PAYLOAD DELIVERY MISSION

INTRODUCTION

The Payload Delivery Mission simulates a real-world drone logistics challenge. Teams must navigate obstacles, transport a payload, and deliver it accurately to the target zone. The mission tests precision flying, stability under load, and safe landing capabilities. It reflects practical applications such as medical supply and disaster relief delivery.

PROBLEM STATEMENT

Design and operate a remotely controlled drone system capable of executing a complete payload delivery mission within a structured obstacle environment. The drone must be manually piloted through a predefined course that replicates real-world challenges such as confined spaces and physical

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barriers, while maintaining flight stability, thrust balance, and structural reliability under additional payload load. It should ensure safe and secure transportation of the payload without compromising maneuverability or control.

The drone must demonstrate precise manual navigation and effective obstacle avoidance throughout the mission, maintaining smooth and stable flight. Upon reaching the designated target area, the payload must be released accurately using a controlled deployment mechanism. Following delivery, the drone must be guided to a specified landing zone and execute a safe, controlled landing.
The problem statement reflects practical real-world applications such as emergency response, medical supply transport, disaster relief operations, and last-mile delivery, with an emphasis on pilot skill, reliability, precision, and operational efficiency.

DRONE SPECIFICATION

Drone Specifications

- Recommended flight time: 20 minutes (not a strict condition; no marks deduction)
- Frame size: 300-550 frame, max 10 inch propeller
- Weight < 3kg.
- It should have a strong receiver and transmitter to operate in small spaces with walls and other structures that can potentially block signals.
- Battery Voltage <= 24 V

ABSTRACT SUBMISSION

The participating teams must submit an abstract of their drone's concept, in online mode. This should include its configuration, design, features, estimated cost, and an approach to tackle the problem statement. The teams must compile all this information in a PDF file. If any extra files are to be included, the submission must be in the form of a ZIP file. Please note that the files submitted should NOT be password-protected or corrupted. In either of the cases, the submissions would be straightly rejected.

GUIDELINES FOR ABSTRACT SUBMISSION

Rough sketches of your idea including the Design Report of your model. The abstract must specify the use of software and the mechanism used in the design analysis of the drone.

- USPs (Unique Selling Propositions) of your design and innovations made by you should be mentioned in the report and mention how they are going to tackle the specific challenges.
- An abstract of the idea needs to be uploaded on the Dronotics website before the deadline.
- The abstract should not exceed 500 words and should include the following details of all team members along with the Team.

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Cover Page Details:

The cover page of the submission must include the following details:

Team Leader Details

Team Name.	**Team Leader Name**
College / Institute Name	**Year of Study**
Email ID	**Phone Number**

Other Team Members

- Name(s) of all team members

File Naming Convention:

The file must be submitted in the following format:

<TeamName>-<LeaderName>-<CompetitionName>.pdf

Example:

CCU-YashAggarwal-PayloadDeliveryMission.pdf

Submission Email

The abstract/design report must be mailed to:

dronoticsjiit128@gmail.com

Important Note

- Only PDF format submissions will be accepted.
- Files must not be corrupted or password-protected.
- Any submission not following the naming convention may be rejected.

ROUND 1

- Drone must take off from the designated starting zone where the payload must be secured onto the drone; **manual loading is permitted, while teams implementing autonomous pickup mechanisms will be awarded bonus points**.
- After successful pickup, the drone must transport the payload to designated drop zone, maintaining stability and control under load.
- The payload must be released only within the target area, and scoring will be based on both the accuracy and softness of the delivery, with higher marks awarded for controlled, low-impact drops.
- The drone is required to return to its original starting position and complete a safe and stable landing within the designated zone; any major instability, crashes, or unsafe operation may result in penalties or disqualification.

Evaluation Metrics:-

- Successful payload handling
- Navigation efficiency
- Delivery precision
- Return capability
- Landing quality
- Overall system reliability and stability

All metrics have not been disclosed and will be specified on day of event.

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ROUND 2

- The drone must take off from the designated starting zone and navigate through a series of obstacles to reach the payload station.
- The drone is expected to grab or pick up the payload. After successfully securing the payload, the drone must navigate through the obstacle course while maintaining stability under load.
- The payload must then be accurately released within the designated drop zone, with scoring based on precision and smoothness of delivery.
- Following the drop, the drone must proceed to the designated landing zone and execute a safe and controlled landing.
- This stage emphasizes advanced maneuverability, reliable gripping mechanisms, and consistent performance in constrained environments, while maintaining full control and avoiding collisions throughout the mission.

Evaluation Metrics:-

- Successful payload handling
- Navigation efficiency
- Delivery precision
- Time Limit
- Landing quality
- Obstacle Avoidance

All metrics have not been disclosed and will be specified on day of event.

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SCORING CRITERA

Round 1 will be of 100 Marks.
Successful mission completion will be 20 marks.
Round 2 will also be of 100 marks.
(100 marks for round 2 will be distributed equally for completing mission and drone stability & control)
In case teams score equal points **completion time** will be considered for resolving.
The final decision lies in the hands of jury.

GUIDELINES

Eligibility: School students, undergraduates, graduates and working professionals are allowed in this event.

Team Size: A team can have a minimum of 3 and a maximum of 5 members.

No Double Troubles: Only one entry would be acceptable. In case of multiple entries, the latest one would be considered for evaluation.

Note: The organizers reserve all rights to change any or all of the above rules.

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