

JuniorSkills Malaysia Online 2021

# Junior Skills Malaysia (JSM) Online 2021

### **TECHNICAL DESCRIPTION**

## **DRONE OPERATING**



### The Technical Description consist of the following:

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#### 1. INTRODUCTION

#### 1.1. NAME AND DESCRIPTION OF THE COMPETITIONS

The name of the skill trade is Drone Operating. This is an online competition and each participant is required to **stay online during the whole competition** period.

#### 1.2. DESCRIPTION OF THE ASSOCIATED WORK ROLE(S) OR OCCUPATION(S).

Drones are being used for civil purposes in a growth business sector predicted to be worth billions of Ringgit over the next 10 years. They are rapidly growing segment of the global market in high-tech industries. They are also revolutionising everything from agriculture, land survey, infrastructure inspection to film-making and are increasingly being used to monitor, cargo delivery, research and conduct data gathering missions in surveying, mining, forestry, ecology, archaeology virtual reality and computer gaming. With the increase in tasks carried out by Drone, the question of training qualified personnel is relevant.

The Skill includes the **management and operation**, **maintenance**, **detection and elimination of malfunctions of Drone**, the use of technical equipment and technology to control the drone flight.

1.3. Number of Participant

Drone Operating skill competition is an individual event competition.

#### 1.4. Age limit of Competitors

The Competitors must be 13 to 15 years old in the year of the competition.

#### 1.5. Pre-qualifier round

In case more than 12 participants, a pre-qualifier round will be held



Method: Tello Edu Apps (see appendix 6.3 for details)

1.6 Safety & precaution.

Participants are required to ensure safety being followed throughout the competition event. The area of competition and the environment should be safe before any action takes place.



#### 2. COMPETENCY AND SCOPE OF WORK

The Competition is a demonstration and assessment of the competencies associated with drone operating knowledge and skills. The Test Project consists of manual and autonomous drone operation, which includes theory and practical assessments.

2.1. Competitor shall possess a range of skills to operate drone safely and efficiently using real drone and simulation environment:

- Drone line of sight (LOS) and first person view (FPV) piloting and handling
- Spatial ability
- Manual dexterity
- Drone flight safety procedures
- Drone equipments diagnostics
- Drone autonomous navigation using block programming
- Mathematical coordinates

#### 2.2. Theoretical UAV knowledge

- Basic understanding about drone technicals
- Drone parts and mechanisms
- Flight theory
- UAV technology general knowledge
- Drone and UAV technological applications



#### 3. ASSESSMENT

This section describes the assessment specifications, procedures and requirements for the marking schemes.

#### 3.1. Assessment criteria

This section defines the assessment criteria and the number of marks awarded. The total number of marks for all assessment criteria must be 100.

SECTION	CRITERIA	OBJECTIVES	ASSESSMENT TYPE	FULL MARK
<b>A1</b> Diagnostic	Demonstrate basic drone technicals	Drone and UAV technical knowledge	Measurement	15
A2	Demonstrate pre- flight drone operation procedures (remote device connection, propeller and equipment's condition)	Drone system diagnostics and configuration	Measurement	10



<b>A3</b> S	Safety in drone operation	Safety operation	Judgment	5
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SECTION	CRITERIA	OBJECTIVES	ASSESSMENT TYPE	FULL MARK
<b>B1</b> Line of Sight/FPV Piloting	a. Successful take off	LOS / FPV Piloting Skills	Measurement	5
	b. Navigate through course	LOS / FPV Piloting Skills	Measurement	10
	c. Successful checkpoint landing and takeoff	LOS / FPV Piloting Skills	Measurement	10
	d. Successful landing	LOS / FPV Piloting Skills	Measurement	5
<b>B3</b> Safety	Demonstrate safety practice	Safety operation	Judgement	5



SECTION	CRITERIA	OBJECTIVES	ASSESSMENT TYPE	FULL MARK
<b>C1</b> Autonomous Operation	Perform autonomous drone program using 'DroneBlocks App'	Show ability to create and execute autonomous drone navigation program	Judgment	10
C2	a. Successful take off	Autonomous flight mission	Measurement	5
	b. Navigate through course	Autonomous flight mission	Measurement	10
	c. Successful landing	Autonomous flight mission	Measurement	5
C3 Safety	Demonstrate safety practice	Safety operation	Judgement	5



#### 3.2. Skill assessment procedures

Participants are required to submit their **best timing with video** of the **flight operation** for **both tasks** within the specific time given.

Assessment by the experts/judges will be based on the video submitted by each competitor.

The points awarded by experts/judges will be based on the fulfilment of each criteria specified in Section 3.1, during the specific time given.

The marking scheme for each module should be objective and normalised. The Experts will decide together on the Test Project and the marking criteria on the marking summary sheet. They will decide together, according to the marking scheme, on the mark to be allotted for every module completion, and demonstration by each competitor in the test project.



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#### 4. MATERIALS & EQUIPMENT

- 4.1 Materials, equipment and tools supplied by Competitors
  - DJI Ryze Tello / Tello Edu / Tello Talent drone
  - Tello Battery
  - Tello Battery charging hub (recommended)
  - Smartphone / Tablet (Android / iOS)
  - Camera / Device for recording
  - Tello Apps (installed in device)
  - DroneBlocks Apps (installed in device)
  - PC / Laptops with webcam
  - Zoom Video Conferencing Basic account (installed in PC / Laptops)
  - Cone, water bottle for flight marker
  - Box, stool, chair for landing platform
    - Height (1 2 feet)
    - Length (1 2 feet)
    - Width (1 2 feet)
  - Take off / landing point marker
  - Measuring Tape
  - Masking Tape
  - Stop Watch



- 4.3. Materials, equipment and tools supplied by Experts Not applicable
- 4.4. Materials, equipment and tools prohibited in the skill area Not applicable.



#### 5. SKILL-SPECIFIC RULES

Skill-specific rules do not contradict or take priority over the competition rules. They do provide specific details and clarity in areas that may vary from competition to competition.

TOPIC	SKILL SPECIFIC RULES		
Video Recording	<ul> <li>Should capture the whole area</li> <li>Should capture the whole operation</li> <li>Clear video recording</li> <li>Continuous recording</li> <li>No editing</li> </ul>		
Assistant / Trainer involvement	<ul> <li>Drone course preparation</li> <li>Video recording</li> <li>Drone handling</li> </ul>		



#### 6. APPENDIX

6.1. Drone Course Layout for LOS and FPV piloting







#### 6.2. Drone Course Layout for autonomous drone operation



6.3. Tellu Edu Apps for pre-qualifier round





