Course Name: Drone Operations: A Practical Approach (Flight, Planning & Field Applications)

Contact Hours: 30 hours

Pre-requisite: N/A

Abstract

This is a practical, skill developing course designed to equip participants with the practical competencies required to safely operate unmanned aerial vehicles (UAVs) in real-world environments. The course starts with first principles and allows participants to master control with both indoor and outdoor flight exercises. It also covers mission planning, programmed flights, and field workflow applications relevant to Trinidad and Tobago and the wider Caribbean.

Participants will gain exposure to how drones are currently used across key sectors such as agriculture, construction, energy, inspection, surveying, and surveillance while developing a strong foundation in UAV safety, regulations, flight principles, and data capture. Guided by a certified UAS practitioner, learners will progressively build confidence through structured exercises, culminating in the design and execution of a real-world mission project aligned to local operational needs.

This course is ideal for individuals seeking practical drone skills for hobbyists, professional use, business applications, or entry into the growing UAS industry.

Target Audience

This course is geared towards:

- Aspiring drone pilots seeking practical, hands-on training
- Professionals in agriculture, entertainment, construction, energy, utilities, engineering, and infrastructure inspection
- Security, safety, and emergency response personnel
- Technicians, engineers, and technologists looking to expand their skill set
- Entrepreneurs and small business owners exploring commercial drone applications
- STEM educators and technology enthusiasts
- Beginners with no prior drone experience who are interested in structured, supervised flight training

Learning Outcomes

On completion of this course, learners will be able to:

- Explain the fundamentals of drone technology, use cases, and safety considerations within the Trinidad and Tobago regulatory context.
- Demonstrate safe pre-flight, in-flight, and post-flight checks during drone operations.
- Manually pilot drones with precision, including take-off, hovering, landing, navigation, and basic manoeuvres.
- Understand and apply principles of drone flight to enhance operational performance.
- Understand and operate drone sensors, telemetry systems, and flight controls.
- Execute basic programmed and automated flights, including return-to-home (RTH) and programmed flight paths.
- Operate gimbals to capture aerial photographs and video.
- Apply drones to practical field applications such as inspection, mapping, surveying, and visual assessments.
- Design, script, and execute a mission relevant to local industry needs, incorporating safety, data capture, and operational planning.
- Present and interpret drone captured data while demonstrating an understanding of emerging UAV applications within Caribbean industries.

Course Content

Week 1: Introduction to Drones & Safety in Trinidad and Tobago

- Overview of drone use globally and locally (Agriculture, Construction, Energy, National Security industries)
- Definitions, Use Cases, Types
- Benefits, Safety and Regulations
- Hands-on: connecting, calibrating, and manual take-off, hovering, and landing indoors (CoDrone EDU)

Week 2: Principles of Drone Flight

- Understanding Airfoil design, lift, thrust, and control
- Safety Pre-Flight Checklists
- Manual piloting drills for precision in confined spaces (CoDrone EDU)
- Basic troubleshooting and drone care (battery management, propeller safety)

Week 3: Operations and Programmed Flights

- Understanding drone sensors (altitude, gyroscope, IR)
- Programming simple commands: automated take-off, hover, land, RTH
- Mini-challenge: Navigation through cones/gates (CoDrone EDU)
- Hands-on activity: Programmed flight

Week 4: Outdoor Exercise - Untitled

- Hands-on activity: Powering On and understanding the Telemetry and Controls
- Drone Safety and using the Preflight Checklist
- Flight Operations

Week 5: Outdoor Exercise - Untitled

- Basic maneuvers - Orbits
- Meta Data & Applications in T&T: Photos, Inspection, Mapping,
- Practical: Obstacle detection and Collision avoidance

Week 6: Outdoor Exercise - Untitled

- Basic Commands - Variables
- Gimbal operations
- Photo and Video controls

Week 7: Outdoor Exercise - Untitled

- Free Flying
- Group Exercises: Navigation and Time trials
- Final project: Design and script a mission relevant to local needs (e.g., visual inspection, UAV survey)

Week 8: Final Project Presentation and Course Wrap-Up

- Participants/teams present their drone capture data
- Data Capture and Software Integration
- Recap of Learnings and Regulations/Technological transformation within Caribbean Industries