AEROSPACE
SHORT COURSES

Aircraft Electrification: Architectures, Technologies, and Components (AERO0710)

Instructor: Pascal Thalin

Course Description

This course will strengthen students' understanding of aircraft electrification for fixed-wing and VTOL aircraft segments.

The stakes, challenges, and applications are addressed in detail. Various degrees of electrification are presented from the perspectives of principles, architectures, technologies, operations and performance.

Design and validation methodologies and means constitute an integral part of the course. Informed case studies also illustrate how design criteria specific to a given aircraft segment (VTOL, commuter, regional, short- and long-range) are implemented. Focus is made on integration aspects. Moreover, for segments considered, payload, range, energy efficiency, and emissions performance are compared with reference aircraft.

Who Should Attend?

Aerospace engineers and managers interested in partial/total electrification of aircraft.

Mechanical engineers interested in learning how to design and incorporate electrified portions into their systems.

General knowledge in engineering and/or management (graduate to post-graduate) is recommended. Basic knowledge in mechanics & electricity will be helpful.

Learning Objectives

- Assess architectures, key components and technologies for aircraft electrification (hybrid-electric to full-electric)

- Identify solutions for electrified Propulsion, electrical energy sources, networks, and their integration

- Identify Systems electrification technology bricks, performance, and benefits (power generation, distribution, EWIS, environmental control, actuation, and other loads)

- Assess aircraft configurations with batteries only (full-electric), or a combination (hybrid-electric) of one or more energy sources: batteries, fuel cells, turbogenerators, (hybrid) turbo(shaft/prop/fan) engines

- Analyze design configurations for incremental aircraft and newly-designed aircraft developments

- Analyze aircraft operations and emissions performance

Classroom hours / CEUs
31.5 classroom hours
3.15 CEUs

Certificate Tracks
Aircraft Design (AD)

Course Fees
Early registration course fee: $2,595 if you register and pay by the early registration deadline (45 days out).

Regular registration course fee: $2,795 if you register and pay after the early registration deadline.

Course Materials
Course materials, including outlines, presentation copies, and supplementary materials, will be accessible through Canvas, KU's online learning system. Instructions to access Canvas will be provided upon completed registration. Students are required to bring a computer or other electronic device with PDF-viewing capabilities with them to class each day. If you require accommodation contact us at professionalprograms@ku.edu and we will work with you on an accessible solution.

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

Pascal Thalin is a Senior Aerospace Expert and Instructor with Aero Mobility, a company engaged with engineering and development of advanced air mobility solutions. In various leadership roles with aircraft, engine and system manufacturers, he has gained longstanding experience in R&D, certification, program management, and business development of power, propulsion, actuation, and avionics systems for a wide range of aircraft. He is a long-standing member of SAE in aeronautics, serving in several key committee roles related to air mobility, including leading standardization. As for sustainable solutions for aerospace, spanning across key topics such as electrification, and alternative fuels including Sustainable Alternative Fuels (SAF) and Hydrogen, his primary focus is on how to best support industry efforts in the lead-up to net-zero carbon emissions in the foreseeable future. This includes helping address challenges coming with wider uptake of SAF, leapfrog hydrogen-based powertrains, and related infrastructure. This also includes synergistic approaches with other mobility sectors. For conventional, hybrid-electric and electric aircraft, along with sustainable aviation in general, he is committed to optimized solutions in design, certification, operations, and business. His publications include the book Fundamentals of Electric Aircraft, which offers in-depth insights into innovative architectures and technologies enabling aircraft electrification. Pascal holds an engineering degree from INP-ENSEEIHT, and a Ph.D. in electrical engineering from the National Polytechnic Institute of Toulouse, France.

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