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Aerodynamics & Flight Mechanics

COURSE OVERVIEW

This foundational course bridges the gap between fluid dynamic theory and the practical reality of aircraft flight. It explores the fundamental principles governing how air interacts with moving bodies to generate lift and drag, and then applies these principles to analyze the stability, control, and performance of aircraft. Participants will progress from the aerodynamics of air foils and wings to the complete flight mechanics of an airplane, examining the forces and moments that dictate its behavior in various phases of flight.

WHO SHOULD ATTEND?

This course is essential for aerospace and mechanical engineers, aircraft designers, flight test engineers, and engineering leads involved in the analysis, design, or testing of aircraft, UAVs, and other flight vehicles to deepen their understanding of how aerodynamic and mechanical principles dictate vehicle performance, stability, and control.

COURSE OUTCOMES

Delegates will gain the skills and knowledge to:

- Apply fluid mechanics principles, including Bernoulli's Equation, to aerodynamic flows.
- Analyze aerodynamic characteristics of air foils and wings.
- Calculate aircraft performance for take-off, climb, cruise, and landing.
- Evaluate static stability and control, including longitudinal stability and control effectiveness.
- Interpret how design affects aerodynamic properties and flight performance.
- Assess the impact of environmental factors, such as wind and air density, on aircraft aerodynamics and performance.

KEY COURSE HIGHLIGHTS

At the end of the course, you will understand;

- Fundamental principles of aerodynamics including air foil and wing aerodynamics.
- How lift, drag, and pitching moments affect aircraft performance.
- The role of atmospheric conditions and their impact on flight dynamics.
- Aircraft stability and control including static and dynamic stability.
- Flight mechanics concepts covering take-off, landing, climb, cruise, and manoeuvring.
- How to analyze flight envelopes and manoeuvre diagrams for safe operation.
- Applications of propulsion systems and their effects on overall aircraft flight performance.

All our courses are dual-certificate courses. At the end of the training, the delegates will receive two certificates.
1. A GTC end-of-course certificate
2. Continuing Professional Development (CPD) Certificate of completion with earned credits awarded