

NUS UNMANNED AIRCRAFT OPERATIONS GUIDELINE

1. OVERVIEW

- 1.1 The National University of Singapore (NUS) Unmanned Aircraft (UA) Operations guideline is established to manage the usage of unmanned aircraft in university.
- 1.2 The use of this guideline must be read in conjunction with the Unmanned Aircraft (Public Safety and Security) Act 2015 and UAS Regulatory Framework November 2019.

2. USES OF UNMANNED AIRCRAFT

- 2.1 The use of unmanned aircraft is becoming increasingly popular in Singapore. Today, unmanned aircraft are used for a range of purposes, such as the delivery of goods, aerial filming and photography, search and rescue, and inspection of infrastructure and facilities.
- 2.2 If not carried out properly, the operation of unmanned aircraft may pose a risk to public safety and security. Despite the safety features in some unmanned aircraft, mechanical malfunction, loss of control link or human error could cause operator to lose control of the aircraft in flight. Payloads carried by unmanned aircraft could be accidentally released. Unmanned aircraft crashing or discharging its payload could cause injury to persons or even death and damage to NUS property.

3. PERMIT APPLICATIONS FOR UNMANNED AIRCRAFT OPERATIONS

- 3.1 Members of the public who are interested in operating an unmanned aircraft in Singapore can go to the one-stop **online portal** on the Civil Aviation Authority of Singapore (CAAS) website to check and apply for the necessary permits from CAAS, the Singapore Police Force (SPF) and/or the Infocomm Development Authority of Singapore (IDA), before they operate an unmanned aircraft.
- 3.2 With the Unmanned Aircraft (Public Safety and Security) Act 2015 coming into force on 1 June 2015, an operator permit and/or activity permit will be required under the following circumstances:

S/N	Purpose	Weight of Unmanned Aircraft	Permit Required
1	Business or Non-Recreation / Non-Education Purpose <u>Examples of Business or Non-Recreation/Non-Education Purposes</u>	≤ 250 grams	1. Operator Permit 2. Class 1 Activity Permit 3. UA Pilot Licence (UAPL)*
		> 250 grams	1. Operator Permit 2. Class 1 Activity Permit 3. UA Registration* 4. UA Pilot Licence (UAPL)*

S/N	Purpose	Weight of Unmanned Aircraft	Permit Required
	<p>a. A business providing aerial surveying or photography services for a public educational institute.</p> <p>b. An organisation conducting a flight demonstration with its UA to its prospective customers.</p> <p>c. A company using its UA to carry out inspections of its facilities or properties.</p> <p>d. A training service provider conducting UA flying courses for an educational institute's students on its behalf.</p> <p>e. A public educational institute using its UA to take photographs and videos of its activities and events.</p> <p>f. A company's public communications department using a UA to take event photographs for marketing or publicity efforts.</p> <p>g. A volunteer using a UA to take photographs and videos for a charity event.</p> <p>h. An individual sharing his personal collection of aerial photographs taken using his UA with a business for marketing purposes, regardless of whether there are any monetary exchanges.</p> <p>Research and development activities are now classified under the same regime as Business or Non-Recreation/Non-Education.</p>		
2	<p>Education Purpose</p> <p>Any lecture, tutorial, seminar, demonstration, class or similar activity on unmanned aircraft provided by an educational institution referred to in section 72 of the Private Education Act (Cap.247A).</p> <p><u>Examples of Education Purposes</u></p> <p>a. A university conducting a course that involves flying of a UA for its enrolled students, as part of its fulltime curriculum.</p> <p>b. A public educational institute within 5km of a civil airport/military airbase flying UA outdoors to demonstrate its capabilities to the students.</p>	<p>≤ 250 grams</p> <p>> 250 grams but ≤ 1.5 kg</p> <p>> 1.5 kg but ≤ 7 kg</p> <p>> 7 kg</p>	<p>1. Apply for Class 2 Activity Permit if flown outdoors[#]</p> <p>1. Apply for Class 2 Activity Permit if flown outdoors[#] 2. UA Registration*</p> <p>1. Apply for Class 2 Activity Permit if flown outdoors[#] 2. UA Registration* 3. UA Basic Training (UABT) Certificate*</p> <p>1. Operator Permit 2. Class 1 Activity Permit 3. UA Registration* 4. UA Pilot Licence (UAPL)*</p>

S/N	Purpose	Weight of Unmanned Aircraft	Permit Required
	<p>c. Students of a public educational institute showcasing their UA as part of a school event.</p> <p>d. A school teacher educating his students on UA technology that involves flying of a UA as part of co-curriculum activities.</p> <p>e. Students of a university conducting flight tests as part of their final year projects.</p>		
3	<p>Recreation Purpose</p> <p>Means any pursuit or activity engaged in for enjoyment, relaxation or leisure, but not the following:</p> <p>a. A sporting activity that forms part of an organized group activity or organised competition or tournament (such as a flying display); or</p> <p>b. A recreational activity provided by a business, or in the course of business.</p> <p><u>Examples of Recreation Purposes</u></p> <p>a. An individual flying a UA for fun in line with CAAS' operating conditions.</p> <p>b. An individual flying a UA higher than 200 feet above mean sea level for aerial photography for personal collection.</p>	≤ 250 grams	1. Apply for Class 2 Activity Permit if flown outdoors [#]
		> 250 grams but ≤ 1.5 kg	1. Apply for Class 2 Activity Permit if flown outdoors [#] 2. UA Registration*
		> 1.5 kg but ≤ 7 kg	1. Apply for Class 2 Activity Permit if flown outdoors [#] 2. UA Registration* 3. UA Basic Training (UABT) Certificate*
		> 7 kg but ≤ 25 kg	1. Apply for Class 2 Activity Permit if flown outdoors Apply for Class 2 Activity Permit if flown outdoors 2. UA Registration* 3. UA Pilot Licence (UAPL)*
		> 25 kg	1. Operator Permit 2. Class 1 Activity Permit 3. UA Registration* 4. UA Pilot Licence (UAPL)*

Note: # Apply for Class 2 Activity Permit if flown outdoors[#]

- i. In any restricted, danger or protected area, or
- ii. Within 5 km of any aerodrome, or
- iii. Above 200 feet AMSL.

Note: * Enforceable UA Regulatory Requirements

- i. UA Registration - Effective 2 April 2020
- ii. UA Basic Training (UABT) Certificate - Effective 1 February 2021
- iii. UA Pilot Licence (UAPL) - Effective 1 February 2021

4. UNMANNED AIRCRAFT OPERATIONS IN NUS

- 4.1 All operators who intend to fly an unmanned aircraft in NUS are required to submit a notification form to Office of Safety, Health and Environment (OSHE). OSHE will assess the request and reply the requestor within 10 working days to allow OSHE time to consult with other NUS counterparts on the suitability of the testing site, as well as study any safety or privacy concerns from the use of it. Due to the time needed for such consultations and coordination, urgent request is thus discouraged, but users may still submit such request directly to OSHE accompany with strong justification for the short notice.
- 4.2 Notification form will not be required if the operations is to be conducted indoor within their own faculty or premises. However, for outdoor operations outside of their faculty or premises, operators shall be required to submit the notification form to OSHE. Operators shall also seek the permission of the owner of the facility, or premise, or building prior to the operations.
- 4.3 In addition to the submission of the notification form, all requestors shall submit the project risk assessment and the following Safety and Emergency Management Plans:
- i. Launch and recovery plan.
 - ii. Flight plan with the following details:
 - a. Details of flight path, flight profile (LOS command and control, or fly-by-video, or programmed, or autonomous), Line-Of-Sight (LOS) profiling with respect to building and infrastructure.
 - b. Avoidance of hazardous/sensitive area/infrastructure and utilities in the area of flight, for example: gas pipe, power lines, air vent of exhaust duct and clean room air-intake to avoid, etc.
 - iii. Emergency recovery plan for the scenarios:
 - a. Loss of control
 - b. Loss of LOS/run-away UAV
 - c. Imminent crash into building/infrastructure
 - d. Autonomous return to launch and recovery point
 - iv. Human and vehicular traffic management and marshaling plan when conducting low flying (less than 30 meters from ground surface) in populated area/movement corridor.
 - v. Emergency response plan with the following details:
 - a. Coordination with facility management office/staff of the building(s) for immediate response to fire incident and damaged infrastructure/equipment caused by crashed UAV.
 - b. Readiness and standby of responders, appropriate fire-fighting equipment (especially for the UAV LiPo battery fire) for UAV related fire incident and injury cases.
 - c. Medical coverage and emergency evacuation of injured personnel.

Company (If applicable):	Email address:
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SECTION B – DATE, TIME AND LOCATION AND DESCRIPTION OF ACTIVITY

Date / Time	<p>Date</p> <p>From: _____ To: _____ (dd/mm/yyyy) (dd/mm/yyyy)</p> <p>Time</p> <p>From: _____ To: _____</p>
Location	Please provide the detailed location and area of operation
Description of Activity	Describe how the unmanned aircraft will be used e.g. aerial filming / photography, aerial surveillance, aerial inspections, aerial mapping, flying display, etc.
Flight profile	Describe the flight profile of the unmanned aircraft (height, speed and flight path). Please state the maximum operating height in feet. Please attach your flight profile in a separate document if this space is insufficient.

<p>Name and contact of designated onsite safety personnel</p>	<p>1. Name: _____</p> <p>Contact: _____</p> <p>2. Name: _____</p> <p>Contact: _____</p> <p>3. Name: _____</p> <p>Contact: _____</p>
<p>Discharge of items or substances</p>	<p>Does the operation involve the carriage or discharge of any items and substances?</p> <p>Yes / No (Please delete)</p> <p>If Yes, please describe below and provide the estimated weight of the items/substances:</p>
<p>SECTION C – UNMANNED AIRCRAFT SYSTEM INFORMATION</p>	
<p>Brand / Model</p>	

Power Source	
Weight (kg)	

SECTION D – REMOTE PILOT DETAILS

Note: Please include additional pilot details if there are more than three

Name : _____	Company / Department:	Faculty:
Staff/Student No.:	Mobile phone no.:	
Designation:	Email Add:	
Year of Birth:	Years of flying experience:	
Name : _____	Company / Department:	Faculty:
Staff/Student No.:	Mobile phone no.:	
Designation:	Email Add:	
Year of Birth:	Years of flying experience:	
Name : _____	Company / Department:	Faculty:

