

# Aerospace Engineering: Aircraft Fundamentals and Advanced

*Aerospace and Aeronautical Engineering: Master the mechanics of airplanes including aerodynamics, flight maneuvers, Jet engines and many more.*

## Course Structure:

### Module 1: Introduction

Presentation of the Course

Course Structure

Introduction to Airplanes and main elements

### Module 2: Classification of airplanes

General Aviation

Commercial Aircraft

Military Aircraft

### Module 3: Aerodynamics

Airplane Forces and Trajectory

Lift and Drag: Newton's 3<sup>rd</sup> Law and Bernoulli

3D Wings Lift and Drag

High Lift Devices

Turbulence and Stall

### Module 4: Airplane Propulsion Engines (JETs)

Engines Overview

Inlets

Compressors

Turbines

Nozzles

TurboJet vs TurboFan Review

### Module 5. Flight Mechanics

Gravity Center and Pressure Center

Control Surfaces of an Aircraft and Maneuvers

### Module 6. Aircraft Performance

Definition of Weights

Range of an Aircraft as function of Weight

Optimization of Range – Breguet Equations

