⚙️ INNOVATEX 4.0 – Presidency University

MakerSpace Cluster | Standard Rule Book Format

🧠1. Event Overview

Field	Details
Event Name	Grab-o-tron : The Ultimate Test of Robotic Precision and Power.
Cluster	MakerSpace Cluster
Event Type	Bot
Mode	Online
Team Size	4 per team
Duration	9:00AM – 1:00PM

🎯2. Event Task / Objective

Grab-O-Tron is a robotics challenge designed to test innovation, precision, and control.
Participants must design, build, and program a robot capable of **grasping** and **transporting** objects within a defined arena.
The event consists of **2 progressively challenging rounds**, where robots must pick and place objects of varying **shapes**, **positions**, and **weights (50-100 g)** at distances ranging from **2–3 meters**.
Teams will be evaluated based on **accuracy**, **mechanical design**, **programming efficiency**, **object handling**, and **completion time**.

⚙️3. Design / Technical Specifications

- The robot **must fit inside a 40 cm × 40 cm** square at all times.
- Maximum robot weight: **3 kg**, including all electronic and mechanical components.
- The bot must be remote controlled (through controllers, mobile, laptop or any application).
- Objects will be placed **2–3 meters** away from the starting point.
- Bot must execute: **approach** → **pick** → **transport** → **place**. If an object is dropped, a penalty will be imposed.
- Allowed components:
    - Microcontrollers (Arduino, ESP32, Raspberry Pi, etc.)
    - Motors (servo/stepper/DC)
    - Any safe gripper (mechanical, magnetic, suction, etc.)
- Prohibited:
    - Dangerous tools, blades, projectiles, open flames
    - Pre-built commercial robots (DIY and custom builds only)
    - High-voltage components beyond safe limits
- Robots must operate safely without damaging the arena or surroundings.

🧩4. General Guidelines

Participants must adhere strictly to the event schedule.

Teams are responsible for their own tools, laptops, batteries, chargers, and spares.

All robots must be designed and built **from scratch** for this competition.

Documentation must include:

1. Problem statement
2. Design approach & materials
3. Logic flow
4. Algorithms used
5. Challenges & solutions

Power supply and basic connectivity will be provided by organizers.

Any dangerous, unethical, or disruptive behavior will result in disqualification.

Team members must remain within designated operational areas.

🔋 5. Safety Rules

- All equipment must comply with safety regulations
- All batteries, wiring, and mechanical systems must be securely mounted.
- No sharp edges, exposed rotating parts, or unstable assemblies.
- No hazardous materials, high-voltage systems, or explosive components.
- Spectators must stay outside marked zones.
- Only participating teams and volunteers may handle robots inside the arena.

🧱 6. Event Rounds / Structure

Round	Description	Duration
Round 1 - Dynamic shapes (Qualification)	2 objects of different shapes will be placed in 2 different checkpoints on the track.	90 min
Round 2 - Weighted objects (Finals)	2 objects of different weights will be placed in 2 different checkpoints on the track.	60 min
Final Evaluation	Judging, Demo, Results	[—]

Round 1 – Dynamic Shapes (Qualification)

Objective:
Test the robot's ability to handle objects of different shapes.

Details:
2 objects of different shapes will be placed at 2 different checkpoints on the track.

The robot must pick and place each object into the designated target area under remote control.

Objects:

1. Cube (side=4cm, weight ≈ 10g)
2. Sphere (radius=2.5cm, weight ≈ 10g)

Evaluation:
Successful handling of different shapes, grip adaptability, placement accuracy, and control stability.

Round 2 – Weighted Objects (Finals)

Objective:
Evaluate the robot's ability to handle objects of varying weights.

Details:
2 objects of different weights will be placed at 2 different checkpoints on the track.

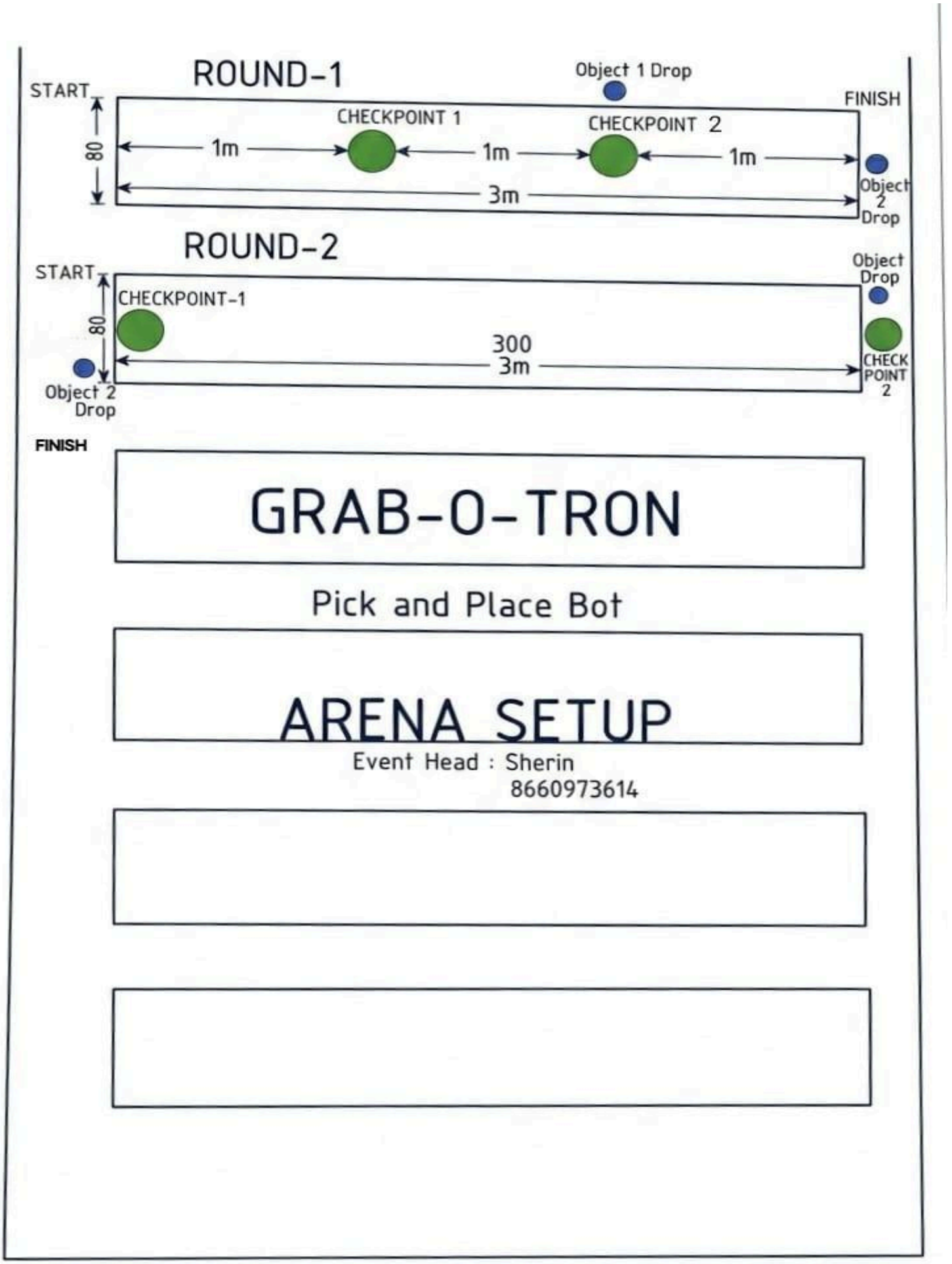
The robot must safely pick and place the objects without dropping or misplacing them.

Objects:

1. Cube (side=4cm, weight ≈ 50g)
2. Cylinder (height=5cm, radius=2.5cm, weight ≈ 100g)

Evaluation:
Ability to lift varying weights, grip strength control, object safety, and successful placement.

ARENA SETUP


ROUND-1
START
Object 1 Drop
FINISH
CHECKPOINT 1
CHECKPOINT 2
80
1m
1m
1m
3m
Object 2 Drop
ROUND-2
START
Object Drop
CHECKPOINT-1
80
300
3m
CHECK POINT 2
Object 2 Drop
FINISH
GRAB-O-TRON
Pick and Place Bot
ARENA SETUP
Event Head : Sherin
8660973614

🧾7. Submission Guidelines

Final submissions must include:

✅ Working prototype / robot demo

✅ Technical report or PPT (design, code, components)

✅ Source code / circuit diagram

✅ On-time physical submission before designated round

✅ Video proof if any round requires validation

🧑‍⚖️8. Judging Criteria

Criteria	Weightage
Innovation & Creativity	25%
Technical Implementation	25%
Functionality & Output	20%
Accuracy/Real-World Relevance	15%
Presentation	15%

💰 9. Scoring Overview

Parameter	Max Points
Performance / Accuracy	50
Technical Design	25
Safety & Compliance	15
Innovation / Aesthetics	10
Total	**100**

🚫 10. Penalties & Disqualifications

Violation	Penalty
Late Submission	-10 Points
Unsafe Operation	Immediate Disqualification
Incomplete or Pre-built Work	-20 Points
Violation of Safety Zone	-15 Seconds / -10 Points
Misconduct or Unethical Practice	Permanent Ban

🏆 11. Awards & Recognition

Category	Prize	Remarks
1st Prize	₹15,000	Winner
2nd Prize	₹10,000	1st Runner-up
3rd Prize	₹7,000	2nd Runner-up

🧭12. Event Team

Role	Name	Department / Club	Contact
Faculty Coordinator	Dr. Divyarani.M.S	Professor and Deputy Director, Makerspace	
Student Event Lead	Sherin	1st year CSE(cybersecurity)	+91 8660973614

📋13. General Instructions

- Follow all university and MakerSpace cluster policies.
- Respect judges, peers, and staff.
- Any form of plagiarism or code reuse will lead to disqualification.
- Decisions of the judges are final and binding.
- Certificates will be awarded to all valid participants.

⚡14. Official Note

This Rule Book serves as the official guideline for all MakerSpace Cluster events under INNOVATEX 4.0, Presidency University.
Any updates or clarifications will be communicated officially via the MakerSpace WhatsApp community and notice board.