Course Name: Drone Operations and Coding Essentials 101: A Practical Approach

Contact Hours: 24 hours

Pre-requisite: N/A

Abstract

Drone Operations and Coding Essentials 101: A Practical Approach equips you with the practical skills to safely operate and program drones using Blockly and Python, while exploring real-world applications relevant to Trinidad and Tobago.

Drones are transforming industries globally and locally—from agriculture and energy to entertainment and public safety.

Take your curiosity for technology to the skies!

Target Audience

This course is geared towards:
- Hobbyist
- STEM enthusiasts
- Educators, and
- Early-career professionals interested in drones, coding, and practical STEM applications relevant to Trinidad and Tobago

Learning Outcomes

On completion of this course, learners will be able to:
- Learn to pilot drones manually and through programming
- Gain practical coding skills using Blockly and Python with CoDrone EDU
- Use drone sensors for navigation and data collection
- Explore real-world applications of drones in Trinidad and Tobago (Agriculture, Energy, Entertainment and Public Safety Industries)
- Understand drone safety, local regulations, and responsible operations in T&T
- Develop teamwork and problem-solving skills through project-based learning
- Complete a final project demonstrating practical skills

Course Content

Week 1: Introduction to Drones & Safety in Trinidad and Tobago
- Overview of drone use globally and locally (Agriculture, Energy, Entertainment and Public Safety Industries)
- CoDrone EDU system introduction: hardware, software, and sensors
- Hands-on: connecting, calibrating, and manual take-off, hovering, and landing indoors

Week 2: Principles of Drone Flight
- Understanding drone stability, lift, thrust, and control
- Manual piloting drills for precision in confined spaces
- Basic troubleshooting and drone care (battery management, propeller safety)

Week 3: Getting Started with Blockly Programming
- Introduction to block-based coding (loops, sequences, conditionals)
- Connecting CoDrone EDU to Blockly
- Programming simple commands: automated take-off, hover, land
- Hands-on activity: first programmed flight

Week 4: Navigation and Programming Challenges
- Programming directional flight (forward, backward, turning)
- Using loops for pattern flying (square, figure-8)
- Mini-challenge: programmed navigation through cones/gates

Week 5: Using Drone Sensors for Practical Tasks
- Understanding and using CoDrone EDU's sensors (altitude, gyroscope, IR)
- Data collection basics: measuring distances and environmental data
- Applications in T&T: agriculture, environmental monitoring
- Practical: obstacle detection and avoidance

Week 6: Introduction to Python for Drone Programming
- Transitioning from Blockly to Python with CoDrone EDU
- Writing and testing simple Python scripts for drone control
- Applying coding to execute autonomous missions

Week 7: Real-World Drone Applications in Trinidad and Tobago
- T&T drone regulations and safety guidelines
- Case studies: drone applications in T&T (Agriculture, Environmental Surveys, Inspections, Disaster management)
- Discussing entrepreneurial opportunities using drones in T&T
- Final project planning: design and script a mission relevant to local needs (e.g., crop survey, 3d mapping)

Week 8: Final Project Demonstration and Course Wrap-Up
- Participants/teams present their programmed drone missions
- Showcase: objectives, coding used, challenges, and outcomes
- Reflection and pathways for further learning in drones and STEM