN) and Required Navigation Performance (RNP) (retired)*

Reliability and 1309 Design Analysis for Aircraft Systems (retired)*

Either one of these courses will satisfy the certificate requirement.

ELECTRICAL WIRING INTERCONNECTION SYSTEM (EWIS)

- p. 27 Commercial Aircraft Safety Assessment and 1309 Design Analysis
- p. 31 Electrical Wiring Interconnection System (EWIS) and FAA Requirements
- p. 32 Electrical Wiring Interconnection System (EWIS) Safety Assessment–25.1709
- p. 44 Introduction to 25.981–Fuel Tank Safety and Ignition Prevention
- p. 42 Instructions for Continued Airworthiness using Enhanced Zonal Analysis Procedure (EZAP)

*Retired courses are no longer offered, but still count toward a Certificate of Specialization in a given track.

AEROSPACE COMPLIANCE

Either one of these courses will satisfy the certificate requirement.

ELECTROMAGNETIC EFFECTS

Either one of these courses will satisfy the certificate requirement.

AIRCRAFT MAINTENANCE AND SAFETY

AIRCRAFT STRUCTURES

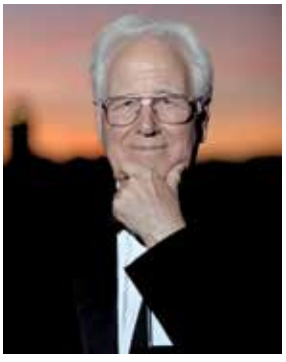
UNMANNED AIRCRAFT

*Retired courses are no longer offered, but still count toward a Certificate of Specialization in a given track.

HISTORY OF AIRPLANE DESIGN WEBINAR SERIES

with Dr. Jan Roskam

Dr. Jan Roskam continues his *History of Airplane Design* webinar series with five new webinars, each focusing on specific companies and their contributions to the commercial, military and transport aircraft industries. Learn from a legend in aircraft design how some of today's best known companies got started, persevered or went bankrupt, merged or made it on their own.



Dr. Jan Roskam is the Ackers Distinguished Professor Emeritus of Aerospace Engineering, University of Kansas, and founder of the KU Aerospace Short Course Program.

Each webinar is presented live, and will not be available for viewing following the live presentation. Registration for each live webinar is $50 per person.

Tupolev, Yakovlev, Sukhoi and Antonov

Wednesday, March 14, 2018 • 11:00 a.m. – Noon CT

These famous former Soviet airplane designers had their own OKB (Design Bureau), and also carried high military ranks. Many interesting design features of their airplanes will be discussed and compared with typical western design practices.

Gloster, Blackburn, Hawker and Bristol

Wednesday, May 9, 2018 • 11:00 a.m. – Noon CT

- Learn about the first British jet driven airplane and the famous Gloster Meteor, early versions of which became operational late in WWII.
- We'll discuss the Blackburn Buccaneer low altitude attack fighter with its interesting speedbrake.
- Hawker produced a long line of fighter airplanes, culminating in the Hawker Hunter and VTOL Hawker Harrier; a version of the latter is still in service with the U.S. Marine Corps.
- Find out what happened to Bristol cargo and passenger airplanes such as the Bristol Freighter, Brittannia and the infamous Brabazon.

Curtiss, Bell, AVRO-Canada, De Havilland-Canada, Canadair, Learjet and Bombardier

Wednesday, July 11, 2018 • 11:00 a.m. – Noon CT

- Curtiss made several types of fighter airplanes during WWII; the most well-known of these were the Warhawk series. Curtiss also produced the Commando transport which did Yeoman service on the "Hump" during WWII.
- Bell manufactured the innovative Airacobra and Kingcobra fighters of WWII, as well as the first U.S. jet fighter, the Airacomet. They also developed several X-planes, including the famous X-1 which was the first to "break" the sound barrier.
- AVRO-Canada and De Havilland Canada produced many successful airplanes. The short-lived AVRO Jetliner was the second jet transport to fly. They also developed the Canuck and Arrow jet fighters. De Havilland Canada produced a long line of civil and military transport airplanes. The Beaver, Otter, Caribou and Dash 7 and Dash 8 will be discussed.
- Find out how Canadair came about and how it transitioned into today's Bombardier which also includes Learjet. Airplanes like the Canadair Scooper and CL-600 Challenger (an original Learjet design), as well as the Learjet 23, 24, 25, 36 and 55 will be discussed. Finally, the Bombardier series of regional jets and the recent CS100 and CS300 jet transports will be discussed.

Westland, English Electric, Folland, Fairey and Miles

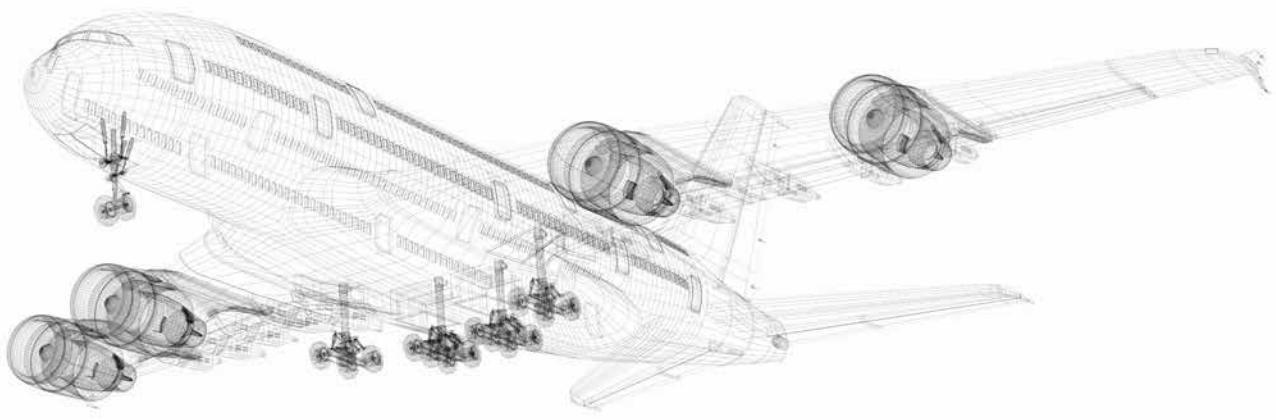
Wednesday, September 12, 2018 • 11:00 a.m. – Noon CT

- Westland built many novel designs during WWII. The Lysander (spy carrying airplane), Whirlwinnd and Wyvern fighters will be discussed.
- English Electric designed and built the famous Canberra bomber (which served in the USAF as the Martin B-57) and the supersonic Lightning fighter.
- Folland built the "pocket" fighter Gnat while Fairey produced a long line of carrier-based aircraft for the British Royal Navy, the most outstanding of which were the Firefly and the Gannett.
- We'll discuss how Miles came about and how the Miles family developed a long line of civil and military airplanes. Typical examples include the Miles Martlett, Aerovan, Messenger, Marathon and Gemini.

Ilyushin, MIG, Bloch, Dassault, Breguet and Fouga

Wednesday, November 14, 2018 • 11:00 a.m. – Noon CT

- Ilyushin built the most produced military airplane (ever), the Shturmovik of WWII. After the war, they developed a long line of military and commercial transports, with the IL-76 (comparable to the Boeing C-17) being the best known.
- MIG (stands for Mikoyan and Gurevich) developed a long line of fighters. The MIG-15 of Vietnam War fame, the mass-produced MIG-21 and the well-known MIG-29 (the USAF also bought 21 of these) will be discussed.
- Find out how Marcel Bloch became Marcel Dassault and how his company built a long line of fighters and business jets.
- Learn how Breguet developed the double-deck Deux-Ponts civil transport, the Alizé carrier based attack airplane, the Atlantique anti-submarine airplane and the innovative, but unsuccessful Model 941 STL transport.
- Finally, find out how a glider manufacturer, Fouga, ended up developing the very successful Magister series of jet trainers.



To register for a webinar, please visit our webinars page at aeroshortcourses.ku.edu.

Advanced Avionics

Instructor: Albert Helfrick

SEATTLE, WASHINGTON
April 24-27, 2018
Tuesday–Friday,
8:00 a.m.–4:00 p.m.
Session Number **PA18140F**

ORLANDO, FLORIDA
November 6–9, 2018
Tuesday–Friday,
8:00 a.m.–4:00 p.m.
Session Number **PA19145F**

CEUs
28 classroom hours
2.8 CEUs

COST

SEATTLE
Early registration fee
$2,195 if registered and paid by March 9

Regular registration fee
$2,395 if registered and paid after March 9

ORLANDO
Early registration fee
$2,195 if registered and paid by September 21

Regular registration fee
$2,395 if registered and paid after September 21

The course registration fee includes instruction, course materials, refreshments and lunches.

U.S. Federal Employee Discount: This course is available to U.S. federal employees at 10% off the registration fee. To receive the federal employee discount, you must enter the code FGVT116 on the registration form or during the online checkout process. Please note that you must validate your eligibility to receive this discount by entering your U.S. government email address (ending in .gov or .mil) on the registration form or when creating your online registration profile. This discount is available for both the early registration and regular registration fees.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Avionics and Avionic Components**. See pages 6-7 for more information.

Description

Advanced Avionics covers systems that will be the mainstay of CNS (communications, navigation and surveillance) in the future. Course material reviews the basic theory of navigation and provides a thorough introduction and survey of global navigation satellite systems (GNSS), with emphasis on GPS. Modern surveillance systems based on Mode-S and ADS-B are also covered as are both wired and wireless communications systems. This course includes in-class exercises that involve college-level mathematics.

This course covers some of the same topics as Fundamental Avionics (taught by the same instructor), but in much greater detail. Fundamental Avionics is not a prerequisite for this course. Additional subject matter covered in this course was previously included in *Introduction to Performance-Based Navigation (PBN) and Required Navigation Performance (RNP)* (also taught by the same instructor), which is no longer offered. Advanced Avionics will provide a good review for those who may have studied these subjects previously.

Highlights

- The art and mathematics of navigation
- Electronic systems used for navigation
- The use of space-based navigation
- Electronically-guided approaches and landing
- The operation of the surveillance systems needed for safe aircraft separation
- The need for communications in modern aviation navigation and safety
- Examples of widely used wired and wireless communications systems
- Discussion of actual implemented systems and those planned for future use
- Systems required for PBN and RNP
- Emphasis on state-of-the-art systems
- Includes problem solving exercises

Who should attend?

This course is intended for engineers involved in the design and development of avionics components and systems.

> "This course presented information that is at the forefront of the aviation world. Due to emerging requirements, learning about performance based navigation and required navigation performance is no longer optional and the course helps to explain the challenges the entire industry is about to encounter. Dr. Helfrick presented the information remarkably well considering the all-encompassing nature of the subject material. As a flight tester, I would strongly recommend this course to my peers; take it sooner than later."
>
> —Joshua Gould, Aerospace Engineer, Redstone Test Center, 2016 San Diego attendee
> Commenting on a former course: RNP/PBN

Advanced Flight Tests

Instructors: Donald T. Ward, Thomas William Strganac

SAN DIEGO, CALIFORNIA
September 17-21, 2018
Monday–Thurday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–2:00 p.m.
Session Number **PA19050F**

CEUs
33 classroom hours
3.3 CEUs

COST
Early registration fee
$2,495 if registered and paid by August 3

Regular registration fee
$2,695 if registered and paid after August 3

The course registration fee includes instruction, course materials, refreshments and lunches.

EARN A CERTIFICATE
This course if part of the Certificate of Specialization in **Flight Tests and Aircraft Performance**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course provides the practical knowledge needed to plan a safe and comprehensive series of flutter envelope expansion tests. It includes suggestions and recommendations for flutter and post-stall certification as well as demonstration of new or significantly modified airplane designs to meet civil or military requirements.

Highlights

- Why advanced flight testing is necessary
- Fundamental principles of aeroelasticity
- Experimental and analytical tools used in preflight preparations
- Instrumentation for flutter envelope expansion
- Subcritical response techniques and interpretation of supporting analyses
- Interpreting test results
- Expanding the envelope
- Discussions of limit cycle oscillations
- Foundations of post-stall flight testing
- Aerodynamic conditions for dynamic equilibrium
- Experimental tools for preflight preparations
- Instrumentation for post-stall flight tests
- Emergency recovery devices
- Subsystem modifications for post-stall testing
- Recommended recovery techniques
- Guidelines and discipline for conducting advanced flight tests
- Planning for efficiency in data collection and data management
- Contingency planning

Who should attend?

Designed for practicing and entry-level flight test engineers and managers, aircraft engineers, and aircraft designers.

> "Excellent instructors with excellent backgrounds. I wish I had more time to learn from the experiences of our instructors."
>
> —Hayrettin Koca, Field Expert, Certification Specialist, HTM, 2016 Orlando attendee

Aerodynamic Design Improvements: High-Lift and Cruise

Instructor: Case van Dam, Paul M. Vijgen (This course may be taught by one or both instructors.)

SAN DIEGO, CALIFORNIA
September 17-21, 2018
Monday–Friday
8:00 a.m.–4:00 p.m.
Session Number **PA19055F**

CEUs
35 classroom hours
3.5 CEUs

COST
Early registration fee
$2,495 if registered and paid by August 3

Regular registration fee
$2,695 if registered and paid after August 3

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Design**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course covers recent advances in high-lift systems and aerodynamics as well as cruise drag prediction and reduction. It includes discussion of numerical methods and experimental techniques for performance analysis of wings and bodies and boundary-layer transition prediction/detection.

Highlights

- Aircraft design and the importance of lift and drag on fuel efficiency
- Reynolds number and Mach number effects on aerodynamic lift and drag
- CFD-based drag prediction and decomposition
- Boundary-layer transition prediction and instrumentation/visualization techniques
- Impact of operational, environmental and manufacturing effects on laminar flow
- Drag reduction techniques including viscous, wave and induced drag
- High-lift physics of multi-element systems
- High-lift wind tunnel and flight testing examples
- Flow separation control and active flow control techniques (cruise and high-lift conditions)

Who should attend?

Designed for engineers and managers involved in the aerodynamic design and analysis of airplanes, rotorcraft and other vehicles.

> "This course was very interesting, with useful information for both the design and the evaluation of aerodynamic devices in the aeronautical industry environment. Professor van Dam's lectures have given me insights for solving actual problems I face continuously at work."
>
> —Rafael Garcia Leal, Embraer S.A.

Aerodynamic Design of Transport Aircraft

Instructor: Roelof Vos

SEATTLE, WASHINGTON
April 23-27, 2018
Monday–Friday,
8:00 a.m.–4:00 p.m.
Session Number **PA18145F**

CEUs
35 classroom hours
3.5 CEUs

COST
Early registration fee
$2,495 if registered and paid by March 9

Regular registration fee
$2,695 if registered and paid after March 9

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Design**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

In this course participants learn how aerodynamics drive the detailed exterior design of transport aircraft. What aerodynamic phenomena play a role in the exterior design of a wing, a cockpit, or an engine intake? What is the effect of aerodynamic add-ons such as vortex generators, fairings, or winglets? What are the advantages and penalties of wing sweep and how can the penalties be mitigated by the aerodynamic design of the wing? Those are the type of questions this course addresses. Participants learn to understand how the various aircraft components should be shaped in order to fulfill aerodynamic requirements in all corners of the flight envelope. The strong ties between aircraft performance, aircraft aerodynamics, and aircraft exterior design are demonstrated through numerous historical and contemporary examples. Although the main focus is on jet aircraft, the course also covers the effects of propeller installation on the aerodynamic design of the empennage.

Highlights

- Causes for interference drag in high-subsonic conditions
- Effect of Reynolds number on shock-boundary-layer interaction
- Design characteristics of supercritical airfoils
- Mach number effects on flow over multi-element airfoils
- Design of root and tip of swept-wing aircraft
- Stability and control beyond the maximum operating Mach number
- Propeller slipstream effects on longitudinal stability and yawing moment
- Design constraints resulting from transonic buffet
- Stalling characteristics of wings with high-lift devices

Who should attend?

Designed for aeronautical engineers, pilots with some engineering background, government research laboratory personnel, engineering managers and educators.

"Well thought-out course, well presented. Good presentation materials, up-to-date information with a historical basis."

—Jeffrey C. Anderson, Guidance, Navigation and Control Engineer, Boeing Commercial Airplanes

Aerospace Applications of Systems Engineering

Instructors: Donald T. Ward, Mark K. Wilson, D. Mike Phillips

DENVER, COLORADO
June 4-8, 2018
Monday–Friday,
8:00 a.m.–4:00 p.m.
Session Number **PA18185F**

CEUs
35 classroom hours
3.5 CEUs

COST
Early registration fee
$2,495 if registered and paid by April 20

Regular registration fee
$2,695 if registered and paid after April 20

NOT PART OF A CERTIFICATE TRACK.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

Participants receive an introduction to systems engineering fundamentals as applied to aerospace systems with emphasis on manned aircraft, both commercial and military. The course is based on evolving systems engineering standards, the current versions of the INCOSE Systems Engineering Handbook (the Systems Engineering Book of Knowledge), and the EIA/IS 632, IEEE P1220 and INCOSE papers. The material provides a working knowledge of all elements, technical and managerial, involved in systems engineering as applied to aerospace systems of varying complexity. It concentrates on the most troublesome areas in systems development: requirements definition and derivation, integration, allocation of requirements, risk management, verification and validation. Hardware and software systems case studies, primarily from the aircraft sector of the aerospace industry, are used as examples. Techniques have been used on many commercial aircraft (from large airliners to military fighters to small personal aircraft), DoD and NASA programs.

Highlights

- Comprehensive exposure of systems engineering practices including a comprehensive synopsis of all processes and terminology suggested by the INCOSE SE Handbook, definition of terms and methods
- Summary of system life cycles as currently utilized by the U. S. Department of Defense, industry and NASA, with discussion of potential changes in the development and sustainment approaches along with the potential impacts [for example, model-based systems engineering (MBSE), product line management (PLM), and other innovations]
- Introduction to standard practices and activities including requirements generation, trade studies, architectural practices, functional allocation and decomposition, and verification/validation methodologies
- Systems engineering plan scopes for specific purposes including examples from large military programs and from a tightly focused research program
- Practical exercises in requirements identification and definition, risk and opportunity management, and in tailoring a systems engineering process to a specific project
- Assessment of specialty engineering contributions to systems engineering effort-value of integrated product and process teams and interaction between project management and systems engineering
- Emphasis on software-intensive systems and innovations in software engineering
- Use of multiple case studies from military, commercial and research implementations of systems engineering to illustrate principles and to illuminate good practices

Who should attend?

The lectures and practice are designed for systems engineers at all levels and program managers developing large or small systems. It is especially well-suited for engineers moving into systems engineering from other disciplines.

> "Well-organized series of classes. The instructors were true experts in their fields and led engaging conversations. They provided material that is applicable to both government and private endeavors and organizations. The class provided the perfect opportunity for our system engineering leads to learn and refocus as a group."
>
> —Nicole Greczyn, Senior Systems Analyst, Gogo Business Aviation, 2016 San Diego attendee

Aircraft Icing: Meteorology, Protective Systems, Instrumentation and Certification

Instructors: Wayne R. Sand, Steven L. Morris

SAN DIEGO, CALIFORNIA
September 18-21, 2018
Tuesday–Friday,
8:00 a.m.–4:00 p.m.
Session Number **PA19060F**

CEUs
28 classroom hours
2.8 CEUs

COST

Early registration fee
$2,195 if registered and paid by August 3

Regular registration fee
$2,395 if registered and paid after August 3

The course registration fee includes instruction, course materials, refreshments and lunches.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aerospace Compliance** and the Certificate of Specialization in **Aircraft Maintenance and Safety**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course covers the meteorology and physics of aircraft icing. Topics include forecasting, finding and avoiding icing conditions, designing and evaluating ice protection systems, and certification of aircraft for flight into known icing conditions.

Highlights

- Descriptions of aircraft icing severities, types and photos
- Atmospheric aerosols
- Cloud physics of icing and conceptual cloud modes
- Ground icing
- Skew-T, Log P adiabatic diagrams
- Assessment of icing potential
- Critical icing parameters, theory and measurements
- Meteorology of SLD icing
- Finding and avoiding icing conditions
- Discussion of sources and meaning of available forecast information
- Ice accretion characteristics
- Effects of ice on aircraft performance
- Anti-ice and de-ice systems
- Icing instrumentation and detection
- Effect of SLD on aircraft
- Engine icing considerations
- Ice-testing methods
- Certification and regulations
- Conceptual methods

Who should attend?

Designed for aerospace engineers, flight test and design engineers, test pilots, line pilots, meteorologists, FAA engineers and Designated Engineering Representatives (DERs), and program managers.

"The instructors demonstrated a very good knowledge of the subject. Their explanations were clear and precise. They were able to answer the vast majority of questions raised by participants. This training allowed me to deepen my knowledge of the subject and will surely be an asset in my work. Overall, I greatly enjoyed this course. Strongly recommended."

—Jean-Marc Ledoux, Regional Manager, Transportation Safety Board of Canada, 2017 Seattle attendee

"The Aircraft Icing course was thorough, relevant and taught by competent, knowledgeable instructors. This was exactly what I needed to enhance my effectiveness at my job."

—Bryan Schultis, Project Engineer, General Atomics, 2017 Seattle attendee

Aircraft Lightning: Requirements, Component Testing, Aircraft Testing and Certification

Instructors: C. Bruce Stephens, Kenneth C. Darbonne, Darren L. Stout (This course may be taught by any of these instructors.)

DENVER, COLORADO
June 4-8, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA18190F**

CEUs
31.5 classroom hours
3.15 CEUs

COST
Early registration fee
$2,495 if registered and paid by April 20

Regular registration fee
$2,695 if registered and paid after April 20

The course registration fee includes instruction, course materials, refreshments and lunches.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Avionics and Avionic Components**, the Certificate of Specialization on **Electromagnetic Effects**, and the Certificate of Specialization in **Aerospace Compliance**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course provides details for direct and indirect effects of aircraft lightning testing and certification. Requirements for both composite and metallic aircraft, including proper RTCA/DO-160 classifications, are examined. The course will also include a high-level overview of Electromagnetic Compatibility (EMC), High-Intensity Radiated Fields (HIRF), Precipitation Static (P-Static) and Electrical Bonding requirements. The new requirements of Electrical Wiring and Installation System (EWIS) and Fuel Tank Safety (14 CFR 25.981 Amd. 102) will also be addressed.

Highlights

- The electromagnetic environment of the aircraft
- Metallic and composite aircraft requirements
- The history of lightning requirements for aircraft certification
- Direct and indirect effects of lightning testing
- FAA compliance for lightning effects

Who should attend?

This course is designed for all design engineering disciplines, project managers, project engineers and laboratory personnel whose aircraft system may require protection from the effects of lightning.

> "The valuable information, based on direct experience, was an important add-on to the full and comprehensive information provided for understanding the lightning phenomenon and relevant investigative approaches."
>
> —Massimo Semoli, Compliance Verification Engineer (CVE), Pilatus Ltd.

Aircraft Propulsion Systems: Principles and Practices NEW COURSE

Instructor: Saeed Farokhi

ON-SITE
This course is only available as an on-site course in 2018. The course can be brought on-site to your company and tailored to fit your individual training needs. On-site courses are delivered throughout the United States and around the world. To obtain a no-cost, no-obligation proposal, please contact the On-site Program Manager at 913-897-8782 or email ProfessionalPrograms@ku.edu.

CEUs
35 classroom hours
3.5 CEUs

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Design** and **Flight Tests and Aircraft Performance**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course studies the basic principles of propulsion systems with emphasis on jets and fan systems. It also includes the study of inlets and nozzles, compressors, burners, fuels, turbines and jets culminating in design and off-design engine analysis, performance and environmental considerations. The impact of propulsion system integration on external aerodynamics and (noise and IR) signature reduction is also presented, along with an introduction to novel concepts in propulsion.

Highlights

- Modern gas turbine engines, Geared Turbofans, ATP
- Component design guidelines
- System performance evaluation
- Propulsion-Airframe Integration
- Future directions in propulsion and power

Who should attend?

This course is designed for engineers, engineering managers, pilots, administrators and educators who are involved in rotary wing design, testing, evaluation or other technical aspects. The course is also suitable for entry- through intermediate-level students, engineers and pilots who are new to the industry.

Aircraft Structural Loads: Requirements, Analysis, Testing and Certification

Instructor: Wally Johnson

SEATTLE, WASHINGTON
April 23-27, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA18150F**

CEUs
31.5 classroom hours
3.15 CEUs

COST

Early registration fee
$2,495 if registered and paid by March 9

Regular registration fee
$2,695 if registered and paid after March 9

The course registration fee includes instruction, course materials, refreshments and lunches.

U.S. Federal Employee Discount: This course is available to U.S. federal employees at 10% off the registration fee. To receive the federal employee discount, you must enter the code FGVT116 on the registration form or during the online checkout process. Please note that you must validate your eligibility to receive this discount by entering your U.S. government email address (ending in .gov or .mil) on the registration form or when creating your online registration profile. This discount is available for both the early registration and regular registration fees.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Structures**, the Certificate of Specialization in **Aircraft Design**, and the Certificate of Specialization in **Aerospace Compliance**. See pages 6-7 for more information.

Description

This course provides an overview of aircraft structural external loads analysis including: criteria, design, analysis, fatigue, certification, validation and testing. It covers FAR 23 and FAR 25 airplane load requirements. However, the concepts may be applicable for military structural requirements. Loads calculation examples using BASICLOADS software will be demonstrated throughout the course week. A copy of BASICLOADS software will be provided to attendees.

Highlights

- Overview of data requirements: aerodynamics, mass properties, stiffness, control systems and propulsion
- Certification requirements: methods of compliance and FAR23 and FAR25 loads requirements
- Structural design airspeeds derivations: construct flight envelope
- V-n diagrams: calculation of maneuvering load factors, gust load factors, construct V-n diagrams
- Maneuver loads: balanced maneuvers, abrupt pitch maneuvers, roll maneuvers, yaw maneuvers and engine-out maneuvers
- Gust loads: gust formula, discrete tuned 1-cos gust, PSD gust, vertical, lateral and head-on gust
- Ground loads: landing, taxi, ground handling, static and dynamic loads and landing gear drop test
- Airframe loads: wing, horizontal tail, vertical tail, fuselage, control surfaces and flaps
- Fatigue loads: certification requirements, mission requirement, exceedance curve, gust and maneuver fatigue loads
- Loads testing: flight loads validation, ground calibration, static limit and ultimate test and fatigue loads test
- Loads calculations using BASICLOADS software throughout the course

Who should attend?

Designed for practicing engineers and engineering managers whose responsibilities include aircraft structures.

> "Very comprehensive in terms of subject. Covers all aspects of load generation for both FAR 23 and 25 aircraft. If you come to this class without any knowledge of structural loads, you certainly leave understanding how loads are generated, and why these loads are important to aircraft structural design."
>
> —2016 Orlando attendee

Aircraft Structures: Analysis and Design

Instructor: Mark S. Ewing

ORLANDO, FLORIDA
November 5-9, 2018
Monday–Friday,
8:00 a.m.–4:00 p.m.
Session Number **PA19110F**

CEUs
35 classroom hours
3.5 CEUs

COST

Early registration fee
$2,495 if registered and paid by September 21

Regular registration fee
$2,695 if registered and paid after September 21

The course registration fee includes instruction, course materials, refreshments and lunches.

U.S. Federal Employee Discount: This course is available to U.S. federal employees at 10% off the registration fee. To receive the federal employee discount, you must enter the code FGVT116 on the registration form or during the online checkout process. Please note that you must validate your eligibility to receive this discount by entering your U.S. government email address (ending in .gov or .mil) on the registration form or when creating your online registration profile. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE

This course if part of the Certificate of Specialization in **Aircraft Structures** and the Certificate of Specialization in **Aircraft Design**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course is an introduction to analysis and design of aircraft structures. Course content includes design criteria, structural design concepts, loads and load paths, metallic and composite materials; static strength, buckling and crippling, durability and damage tolerance, practical design considerations, certification and repair. Analysis exercises and a design project are included to better involve students in the learning process.

Highlights

- Structural design overview
- Aircraft loads
- Metals
- Fiber-reinforced composites
- Material selection
- Design to static strength
- Mechanical joints
- Mechanics of thin-walled and built-up structure
- Design to buckling and stiffness requirements
- Component design concepts
- Design for damage tolerance
- Design for durability
- Certification of structure
- Continued airworthiness of aging fleets

Who should attend?

This course is designed for engineers, engineering managers, certification authorities and educators whose responsibilities include aircraft structures.

> "I have been working in the Aerospace industry for the past seven years. Only after attending this course was I able to understand more about the aircraft major load carrying members and the possible ways of determining the structural strength and sizing the major load carrying members, along with the possible checks to be performed while considering new repairs to reinforce the weak/failed structural joints and attachments, floor beams, etc."
>
> —Amarnath Donga, 2017 Denver attendee

Airplane Flight Dynamics

Instructor: Willem A.J. Anemaat

ORLANDO, FLORIDA
November 5-9, 2018
Monday–Friday,
8:00 a.m.–4:00 p.m.
Session Number **PA19115F**

CEUs
35 classroom hours
3.5 CEUs

COST

Early registration fee
$2,495 if registered and paid by September 21

Regular registration fee
$2,695 if registered and paid after September 21

The course registration fee includes instruction, course materials, refreshments and lunches.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE

This course is part of the Certificate of Specialization in **Flight Tests and Aircraft Performance** and the Certificate of Specialization in **Aircraft Design**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

Participants learn an overview of airplane static and dynamic stability and control theory and applications, as well as classical control theory and applications to airplane control systems. An overview of flying qualities and regulations is included.

Highlights

- General airplane equations of motion
- Review of basic aerodynamic concepts
- Longitudinal aerodynamic forces and moments
- Lateral-directional aerodynamic forces and moments
- Thrust forces and moments
- The concept of static stability
- Applications of the steady state airplane equations of motion
- Effects of the flight control system; control forces
- Applications of the perturbed state equations of motion
- Dynamic stability: short period, phugoid, Dutch Roll, spiral and roll mode
- Review of flying qualities criteria
- Introduction to human pilot transfer functions
- Synthesis of stability augmentation systems

Who should attend?

Aeronautical engineers, mechanical engineers, electrical engineers needing to learn more about flight dynamics, along with pilots with some engineering background, government research laboratory personnel, engineering managers and educators.

> "Excellent course! Thanks, Professor Anemaat for the explanations and answers to my questions. Excellent books and classroom examples."
>
> —Felix Martinez, Ph.D., Universidad Pan Americana, 2016 San Diego attendee

Airplane Preliminary Design

Instructor: Willem A.J. Anemaat

ON-SITE
This course is only available as an on-site course in 2018 (it may return to our open enrollment schedule in subsequent years.) The course can be brought on-site to your company and tailored to fit your individual training needs. On-site courses are delivered throughout the United States and around the world. To obtain a no-cost, no-obligation proposal, please contact the On-site Program Manager at 913-897-8782 or email ProfessionalPrograms@ku.edu.

CEUs
35 classroom hours
3.5 CEUs

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Design**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course provides an overview of the fixed-wing airplane design decision-making process and the relation of design to manufacturing, maintainability and cost-effectiveness. It is applicable to jet transport, turboprop commuter transport, military (trainers, fighter bomber, UAV) and general aviation aircraft. The design process covers sizing (weight, wing area, thrust/power), aerodynamics, weight and balance, stability, control and cost. Numerous examples are shown. Lessons learned and "what to watch out for" are discussed.

Highlights

- Review of drag polar breakdown for subsonic and supersonic airplanes
- Preliminary sizing of airplane takeoff, empty and fuel weights for a given mission specification
- Performance constraint analyses
- Preliminary configuration selection
- Fundamentals of fuselage and wing layout design
- High-lift and lateral control design considerations
- Fundamentals of powerplant integration
- Fundamentals of landing gear layout design
- Class I weight and balance prediction
- Class II weight, balance and moment of inertia prediction
- Fundamentals of static longitudinal stability
- Deep stall and how to design for recoverability
- Takeoff rotation and the effect of landing gear location
- Review of dynamic stability concepts and prediction methods
- Unusual configurations
- Design optimization
- Cost

Who should attend?

Aeronautical engineers, mechanical engineers and electrical engineers needing to learn more about design, pilots with some engineering background, government research laboratory personnel, engineering managers and educators.

"This was an amazing class! Dr. Anemaat stepped through the process of design, introduced us to some very useful tools and loaded us up with books, papers and lessons learned that I can't wait to dive into."

—Mariel Ludwig, Aerospace Engineer, NAVAIR, 2016 Orlando attendee

Airplane Sizing ONLINE COURSE

Instructor: Willem A.J. Anemaat

ONLINE
There are no sessions currently scheduled for this course. If you are interested in taking this online course, please email us at ProfessionalPrograms@ku.edu.

CEUs
14 classroom hours
1.4 CEUs

COST (WHEN SCHEDULED)
Early registration fee
$1,495

Regular registration fee
$1,595

U.S. Federal Employee Discount:
This course is available to U.S. federal employees at 10% off the registration fee. To receive the federal employee discount, you must enter the code FGVT116 on the registration form or during the online checkout process. Please note that you must validate your eligibility to receive this discount by entering your U.S. government email address (ending in .gov or .mil) on the registration form or when creating your online registration profile. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Design** and the Certificate of Specialization in **Aircraft Structures**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course provides an overview of the fixed-wing airplane sizing process. It is applicable to jet transport, turboprop commuter transport, military (trainers, fighter bomber, UAV) and general aviation aircraft. The design process covers sizing (weight, wing area, thrust/power), drag, high lift device sizing, weight and balance, stability, control and geometry. Numerous examples are shown. Lessons learned and "what to watch out for" are discussed. Please note: If you prefer a more in-depth course on this subject matter, please review this instructor's course: Airplane Preliminary Design.

Highlights

- Introduction to airplane design: flowchart of the design process
- Review of drag polar breakdown for subsonic and supersonic airplanes, rapid method for drag polar prediction, check of drag polar realism
- Two airplanes: same mission, different design: comparison of the Boeing B-47 with the B2 Vulcan
- Preliminary sizing of airplane takeoff weight, empty weight and fuel weight for a given mission specification: applications; sensitivity of takeoff weight to changes in payload, empty weight, range, endurance, lift-to-drag ratio and specific fuel consumption; role of sensitivity analyses in directing program-oriented research and development: applications
- Performance constraint analyses: relation between wing loading and thrust-to-weight ratio (or wing loading and weight-to-power ratio) for the following cases: stall speed, takeoff field length and landing field length, statistical method for estimating preliminary drag polars, review and effect of airworthiness regulations; relation between wing loading and thrust-to-weight ratio (or wing loading and weight-to-power ratio) for the following cases: climb and climb rate (AEO and OEI), cruise speed and maneuvering; the matching of all performance constraints and preliminary selection of wing area and thrust required: applications
- Preliminary configuration selection; what drives unique (advanced) configurations? Discussion of conventional, canard and three-surface configurations; fundamentals of configuration design
- Preliminary Design Sequence:
- Fuselage/cockpit
  - Type of propulsion
  - Wing planform
  - Type, size and disposition of high lift devices
  - Layout of empennage (horizontal tail, canard, V-tail, vertical tail sizing)
  - Type of landing gear
  - Preliminary drawing (CAD)
  - Class I weight and balance including loading diagram
  - Class I stability and control
  - Class I moment of inertia estimate
- Example airplane sizing exercise using Advanced Aircraft Analysis (AAA)

Who should attend?

Aeronautical engineers, mechanical engineers, electrical engineers needing to learn more about design, pilots with some engineering background, government research laboratory personnel, engineering managers and educators.

Application of Human Factors Engineering to the Life Cycle Management of Aeronautical Products and Systems

Instructor: Andrew Appleton

SAN DIEGO, CALIFORNIA
September 11-14, 2018
Tuesday–Friday,
8:00 a.m.–4:00 p.m.
Session Number **PA19000F**

CEUs
28 classroom hours
2.8 CEUs

COST

Early registration fee
$2,195 if registered and paid by July 27

Regular registration fee
$2,395 if registered and paid after July 27

The course registration fee includes instruction, course materials, refreshments and lunches.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Maintenance and Safety**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This introductory course will provide attendees with a solid foundation of knowledge and skills necessary to successfully apply Human Factors Engineering (HFE) and Human System Integration (HSI) to their daily work. Attendees will attain familiarity with and trust in HFE/HSI principles and practices to consider and implement at their workplace. This understanding will provide attendees with the knowledge and skills to inject HFE/HSI at an early stage in the life cycle of their aeronautical products and systems. Doing so will produce a safer, user-centered product that can lower the cost of the product over the entire course of its life cycle.

Highlights

- Characteristics and capabilities of aircrew and how they are affected by the technical aircraft systems with which they work
- How the application of HFE and HSI considerations to aeronautical product and system design and modification contributes to safe operation
- How to consider and apply HFE and HSI principles and practices in aviation design, modification or maintenance duties
- How to consider and apply HFE in a systems integration approach to aeronautical product and system design and modification
- How to apply Human Factors requirements traceability to aeronautical product and system design and modifications
- The cost savings to aeronautical product and system or airworthiness projects through the early injection of HFE and HSI

Who should attend?

Aeronautical product designers, aeronautical system specialist engineers, aviation system safety specialist, aircraft occupant safety specialists and airworthiness program managers.

"The course offers a great grounding and exposure to the HFE lifecycle, from regulations to requirements to assessment and validation. It develops the process down logically to give a good presentation about how designs evolve for flight deck HMI."

—2017 Seattle attendee

Cabin Electronics: Management, Entertainment and Connectivity Systems

Instructor: Kenneth C. Darbonne

ORLANDO, FLORIDA
November 6-9, 2018
Tuesday–Friday,
8:00 a.m.–4:00 p.m.
Session Number **PA19120F**

CEUs
28 classroom hours
2.8 CEUs

COST
Early registration fee
$2,195 if registered and paid by September 21

Regular registration fee
$2,395 if registered and paid after September 21

The course registration fee includes instruction, course materials, refreshments and lunches.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Avionics and Avionic Components**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course provides an introduction to cabin electronics, including cabin management, entertainment and connectivity systems. Fundamental elements of these systems will be presented along with common installation concerns. Certification aspects including FAA regulations and guidance for showing compliance to the regulations will be discussed. Practical examples and in-class activities further enhance the learning experience.

Highlights

- Cabin management system designs
- Electrical interface fundamentals
- Cabin entertainment elements
- Passenger interfaces
- Common cabin internet connectivity options
- Certification requirements & guidance
- Installation considerations
- Environmental qualification
- Electrical load analyses
- Electromagnetic compatibility

Who should attend?

This course is aimed at designers, engineers, integrators and project/program managers involved in aircraft completions. Individuals tasked with the design and certification of cabin electronics will also benefit from the information presented.

"Excellent overview of regulations and requirements for cabin systems and equipment, along with means of compliance—it can be applied immediately to my daily tasks in my job assignment."
—Remon Klaver, Electrical Design Engineer, Carlisle Interconnect Technologies, 2016 KU Edwards Campus attendee

Cabin Safety and Crashworthiness of Aircraft Cabin Interiors

Instructor: Jose Mora-Vargas

SAN DIEGO, CALIFORNIA
September 17-21, 2018
Monday–Thursday,
8:00 a.m–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA19065F**

CEUs
31.5 classroom hours
3.15 CEUs

COST

Early registration fee
$2,495 if registered and paid by August 3

Regular registration fee
$2,695 if registered and paid after August 3

The course registration fee includes instruction, course materials, refreshments and lunches.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Maintenance and Safety** and the Certificate of Specialization in **Aircraft Structures**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course provides a fundamental review of transport airplane regulatory requirements and compliance-finding methodologies associated with cabin safety and crashworthiness regulations on aircraft cabin interior configurations. The course also reviews FAA/EASA criteria to determine the certification bases of Type Certification and Supplemental Type Certification projects.

Highlights

- Review of FAA requirements and advisory material associated with cabin safety/crashworthiness
- Provides practical insight into industry practices to evaluate transport airplane cabin interiors
- Covers establishing a certification basis applicable to TC/STC projects
- Reviews seats qualification requirements and impact on cabin safety/crashworthiness compliance

Who should attend?

This course is designed for FAA designees, FAA organizational designees/authorized representatives and certification engineers associated with STC cabin interior projects.

"This course would benefit an engineer at an aircraft completion center, OEM, a support vendor, a designee or regulator. An understanding is obtained of how transport category aircraft cabin interiors are assessed to show and/or find compliance to the crashworthiness requirements of FAA 14CFR Part 25. Also, insights and parallels with EASA requirements are discussed. The course is regulatory in nature, but was prevented from being boring by enlivened exchanges of experiences between students and the instructor. Case studies throughout the week spawn additional discussions that are directly related to the regulations. Great course."

—Tom Deiters, 2016 Orlando attendee

Civil and Military Certification of Propulsion Systems to Support Aircraft and Helicopter Operations

Instructors: Luc Deniger, Derek Ferguson

SAN DIEGO, CALIFORNIA
September 17-21, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA19070F**

CEUs
31.5 classroom hours
3.15 CEUs

COST

Early registration fee
$2,495 if registered and paid by August 3

Regular registration fee
$2,695 if registered and paid after August 3

The course registration fee includes instruction, course materials, refreshments and lunches.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aerospace Compliance**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course reviews fundamental design considerations for certification of propulsion systems. It discusses design requirements, methods of compliance, tests and analyses to demonstrate compliance to civil and military certification requirements. Using practical examples, participants will gain knowledge to support their role as propulsion engineers.

Highlights

- Propeller certification
- Engine certification
- Integration of propulsion systems on aircraft/helicopters
- System safety and safety assessments for propulsion systems
- Propulsion systems flight testing
- Electronic control aspects, including FADECs
- Helicopter gear boxes
- Environmental aspects (rain, ice/hail, snow, sand, volcanic ash, etc.)
- Fuel system considerations
- ETOPS considerations
- Thrust reversers
- Critical components lives
- In-service monitoring and engine structural integrity programs
- Continuing airworthiness of propulsion systems

Who should attend?

This course is designed for entry-level and practicing propulsion engineers and managers, aircraft engineers and aircraft designers.

> "Very informative and well-prepared training materials and presentation slides. A very interesting course and definitely will help out my career in the future."
>
> —2016 Orlando attendee

Commercial Aircraft Safety Assessment and 1309 Design Analysis

Instructor: Marge Jones

DENVER, COLORADO
June 4-8, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA18195F**

ORLANDO, FLORIDA
November 5-9, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA19125F**

CEUs
31.5 classroom hours
3.15 CEUs

COST

DENVER
Early registration fee: $2,495 if registered and paid by April 20
Regular registration fee: $2,695 if registered and paid after April 20

ORLANDO
Early registration fee: $2,495 if registered and paid by September 21
Regular registration fee: $2,695 if registered and paid after September 21

The course registration fee includes instruction, course materials, refreshments and lunches.

U.S. Federal Employee Discount: This course is available to U.S. federal employees at 10% off the registration fee. To receive the federal employee discount, you must enter the code FGVT116 on the registration form or during the online checkout process. Please note that you must validate your eligibility to receive this discount by entering your U.S. government email address (ending in .gov or .mil) on the registration form or when creating your online registration profile. This discount is available for both the early registration and regular registration fees.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE

This course is part of the Certificate of Specialization in **Aerospace Compliance**, the Certificate of Specialization in **Aircraft Maintenance and Safety**, the Certificate of Specialization in **Avionics and Avionic Components**, and the Certificate of Specialization in **Electrical Wiring Interconnection System (EWIS)**. See pages 6-7 for more information.

Description

This course provides the practical knowledge of system safety requirements in 14 CFR 2X.1309 regulation, from fundamental philosophies and criteria to the analysis techniques used to accomplish safety requirement identification, validation and verification. It includes a detailed review of SAE ARP 4761 and system safety aspects of ARP 4754A, including allocation of safety requirements and assigning development assurance levels. Students will be able to apply the principles taught to all types of commercial aircraft certification and/or adapt them to any system safety activity.

Highlights

- Detailed review of the 14 CFR2X.1309 regulation and the requirements of this regulation
- Overview of the SAE ARP 4761 safety assessment process for commercial aviation
- Overview of the SAE ARP 4754A development process focused to system safety aspects
- Aircraft and system functional hazard assessments
- Preliminary system safety assessments
- Failure rate prediction techniques
- Failure mode and effects analysis (FMEA) and summary (FMES)
- Fault tree analysis concepts
- Common cause analysis
- System safety assessments
- Tailoring the safety process for modifications
- Safety analysis and information required to support development of certification plans
- Guidelines for preparing 1309 safety related compliance statements

Who should attend?

This course is designed for Parts 23, 25, 27 and 29 system certification engineers, system designers, FAA Designated Engineering Representatives (DERs), aircraft certification personnel, system safety specialists new to the commercial certification safety process and military personnel procuring civil equipment.

"This is an extremely valuable, comprehensive treatment of the topic that I could not find elsewhere."
—Darren Thompson, Systems Engineer, The Boeing Company, 2017 Denver Attendee

"Wonderful course, gives a complete insight into aerospace safety requirements. I came to the course having heard terms like FMEA and FTA, and came out of the course with a good understanding. The course content was well organized, pitched at the right level with plenty of real-life examples. Thank you, University of Kansas. It was totally worth flying all the way from the UK to attend this course."
—Umer Farooq, 2016 Orlando attendee.

"Everyone performing a safety engineering function in an aerospace company needs to take this course."
—Ian MacLeod, Principal Systems Engineer, Bendix King

Complex Electronic Hardware Development and DO-254

Instructor: Jeff Knickerbocker

SAN DIEGO, CALIFORNIA
September 18-20, 2018
Tuesday–Thursday,
8:00 a.m.–4:00 p.m.
Session Number **PA19100F**

CEUs
21 classroom hours
2.1 CEUs

COST
Early registration fee
$1,895 if registered and paid by August 3

Regular registration fee
$1,995 if registered and paid after August 3

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Avionics and Avionic Components** and the Certificate of Specialization in **Aerospace Compliance**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course reviews the fundamentals of developing and assessing electronic components to the standard RTCA/DO-254 Design Assurance Guidance for Airborne Electronic Hardware. The course also provides insight into the FAA's review process and guidance along with practical keys for successful development and certification. Practical exercises and in-class activities further enhance the learning process.

Highlights

- The course addresses RTCA/DO-254 as applied via FAA Advisory Circular AC20-152.
- FAA Order 8110.105 is addressed, as are current standard EASA certification review items and FAA issue papers.
- Potential deficiencies in current regulatory guidance material is addressed versus the current state of practice verification techniques.
- Best practices for requirements capture and subsequent verification methodologies are discussed.
- White papers will be provided. Some out-of-class reading will enhance the participant's experience.

Who should attend?

Designed for developers, avionics engineers, systems integrators, aircraft designers and others involved in development or implementation of complex electronic hardware and programmable devices (application specific integrated circuits, field-programmable gate arrays, etc.).

COMBINE COURSES AND SAVE!
This course can be combined with **Integrated Modular Avionics (IMA) and DO-297**, which is being offered September 17, 2018 (Monday) in San Diego, California (see page 43). If registering for both courses, please choose the following COMBO COURSE NUMBER: **PA19105F**.

The cost to attend both courses is $2,195 if you register and pay by August 3, 2018, or $2,395 if registered and paid after August 3, 2018.

"Very good course. You will know Complex Electronic Hardware Development and DO-254 from A to Z. Very well organized course."

—2017 onsite attendee

"This course dovetails well with the KU '1309' class, and helps the safety analyst better understand the activities necessary to ensure compliance with safety objectives. This course develops the safety analysis into the box via FFPA, etc. which provides insight into how to optimize hardware design for safe performance."

—Matthew Loveless, Aerospace Engineer, U.S. Army Aviation Engineering, Redstone Arsenal, 2017 onsite attendee

Conceptual Design of Unmanned Aircraft Systems

Instructor: Bill Donovan

SAN DIEGO, CALIFORNIA
September 10-14, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA19005F**

CEUs
31.5 classroom hours
3.15 CEUs

COST
Early registration fee
$2,495 if registered and paid by July 27

Regular registration fee
$2,695 if registered and paid after July 27

The course registration fee includes instruction, course materials, refreshments and lunches.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Design** and the Certificate of Specialization in **Unmanned Aircraft**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course provides a conceptual approach to overall design of Unmanned Aircraft Systems (UAS) including concepts of operations, communications, payloads, control stations, air vehicles and support. It also covers requirements and architecture development, initial sizing and conceptual-level parametric and spreadsheet assessment of major system elements.

Highlights

- Introduction to Unmanned Aircraft Systems (UAS), including conceptual design issues and operating environments
- Control station, communication and payload considerations and sizing
- Life-cycle cost estimation
- Air vehicle parametric design and propulsion
- Conceptual-level aerodynamics
- Standard atmosphere models
- Conceptual-level mass estimation
- Parametric geometry
- Air vehicle performance
- Mission assessment
- Methodology and correlation
- Air vehicle optimization
- Overall system optimization
- Reliability, maintainability and support

Who should attend?

This course is designed primarily for practicing conceptual-level design engineers, systems engineers, technologists, researchers, educators and engineering managers. For maximum course benefit, students should have some knowledge of basic aerodynamics and conceptual aircraft design, although it is not mandatory. A basic knowledge of spreadsheet analysis methods is assumed.

> "This course was extremely valuable in that it covers everything one needs to know when building a UAS program for our military. It offers a core baseline understanding of UAS platforms, payloads, control stations, data links plus cost breakdown. I was able to complete a thorough cost estimate for my commander on an upcoming procurement of a small tactical VTOL fleet with Bill's cost estimate analysis. The most timely and relevant course I have ever taken."
>
> —Troy Kelly, Air/Aviation/UAS Command Lead, Canadian Armed Forces, 2016 Orlando attendee

Dynamics for Aerospace Structures

Instructor: Dennis Philpot

DENVER, COLORADO
June 5-8, 2018
Tuesday–Friday,
8:00 a.m.–4:00 p.m.
Session Number **PA18200F**

CEUs
28 classroom hours
2.8 CEUs

COST
Early registration fee
$2,195 if registered and paid by April 20

Regular registration fee
$2,395 if registered and paid after April 20

The course registration fee includes instruction, course materials, refreshments and lunches.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Design** and the Certificate of Specialization in **Aircraft Structures**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course is designed to provide participants with a strong theoretical, as well as practical knowledge of the methodologies for performing rigid body and modal-based dynamics analysis on a wide range of structural and mechanical systems. The course builds upon the theoretical foundation with practical applications that can be immediately put into practice in the workplace. Both the theory and practice of classical "hand" analysis techniques are presented, along with the more modern (numerical/computational) methods used in the industry. The subject matter difficulty-level is intermediate.

Highlights

- Solid mechanics: the big picture
- Dynamics for structural verification
- Time-domain vs. frequency-domain analysis
- The structural dynamics analysis process
- Kinetic energy and momentum
- Strain energy in structural elements
- d'Alembert's Principle
- Mode shapes, boundary conditions and natural frequencies
- The nature of dynamic response
- Newtonian dynamics: first- and second-order systems
- Response of first-order systems to various load conditions
- Second-order systems
- Dynamic response of second-order systems
- Introduction to random vibration
- Probability density functions
- Power spectral density functions
- Multiple-degree-of-freedom (MDOF) Systems
- Computation of eigenvectors and eigenvalues
- Dynamic response of MDOF Systems
- Common failure modes for dynamically-loaded structures
- Practical examples for the aerospace industry
- Shock and vibration testing
- Introduction to MIL-STD-810G
- Deriving environments from flight test data
- Computing RMS values of acceleration, velocity and displacement

Who should attend?

This course will benefit design engineers who would like to become more familiar with the techniques and modern practices of dynamics analysis to help them be more knowledgeable and bring more capability to the work place. It is also appropriate for mechanical engineers who need to become more proficient in the area of structural dynamics due to a particular job assignment or new career opportunity. Department managers whose staff are involved in loads and dynamics work are also encouraged to attend.

> "Overall, this was a very good course, and I would highly recommend it to engineers seeking to improve their knowledge of vibration analysis and testing. The organization was great, as well, with enough breaks to allow participants to stay focused."
>
> —Onno Bartels, MSC, 2016 San Diego attendee

Electrical Wiring Interconnection System (EWIS) and FAA Requirements

Instructors: C. Bruce Stephens, Franklin L. Cummins, Thomas N. Taylor (This course may be taught by any of these instructors.)

DENVER, COLORADO
June 4-8, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA18205F**

ORLANDO, FLORIDA
November 5-9, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Course Number **PA19130F**

CEUs
31.5 classroom hours
3.15 CEUs

COST

DENVER
Early registration fee
$2,495 if registered and paid by April 20
Regular registration fee
$2,695 if registered and paid after April 20

ORLANDO
Early registration fee
$2,495 if registered and paid by September 21
Regular registration fee
$2,695 if registered and paid after September 21

The course registration fee includes instruction, course materials, refreshments and lunches.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aerospace Compliance**, Certificate of Specialization in **Aircraft Maintenance and Safety**, Certificate of Specialization in **Avionics and Avionic Components**, Certificate of Specialization in **Electrical Wiring Interconnection System (EWIS)** and Certificate of Specialization in **Electromagnetic Effects**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course discusses the FAA Code of Federal Regulations (CFRs) and design concepts required to ensure all aspects of aircraft electrical wiring and installation are safe. It examines aircraft wiring as a system and reviews all Part 25 CFRs related to EWIS FAA certification. Student teams will review FAA Advisory Circulars and present practical applications of the information in a simulation of the EWIS certification process. EWIS requirements for aircraft maintenance and inspection will also be discussed.

Highlights

- EWIS best practices
- Team EWIS workshops
- DER/UM EWIS requirements
- EWIS examples and practical applications
- Review of advisory circulars

Who should attend?

The course is designed for all aircraft design areas including electrical, avionics, and HIRF/lightning engineers and aircraft technicians. Aircraft managers and project engineers working in electrical/avionics related areas should also attend.

"Every electrical engineer in the aerospace industry will benefit from this course early-on in their careers to make them even better engineers and designers."

—2017 Onsite attendee

"Great class. Tom and Bruce have teaching styles that complement each other well. The course material was well laid out and presented in a way that kept the attention of the class. I plan on taking the things I learned back to my group to increase awareness of EWIS regulations."

—Brian Raymond, EME Continued Airworthiness, 2017 Seattle attendee

"FAA-related training can be very dry. The instructors made the course very interesting and fun. Very informative course for those who want to get a general knowledge of EWIS and its requirements."

—Ken Farsi, Vice President–Certification and Airworthiness, Dassault Aircraft Services, 2017 Seattle attendee

Electrical Wiring Interconnection System (EWIS) Safety Assessment–25.1709

Instructors: Thomas N. Taylor, C. Bruce Stephens (This course may be taught by one or both instructors.)

SEATTLE, WASHINGTON
April 23-27, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday 8:00 a.m.–11:30 a.m.
Session Number **PA18155F**

CEUs
31.5 classroom hours
3.15 CEUs

COST
Early registration fee
$2,495 if registered and paid by March 9

Regular registration fee
$2,695 if registered and paid after March 9

The course registration fee includes instruction, course materials, refreshments and lunches.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aerospace Compliance**, Certificate of Specialization in **Aircraft Maintenance and Safety**, Certificate of Specialization in **Avionics and Avionic Components**, and Certificate of Specialization in **Electrical Wiring Interconnection System (EWIS)**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course focuses on the requirements and methods that can be used to demonstrate compliance to 14 CFR 25.1709 (EWIS Safety Analysis). The discussion will examine the use of FAA AC 25.1701-1 to prepare a Functional and Physical Analysis. The course will also include an overview of the EWIS requirements included in 14 CFR Part 25, subpart H.

Highlights

- A detailed review of FAA AC 25.1701-1C and 25.1709 flow diagram
- Practical EWIS examples for new and modified aircraft
- 25.1709 Functional and Physical Analysis Development through team workshops

Who should attend?

The course is designed for engineers, technicians and managers involved in the design and certification of Transport Category Aircraft. The course is intended for both Original Equipment Manufacturers (OEMs) and aircraft modifiers.

> "The EWIS 25.1709 short course is really helpful in understanding the importance of system planning and safety of all aircraft. Whether you're in the air or space industry, the course is very valuable."
>
> —Jade Macabulos, Electrical Engineer, Northrop Grumman Aerospace Systems, 2016 KU Edwards Campus attendee

> "This course has significantly contributed to improve my knowledge on the subject matter. It was very well presented and enjoyable due to the outstanding attributes of the instructors."
>
> —Saul Pascal, System Engineering Manager, CAAI, 2016 KU Edwards Campus attendee

Electromagnetic Effects Aircraft Level Testing and FAA Requirements

Instructors: C. Bruce Stephens, Darren L. Stout, Franklin L. Cummins (This course may be taught by any of these instructors.)

SAN DIEGO, CALIFORNIA
September 17-21, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA19075F**

CEUs
31.5 classroom hours
3.15 CEUs

COST
Early registration fee
$2,495 if registered and paid by August 3

Regular registration fee
$2,695 if registered and paid after August 3

The course registration fee includes instruction, course materials, refreshments and lunches.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Maintenance and Safety**, Certificate of Specialization in **Avionics and Avionic Components**, Certificate of Specialization in **Aerospace Compliance** and Certificate of Specialization in **Electromagnetic Effects**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course discusses the concepts of aircraft ground and flight testing that may be required to ensure aircraft level systems are safe for operation when exposed to the effects of electromagnetic effects (EME), high intensity radiated fields (HIRF), lightning, precipitation static (P-static), and transmitting personal electronic devices (TPEDs). This course presents the fundamentals of coordinating and performing aircraft testing from a very practical, step-by-step perspective, and examines the process used by aircraft OEMs to show compliance to regulations relating to EME, HIRF, lightning, p-static, and TPEDs. The course will also include a high-level overview for electromagnetic effects areas including electromagnetic compatibility (EMC), high intensity radiated fields (HIRF), lightning transit analysis, precipitation static (P-static) and transmitting personal electronic devices (TPEDs) requirements.

Highlights

- Aircraft testing fundamentals
- Coordination of aircraft testing activities
- Documentation of test procedures and results
- FAA aircraft-level certification requirements
- Problem and solution discussions
- EME testing team workshops

Who should attend?

The course is designed for engineers and technicians working in all aircraft design and testing areas, including electrical, avionics and communications. Aircraft managers and project engineers who coordinate airplane testing and/or certification-related areas are also recommended to attend.

FAA Certification Procedures and Airworthiness Requirements as Applied to Military Procurement of Commercial Derivative Aircraft/Systems

Instructor: Gilbert L. Thompson

SEATTLE, WASHINGTON
April 24-26, 2018
Tuesday–Thursday,
8:00 a.m.–4:00 p.m.
Session Number **PA18160F**

CEUs
21 classroom hours
2.1 CEUs

COST

Early registration fee
$1,895 if registered and paid by March 9

Regular registration fee
$1,995 if registered and paid after March 9

The course registration fee includes instruction, course materials, refreshments and lunches.

U.S. Federal Employee Discount: This course is available to U.S. federal employees at 10% off the registration fee. To receive the federal employee discount, you must enter the code FGVT116 on the registration form or during the online checkout process. Please note that you must validate your eligibility to receive this discount by entering your U.S. government email address (ending in .gov or .mil) on the registration form or when creating your online registration profile. This discount is available for both the early registration and regular registration fees.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aerospace Compliance**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course provides an overview of FAA functions and requirements applicable to Type Design Approval, Production Approval, Airworthiness Approval and Continued Airworthiness associated with military-procured commercial derivative aircraft and products. This course focuses on the unique military needs in procurement (customer versus contractor) of products meeting civil airworthiness requirements, which are aligned with military-specific mission/airworthiness goals. Prior certification experience is beneficial, but not required.

Highlights

- Overview of FAA Aircraft Certification (AIR) and Flight Standards (AFS) service organizations
- Applicability of FAA advisory circulars, notices and orders
- FAA baseline and Program Specific Service Agreement (PSSA) services following Title 14, Code of Federal Regulations (CFRs), Parts 1, 11 and 21
- Parts Manufacturer Approval (PMA) process
- FAA "baseline" and "Program Specific Service Agreement" (PSSA) services following Title 14, Code of Federal Regulations (CFRs), Parts 1, 11, 21
- Eligibility of Department of Defense contractor installations and modification centers as FAA Part 145 Repair Stations
- Part 39 Airworthiness Directives
- Flight Standards Aircraft Evaluation Group's (AEG) role in aircraft certification
- Type Certification (TC) and Supplemental Type Certification (STC) process (FAA Order 8110.4)
- Project Specific Certification Plan (PSCP) principles in the RFP process
- FAA Form 337/Field Approval process
- Role of FAA Military Certification Office (MCO)
- Federal Reimbursable Agreement AVS-OA-ACE-12-3035 between DOT/FAA and armed services of the United States
- USAF Policy Directive 62-6, NAVAIR Instruction 13100.15, Army Regulation 70-62, application of Mil-HDBK-516B, TACC/MACC

Who should attend?

This course is designed and focused specifically for U.S. Department of Defense (DoD), Department of Homeland Security, U.S. Coast Guard and non-U.S. military procurement and airworthiness personnel, as well as associated military/supplier engineers, consultants and project directors involved in procurement of commercial derivative aircraft (CDA) or equipment developed for use on CDA.

> "This was an incredibly informative course! I have learned more in three days about aircraft certification and how the DOD interacts with the civilian regulatory agencies than I have in five years working in the aerospace industry."
>
> —Bhavik Mistry, Modifications and Retrofit Engineer, 2017 Denver attendee

FAA Functions and Requirements Leading to Airworthiness Approval

Instructors: Gilbert L. Thompson

SAN DIEGO, CALIFORNIA
September 11-13, 2018
Tuesday–Thursday,
8:00 a.m. 4:00 p.m.
Session Number **PA19010F**

CEUs
21 classroom hours
2.1 CEUs

COST

Early registration fee
$1,895 if registered and paid by July 27

Regular registration fee
$1,995 if registered and paid after July 27

The course registration fee includes instruction, course materials, refreshments and lunches.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aerospace Compliance**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course provides an overview of the FAA organizational structure and its function in aircraft certification, the rule-making and advisory process, production rules applicable to aircraft and aircraft components, the subsequent certification process, and continued airworthiness. The course is specifically tailored toward civil airworthiness certification. The course is FAA-approved for Inspection Authorization (IA) renewal. Prior certification activity is beneficial, but not required.

Highlights

- Overview of FAA Aircraft Certification (AIR) and Flight Standards (AFS) service organization and functions
- Advisory circular, notice and order process and issuance
- Federal Aviation Regulations (FAR) Parts 1, 11, 23, 25, 26, 27, 29, 33, 36, 39, 43, 45 and 183
- Parts Manufacturer Approval (PMA)
- Type Certification (TC) and Supplemental Type Certification (STC) process
- Certification process improvement
- FAA guide to product certification
- Documentation of typical TC/STC products
- Safety management concepts
- FAA Form 337/Field Approval
- Flight Standards Information Management System (FSMIS) notices and orders
- Bilateral Aviation Safety Agreements

Who should attend?

This course is designed for engineers and managers involved in the aerodynamic design and analysis of airplanes, rotorcraft and other vehicles.

"The FAA class is essential to anyone/engineer who deals with the build-up to get type certification or supplemental type certification. This class gives clear guidance to follow the rules and regulations, what not to do and who is the governing body to contact to get the job done correctly the first time. We are in the Aero business where safety is #1 and safety leads to sound business practices and continuity/longevity."

—Rudy Hartanto, Aerodynamicist, 2017 Seattle attendee

Flight Control and Hydraulic Systems

Instructor: Wayne Stout

ORLANDO, FLORIDA
November 5-9, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA19135F**

CEUs
31.5 classroom hours
3.15 CEUs

COST

Early registration fee
$2,495 if registered and paid by September 21

Regular registration fee
$2,695 if registered and paid after September 21

The course registration fee includes instruction, course materials, refreshments and lunches.

U.S. Federal Employee Discount:
This course is available to U.S. federal employees at 10% off the registration fee. To receive the federal employee discount, you must enter the code FGVT116 on the registration form or during the online checkout process. Please note that you must validate your eligibility to receive this discount by entering your U.S. government email address (ending in .gov or .mil) on the registration form or when creating your online registration profile. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Design**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course covers fundamental design issues, along with analysis and design methodologies for aerospace hydraulic and flight control systems. Topics include design requirements, component description and operation, component and system math modeling, component sizing, system layout rationale, system sizing and airframe integration. The course emphasizes the fundamentals and necessary engineering tools (both analytical and otherwise) needed to understand and design aerospace hydraulic and flight control systems. Practical examples and actual systems are presented and discussed throughout the class.

Highlights

- Hydraulic flow fundamentals
- Hydraulic components operation and sizing (actuators, valves, regulators, pumps, motors, accumulators, etc.)
- Servovalve operation and sizing
- Power Control Units (PCUs) function and operation
- Hydraulic system design and airframe integration
- Mechanism fundamentals
- Flight control system design and airframe integration
- Flight control system failure modes and design considerations
- Fly by Wire Systems

Who should attend?

This course is designed for system- and component-level engineers and managers, including airframe, vendor, industry and government. It is also designed for educators involved with aerospace mechanical systems.

> "This course is good for people who have basic or little knowledge of hydraulic systems. It would not be an ideal course for someone who has no knowledge of hydraulic systems. The course is a good refresher and provides insights to some very important concepts. The course material provides a good source of information and can definitely be a useful reference while working on hydraulic systems."
>
> —Vinay Viswanathan, Systems Integrator, 2016 San Diego attendee

Flight Test Principles and Practices

Instructors: Donald T. Ward, George Cusimano

SEATTLE, WASHINGTON
April 23-27, 2018
Monday–Friday,
8:00 a.m.–4:00 p.m.
Session Number **PA18165F**

CEUS
35 classroom hours
3.5 CEUs

COST

Early registration fee
$2,495 if registered and paid by March 9

Regular registration fee
$2,695 if registered and paid after March 9

The course registration fee includes instruction, course materials, refreshments and lunches.

U.S. Federal Employee Discount: This course is available to U.S. federal employees at 10% off the registration fee. To receive the federal employee discount, you must enter the code FGVT116 on the registration form or during the online checkout process. Please note that you must validate your eligibility to receive this discount by entering your U.S. government email address (ending in .gov or .mil) on the registration form or when creating your online registration profile. This discount is available for both the early registration and regular registration fees.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Flight Tests and Aircraft Performance**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course provides an introduction to and definition of the basic flight test process, application of engineering principles to flight test and description of common flight test practices, along with an introduction to the flight test discipline. The course is embellished with a variety of examples from completed flight test programs.

Highlights

- Flight test introduction/overview and brief history
- The atmosphere
- Mass, center of gravity and moment of inertia determination
- Time/space position measurements
- Air data calibration methods
- Instrumentation system principles
- Data recording and processing methods
- Proper use of digital bus data
- In-flight measurement of thrust and power
- Stall tests
- Flight test planning and interaction with program planning
- Preliminary preparation: modeling and simulation preparation, and value of ground testing
- Takeoff and landing and cruise performance
- Climb performance
- Advanced performance methods
- Static stability and control
- Structural flight tests
- Spin testing
- Systems testing and evaluation

Who should attend?

The course is designed for all levels of engineers and managers in industry working on flight test projects, military and civil project engineers, test pilots and flight test engineers, government research laboratory personnel and FAA and other regulatory agency engineers. It is ideally suited for engineers and managers from other disciplines who are moving into the flight test discipline for the first time or who must interact with flight test engineers regularly on a given project.

"This course is perfect to broaden your knowledge. The instructors are experts in the flight test field. George and Don are a perfect duo."

—Nugroho Agung Prasetyo, LAPAN, 2016 San Diego attendee

Flight Testing Unmanned Aircraft Systems–Unique Challenges

Instructor: George Cusimano

ORLANDO, FLORIDA
November 6-8, 2018
Tuesday–Thursday,
8:00 a.m.–4:00 p.m.
Session Number **PA19140F**

CEUs
21 classroom hours
2.1 CEUs

COST

Early registration fee
$1,895 if registered and paid by September 21

Regular registration fee
$1,995 if registered and paid after September 21

The course registration fee includes instruction, course materials, refreshments and lunches.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE

This course is part of the Certificate of Specialization in **Flight Tests and Aircraft Performance** and the Certificate of Specialization in **Unmanned Aircraft**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

Unmanned Aircraft Systems (UAS) are comprised of an unmanned vehicle (UAV), a manned control element(s), and various data and control links. Although unmanned, the vehicle is still an aircraft and must be tested with the same rigor and precision as manned systems. However, being "unmanned" and being part of an integrated system, UAVs demand unique flight test approaches that present corresponding challenges. If these challenges go unmet, the UAS Development Test and Evaluation (DT&E) program often experiences unacceptable cost and schedule overruns, which could lead to program termination. This course introduces the primary challenges associated with flight-testing remotely piloted and command-directed (a.k.a. autonomous) vehicles, with primary emphasis on Tactical, MALE and HALE class systems. The course also recommends solutions to these challenges that are meant to either mitigate or eliminate potential problems before they become unmanageable.

Highlights

- Fundamentals of flight test: review the purpose of flight test and evaluation and discuss the flight test and evaluation process as it applies to UAS testing.
- Typical test requirements: review both typical user requirements and certifying airworthiness requirements.
- UAV Flight Operations: review the current regulations for conducting UAV flight operations within both the National Airspace.
- System and on national test ranges: discuss the present state of "sense and avoid" requirements and technology, and the resulting impacts on flight test operations.
- Typical UAS architectures: review the system concept and understand why it is necessary to know typical UAS architectures in order to assure a successful flight test program.
- UAV software and modeling: examine the level and complexity of UAS software testing and appreciate the need for systems level flight test.
- UAV design characteristics: appreciate the basis for UAV designs with emphasis on those features that create development and test challenges.
- Typical UAV ground and flight testing: review the most problematic areas of UAV ground and flight test.
- Risk analysis and management: review the risk management process and how it applies to UAV testing.
- Cause-Effect/Effect-Response method to mitigate flight test challenges: introduce a new methodology designed to help mitigate UAV flight test problems.
- Human factors considerations: discuss the application of human factors principles to UAS command and control design and test.
- First flight(s) planning: discuss the unique aspects of UAV first flight(s).
- Lessons learned in UAV flight testing: share UAV lessons learned.
- Summary of UAV unique challenges: review the top 20 flight test challenges presented in the course.

Who should attend?

The course is designed for practicing flight test engineers, test pilots, test managers, aircraft engineers, aircraft designers and educators who already possess a fundamental understanding of flight test principles and practices. The course content is also appropriate for civilian, military and academic researchers.

> "In George's class, I enjoyed learning techniques that we will be able to implement today for safe and efficient testing. With the information learned in this class, we will have faster interpretation of payloads and changes to our UAS fleet."
>
> —Nick Adams, ACUASI, 2016 Orlando attendee

Fundamental Avionics

Instructor: Albert Helfrick

DENVER, COLORADO
June 4-8, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–2:45 p.m.
Session Number **PA18210F**

CEUs
33.75 classroom hours
3.375 CEUs

COST
Early registration fee
$2,495 if registered and paid by April 20
Regular registration fee
$2,695 if registered and paid after April 20

The course registration fee includes instruction, course materials, refreshments and lunches.

U.S. Federal Employee Discount: This course is available to U.S. federal employees at 10% off the registration fee. To receive the federal employee discount, you must enter the code FGVT116 on the registration form or during the online checkout process. Please note that you must validate your eligibility to receive this discount by entering your U.S. government email address (ending in .gov or .mil) on the registration form or when creating your online registration profile. This discount is available for both the early registration and regular registration fees.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Avionics and Avionic Components**. See pages 6-7 for more information.

Description

This course provides a very broad overview of avionics. It covers the historical evolution of the avionics industry and usage of avionics to the present day. This gives the student an understanding of why avionics is what it is today, in addition to understanding how it works. The course covers legacy systems still in use and the latest state-of-the-art systems currently being installed. The avionics environment is an important part of this course. In the context of this course, "environment" refers not only to the physical environment of pressure, temperature, vibration, etc. but the regulatory environment. Systems are an important part of this course, and system communications and assessment are covered. This course introduces the student to the unique language of avionics (abbreviations, terms and acronyms) and connects these terms to the systems they represent.

Highlights

- A very comprehensive overview of avionics from the early years to the present
- Covers the fundamentals of navigation, communications and surveillance
- Explains the roles of worldwide regulatory and advisory groups
- Introduces future systems currently under development and equipage
- Special emphasis on satellite-based navigation, the backbone of future navigation and surveillance
- Covers safety assessment and human factors as associated with avionics systems

Who should attend?

This course is for engineers and technicians involved with avionics but may not have attended formal courses in avionics. It would also suit those who work in a specific area of avionics and who would benefit from learning the latest developments in areas outside of their discipline or a brush-up on basics.

"I thought the instructor's knowledge was exceptional, and the course material and presentation excellent. The instructor's enthusiasm for the material kept the class very focused and interesting."
—Mark Almedia, Instrumentation Engineer, Honeywell Flight Test, 2016 Orlando attendee

"The course content was excellent, presented from a practical perspective as it relates to real-world scenarios."
—Earl O. Reyes, Component Development Engineer, Allegiant Air, 2016 Orlando attendee

Fundamentals of Project Management for Aerospace Professionals

Instructor: Herbert Tuttle

ORLANDO, FLORIDA
November 6-9, 2018
Tuesday–Friday,
8:00 a.m.–4:00 p.m.
Session Number **PA19150F**

CEUs
28 classroom hours
2.8 CEUs

COST

Early registration fee
$2,195 if registered and paid by September 21

Regular registration fee
$2,395 if registered and paid after September 21

The course registration fee includes instruction, course materials, refreshments and lunches.

NOT PART OF A CERTIFICATE TRACK.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course is designed to familiarize aerospace professionals with current project management techniques. Topics discussed include selecting the project team, identifying the functions of a project team and management team, integration of project management, work breakdown structures, interfaces, communications and transfers, estimating and planning, risk and challenges for the project manager, alternative organizational structures, and control and planning of time, money and technical resources. Course attendees are asked to bring a current project management problem from your team or organization. During class you will work on developing a reasonable solution and a project plan to accomplish it.

Highlights

- Understanding the five phases of project management
- Project definition and distinguishing characteristics, and how they are related
- Strategic issues including how this project is significant for the organization
- Internal project planning, or how to wear many hats simultaneously
- Work breakdown structure, taken to the appropriate level and not just the lowest level
- Time estimation, as well as "guesstimating" and scheduling techniques
- Network diagrams and how to determine the most efficient and expedient options
- Cost estimating for the top-down and bottom-up perspective
- Contingency and risk for every phase of the project
- Project team selection, training, mentoring, team building and dealing with special people
- Project cost reporting during the course of each phase and calculating the end cost

Who should attend?

This course is designed for engineers and other technical professionals at all levels, along with new project managers responsible for small-large and long-duration projects. This course is best suited to people who are new to project management and current project managers who want to hone their management skills.

"Herb conducts a fantastic class using a combination of lecture, discussion and hands-on activities to demonstrate key concepts and practices."

—Steven Majstorovic, Development Engineer, Moog. Inc., 2017 Seattle attendee

"Starting with basic concepts, the instructor covered the vitals of project management. The desired learning objectives were achieved in a very congenial environment, especially the project assigned during the course of making a balsa airplane–enlightened the need for teamwork. A presentation on a project of choice also helped develop the thinking process and enabled us to demonstrate the knowledge we accrued during the course."

—Syed Babar Ali Shams, Pakistan Air Force, 2017 Seattle attendee

Fundamentals of V/STOL Rotorcraft NEW COURSE

Instructor: Harold Rosenstein

SAN DIEGO, CALIFORNIA
September 11-13, 2018
Tuesday–Thursday,
8:00 a.m.–4:00 p.m.
Session Number **PA19015F**

CEUs
21 classroom hours
2.1 CEUs

COST

Early registration fee
$1,895 if registered and paid by July 27

Regular registration fee
$1,995 if registered and paid after July 27

The fee includes instruction, course materials, refreshments and lunches.

U.S. Federal Employee Discount: This course is available to U.S. federal employees at 10% off the registration fee. To receive the federal employee discount, you must enter the code FGVT116 on the registration form or during the online checkout process. Please note that you must validate your eligibility to receive this discount by entering your U.S. government email address (ending in .gov or .mil) on the registration form or when creating your online registration profile. This discount is available for both the early registration and regular registration fees.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Flight Tests and Aircraft Performance** and **Aircraft Design**. See pages 6-7 for more information.

Description

This course will present key aspects of vertical flight and rotorcraft challenges through a review of the historical evolution, basic principles and enabling technologies. It will cover the fundamental principles underlying rotorcraft flight, flight performance, rotor limitations, configurations and conceptual design. Emphasis is placed on relating rotorcraft aerodynamics to airplane aerodynamics for those making the transition.

Highlights

- Practical understanding of how rotorcraft evolved and differences with fixed wing
- The technologies that were needed to bring the industry to its current level, and those needed for continued evolution and growth
- Basic procedures to estimate rotorcraft flight performance, and understand rotor limitations
- Vertical/ Short Takeoff & Landing (V/STOL) configurations, attributes and limitations
- Overview of the design process and introduction to conceptual design, with case studies to illustrate how different configurations compare

Who should attend?

This course is designed for engineers, engineering managers, pilots, administrators and educators who are involved in rotary wing design, testing, evaluation or other technical aspects. The course is also suitable for entry- through intermediate-level students, engineers and pilots who are new to the industry.

Instructions for Continued Airworthiness Using Enhanced Zonal Analysis Procedure (EZAP)

Instructors: C. Bruce Stephens, Thomas N. Taylor (This course may be taught by one or both instructors.)

SEATTLE, WASHINGTON
April 25-27, 2018
Wednesday–Friday,
8:00 a.m.–4:00 p.m.
Session Number **PA18170F**

CEUs
21 classroom hours
2.1 CEUs

COST
Early registration fee
$1,895 if registered and paid by March 9

Regular registration fee
$1,995 if registered and paid after March 9

The course registration fee includes instruction, course materials, refreshments and lunches.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Electrical Wiring Interconnection System (EWIS)**.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course will discuss the Enhanced Airworthiness Program for Airplane Systems/Fuel Tank Safety (EAPAS/FTS) rule. This rule requires design approval holders (DAH) and applicants to develop instructions for continued airworthiness (ICA) consisting of maintenance and inspection tasks, intervals, and procedures for the representative airplane's electrical wiring interconnection systems (EWIS) for each affected type design.

Highlights

- EZAP best practices
- Team EZAP workshops
- DER/UM EZAP requirements
- EZAP examples and practical applications
- Review of Advisory Circulars

Who should attend?

The course is designed for all aircraft design areas including electrical, avionics, EWIS and HIRF/lightning engineers and aircraft technicians. Maintenance and inspection managers, operators and aircraft managers should also attend.

Integrated Modular Avionics (IMA) and DO-297

Instructor: Jeff Knickerbocker

SAN DIEGO, CALIFORNIA
September 17, 2018
Monday,
8:00 a.m.–4:00 p.m.
Session Number **PA19095F**

CEUs
7 classroom hours
.7 CEUs

COST
Early registration fee
$895 if registered and paid by August 3

Regular registration fee
$945 if registered and paid after August 3

The course registration fee includes instruction, course materials, refreshments and lunches.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Avionics and Avionic Components** and the Certificate of Specialization in **Aerospace Compliance**. See pages 6-7 for more information.

Description

This course provides the fundamentals for developing and integrating IMA systems, using TSO-C153 (Integrated Modular Avionics Hardware Elements), FAA Advisory Circular 20-170 (Integrated Modular Avionics Development, Verification, Integration and Approval Using RTCA/DO-297 and Technical Standard Order C153) and DO-297 (Integrated Modular Avionics (IMA) Development Guidance and Certification Considerations). Discussions and in-class activities further enhance the learning process.

Highlights

- What is IMA?
- What are the benefits of IMA?
- History of IMA
- Overview of IMA guidance material
- TSO-C153 (Integrated Modular Avionics Hardware Elements)
- FAA Advisory Circular 20-170 (Integrated Modular Avionics Development, Verification, Integration and Approval Using RTCA/DO-297 and Technical Standard Order C153)
- Purpose of the advisory circular (AC)
- Technical highlights from the AC
- Roles and responsibilities
- DO-297 (Integrated Modular Avionics (IMA) Development Guidance and Certification Considerations)
- ARINC 653 Usage in IMA Systems
- SAE ARP 4754A aspects in IMA Systems
- Using TSO-C153, AC 20-170, DO-297 and ARINC 653 together
- Common challenges in IMA development and certification
- Practical tips for IMA development and certification

Who should attend?

This course is designed for developers and integrators of integrated modular avionics systems. The focus will be on identifying challenges with IMA and satisfying the regulatory guidance.

COMBINE COURSES AND SAVE!
This course can be combined with **Complex Electronic Hardware Development and DO-254**, which is being offered September 18-20, 2018 (Tuesday-Thursday) in San Diego, California (see page 28). If registering for both courses, please choose the following COMBO COURSE NUMBER: **PA19105F**.

The cost to attend both courses is $2,195 if you register and pay by August 3, 2018, or $2,395 if registered and paid after August 3, 2018.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Introduction to 25.981—Fuel Tank Safety and Ignition Prevention

Instructors: Franklin L. Cummins, C. Bruce Stephens (This course may be taught by one or both of these instructors.)

SEATTLE, WASHINGTON
April 23-27, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA18180F**

CEUs
31.5 classroom hours
3.15 CEUs

COST
Early registration fee
$2,495 if registered and paid by March 9

Regular registration fee
$2,695 if registered and paid after March 9

The course registration fee includes instruction, course materials, refreshments and lunches.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Maintenance and Safety**, Certificate of Specialization in **Electromagnetic Effects**, Certificate of Specialization in **Aerospace Compliance**, and Certificate of Specialization in **Electrical Wiring Interconnection System (EWIS)**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course provides details on all elements of fuel tank design needed for compliance with the regulation, with specific emphasis on electrical design aspects. Some review of regulatory history and 25.981 [25-102] is included for reference and TCA, STC work. Specific design implementations are examined and evaluated. The course will also include a high-level overview of electromagnetic effects and compatibility (EME/EMC), lightning effects (direct and indirect), high intensity radiated fields (HIRF), precipitation static (P-static), electrical bonding requirements, and requirements for electrical wiring interconnection system (EWIS).

Highlights

- The electromagnetic environment: considerations for 25.981
- Metallic and composite aircraft structures: considerations for 25.981
- The history of fuel tank protection requirements for aircraft certification
- Direct and indirect effects of lightning and HIRF testing for 25.981 compliance
- Requirements for in-tank mounted equipment (including FQIS)
- Requirements for out-of-tank mounted FQIS
- Requirements for fuel control equipment mounted out-of-tank
- Fuel tank bonding and continued safety
- 25.981 ICA: critical design configuration control limitations

Who should attend?

This course is designed for all design engineering disciplines, project managers, project engineers and laboratory personnel whose aircraft system may require protection of the airplane's fuel system from ignition/explosion.

> "I left with a much greater understanding of the impact of bonding and EWIS and lightning in regard to fuel tank ignition sources. As a side note, I have a much better understanding of what the FAA/DERs are looking for to show compliance."
>
> —Hugh Copeland, Sr. Staff Engineer, 2016 KU Edwards Campus attendee

Introduction to Electromagnetic Effects (EME)

Instructors: C. Bruce Stephens, Darren L. Stout, Kenneth C. Darbonne (This course may be taught by any of these instructors.)

SAN DIEGO, CALIFORNIA
September 10-14, 2018
Monday-Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA19020F**

CEUs
31.5 classroom hours
3.15 CEUs

COST
Early registration fee
$2,495 if registered and paid by July 27

Regular registration fee
$2,695 if registered and paid after July 27

The course registration fee includes instruction, course materials, refreshments and lunches.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Maintenance and Safety**, Certificate of Specialization in **Avionics and Avionic Components** and the Certificate of Specialization in **Electromagnetic Effects**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course will provide participants with an understanding of electromagnetic effects related to aircraft engineering requirements, FAA certification requirements, testing requirements for both DO-160 bench testing and aircraft level testing related to EMC/P-Static/ESD/TPED's/HIRF/EWIS and lightning.

Highlights

- EME best practices
- Team EME compliance workshops
- DER/UM EME requirements
- EME examples and practical applications
- Review of the Advisory Circulars related to EME
- Daily real examples of problems and solutions related to EME certification

Who should attend?

The course is designed for all aircraft design areas including certification engineers and managers, electrical, avionics, HIRF & lightning engineers, DO-160 laboratory and aircraft technicians. Aircraft managers, project engineers, and all other system engineers working in electrical/avionics/HIRF/lightning/EWIS-related areas should also attend.

Introduction to High Intensity Radiated Fields (HIRF)

Instructors: C. Bruce Stephens, Darren L Stout, Franklin L. Cummins (This course may be taught by any of these instructors.)

ORLANDO, FLORIDA
November 5-9, 2018
Monday-Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA19155F**

CEUs
31.5 classroom hours
3.15 CEUs

COST
Early registration fee
$2,495 if registered and paid by September 21

Regular registration fee
$2,695 if registered and paid after September 21

The course registration fee includes instruction, course materials, refreshments and lunches.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Maintenance and Safety**, Certificate of Specialization in **Avionics and Avionic Components**, Certificate of Specialization in **Electromagnetic Effects** and the Certificate of Specialization in **Aerospace Compliance**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course will discuss the design concepts required to ensure all aspects of aircraft HIRF electrical wiring, installations, and aircraft-level systems are safe for operation. This course will discuss the typical certification process for HIRF from a very practical, step-by-step perspective and examine all steps used by aircraft OEMs to show compliance to HIRF regulations. The 14 CFR 25.1317 for transport category airplanes will be used as the baseline regulation. A review of FAA Advisory Circulars and practical applications of the information will be presented, and teams will be selected to simulate the HIRF certification process. HIRF requirements for aircraft maintenance and inspection will also be discussed. The course will also include a high-level overview for electromagnetic effects areas; topics discussed include electromagnetic compatibility (EMC), precipitation static (P-static), lightning, ESD, and electrical bonding requirements. An overview of the new requirements for electrical wiring Interconnection system (EWIS) will also be addressed.

Highlights

- HIRF best practices
- Team HIRF workshops
- DER/UM HIRF requirements
- HIRF examples and practical applications
- Review of the HIRF Advisory Circulars

Who should attend?

The course is designed for all aircraft design areas including electrical and avionics, along with HIRF engineers, laboratory and aircraft technicians. Aircraft managers and project engineers working in electrical/avionics related areas should also attend.

> "Excellent course on an often difficult and misunderstood topic. The topic is important to design, testing and certification. The information in this course can help participants navigate these turbulent waters with ease. The instructors are well-prepared, extremely knowledgeable and entertaining."
>
> —Steve Rundus, Lead/Principal Engineer, Honeywell, 2017 Denver attendee

Introduction to RTCA DO-160 Qualification: Purpose, Testing and Design Considerations

Instructors: C. Bruce Stephens, Franklin L. Cummins (This course may be taught by one or both instructors.)

SAN DIEGO, CALIFORNIA
September 10-14, 2018
Monday-Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA19040F**

CEUs
31.5 classroom hours
3.15 CEUs

COST
Early registration fee
$2,495 if registered and paid by July 27

Regular registration fee
$2,695 if registered and paid after July 27

The course registration fee includes instruction, course materials, refreshments and lunches.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Avionics and Avionic Components**, Certificate of Specialization in **Aerospace Compliance** and the Certificate of Specialization in **Electromagnetic Effects**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This is an introductory class, designed to educate system engineers, hardware design engineers and test engineers in the aspects of DO-160 as it pertains to equipment qualification in support of aircraft certification. For system and hardware engineers, the intent is to educate and empower them to develop equipment designs that are compliant with DO-160 by design, and avoid expensive redesigns to correct issues found late in the development cycle during test. For test engineers, it is intended to assist them to properly develop test plans for their products. For each test section of DO-160, we provide purpose, adverse effects, categories, a high-level, step-by-step guide through the test procedure and design considerations for passing the test. Also included is an overview of a top-down requirements management approach (systems engineering), review of related FAA advisory material, an overview of grounding and bonding, wire shielding practices and lightning protection for composites.

Highlights

- The aircraft environment
- Overview of RTCA and DO-160
- Advisory Circular AC 21-16G
- Requirements, development and management
- FAA test requirements
- Pass/fail requirements

Who should attend?

This class is designed for system engineers responsible for developing requirements for airborne electronic equipment, hardware design engineers responsible for building such equipment and test engineers responsible for writing test plans.

Additional course format

An online version of this course is also available. See page 48 for details.

Introduction to RTCA DO-160 Qualification: Purpose, Testing and Design Considerations ONLINE COURSE

Instructor: Bruce Stephens

ONLINE
July 9–August 10, 2018 (five weeks) with live discussion sessions on Wednesdays at 7:00 p.m. CT (July 11, 18, 25 and August 1 & 8).
Session Number **PA195000**

CEUs
28 classroom hours
2.8 CEUs

COST
Early registration fee
$1,795 if registered and paid by May 25, 2018

Regular registration fee
$1,895 if registered and paid after May 25, 2018

Includes hardcopies of RTCA DO-160 and RTCA DO-357 documents.

U.S. Federal Employee Discount: This course is available to U.S. federal employees at 10% off the registration fee. To receive the federal employee discount, you must enter the code FGVT116 on the registration form or during the online checkout process. Please note that you must validate your eligibility to receive this discount by entering your U.S. government email address (ending in .gov or .mil) on the registration form or when creating your online registration profile. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Avionics and Avionic Components**, Certificate of Specialization in **Aerospace Compliance** and the Certificate of Specialization in **Electromagnetic Effects**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a course outline, instructor bio(s) and downloadable PDF with course details.

Description

This is an introductory class, designed to educate engineers of all disciplines (hardware design engineers, test engineers, certification engineers, program managers, project engineers and laboratory employees) in the aspects of DO-160 as it pertains to equipment qualification in support of aircraft certification. For system and hardware engineers, the intent is to educate and empower them to develop equipment designs that are compliant with DO-160 by design, and avoid expensive redesigns to correct issues found late in the development cycle during test. For test engineers, it is intended to assist them to properly develop test plans for their products. Certification engineers, program managers and project engineers will gain knowledge in the process and requirements of conducting the testing. Laboratory employees will learn the details of each DO-160 section and the requirements for certification. For each test section of DO-160, we discuss the purpose, adverse effects and categories. We also provide a high-level, step-by-step guide through the test procedure and design considerations for passing the test. A high-level review of related FAA advisory material and certification requirements will be discussed.

Please note that you must have access to the two required RTCA documents in order to complete this course. The two required documents are: RTCA DO-160G: Environmental Conditions and Test Procedures for Airborne Equipment and RTCA DO-357: User Guide, Supplement to DO-160G.

Plan to devote five continuous weeks of study to this online course, which will include readings, review of RTCA DO-160G and DO-357 documents, discussion posts, live discussion sessions, weekly learning summaries and progression toward your course project.

This course is delivered via Blackboard®, KU's online course hosting platform. Course materials will be sent to you approximately two weeks prior to the start of the course. You will not be given access to Blackboard® or be sent the course materials until KU has received payment for the course.

Highlights

- The aircraft environment
- Overview of RTCA and DO-160
- Advisory Circular AC 21-16G
- Requirements, development and management
- FAA test requirements
- Pass/fail requirements

Who should attend?

This class is designed for all engineering disciplines, program and project management employees, certification employees, and test lab personnel responsible for developing qualification requirements for airborne electronic equipment.

Additional Course Format

If you prefer a classroom-based learning environment, this course will be offered in San Diego, California in September, 2018 (see page 47).

MIL-STD Qualification: Purpose, Testing and Design Considerations

Instructor: Tom Cash

SAN DIEGO, CALIFORNIA
September 18-20, 2018
Tuesday–Thursday,
8:00 a.m.–4:00 p.m.
Session Number **PA19080F**

CEUs
21 classroom hours
2.1 CEUs

COST

Early registration fee
$1,895 if registered and paid by August 3

Regular registration fee
$1,995 if registered and paid after August 3

The course registration fee includes instruction, course materials, refreshments and lunches.

U.S. Federal Employee Discount: This course is available to U.S. federal employees at 10% off the registration fee. To receive the federal employee discount, you must enter the code FGVT116 on the registration form or during the online checkout process. Please note that you must validate your eligibility to receive this discount by entering your U.S. government email address (ending in .gov or .mil) on the registration form or when creating your online registration profile. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Avionics and Avionic Components** and the Certificate of Specialization in **Aerospace Compliance**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This class is designed to educate program managers, system engineers, design engineers and test engineers/technicians about United States military standard-oriented environmental, electromagnetic interference and power quality testing, with the goal of obtaining an Airworthiness certification. The course will acquaint personnel involved in new military aircraft efforts or the modifications of existing military aircraft with information about the required testing. It will assist system and design engineers to develop equipment designs that are robust enough to pass the Military Standard testing, and test engineers to properly design test plans for their equipment. Program managers will become aware of the time necessary to accomplish this testing.

Highlights

- Top level overview of the U.S. military airworthiness process
- Comparison of the military versus civilian airworthiness process
- Introduction and overview of the documents defining military testing
- An introduction to the environmental tests, their purpose, and a typical setup for performing each test
- An introduction to the electromagnetic interference tests, their purpose, and a typical setup for performing each test
- An introduction to the power quality tests, their purpose, and a typical setup for performing each test

Who should attend?

This course is designed to benefit any program manager, systems engineer, design engineer and/or test personnel who are or may become involved in the design and manufacturing of any items for which an airworthiness certification is desired.

> "If you are going to be writing requirements, testing or in general procurement that will deal with testing on DOD programs, this course is a must."
>
> —2017 onsite attendee

> "This short course provides a good overall view on Mil-Std 810 (environmental testing), Mil-Std 461 (EMI, EMC) and Mil-Std 704 (power). It enabled me to gain a better understanding on the test requirements and processes."
>
> —2017 onsite attendee

Operational Aircraft Performance and Flight Test Practices

Instructor: Mario Asselin

ON-SITE
This course is only available as an on-site course in 2018 (it may return to our open enrollment schedule in subsequent years.) The course can be brought on-site to your company and tailored to fit your individual training needs. On-site courses are delivered throughout the United States and around the world. To obtain a no-cost, no-obligation proposal, please contact the On-site Program Manager at 913-897-8782 or email ProfessionalPrograms@ku.edu.

CEUs
35 classroom hours
3.5 CEUs

EARN A CERTIFICATE
This course if part of the Certificate of Specialization in **Flight Tests and Aircraft Performance**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course provides an overview of airplane performance theory and prediction, certification standards and basic flight test practices. The course will focus on turbojet/turbofan powered aircraft certified under JAR/CAR/14 CFR Part 25. This standard will briefly be compared to military and Part 23 standards to show different approaches to safety, certification, operational and design differences.

Highlights

- Basic airplane performance theory
- Determining what to test in order to build performance models
- Using required instrumentation to best measure airplane performance
- Minimizing scatter during flight testing
- Developing performance models to match flight test results
- Certification requirements
- How to demonstrate certification compliance
- Presentation of airplane performance information to the flight crew
- Setting operational limits to ensure continued operational safety

Who should attend?

This course is designed for aeronautical engineers in the design or flight test departments, educators, aircrews with engineering background, and military personnel involved in managing fleets of 14 CFR Part 25 (FAR 25) certified aircraft.

> "This short course is great. All of the material is relevant to my job as an aerospace engineer. I suggest this course to anyone who is involved in design, operation and aircraft systems. Another benefit–we can make friends with people who work, research and develop aircraft in many ways. This was my first short course, and I recommend it. Thank you, University of Kansas."
>
> —Ildefonsa Nahak, LAPAN, 2016 San Diego attendee

Principles of Aeroelasticity

Instructor: Thomas William Strganac

SAN DIEGO, CALIFORNIA
September 10-14, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday 8:00 a.m.–11:30 a.m.
Session Number **PA19025F**

CEUs
31.5 classroom hours
3.15 CEUs

COST

Early registration fee
$2,495 if registered and paid by July 27

Regular registration fee
$2,695 if registered and paid after July 27

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Flight Tests and Aircraft Performance** and the Certificate of Specialization in **Aircraft Design**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course is designed to provide a qualitative understanding of aeroelastic behavior for aerospace vehicles. The class will explore different forms of aeroelastic phenomena and associated issues in structural dynamics and aerodynamic-structure interaction. Topics include solution methodologies, computational methods for aeroelastic analysis, development of the operational flight boundary, aeroservoelasticity, and contemporary topics such as limit cycle oscillations and related nonlinear pathologies in aeroelastic systems. The class addresses practical issues such as ground and flight tests. The course material will require selected study of the essential equations.

Highlights

- A brief overview of history, definitions and fundamentals
- Description of static aeroelastic phenomena, including divergence and reversal
- Review basic mechanical vibration theory leading to modal methods
- An introduction to unsteady aerodynamics
- An introduction to dynamic aeroelasticity
- The development of the governing equations for the aeroelastic system
- The pros and cons of frequency domain versus time domain methods
- Flutter identification and review of flutter models
- Development of the flutter boundary, federal regulations and application to the flight envelope
- Example problems used to elucidate concepts
- Ground tests, GVTs and wind tunnel tests
- Aeroservoelasticity for response mitigation and flutter alleviation
- Flight test program examples
- Nonlinear aeroelasticity

Who should attend?

This course is designed for engineers and technical managers involved in aerospace vehicle design, analysis and testing related to aeroelastic response and stability issues. The level of class instruction is appropriate for engineers and managers with an undergraduate degree in engineering.

> "Aeroelasticity is a highly complex science. Dr. Strganac presents it in a way that is easy to understand, providing the perfect mix of theory and practical examples."
>
> —Laird McKinnon, Flight Sciences Team Lead, Department of National Defence–Canada, 2016 San Diego attendee

Principles of Aerospace Engineering

Instructor: Wally Johnson

SAN DIEGO, CALIFORNIA
September 10-14, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA19030F**

CEUs
31.5 classroom hours
3.15 CEUs

COST

Early registration fee
$2,495 if registered and paid by July 27

Regular registration fee
$2,695 if registered and paid after July 27

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Design**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course provides an overview and integrated exposure to airplane aerodynamics, performance, propulsion, flight mechanics, mass properties, structural dynamics, aeroelasticity, structural loads, structures, ground testing, flight testing and certification. Examples to support the lecture are provided using Basic Aerospace Engineering software. This course demonstrates the relationship between aircraft certification requirements, engineering analysis and testing.

Highlights

- Atmospheric models and airspeed measurements
- Introduction to certification requirements
- Introduction to aerodynamics
- Weight and balance
- Introduction to propulsion
- Airplane performance
- Flight mechanics
- Mechanical vibrations and structural dynamics
- Aeroelasticity
- Structural design envelopes
- Structural analysis
- Ground testing and flight testing

Who should attend?

This course is intended as an overview for engineering professionals whose degree is not in aerospace, managers and military and government personnel involved in aircraft design and certification.

"Great course. I only wish I had taken it sooner in my career. Every engineer at Tinker AFB that works on aircraft should be required to take this course in the first 1-3 years."

—Hannah Diaz, Aerospace Engineer, 2017 onsite attendee

"This course is extremely useful for anyone in the aerospace industry. Learning how it all works together is of great value, and helps you make more informed decisions in your workplace."

—Chris Damron, Mechanical Engineer, 2017 onsite attendee

"This class allowed non-major engineers to learn and understand the basic criteria and specifications used in aerospace design. It was extremely comprehensive, yet easy to understand."

—Rebecca Kretter, Second Lieutenant, USAF, 2017 onsite attendee

Process-Based Management in Aerospace: Defining, Improving and Sustaining Processes

Instructor: Michael Wallace

ON-SITE
This course is only available as an on-site course in 2018 (it may return to our open enrollment schedule in subsequent years.) The course can be brought on-site to your company and tailored to fit your individual training needs. On-site courses are delivered throughout the United States and around the world. To obtain a no-cost, no-obligation proposal, please contact the On-site Program Manager at 913-897-8782 or email ProfessionalPrograms@ku.edu.

CEUs
35 classroom hours
3.5 CEUs

NOT PART OF A CERTIFICATE TRACK.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course covers foundational principles and the tools and techniques of Process Based Management (PBM), and delineates the strategies for successful implementation of PBM in an aerospace organization. Course content focuses on how to depict an enterprise process view, develop process measures, define key components and identify critical success factors to maintain the focus on priority requirements for managing processes to achieve sustainable performance improvements. It includes how this fits with and supports Lean, Six Sigma, Total Quality Management and the Toyota Production System. Several aerospace organizational case studies are used to augment the theoretical components.

Highlights

- Overview of the aerospace design and manufacturing process(es)
- Foundational principles of process management
- Data gathering methods and analysis
- Identifying, reducing and controlling variation
- Increasing efficiencies and effectiveness of the designer and production
- Setting, achieving and holding performance goals
- Achieving a culture of continuous improvement

Who should attend?

This course is designed for managers, engineers, quality, IT and planning professionals in the aerospace industry who are responsible for the identification, implementation and improvement of existing organizational processes and the development of new processes necessary to compete in the future.

"This course opened my eyes about things that I never thought about. It was very good and will help me to help people from my company."

—Las Vegas Course Participant

Propulsion Systems for UAVs and General Aviation Aircraft

Instructor: Ray Taghavi

SAN DIEGO, CALIFORNIA
September 10-14, 2018
Monday–Friday,
8:00 a.m.–4:00 p.m.
Session Number **PA19035F**

CEUs
35 classroom hours
3.5 CEUs

COST
Early registration fee
$2,495 if registered and paid by July 27

Regular registration fee
$2,695 if registered and paid after July 27

The course registration fee includes instruction, course materials, refreshments and lunches.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Design** and the Certificate of Specialization in **Unmanned Aircraft**. See pages 6-7 for more information.

Description

This course provides an in-depth understanding of the state-of-the-art propulsion issues specific to UAVs and general aviation aircraft, including propulsion options, cycle analysis, principles of operation, systems, components, performance and efficiencies.

Highlights

- Fundamentals of aircraft propulsion systems, engine types and aircraft engine selection
- Aircraft spark-ignition, diesel and Wankel engines
- Two-stroke and four-stroke cycle engines
- Aircraft engine classification by cylinder arrangement, cooling, cycle, etc.
- Carburetion, ignition and lubrication systems
- Aviation fuels
- Propellers
- Engine testing and simulations
- Electric propulsion
- Overview of turbo-propeller and turboshaft engines
- Engines for special applications, UAVs, RPVs, blimps, etc.

Who should attend?

This course is designed for propulsion engineers, aircraft designers, aerospace industry managers, educators, research and development engineers from NASA, FAA, and other government agencies.

> "Dr. Taghavi is a knowledgeable, thorough and effective instructor. He brings things/topics down to the practical level. Love his attitude, personality and his sense of humor."
>
> —San Diego Course Participant

Software Safety, Certification and DO-178C

Instructor: Jeff Knickerbocker

SAN DIEGO, CALIFORNIA
September 11-14, 2018
Tuesday–Friday,
8:00 a.m.–4:00 p.m.
Session Number **PA19045F**

CEUs
28 classroom hours
2.8 CEUs

COST

Early registration fee
$2,195 if registered and paid by July 27

Regular registration fee
$2,395 if registered and paid after July 27

The course registration fee includes instruction, course materials, refreshments and lunches.

Canada Department of National Defence Discount: This course is available to Canada DND employees at 10% off the registration fee. Please contact the DND Procurement Authority (DAP 2-3) for details. Please note that you cannot register using our online system when requesting this discount. This discount is available for both the early registration and regular registration fees.

EARN A CERTIFICATE

This course is part of the Certificate of Specialization in **Avionics and Avionic Components**, and the Certificate of Specialization in **Aerospace Compliance**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course provides the fundamentals for developing and assessing software to the standard RTCA DO-178B and DO-178C Software Considerations in Airborne Systems and Equipment Certification, as well as associated RTCA DO-178C supplements in DO-330, DO-331, DO-332 and DO-333. Similarities and differences to RTCA DO-278A for CNS/ATM equipment will also be addressed. The course also provides insight into the FAA's software review process, the FAA's software policy, practical keys for successful software development and certification, common pitfalls of software development, and software challenges facing the aviation community. Practical exercises and in-class activities will further enhance the learning process.

Highlights

- Differences between DO-178B and DO-178C
- DO-178C supplemental documents and where they fit
- Overview of existing standards related to software safety
- Configuration management
- Development and integration/test processes
- Verification processes
- Quality assurance objectives
- Supplements
- Assessing compliance-the Software Job-Aid
- Planning process
- Common pitfalls
- Software challenges facing the aviation industry

Who should attend?

This course is designed for software developers, avionics engineers, systems integrators, aircraft designers and others involved in development or implementation of safety-critical software. The focus is on civil aviation, certification and use of RTCA DO-178C; however, the concepts may be applicable for other safety domains, such as military, medical, nuclear and automotive.

"While I have accepted software as a customer, and had a rudimentary understanding of DO-178C, Jeff's course has been a revelation. Over the four days, we've been taken through the standard and had our misunderstandings straightened out. In particular, the structural coverage section showed me how to consider the objective achieved/met and why it must be proven. Directly applicable to my job."

—Ivan Irving, 2016 San Diego attendee

"This professor was very knowledgeable and professional, bring real-world examples to give context to the difficult concepts covered. I have worked with DO-178 for eight years and found there was still much to learn. Excellent course!"

—2016 San Diego attendee

Stress Analysis for Aerospace Structures

Instructor: Dennis Philpot

SAN DIEGO, CALIFORNIA
September 17-21, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA19085F**

CEUs
31.5 classroom hours
3.15 CEUs

COST
Early registration fee
$2,495 if registered and paid by August 3

Regular registration fee
$2,695 if registered and paid after August 3

The course registration fee includes instruction, course materials, refreshments and lunches.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Design** and the Certificate of Specialization in **Aircraft Structures**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course is designed for the practicing engineer who has an interest in the various aspects of stress analysis in aerospace structural-mechanical design and would like to enhance his or her expertise in this important field. The approach taken in this course is to start with a strong theoretical foundation and then build upon that foundation with practical applications that can be immediately put into practice in the workplace. In this manner, both the theory and practice of classical "hand" analysis techniques are presented as well as the more modern (numerical/computational) methods used in the industry. The subject-matter difficulty level is intermediate.

Highlights

- Introductory topics
- Engineering mechanics review
- Energy methods in mechanical analysis
- Failure prevention of engineering materials
- Fundamentals of deterministic stress analysis
- Analysis of bolted joints
- Fatigue analysis in mechanical design
- Numerical optimization

Who should attend?

- Design engineers who would like to become more familiar with the techniques and modern practices of stress analysis to help them be more efficient and productive in their work.
- Mechanical engineers who have been out of college for a while and need to become more knowledgeable in the area of stress analysis due to a particular job assignment or new career opportunity that requires expertise in analyzing structures.
- Department managers whose staff are involved in stress analysis work.

"Dennis is very knowledgeable about this subject and articulates it to the class. He is very passionate in teaching this subject, and keeps it interesting."

—Ron Grose, Falcon Program Manager & Technical Specialist, Duncan Aviation

Structural Composites

Instructor: Max Kismarton

ORLANDO, FLORIDA
November 5-9, 2018
Monday–Thursday,
8:00 a.m.–4:00 p.m. and
Friday, 8:00 a.m.–11:30 a.m.
Session Number **PA19160F**

CEUs
31.5 classroom hours
3.15 CEUs

COST
Early registration fee
$2,495 if registered and paid by September 21

Regular registration fee
$2,695 if registered and paid after September 21

The course registration fee includes instruction, course materials, refreshments and lunches.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Aircraft Structures**. See pages 6-7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course provides an introduction to high-performance composite materials, covering both engineering and manufacturing of composite parts and assemblies, basic material properties of the constituents (fiber and matrix), how they combine to form plies, or lamina, how to obtain lamina properties, how laminae are combined to form laminates and how to obtain the laminate properties. Other engineering topics include stress analysis, failure criteria and testing methods. Case studies and lessons-learned will be discussed. Design using composites will include material selection, lamination rules of thumb, weight analysis, fabrication process description, tool design, and preliminary cost and production rate analysis.

Highlights

- Historical review of laminated composite usage
- Constituent materials and properties
- Formulas and analysis tools to predict mechanical properties of laminates
- Introduction to manufacturing composites
- Failure theories and their limitations
- Coupon level testing methods
- Introduction to tooling design
- Design of simple structures and lamination rules of thumb
- Inspection methods
- Bonded and bolted joints
- Hygro-thermal effects
- Interlaminar and free-edge effects
- Durability and environmental issues
- Design problems

Who should attend?

The course has proven very helpful to those wanting a broad overview and/or a crash course in composites, experienced engineers looking for a refresher course, stress engineers wanting to understand how composites really work or fail and what to look out for when analyzing parts, data and margins, practicing engineers and managers with metal experience wishing to expand their skill set, anyone wanting to jump into the field but does not know how to go about it, and engineering teams embarking on new projects involving composites.

> "Excellent class for someone getting into the composite aircraft world. It covers the full range of topics and shows you what it really takes to build a composite aircraft."
>
> —John Miesen, Senior Engineer, 2017 Seattle attendee

> "Hospitality was amazing. Everything was well organized and well prepared. Course content was very interesting. The instructor was incredibly knowledgeable and highly motivated to pass on his knowledge, Overall, it was an excellent experience for me and surely I would return to another course in the future."
>
> —Moshe Encaoua, Civil Aviation Authority of Israel (CAAI), 2017 Seattle attendee

Unmanned Aircraft System Software Airworthiness

Instructor: Willie J. Fitzpatrick, Jr.

SAN DIEGO, CALIFORNIA
September 18-20, 2018
Tuesday–Thursday,
8:00 a.m.–4:00 p.m.
Session Number **PA19090F**

CEUs
21 classroom hours
2.1 CEUs

COST
Early registration fee
$1,895 if registered and paid by August 3

Regular registration fee
$1,995 if registered and paid after August 3

The course registration fee includes instruction, course materials, refreshments and lunches.

EARN A CERTIFICATE
This course is part of the Certificate of Specialization in **Avionics and Avionic Components** and the Certificate of Specialization in **Unmanned Aircraft**. See pages 6–7 for more information.

Visit our website, aeroshortcourses.ku.edu, to access a day-by-day course outline, instructor bio(s) and downloadable PDF with course details.

Description

This course covers the software airworthiness requirements for unmanned aircraft systems (UAS). It addresses the development and airworthiness evaluation of complex integrated software intensive unmanned aircraft systems, as well as the relationship between the acquisition/development processes for these systems and the key software airworthiness assessment processes. The course also identifies the deliverables, artifact requirements and approaches for documenting the software airworthiness assurance case, which is required to ultimately provide the certification/qualification basis for approval of the airworthiness of the unmanned aircraft system. The course offers key lessons learned in the application of the airworthiness assessment processes in software intensive unmanned aircraft systems.

Highlights

- Overview of UAS software requirements
- Software acquisition and development
- Software airworthiness products and assessment process during the system life cycle
- Assessments of: planning and requirements analysis; preliminary and architectural design; detailed design, coding and unit test; software integration and formal qualification test and system integration test; and aircraft integration, ground test and flight test
- Developing recommendations for formal flight and airworthiness releases to approval authority
- Documenting the UAS software airworthiness assurance case
- Keys to successful software airworthiness process implementation for UAS
- Problem areas, concerns and lessons learned
- Future trends

Who should attend?

This course is intended for managers, systems engineers, software system safety engineers and software engineers who design, develop or integrate software in unmanned aircraft systems or evaluate these systems to provide the qualification/certification basis for their software airworthiness.

> "Very good course putting together the best practices in software certification, combining DO 178 B/C and MIL-STD 498 experiences and providing guidance through the complicated and often long airworthiness certification process."
>
> —Prodrag Vucetic, 2015 Orlando attendee

OUR CLIENTS INCLUDE

Airbus Group

Aeronautical Radio, Incorporated (ARINC)

Air Methods/United Rotorcraft

ASELSAN A.Đ.

BAE Systems, plc

Beechcraft Corporation

Bell Helicopter Textron, Inc.

The Boeing Company

Bombardier Aerospace

Brazilian Organization for the Development of Aircraft Certification (DCA-BR)

Cessna Aircraft Company

Cirrus Aircraft

Civil Aviation Administration of China (CAAC)

Commercial Aircraft Corporation of China (COMAC)

Dassault Aviation

Defense Acquisition Program Administration (DAPA)

Department of National Defence and the Canadian Armed Forces

Embraer S.A.

European Aviation Safety Agency (EASA)

Federal Aviation Administration (FAA)

Garmin International, Inc.

General Atomics Aeronautical Systems, Inc.

General Electric Aviation

The Goodrich Corporation

Gulfstream Aerospace Corporation

Honeywell Aerospace

Insitu

L-3 Communications

Lockheed Martin

Lufthansa Technik AG

Lycoming Engines

NASA

National Aerospace Laboratory (NLR)

National Transportation Safety Board (NTSB)

New Zealand Defence Force (NZDF)

Northrop Grumman Corporation

Parker Hannifin Corporation

Pilatus Aircraft Ltd.

Pratt & Whitney

QinetiQ Group plc

Raytheon Company

Rockwell Collins, Inc.

Rolls-Royce

Samsung Techwin

Saab Group

Savunma Teknolojileri Muhendislik (STM)

Sierra Nevada Corporation (SNC)

Sikorsky Aircraft Corporation

Singapore Technologies Aerospace (ST Aerospace)

Spirit AeroSystems, Inc.

SR Technics

Taikoo (Xiamen) Aircraft Engineering Co., Ltd.

Transport Canada

U.S. Department of Defense (Air Force, Army, Navy and Coast Guard)

LODGING AND TRAVEL INFORMATION

- Lodging and transportation costs are NOT included in course fees. Attendees are responsible for making their own lodging and travel arrangements.
- The following lodging and transportation suggestions are provided for your convenience and do not represent an endorsement.
- For additional travel information, including convenient weblinks to assist you in making your travel plans, please visit our website: www.aeroshortcourses.ku.edu.

International Travelers

Are you planning to attend one of our courses in the United States but are not a U.S. citizen? Please visit www.travel.state.gov for visa and travel information.

SEATTLE, WASHINGTON

April 23-27, 2018

DoubleTree Suites by Hilton Hotel Seattle Airport Southcenter
16500 Southcenter Parkway
Seattle, Washington 98188

HOTEL INFORMATION:

- A limited number of rooms have been reserved for course attendees.
- The standard single/double room rate is $129, plus applicable taxes.
- Free in-room internet and parking are included in the group rate.
- The room block will only be held until April 6, 2018.
- When making a reservation, provide the group code UOK.
- Make a reservation by calling 1-800-222-8733.
- A dedicated group reservation link can be accessed from our website.

FROM THE AIRPORT:

- The Seattle-Tacoma International Airport (SEA) is 3.5 miles (5.6 km) from the hotel.
- Complimentary shuttle service is provided by the hotel (no reservation is required).
- Hotel shuttle courtesy phones are located on the baggage claim level, in the shuttle pickup area at Islands #1 and #3.

DENVER, COLORADO

June 4-8, 2018

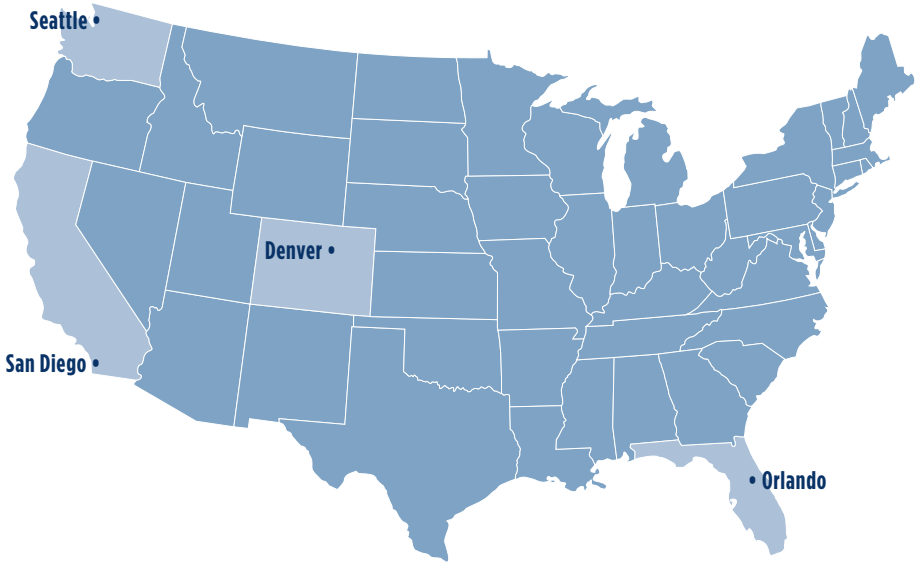
Crowne Plaza Denver Downtown
1450 Glenarm Place
Denver, Colorado 80202

HOTEL INFORMATION:

- A limited number of rooms have been reserved for course attendees.
- The standard single/double room rate is $164, plus applicable taxes.
- People in our room block receive free in-room internet and a discounted parking rate ($5 each day).
- The room block will only be held until May 10, 2018.
- When making a reservation, state that you are with KU Aerospace Short Courses.
- Make a reservation by calling 1-720-269-3257.
- A dedicated group reservation link can be accessed from our website.

FROM THE AIRPORT:

- The Denver International Airport (DEN) is 26 miles (41 km) from the Crowne Plaza Denver Downtown.
- SuperShuttle provides ground transportation for approximately $19 each way. Provide group code UPBP7 to receive the discounted rate.
- To reserve the SuperShuttle, call 1-800-258-3826 (toll free in the U.S.) or visit www.supershuttle.com
- The NEW light rail from the airport to Downtown Union Station costs $9 each way. For details visit http://www.rtd-denver.com/a-line.shtml. From Union Station take the MallRide bus at 16th Street Mall & Wynkoop Street to 16th Street Mall and Glenarm Place. Then walk to 1450 Glenarm Place.



SAN DIEGO, CALIFORNIA

September 10-14, 2018 | September 17-21, 2018

San Diego Marriott Mission Valley
8757 Rio San Diego Drive
San Diego, California 92108

HOTEL INFORMATION:

- A limited number of rooms have been reserved for course attendees.
- The standard single/double room rate will be the prevailing U.S. Federal Government per diem rate for San Diego at the time of the event (FY2018), plus applicable taxes. The FY2017 U.S. Federal Government per diem rate is $149.
- People in our room block receive free in-room internet and a discounted parking rate.
- The room block will only be held until August 23, 2018.
- Make a reservation by calling 1-877-622-3056 (toll free worldwide).
- The group rate code will be listed on the website when it is available.
- A dedicated group reservation link can be accessed from our website.

FROM THE AIRPORT:

- The San Diego International Airport (SAN) is 8.1 miles (13km) from the hotel.
- SuperShuttle provides ground transportation for approximately $12 each way.
- Provide group code UPBP7 to receive the discounted rate.
- To reserve the SuperShuttle, call 1-800-258-3826 (toll free in the U.S.) or visit www.supershuttle.com.

ORLANDO, FLORIDA

November 5-9, 2018

DoubleTree by Hilton at the Entrance to Universal Orlando
5780 Major Boulevard
Orlando, Florida 32819

HOTEL INFORMATION:

- A limited number of rooms have been reserved for course attendees.
- The standard single/double room rate will be the prevailing U.S. Federal Government per diem rate for Orlando at the time of the event (FY2018) plus applicable taxes. The FY2017 U.S. Federal Government per diem rate is $133.
- People in our room block receive free in-room internet and a discounted parking rate.
- The room block will only be held until October 17, 2018.
- Make a hotel reservation by calling 1-800-222-8733.
- The group rate code will be listed on the website when it is available.
- A dedicated group reservation link can be accessed from our website.

FROM THE AIRPORT:

- The Orlando International Airport (MCO) is 18 miles (29 km) from the hotel.
- Mears Transportation provides 24 hours shuttle service for approximately $19 one-way ($30 round trip).
- Mears reservations can be made online at www.mearstransportation.com or by phone at 407-423-5566

HOW TO REGISTER

Online aeroshortcourses.ku.edu

Phone 785-864-5823 / 877-404-5823 toll-free in the U.S.

Mail KU Professional & Continuing Education
1515 Saint Andrews Drive
Lawrence, KS 66047-1619

To register by mail, please use the registration form on page 64 of this catalog.

Registration

Course registration is limited and will be accepted in the order received. Payment is due upon registration. A registration confirmation will be emailed to each paid registrant. If you do not receive a confirmation, please contact us.

Early Registration Discount

Register early and save. Register and pay by the early registration deadline and save up to $200 on the course regular registration fee. Early registration deadlines are listed on each course description page. Registrations that occur after the early registration deadline will be charged the regular registration fee.

U.S. Federal Government Employee Discount

Select short courses are available to U.S. federal employees at 10% off the registration fee. To receive the federal employee discount, you must enter the code FGVT116 during the online checkout process. Please note that you must validate your eligibility to receive this discount by entering your U.S. government email address (ending in .gov or .mil) when creating your online registration profile. This discount is available for both the early registration and regular registration fees.

Payment

All fees are payable in U.S. dollars and due upon registration.

Payment by Credit Card
Online registrations must be paid by credit card. KU accepts MasterCard, VISA, Discover and American Express.

Payment by Check (personal or company check) or Money Order
Please mail your registration form and a check or money order in U.S. dollars to the address listed. Make your check or money order payable to "The University of Kansas". Please reference "KU Professional & Continuing Education" on the check. A $30 fee will be charged for returned checks.

Payment by Purchase Order or Wire Transfer
The University of Kansas requires payment upon registration. If your organization requires use of a purchase order before payment is issued or must pay by wire transfer, please contact the Registration Center at kupce@ku.edu. Please note that to receive the Early Registration Discount, full payment will be required before the early registration deadline as listed on each course page. After the deadline, your registration may be canceled and you can enroll again at the regular course fee.

How To Register Online

The KU Aerospace Short Course Program's new registration system makes it easy to register and pay for your short course online. The new registration system tracks your progress toward a Certificate of Specialization, and allows you to access course completion certificates in your customer profile.

Please follow these directions to register online:

Select your course
Click on the available session (course dates and location) you would like to attend. To register for the session, click the red ADD TO CART button at the bottom of the page.

Create an account or sign-in
1. Create an account: if you have not yet created an account, click on the blue Add Attendee button, and create your profile. Click the red SUBMIT button. You will automatically be added to the session.

2. Sign-in: if you have previously created an account, click the blue Sign in button. Once you have signed in, you will see a box "Add Attendees to Session." Click the black down arrow, and add yourself to the session.

Do you have a discount code?
If you have a discount code (for example, the U.S. Federal government employee discount code), enter that code in the PROMO CODE box, then click the red PROMO CODE button. You will see the discounted amount, and the "Total price" should reflect the discount.

Checkout and pay
1. Click the red Checkout button.

2. Under Billing Information, answer "How did you hear about us?" by choosing an option from the drop down menu. Click the red NEXT button.

3. Under Summary Review, please review your order, including the class name, dates, location and price. If everything appears to be correct, click the red SUBMIT ORDER button.

4. Enter your credit card information, and click the green Continue button.

5. If your payment is accepted, you will receive an emailed receipt, acknowledging your payment.

6. You will also receive a Registration Confirmation email, with an attachment that includes important details about the session for which you have registered.

7. Please note that Registration Confirmations are run at specific times during the day, so you may not receive this confirmation immediately. If you do not receive a Registration Confirmation within 24 hours of registering, please contact the Registration Center at kupce@ku.edu.

How To Register By Mail

1. Select a course.

2. Download the registration form (PDF) from our website, or use the form on page 64 of this catalog.

3. Complete the form and attach a check or money order payable to University of Kansas.

4. Mail the form and payment to:
KU Professional & Continuing Education
1515 Saint Andrews Drive
Lawrence, KS 66047-1619

How To Register By Phone

If you would like to register by phone, please contact our KU Registration Center at 785-864-5823 or 877-404-5823 toll-free in the U.S.

Policies

Audio or Video Recording Audio or video recording is not permitted in the classroom.

Cancellation Policy KU Professional & Continuing Education reserves the right to cancel a course and return all the registration fees in the event of insufficient registrations, inclement weather or other unforeseen circumstances. The liability of the University of Kansas is limited to the registration fee. The University of Kansas will not be responsible for any losses incurred by a registrant including, but not limited to, airline cancellation charges or hotel deposits.

If you are unable to attend a course, you have the following options:

- **Send a qualified substitute**
  Please contact the Registration Center at kupce@ku.edu to inform them you will not be attending and provide your substitute's name. Ask your substitute to also contact the registration department to provide his/her complete registration information.

- **Transfer or Request a Refund**
  - **For Public Short Courses:** Contact the Registration Center at kupce@ku.edu at least two weeks prior to the course start date to receive a full refund. Cancelations made after the two-week deadline, but before the course start date, are eligible to receive a refund less a $250 administrative fee or transfer to another course. If transferring, you have one year from the original course date to complete a short course of equal value.
  - **For Self-Paced (Asynchronous) and Live (Synchronous) Online Courses:** No refunds or transfers will be granted for the class once the published start date has passed and/or the student has accessed the Blackboard class site. A full refund of registration fees, less a $30 administrative fee, will be approved if requested in writing prior the published start date and/or accessing the course. The cost of any text or course materials that have already shipped will also be withheld from your refund.

Please note that if you fail to cancel and do not participate, you are still responsible for payment.

Certificate of Attendance A certificate of attendance is awarded to each participant who is present for 100 percent of the course.

CEUs Continuing Education Units (CEUs) are assigned to each course and are listed on each course page. CEUs may not be used for college credit.

Course Materials The course materials (course notes) are for participants only and are not for sale.

Course Schedule The University of Kansas Professional & Continuing Education and/or its instructors reserve the right to adjust course outlines, schedules and/or materials. Course times and total hours are approximate and may be adjusted by the instructor(s) as the situation warrants.

Instructor Substitution The University of Kansas Professional & Continuing Education reserves the right to substitute an equally qualified instructor in the event of faculty illness or other circumstances beyond its control.

Nondiscrimination Policy The University of Kansas prohibits discrimination on the basis of race, color, ethnicity, religion, sex, national origin, age, ancestry, disability, status as a veteran, sexual orientation, marital status, parental status, gender identity, gender expression and genetic information in the University's programs and activities. Retaliation is also prohibited by university policy. The following person have been designated to handle inquiries regarding the non-discrimination policies: Executive Director of the Office of Institutional Opportunity and Access, I0A@ku.edu, 1246 W. Campus Road, Room 153A, Lawrence, KS, 66045, (785)864-6414, 711 TTY. For the most current information on this subject, visit http://policy.ku.edu/IOA/nondiscrimination.

Privacy Policy The University of Kansas Professional & Continuing Education does not share, sell or rent its mailing lists. You have our assurance that any information you provide will be held in confidence by the University of Kansas Professional & Continuing Education. We occasionally use mailing lists that we have leased. If you receive unwanted communication from KUPCE, it may be because your name appears on a list we have acquired from another source. In this case, please accept our apology.

Program Accessibility We accommodate persons with disabilities. Please call (785) 864-5823, or email ProfessionalPrograms@ku.edu to discuss your needs. To ensure accommodation, please contact us at least four weeks before the start of the course. See the nondiscrimination policy above.

Returned Check A $30 fee will be charged for returned checks.

AEROSPACE SHORT COURSES

2018 REGISTRATION FORM

Easy Ways to Register

Mail *Complete the registration form and mail with payment to:*

KU Professional & Continuing Education Aerospace Short Courses
1515 Saint Andrews Drive
Lawrence, Kansas 66047-1619 USA

Online aeroshortcourses.ku.edu

Phone Toll-free 877-404-5823 or 785-864-5823

TDD 800-766-3777

1

Please print. ***If your mailing address requires a different format than indicated here, please use that format and ignore the printed guidelines.***

Full name (first, middle initial, last name or surname, suffix) ☐ Male ☐ Female

Email address (Your confirmation letter and receipt will be sent to this email address.)

Company or organization

Position/job title

Mail stop, building or room number (if needed)

Street address or post office box ☐ Home ☐ Work

City, state or province | Zip+four or postal code | Country

Daytime phone | Alternate/evening phone

If you will need special accommodation, please call 785-864-5823, or email ProfessionalPrograms@ku.edu.

2

Please register me for the following course:

Course Name | Course #

Dates | Location

3

FEES (Registration fees are listed on each course page. Please check the course page online at aeroshortcourses.ku.edu or in the Course Catalog.)

☐ Early registration fee (must be paid before the published early registration deadline)

☐ Regular registration fee

☐ I am a U.S. federal employee requesting the federal discount (10% off the registration fee). Enter discount code (required): _____
(*Note: Not all courses are eligible for this discount. Please check the course page online or in the Course Catalog.)*

4

PAYMENT

Amount due $_____

☐ Check enclosed, payable in U.S. dollars, to **The University of Kansas**.

☐ Please call me at the number listed above so I can pay by credit card.
Note: KU's business hours are 8:00 a.m.–5:00 p.m. CDT, Monday-Friday. If paying by credit card, you may opt to register and pay online at aeroshortcourses.ku.edu.

Payment by Purchase Order or Wire Transfer

The University of Kansas requires payment upon registration. If your organization requires the use of a purchase order before payment is issued, or if you must pay by wire transfer, please contact the Registration Center at kupce@ku.edu. Please note that to receive the Early Registration Discount, full payment will be required before the early registration deadline as listed on each course page. After the deadline, your registration will automatically be canceled and you can enroll again at the regular course fee.

How did you hear about this KU Aerospace Short Course?

☐ Referral ☐ Course catalog ☐ Website ☐ Email ☐ LinkedIn group ☐ Print ad ☐ Tradeshow ☐ Other _____

AEROSPACE
SHORT COURSES

The professional training choice of the global aerospace community.

THE UNIVERSITY OF KANSAS
Professional & Continuing Education

1515 St. Andrews Drive
Lawrence, KS 66047-1619
U.S.A.

OFFERING INDIVIDUAL SHORT COURSES AND CERTIFICATES OF SPECIALIZATION IN:

Aerospace Compliance
Aircraft Design
Aircraft Maintenance & Safety
Aircraft Structures
Avionics & Avionic Components
Electrical Wiring Interconnection System (EWIS)
Electromagnetic Effects
Flight Tests & Aircraft Performance
Unmanned Aircraft

aeroshortcourses.ku.edu