Conceptual Design of Unmanned Aircraft Systems (AERO0210)

Instructor: Bill Donovan

Course 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

Course Description

This course provides a conceptual approach to the 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.

Who Should Attend?

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. Basic knowledge of spreadsheet analysis methods is assumed.
Learning Objectives

• Design and analyze overall unmanned aircraft systems
• Estimate sensor size and performance and impact on overall system performance
• Understand basic elements of UAS communications and know how to estimate overall communication system size and power requirements
• Develop overall concepts of cooperation and assess impacts of sortie rate and supportability
• Understand key air vehicle configuration drivers, how to estimate aero/propulsion/weight/stability, overall air vehicle performance, size and tradeoffs

Course Outline

Day One
• Course introduction
• Introduction to UAS
• UAS conceptual design issues
• Fundamentals of system design
• UAS operating environments
• Sortie rate estimates

Day Two
• Requirements analysis
• Control station considerations and sizing
• Communication considerations/sizing
• Payload (EO/IR and radar) considerations and sizing
• Reliability, maintainability and support
• Life cycle cost
• Decision making

Day Three
• Air vehicle parametric design
• Conceptual level aerodynamics
• Standard atmosphere models
• Parametric propulsion

Day Four
• Mass properties
• Parametric geometry
• Air vehicle performance
• Mission assessment
• Methodology and correlation

Day Five
• Air vehicle optimization
• Overall system optimization
• Class design presentation
Classroom hours / CEUs
31.50 classroom hours
3.15 CEUs

Certificate Track
Aircraft Design, Unmanned Aircraft

Course Fees
Early registration course fee: $2,495 if you register and pay by the early registration deadline (45 days out).

Regular registration course fee: $2,695 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.

Netherlands Defence Academy Discount
This course is available to Netherlands Defence Academy employees at a discounted registration fee. Please contact the NDA Procurement and Contracting department for details. Please note that you cannot register using our online system when requesting this discount.

This class is available for delivery at your company.
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 on a specific topic. For more information on on-site course delivery, or to request a cost proposal, please contact us at 913-897-8782, or email us at ProfessionalPrograms@ku.edu.
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