

# AEROSPACE

## SHORT COURSES

## Unmanned Aircraft System Software Airworthiness (AERO0500)

Instructor: Willie J. Fitzpatrick, Jr.

### Course 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.

### Course 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.

## **Learning Objectives**

- Identify key elements required to evaluate or achieve the successful airworthiness substantiation of Unmanned Aircraft System (UAS) software
- Apply techniques and approaches for documenting and evaluating the software substantiation/safety case for acceptance by the Unmanned Aircraft System Airworthiness Qualification/Certification Authority
- Assess the readiness of the UAS software to transition to various software and system life-cycle phases
- Identify critical areas of risk to the successful substantiation of the UAS software airworthiness
- Apply acquired knowledge and skills to real world scenarios
- Prepare the software portion of an UAS Assurance Case

## **Course Outline**

### **Day One**

- Introduction and overview of UAS software requirements
- Software acquisition/development and relationship to software airworthiness in unmanned aircraft systems
- Software airworthiness in the context of the system safety/airworthiness program
- Software airworthiness products during the system life-cycle
- Software airworthiness assessment process during the system life-cycle

### **Day Two**

- Assessment of planning and requirements analysis
- Assessment of preliminary and architectural design
- Assessment of detailed design
- Assessment of coding and unit test
- Assessment of software integration and formal qualification test
- Assessment of system integration test and aircraft integration/ground test/flight test

### **Day Three**

- Developing recommendations for formal flight release/airworthiness release to approval authority
- Documenting the UAS software airworthiness assurance case
- Useful guidebooks, handbooks and procedures in UAS software airworthiness
- Keys to successful software airworthiness process implementation for UAS
- Problem areas, concerns, and lessons learned
- Future trends in UAS software airworthiness

## **Classroom hours / CEUs**

21.00 classroom hours

2.1 CEUs

## **Certificate Track**

Avionics and Avionic Components  
Unmanned Aircraft

## **Course Fees**

Early registration course fee: \$1,995 if you register and pay by the early registration deadline (45 days out).

Regular registration course fee: \$2,095 if you register and pay after the early registration deadline.

## **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** during the 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.

## **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.

## **Instructor Bio**

**Willie J. Fitzpatrick, Jr.**, is a Senior Software Engineer and Subject Matter Expert, specializing in software engineering, airworthiness, and safety at TriVector Services, Inc. He has over 40 years of experience in the software/systems engineering area. His experience includes the development and assessment of automatic control systems, systems engineering and software engineering on various aviation and missile systems. He recently retired as the chief engineer and subject matter expert in the Software Engineering Directorate (SED) of the U.S. Army Research, Development, and Engineering Command's Aviation and Missile Research Development and Engineering Center. Fitzpatrick served for over 12 years as the Chief, Aviation Division, SED and was responsible for the management of life cycle software engineering support and software airworthiness assessments for several aviation systems, including manned rotary and fixed wing aircrafts and unmanned aircraft systems. Fitzpatrick was honored by the Huntsville Association of Technical Societies as the recipient of the Sixth Annual Joseph C. Moquin Award in 2011, where he was also recognized as the IEEE Huntsville Section 2011 Professional of the Year. He has served in various officer capacities for the IEEE Huntsville Section, including Section Chair for 2007 and 2008. Fitzpatrick holds a B.S. in electrical engineering from Tuskegee University, an M.S. in electrical engineering from Stanford University and a Ph.D. in industrial and systems engineering from the University of Alabama-Huntsville.

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