

# AEROSPACE

## SHORT COURSES

### **Hydrogen-based Aircraft and Airports: Concepts, Technologies, and Configurations (AERO0720)**

**Instructor:** Pascal Thalin

#### **Course Description**

This course will equip students with the skills necessary to understand hydrogen as an alternative fuel source including its integration with conventional and cleaner fuels for aircraft and airports.

The stakes, applications and constraints are addressed in detail. Use cases (airports/aircraft), as well as short-, medium- and long-term aircraft implementations, are presented from the perspectives of architectures, technologies and operational ecosystems. Design and validation methodologies and means are an integral part of the course. Informed case studies also illustrate how design criteria specific to the addressed aircraft segments are considered while focus is made on integration aspects. Finally, safety considerations when handling and utilizing hydrogen are reviewed for aircraft as well as airport planning and infrastructure.

#### **Who Should Attend?**

Aviation and Aerospace Engineers and Managers (design, testing, certification, operations, maintenance, airport planning).

Aerospace engineers interested in electric power generation/utilization leveraging hydrogen, hybrid-electric, hydrogen-electric and hydrogen propulsion systems.

Electrical/mechanical engineers interested in zero-carbon UAS and VTOL, regional, short- and medium-range aircraft.

General knowledge in engineering and/or management (graduate to post-graduate) is recommended. Basic knowledge about aircraft propulsion and systems, or aircraft/airport operations and/or maintenance will be helpful.

**Learning Objectives**

- Identify technology bricks and key components for UAS, VTOL, General Aviation, Regional, Short- & Medium-range aircraft
- Apply concepts and methods for developing hydrogen-based aircraft and airport solutions with gaseous and liquid hydrogen
- Adapt space and automotive technologies for aircraft implementation (cross-sector synergies)
- Identify production-to-utilization pathways (feedstocks, processes) for hydrogen
- Evaluate performance (efficiency and emissions)
- Understand and apply specific criteria and rules pertaining to the design of airport infrastructure, and aircraft/airport safety and security considerations

**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](mailto: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-ENSEEIH, and a Ph.D. in electrical engineering from the National Polytechnic Institute of Toulouse, France.

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