

Drone Senior Category

(14 – 19 Years Old)



(Surveillance Bird)

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Summary for Safe Cities: Senior Drone Category Competition

This document outlines the competition rules for the **Senior Drone Category** of the STEM Festival with a focus on **Surveillance Bird**. You'll have 2-3 months to acquire your drone (DJI Tello drone), perfect your flying skills and practice programming custom missions with the DJI Tello Python Software Development Kit (SDK) before traveling to Port Harcourt, the host city, for the competition.

Key Points:

- **Focus:** To develop, promote and showcase excellent drone remote piloting, programming, critical thinking, and problem-solving skills relevant to security and emergency response applications.
- **Skill Level:** This category is designed for 15 – 19 years old students with basic understanding of indoor flying and Python programming of DJI Tello drones.
- **Prerequisites:**
 - DJI Tello drone and Laptop: Competitor must own or have access to a functional DJI Tello drone and Laptop.
 - Personal mobile phone and basic experience with Tello mobile app: Ability to safely take off, fly and land the drone using the mobile app installed on personal mobile phone.
 - Python Programming: Basic understanding of Python Programming Language.
 - Familiarity with the DJI Tello drone SDK: Ability to code and deploy basic flight missions for the DJI Tello drone using the designated SDK.

Competition Format:

- **Preparation:** Utilize the allotted time to familiarise yourself with the requisite SDK, mobile application, and drone. Come with already written code for basic flight i.e. take off, land, move left, move up, etc. Furthermore, ensure your drone is in perfect flying condition for flying in our indoor competition environments.
- **The Challenge:** The competition will take place in Port Harcourt. Be prepared to demonstrate your remote piloting and programming skills through a series of pre-defined scenarios representing real-world emergency response.
- **Evaluation:** Judges will assess your remote piloting and programming skills. Accuracy, critical thinking, speed, innovation, and completion of the task will also be considered.

Ethics Code for Teams:

- Participating and learning are more important than winning the prizes.
- Teams are encouraged to learn and master new skills while having fun together.
- It is not whether you win or lose, but how much you learn that counts.
- Join the global community of inventors and practical problem-solvers across Africa and the globe at STEM Festival.

STEM Festival Team

Safe Cities

Junior Drone Category (15 – 19 years old)

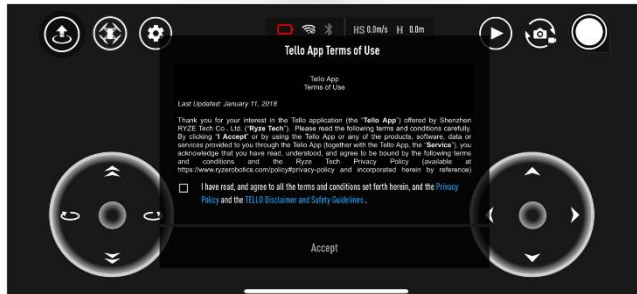
Category Focus: **Surveillance Bird**

Introduction:

Welcome to Port Harcourt City! In this bustling metropolis, assuming emergencies can strike anywhere, anytime. As a leading drone pilot or group of pilots, you've been tasked with flying through challenging environments for surveillance purposes.

About the DJI Tello

The DJI Tello is a compact and easy-to-fly drone equipped with advanced features such as high-quality image capture, precise hovering, and programmable flight patterns. With its lightweight design and intuitive control, the Tello is perfect for beginners and experienced pilots alike.



NB:
 The DJI Tello drone and mobile application

Mission:

Pilot the drone manually and autonomously as needed in various emergency response scenarios simulated in the specific tasks described.

Tasks:

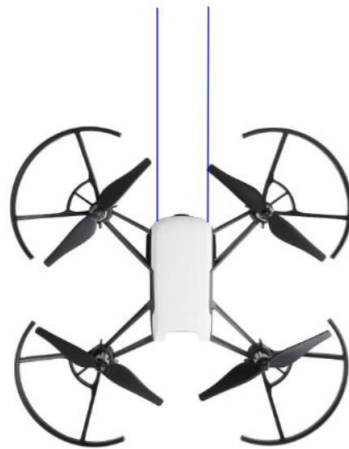
Total Points: 100

Task Number	Description	Points awarded	Extra Material Required
1.	Take-off autonomously, fly square pattern with 100 cm sides, and land	5	
2.	Take-off autonomously, fly circle pattern and land	5	
3.	Take-off autonomously, fly diamond pattern with 100 cm sides, and land	10	
4.	Take-off autonomously, take a team selfie and land	20	
5.	With the Tello mobile application, fly through designated flight route and pop all red balloons. You must fly only using video feed from the app, without looking at the drone.	30	Red balloon, Balloon popper attached to drone

6.	Take-off autonomously, fly through designated flight route and scan the competition area for yellow balls. Count all found yellow balls and land.	30	Yellow balls
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Overall Comments:

Please Note: Judges may award bonus (2pnts) points for exceptional performance beyond the core requirements. The balloon popper attachment will be provided to you during the competition. You are also allowed to come with yours if you wish to, however it must be up to 5 inches but less than 1ft. Below is a picture of a Tello drone with 2 balloon popper attachments. You are allowed to use 1 or 2 balloon popper attachments.



Remember:

- Always be alert and prioritize safety while performing the tasks.
- Wear safety goggles and gloves while working with the drones.
- Do not attempt to catch the drone while it is armed.
- In case of loss of control of the drone, move to muster point and allow the designated safety personnel to deal with the drone.

We wish you the best of luck in demonstrating your drone piloting and programming skills towards creating life-saving emergency response drone surveillance for African Cities!