DR. B.R AMBEDKAR NATONAL INSTITUTE OF TECHNOLOGY JALANDHAR

DRONOLYMPICS 2025

RULEBOOK

DEC 27TH TO 28TH

INDIA

ABOUT NITJ

The Mission : One of India’s premier technical institutes, renowned for its strong engineering programs and research.

The Campus : 154-acre urban campus providing a world-class environment for innovation and learning. Visual: Image of NIT Jalandhar campus/main building.

Vision : Empowering minds, engineering the future through innovation and excellence.

🎯COMPETITION OBJECTIVES & ELIGIBILITY

Objective: To design, build, and pilot a drone to execute a four-stage disaster response mission: Navigation, Reconnaissance (CV), and Precision Aid Delivery.

Eligibility: Open to all students (10+, 12+, UG, PG, PhD).

Team Size: Mandatory 3 to 5 members per team.

Registration: Must pay the ₹500 fee and register by 15 December 2025.

Conduct: All participants must follow the spirit of fair play. Decisions of the judges (DRDO/Army/BSF experts) are final.

DRONE SPECIFICATIONS & CONSTRAINTS

Section	Rule / Requirement
Number of drones allowed	**Only one and same drone will be used for all rounds.**
Physical Size	**Small size Drone**
Payload	**Must be able to securely carry and remotely release the standard 100g aid package provided by the organizers.**
Power	**Battery type must be declared during registration.Drone must be a battery powered drone, no combustion engines are allowed.**
Open CV	**Real time Detection of Living Being and Disaster Affected Prone Area will be done on Recording after flight . Camera on drone must be able to screen live on a laptop.**
Time between two flights	**15 minutes , So come prepared with charger and batteries accordingly.**
Weather Conditions during competition	**During December Punjab weather will be foggy and cloudy with low visibility ,so be prepared with spare parts and drone configuration acordingly .**
Controll	**Pilot must operate the drone remotely, relying exclusively only on visual inputs he get from drone.**

⚠ SAFETY GUIDELINES & DISQUALIFICATIONS

SAFETY IS NON-NEGOTIABLE—VIOLATIONS LEAD TO IMMEDIATE MISSION HALT AND POTENTIAL DQ.

- **Flight Range :** Flight Range Should be atleast 1km under the Prone area.
- **Fail safe:** Return to Launch (RTL) or motor cut-off must activate within 5 seconds of signal loss.
- **Emergency Stop:** Every team must have a clearly labeled, functional Emergency Motor Stop mechanism accessible to the pilot.
- **Protocols:** Pre-flight checklist must include weight verification and frequency check (declare 2.4 GHz or 5.8 GHz channel to avoid interference).
- **Medical:** Teams are advised to have basic first-aid knowledge. A medical station will be on-site.

Violation	Penalty / Consequence
Unsafe Flight	Immediate mission halt. Judges may award a -100 point penalty.
Intentional Damage	Immediate Disqualification (DQ) of the team.
Flying Out-of-Bounds	-50 points and immediate relaunch from the starting base.

COMPETITION STRUCTURE: FOUR PROGRESSIVE ROUNDS

The mission time starts when the drone motors are armed and stops when the drone lands safely after completing the final task of the round.

Round	Objective	Approx flight Time	Key Criteria
Round 1: Basic Payload & Nav	Take off, carry the 100 g payload, fly A to B, and land accurately.	7 minutes	**Dropping payload accuracy within the 1 m × 1 m(max) marked zone and time taken.**
Round 2: Obstacle Course	Navigate a course simulating debris, including gates, tunnels, and elevation changes. (No payload required).	15 minutes	**Accurcy in clearing obstacles and time taken.**
Round 3: Multi-Point Recon & CV	Scan three locations capturing footage for Computer Vision detection.	25 minutes	**Time taken for scannimg all three locations and no of humans detected.**
Round 4: Final Aid Delivery	Pickup payload and execute two precise drops at the two most critical zones identified in Round 3.	15 minutes	**Time, No of humans recieved the aid according to no of detected humans by your model in 3rd round.**

LOGISTICS & JUDGING

- Judging: Expert evaluators (DRDO/Army/BSF) will judge performance.
- Tie-Breaker: In the event of a tie in the final cumulative score, the team with the lowest total cumulative mission time across all four rounds will be ranked higher.
- Video Evidence: Teams must retain recorded video from Round 3 for verification of CV detection accuracy.
- Mission Restart: Only one mission restart (after a crash/technical issue) is allowed per team per round.

CV TECHNICAL SPECIFICATIONS FOR ROUND 3

Parameter	Requirement
Detection Target	Human victims partially hidden or represented only by visible body parts, rather than a full-body view
Accepted Output Format	Processing must be performed on the recorded footage after the flight concludes, rather than in real-time. The Computer Vision model is required to output the specific timestamp, the instantaneous human count, and the cumulative total of unique humans detected. Additionally, the system must save a screenshot for each timestamp, with every detected human clearly enclosed within a bounding box.
Accuracy Metric	No of humans detected , Time taken.
Software Constraints	Open-source libraries (e.g., OpenCV, TensorFlow Lite) encouraged; no cloud processing during flight. Code and model will be reviewed by our team.