Small Unmanned Aircraft: Theory and Practice

COURSE SYNOPSIS

Synopsis

Unmanned aircraft systems (UAS) are playing increasingly prominent roles in defense programs and defense strategy around the world. Technology advancements have enabled the development of both large unmanned aircraft (e.g., Global Hawk, Predator) and smaller, increasingly capable unmanned aircraft (e.g., Wasp, Nighthawk). As recent conflicts have demonstrated, there are numerous military applications for unmanned aircraft, including reconnaissance, surveillance, battle damage assessment, and communications relays. The objective of this course is to enable participants to develop a complete end-to-end flight simulator that includes realistic flight dynamics, sensor models, autopilot design, and path planning.

Learning Outcomes

At the end of the course, the student should be able to:

1. Implemented each piece of the puzzle and therefore understand how each piece fits together.
2. Understand the inner workings of a sophisticated flight simulation package that can be used in their future research projects.   .

Delivery Mode

Lectures/Case Study/Presentation that shall be conducted for a continuous period of 4.5 working days. The entire programme shall contain 16 x Lectures and 3 x Exercise.

Duration

4.5 days

Target Participants

Military/Security Agency officers of Lt Col, Maj or Capt rank and equivalent

Topics Covered
- 1 - Introduction
- 2 - Coordinate Frames
- 3 - Kinematics and Dynamics
- 4 - Forces and Moments
- 5 - Linear Design Models
- 6 - Autopilot Design
- 7 - Sensors
- 8 - State Estimation
- 9 - Nonlinear Design Models
- 10 - Waypoint and Orbit Following
- 11 - Path Manager
- 12 - Path Planning
- 13 - Cameras

Course Fee
RM 1,500.00

Lecturers/Tutors

Lt Col Assoc Prof Mohamed Tarmizi Ahmad (Retired). He received his BSc Aeronautical Engineering in Kingston Polytechnic and MSc in Aerodynamic and Applied Flight Mechanics in Cranfield Institute of Technology UK. He has vast experiences in light aircraft maintenance, manufacturing and flight-testing, development of guided system including missiles and UAV. He is also a pilot with PPL, had assembled, and tested experimental aircraft and flight simulator. He is also an inventor and designer and had won gold awards in local and international invention competitions.