



Smart Drones

Challenge Booklet 2026

Partner:



Organised by:



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SAFMC 2026 CATEGORY SMART DRONES CHALLENGE BOOKLET

CHANGE LOG

Version	Release Date	Description
1.0	03 Nov 2025	Official challenge booklet release
2.0	14 Nov 2025	Change in prize structure in Section 2.4
3.0	06 Feb 2026	Revision to technical rules in Section 5 <ul style="list-style-type: none">• Usage of DJI Tello Talent Expansion Kit not permitted for SAFMC 2026• Restriction on the usage of personal hotspot connection

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1. INTRODUCTION

Competition Schedule, General Rules and Regulations can be found in the “General Rules and Regulations” Booklet.

For Category Smart Drones¹, teams made up of **TWO (2)** to **FOUR (4)** members are expected to work together to code their programmable drone to perform tasks under given mission scenarios.

2. CATEGORY AWARDS

Award winners will be selected based on either presentation scores, performance on the competition’s challenge day, or a combination of both.

There is no limit to the number of awards that a team can win, but there may not be a winner for every award.

All scoring decisions made by the judges are **final**. For cases that require arbitration, the Singapore Amazing Flying Machine Competition (SAFMC) organising committee will have the **final** say.

The list of awards for Smart Drone Category is listed in the subsequent sections.

¹ Each team must include at least one Singapore citizen to be eligible to participate.

2.1. CHAMPIONSHIP AWARD

Award	Weightage
Presentation	30%
Challenge Performance	70%
Total	100%

This is the pinnacle award that any team can win. It is bestowed on the team that embodies the spirit of SAFMC. Teams are considered for the Championship Award based on their overall excellent performance during the presentation and actual challenge.

The following are the main categories for Smart Drones 2026:

Main Categories	Sub-categories	Level
Smart Drones - Beginner	Eagle Drone 1003	Primary
	DJI Tello Edu ²	Primary
Smart Drones - Intermediate	Eagle Drone 1003	Secondary / Integrated Programme (Year 1 to 4)
	DJI Tello Edu ²	Secondary / Integrated Programme (Year 1 to 4)

² Usage of DJI Tello Talent Expansion Kit is not permitted for SAFMC 2026 competition.

2.2. THE BEST PRESENTATION AND KNOWLEDGE AWARD

The presentation plays an integral part for teams who wish to compete for the SAFMC Championship Award. In addition, the teams will be assessed for different awards listed in Section 2.

The theme of this year's Smart Drone is **Innovate. Integrate. Impact.** Teams should present their innovative idea, explain how it integrates drone technology with real-world applications, and highlight the positive impact it creates for society or the environment.

The judging criteria for the presentation are as follows:

Award	Areas of consideration
Presentation	<ul style="list-style-type: none">• Creativity• Fluency• Confidence and Flair
Knowledge	<ul style="list-style-type: none">• Problems / Applications identification• Problems / Applications analysis• Source of information• Drone fundamental• Awareness of real-world and STEM Concepts• Clarity in explanation and reflection

2.3. THE BEST PERFORMANCE AWARD

Scores shall be awarded to the team based on the sum of all points allocated to tasks completed by the flying machine during the flying mission.

There are TWO (2) attempts ONLY for the flying mission and the best score among the two attempts shall be taken as the final score. The time taken for each attempt to complete all the tasks will be taken into consideration if there is a tie-in score. Each attempt is allocated Five (5) minutes.

Tasks and challenges for the finals will be made known on the day of the challenge itself.

Only one coding device is allowed during attempts. NO exchanging of identical smart drones and coding device is allowed during the attempt.

2.4. PRIZES

CATEGORY SMART DRONES – BEGINNER (DJI DRONES)			
Awards	Medals	Trophy	Cash Prize(s)
Championship Award	✓	✓	\$ 400
1st Runner Up	✓		\$ 200
2nd Runner Up	✓		\$ 100
Best Performance Award	✓		\$ 100
1st Runner Up	✓		
2nd Runner Up	✓		
Best Presentation Award	✓		\$ 100

1st Runner Up	✓	
2nd Runner Up	✓	
Best Knowledge Award	✓	\$ 100
1st Runner Up	✓	
2nd Runner Up	✓	

CATEGORY SMART DRONES – BEGINNER (EAGLE DRONES)			
Awards	Medals	Trophy	Cash Prize(s)
Championship Award	✓	✓	\$ 400
1st Runner Up	✓		\$ 200
2nd Runner Up	✓		\$ 100
Best Performance Award	✓		\$ 100
1st Runner Up	✓		
2nd Runner Up	✓		
Best Presentation Award	✓		\$ 100
1st Runner Up	✓		
2nd Runner Up	✓		
Best Knowledge Award	✓		\$ 100
1st Runner Up	✓		
2nd Runner Up	✓		

CATEGORY SMART DRONES – INTERMEDIATE (DJI DRONES)

Awards	Medals	Trophy	Cash Prize(s)
Championship Award	✓	✓	\$ 900
1st Runner Up	✓		\$ 700
2nd Runner Up	✓		\$ 500
Best Performance Award	✓		\$ 150
1st Runner Up	✓		
2nd Runner Up	✓		
Best Presentation Award	✓		\$ 150
1st Runner Up	✓		
2nd Runner Up	✓		
Best Knowledge Award	✓		\$ 150
1st Runner Up	✓		
2nd Runner Up	✓		

CATEGORY SMART DRONES – INTERMEDIATE (EAGLE DRONES)

Awards	Medals	Trophy	Cash Prize(s)
Championship Award	✓	✓	\$ 900
1st Runner Up	✓		\$ 700
2nd Runner Up	✓		\$ 500

Best Performance Award	✓	\$ 150
1st Runner Up	✓	
2nd Runner Up	✓	
Best Presentation Award	✓	\$ 150
1st Runner Up	✓	
2nd Runner Up	✓	
Best Knowledge Award	✓	\$ 150
1st Runner Up	✓	
2nd Runner Up	✓	

3. **SAMPLE CATEGORY MISSION**

3.1. **PLAYFIELD**

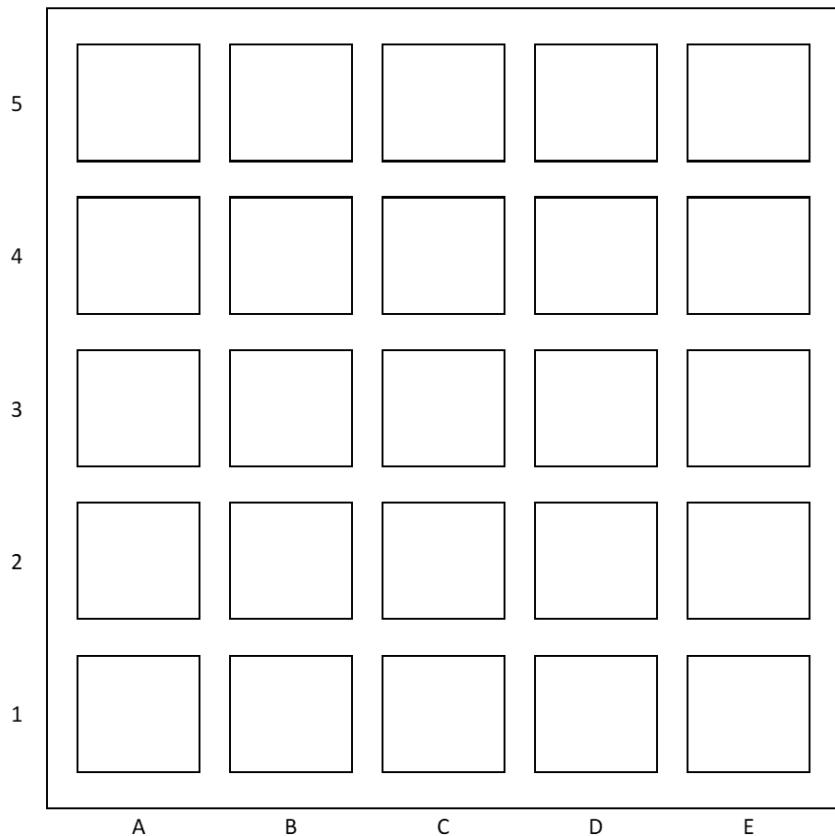


Figure 1: Playfield

- Size of the playfield is 5(FIVE) by 5(FIVE) meters.
- Maximum flying height of the playfield is 240 cm.
- Each grid is approximately 80cm by 80cm.
- Gap between grids is approximately 20 cm to 30 cm.
- Participants are allowed to bring measuring tools.

3.2. OBSTACLE

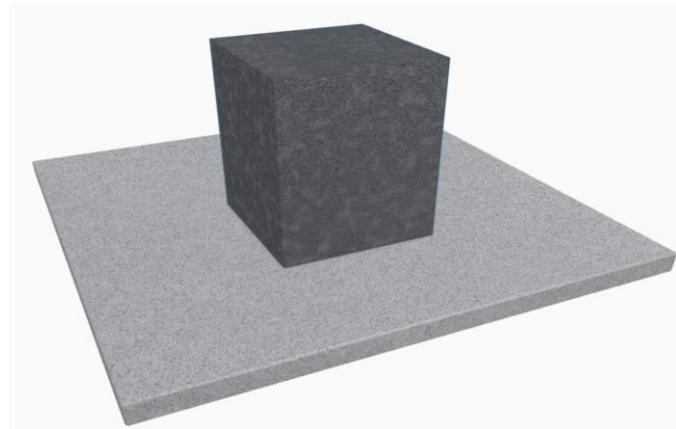


Figure 2: Obstacle

- Size of the obstacle approximately 60cm(Breadth) by 60cm(Breadth) by 80cm(height).
- Obstacle can be stacked on top of another obstacle
- Maximum height of obstacle is 240cm

3.3. BALL

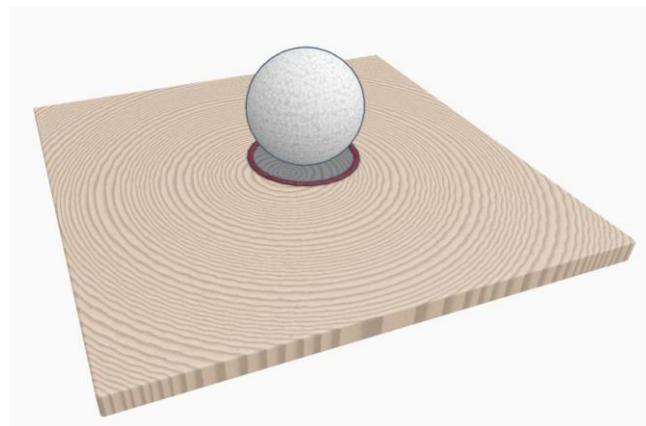


Figure 3: Ball

- Personnel will be represented by a Standard size ping pong ball.
- Rubber band will be used to hold the start position of the ping pong ball.

3.4. GUIDING RAIL

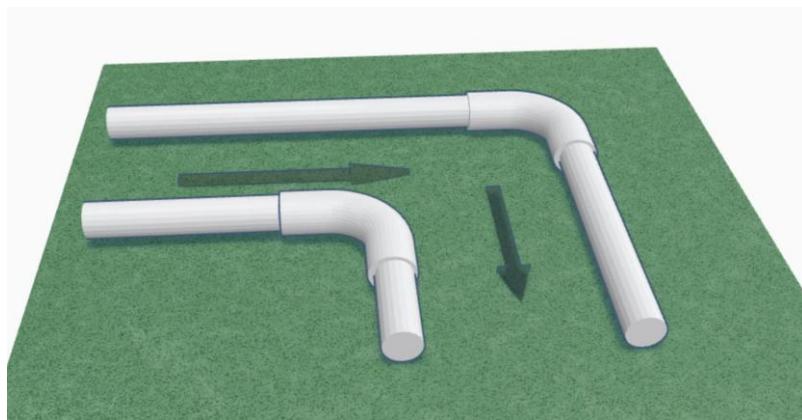


Figure 4: Guard rail

- The Guiding Rail will be represented by PVC pipe. PVC size: $\frac{1}{2}$ "

3.5. SMART DRONE: EAGLE DRONE SAMPLE PLAYFIELD

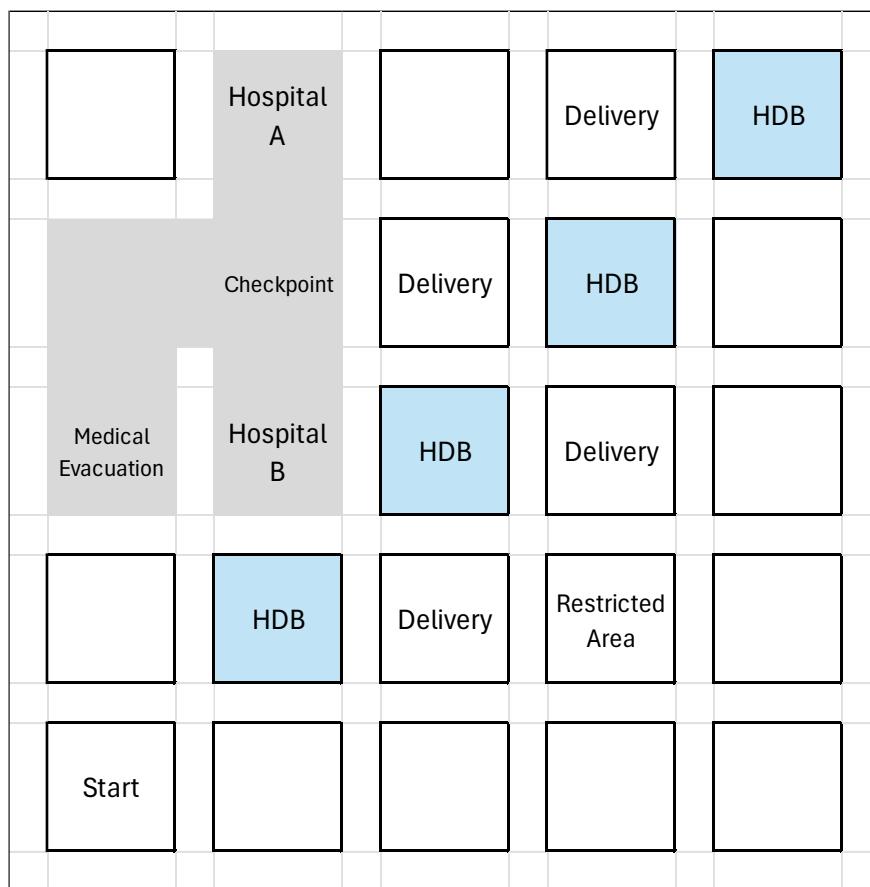


Figure 5: Sample playfield

3.5.1 SMART DRONE: EAGLE DRONE SCORING RUBRICS

For the Smart Drones Beginner Category (Primary schools), participants who achieve one maximum score of 50 points in any of the 4 challenges will receive a 110% score multiplier applied to their coding attempt.

For the Smart Drones Intermediate Category (Secondary Schools / IP Year 1-4), participants who use Python for their coding attempts will receive a **110% score multiplier**, meaning their total challenge score will be increased by 10% as a bonus for coding in Python.

3.5.2 SMART DRONE: EAGLE DRONE SCORING RUBRICS

Eagle Drone 1003 sub-category	
Medical Evacuation challenge	
Evacuate personnel to check point	5
Number of personnel(s) at selected Hospital at the end of run	10
	Maximum Score 50
Construction of building challenge	
Detect and record the reading in a variable of one HDB in a single program	20
Detect and record the reading in a variable of two HDB in a single program	30
Detect and record the readings at all HDBs in a single program	50
	Maximum Score 50
Delivering of parcel challenge	
Fly and land at the location with the AprilTag value of “5.”	20
Fly and land at the location with the AprilTag value of “5.” Light up “Blue” LEDs when flying. Lights off when Landing	30
Fly and land at all to the location with the AprilTag value of factors of “24”. Light up “Blue” LEDs when it detects even number. Light up “Red” LEDs when it detects odd number. Lights off when Landing	50
	Maximum Score 50
Patrol restricted area challenge	
Patrol the perimeter of D2 in a single program	20
Patrol the perimeter of D2 in a single program and Land at C3	50
	Maximum Score 50
	Total Score 200

3.6. SMART DRONE: DJI DRONE SAMPLE PLAYFIELD

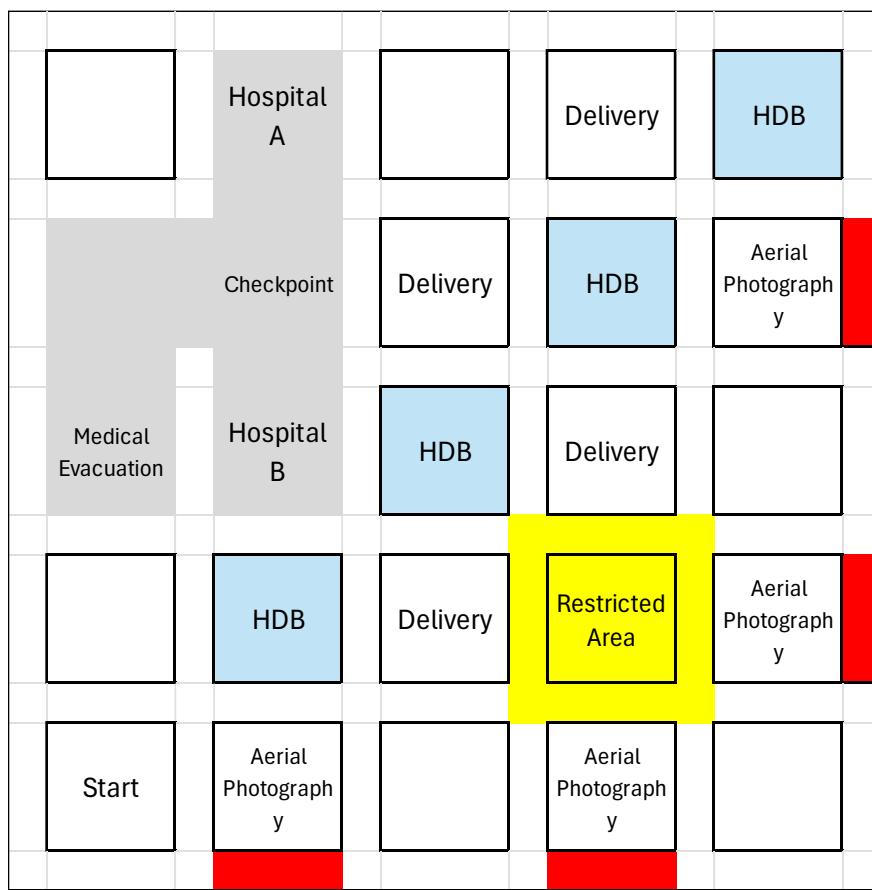


Figure 6: Sample playfield II

* *Yellow Marked Areas will be equipped with QR codes*

* *Red Marked Areas will be equipped with Images*

3.6.1 SMART DRONE: DJI DRONE SCORING RUBRICS

For the Smart Drones Beginner Category (Primary schools), participants who achieve one maximum score of 50 points in any of the 4 challenges will receive a 110% score multiplier applied to their coding attempt.

For the Smart Drones Intermediate Category (Secondary schools / IP Year 1-4), participants who use Python for their coding attempts will receive a **110% score multiplier**, meaning their total challenge score will be increased by 10% as a bonus for coding in Python.

3.6.2 SMART DRONE: DJI DRONE SCORING RUBRICS

DJI Tello Edu² sub-category	
Medical Evacuation challenge	
Evacuate personnel to check point	5
Number of personnel(s) at selected Hospital at the end of run	10
	Maximum Score 50
Construction of building challenge	
Detect and record the reading in a variable of one HDB in a single program	20
Detect and record the reading in a variable of two HDB in a single program	30
Detect and record the readings at all HDBs in a single program	50
	Maximum Score 50
Delivering of parcel challenge	
Fly and land at the location with the mission pad value of “5”	20
Fly and land at the location with the mission pad value of “5” Light up “Blue” dot-matrix display when flying. Lights off when Landing	30
Fly and land at all to the location with the mission pad value of prime number Light up “Blue” dot-matrix display when it detects even number. Light up “Red” dot-matrix display when it detects odd number. Lights off when Landing	50
	Maximum Score 50
Patrol restricted area challenge	
Patrol the perimeter of D2 in a single program	20
Patrol the perimeter of D2 in a single program and Land at C3	50
	Maximum Score 50

Artificial Intelligence	
Identify QRcode value at one of the locations	10
Identify QRcode value at two of the locations	20
Image recognition of one image at one of the locations	30
Image recognition of images at two of the locations Or Identify QRcode value at all the locations and if the sum of QRcode value is higher than 10, Land at A1, Else land at A2	50
Total Score	250

4. FLOW OF EVENTS

On the scheduled competition day, teams shall proceed to the presentation segment followed by the challenge segment. All teams shall be ready and report 15 minutes before their designated timeslot. Teams shall be guided by the SAFMC usher to their respective areas after they have reported for the competition.

4.1. PRESENTATION

Teams will present their presentation to a panel of judges.

1. Upon registration, the team shall be ushered to the Presentation Holding Area.
2. Every team shall be ushered to the respective room for their presentation. The team shall bring their own laptop or tablet to showcase the short video clip.
3. Each team will have FIVE (5) minutes for their presentation followed by FIVE (5) minutes for the Q&A session.

4. After the completion of the presentation, the team shall proceed to the inspection station.

4.2. CHALLENGE SEGMENT

Teams are expected to use the sample challenge manual to prepare for the competition. Each team has TWO (2) attempts for the challenge course.

1. At the inspection station, an SAFMC official shall check the smart drone for any violation of the category rules and regulations. Refer to Section 5 for more details provided.
2. The team will be brief by the SAFMC on the challenge.
3. Each team will be given FIVE (5) minutes to prepare for the challenge.
4. Each team are allowed to use measuring tool to measure the obstacles and playfield.
5. At the coding zone, the team will perform the connection of the smart drone to coding device to the SAFMC official.
6. Once connection complete, the team shall wait for their cue to start the attempt
7. The team is given FIVE (5) minutes to complete each attempt. The start of the attempt is defined as the flying machine performing a take-off from the start area inside the flight zone of the play field.
 - a. Points will be awarded according to Section 3.
 - b. During the attempt, ONLY TWO (2) members (the pilot and one (1) assistant) are allowed in the play field.
 - c. During each attempt, the team is given a maximum of ONE (1) minute to set up their flying machine.
 - d. If the team is not ready to take off within the given time, the team is deemed to have executed and completed the attempt.

- e. When the first attempt is completed, the team shall be given FIVE (5) minutes to repair or prepare the flying machine for the second attempt.
- 8. If the flying machine touches the ground or hits any object within the play field during the attempt, the team can recover the flying machine and continue the challenge until it is non-airworthy.
- 9. During the recovery of the flying machine, the flight crew shall observe the following:
 - a. The coder stationed in the coder zone is to ensure the smart drone machine is not running any program.
 - b. ONLY the assistant is allowed to enter the playfield. The assistant can recover the drone back at the starting zone.
- 10. The completion of an attempt is described when the smart drone has:
 - a. declared end by the challenging team, or
 - b. hit the safety net or barrier and cannot resume flight, or
 - c. declared it is non-airworthy by the challenging team, or
 - d. completed FIVE (5) minutes of flight time.
- 11. Once the FIVE (5) minutes of flight time is up, the pilot shall land the flying machine immediately. If the total flight time taken is less than FIVE (5) minutes, the best attempt total time will be recorded and used for consideration in the event of a tie situation.
- 12. At the end of the challenge, the smart drone **MUST** be switched off immediately. The team shall vacate the competition area immediately.

4.3. KEY RULES TO NOTE

Rules for personnel movement and communication during the setup time and the challenge attempt are dictated in the following points:

1. ONLY TWO (2) members of the participating team are allowed to be inside the play field at any one time.
2. NO outside communication or assistance from the audience/spectators is allowed at any point. NO headphones or earpieces are allowed to be worn by the operator/pilot. Communication among teammates is allowed. Teams who flout this rule may be removed from the competition.
3. During the recovery of the smart drone, the referee may follow the assistant into the playfield to observe the safety of the assistant.
4. The other teammates are required to remain outside of the playfield and be behind the safety net when the aircraft is airborne.
5. The team are responsible for the safe flying of their flying machine(s) for the duration of the entire competition. The referees reserve the right to ground the smart drone(s) of any team at any point in the competition.
6. All repairs/ maintenance/ troubleshooting should be done in the Repair Area. The teams who flout this rule may be removed from the competition.

5. TECHNICAL RULES & REGULATIONS

1. Each team is to use the drone stated for the category.
2. Teams are allowed to use any block-based and text-based programming software.
3. The DJI Tello Talent Expansion Kit is not permitted during practice sessions and mission runs.
4. Participants are strictly prohibited from activating personal mobile hotspots during practice sessions and mission runs.
5. Personal mobile devices must be always set to Airplane Mode.
6. The use of any external navigation station is strictly prohibited.
7. There is no limit on the number of batteries used.
8. No remote controller is allowed

5.1. GENERAL RULES & REGULATIONS

1. Each member can only participate in one team within their eligible category.
2. Members and immediate family members of the SAFMC organising committee are not allowed to participate in the competition.
3. The organisers reserve the right to amend the rules and regulations. In the event of any change, all teams will be informed at least TWO (2) weeks prior to the start of the competition.
4. Prizes will be awarded to the designated recipient(s), as stated in the registration form.
5. The organisers of SAFMC will not be held responsible for any damage to, or the loss of, any drone(s) and associated equipment throughout the entire competition.

6. All participants will be held responsible for the safe flying of their drone(s) throughout the entire competition. The organisers reserve the right to ground the flying machine(s) of any team.