MILITARY AIRCRAFT TECHNOLOGY

This course is intended to provide an overview of primary Military Fixed Wing Aircraft Technologies. Course covers the fundamentals of aeronautics and aircraft technology with supplementary aerodynamics, flight mechanics, structural engineering and avionics information.

- **Introduction**, 3 hours
  - Scope
  - History
  - Military Aircraft Worldwide
  - Major Manufacturers and Models

- **Aircraft Basics**, 2 hours
  - Basic Aerodynamics and Performance
  - Aircraft Design Challenges
  - Design Concepts

- **Fundamental Aerodynamics**, 5 hours
  - Fundamentals of Aerodynamics
  - Aerodynamic Forces and Moments
  - Aerodynamic Design Considerations on Fixed Wings
  - Computational Fluid Dynamics

- **Stability and Control**, 4 hours
  - Aircraft Flight Mechanics
  - Basic Control Theory
  - Fundamentals of Feedback Control
  - Dynamics and Control
  - Automatic Flight Control Systems
  - Autopilots and Flight Directors, Guidance and Navigation

- **Transonic/Supersonic Flow**, 2 hours
  - Viscous Flow & High Speed Aerodynamics
  - Shock Waves

- **Structures and Materials**, 4 hours
  - Structural Loads
  - Airframe Structures
  - Material Selection
  - Composite Structures/New Technologies
- **Propulsion**, 3 hours
  - Basic Propulsion
  - Propellers
  - Gas Turbines
  - Turbojets/Turbofans
- **Noise**, 2 hours
  - Physics of Acoustics
  - Noise Reduction Techniques
- **Vibration**, 2 hours
  - Physics of Vibration
- **Basic Avionics**, 3 hours
  - Instrumentation
  - Communication Systems
  - Navigation Systems
  - Radars & Sensors
  - Optical Systems
- **Signature**, 2 hours
  - Radar/Thermal Signature
  - Electronic Warfare Applications
  - Stealth Design & Technologies
- **Unmanned Combat Air Vehicles**, 4 hours
  - UAV Mission Systems
  - Autonomous Flight Control
  - Ground systems
- **Aircraft Systems & Maintenance**, 2 hours
  - Electrical Systems
  - Hydraulics/Pneumatics
  - Fuel Systems
  - Landing Gears
  - Basic Maintenance Practices
  - Lifecycle Management
- **Aircraft Design Challenges**, 2 hours
  - Technological Challenges
  - New concepts
- **Airworthiness**, 2 hours
  - Airworthiness Basics
  - Major Certification and Qualification Regulations

- **Aircraft Systems Integration**, 2 hours
  - Projects of Aircraft Systems Integration

- **Flight Testing**, 2 hours
  - Flight Testing Principles
  - Experimental Methods
  - Instrumentation & Testing
  - Data Analysis

- **Pilot Lecture**, 1 hour
  - Pilot’s View of Flying
  - Personal Experiences

- **Case Study**, 2 hours
  - Interactive Application on A Case Study

- **Laboratory Visit**, 3 hours
  - Demonstration of Basics on an Aircraft