



ORION

UAV DESIGN CHALLENGE · 48-HOUR HACKATHON

Event Report

Pegasus UAV Club (P.E.G.A.S.U.S.) · IIST Thiruvananthapuram
In collaboration with S.K.E.T.C.H. & CCGP IIST
Event dates: 10-11 October 2026

Submitted to the Administrative Block, IIST Thiruvananthapuram

Report date: 12 October 2026

1. Event at a Glance

15	57	12	2
teams registered	participants registered	projects submitted	competition tracks

The Orion UAV Design Challenge was a 48-hour hackathon held on 10–11 October 2026 and organised by the Pegasus UAV Club (P.E.G.A.S.U.S.) of IIST Thiruvananthapuram, in collaboration with S.K.E.T.C.H. and CCGP IIST. Each team was allotted an engineering problem statement matching its track and had to submit a design report, a CAD model, and a pitch. Teams submitted through a custom Orion portal, and judges scored every project on the same portal against a 100-mark rubric.

Team Varuna won the Senior Track, Team Aero Drift finished second, and Team BASH took the First-Year Special Track.

Event	Orion UAV Design Challenge (48-hour hackathon)
Dates	10–11 October 2026
Organiser	Pegasus UAV Club (P.E.G.A.S.U.S.), IIST Thiruvananthapuram
In collaboration with	S.K.E.T.C.H. and CCGP IIST
Tracks	Senior Track (10 registered teams) · First-Year Special Track (5 registered teams)
Evaluation	Two judges per team on the Orion portal; 100-mark rubric plus interdisciplinary bonus, minus penalties
Venue	Swayam Prabha hall and Seminar hall, Avionics Block
Faculty coordinator	Prof Rajesh Joseph Abraham



P.E.G.A.S.U.S. x CCGP x S.K.E.T.C.H.

INTERDISCIPLINARY
UAV HACKATHON

10 - 11
OCTOBER

TEAM SIZE
4
(VIEW BROCHURE)

REGISTRATION
200 INR
PER TEAM

DEDICATED CAD MODELLING WORKSHOP
BY S.K.E.T.C.H. CLUB INCLUDED

CASH
PRIZES
FOR TOP PERFORMING
TEAMS

INTERNSHIP
OPPORUTNITIES
WINNING PROFILES FAST-TRACKED TO UAV INDUSTRY LEADERS
FOR DIRECT INTERNSHIP OPPORTUNITIES THROUGH CCGP

8302272147
ISHAAN GUPTA

FOR REGISTRATIONS AND QUERIES
6382437689
NISHKALAN

9830726470
SAGNIK

Event banner

2. Winners

Final score = averaged judge rubric total (out of 100) + interdisciplinary bonus – penalties, as recorded on the Orion portal.

1ST POSITION · SENIOR	Team Varuna	Final score 95
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Project: Ship-to-Shore and Island Supply Drone · **Senior Track**

Rubric average 90/100 plus a 5-mark interdisciplinary bonus.

Role	Name	SC Code	Branch & Year
Team Leader · CAD	Ishaan Mundhra	SC24B021	Aerospace, 3rd Year
Member 2	Ishaan Shankar	SC24B094	Avionics, 3rd Year B.Tech
Member 3	Yash Gupta	SC24B069	Aerospace, 3rd Year B.Tech
Member 4	Pusala Prashanth	SC24B117	Avionics, 3rd Year B.Tech

2ND POSITION · SENIOR	Team Aero Drift	Final score 90
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Project: Propulsion Fault Detection from Vibration Signatures · **Senior Track**

Rubric average 93.5/100, the highest in the Senior Track, less a 3.5-mark penalty (submission flagged late by the portal).

Role	Name	SC Code	Branch & Year
Member 1	Aditya Mohanty	SC24B003	TBC
Member 2	Mainak Maity	SC24B100	TBC
Member 3	Parth Goel	SC24B043	TBC
Member 4	Sanidhya Rungta	SC24B053	TBC

FIRST-YEAR SPECIAL TRACK	Team BASH	Final score 89
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Project: Crop Health Monitoring Drone · **First-Year Special Track**

Rubric average 86/100 plus a 3-mark interdisciplinary bonus.

Role	Name	SC Code	Branch & Year
Team Leader	Avrodeep Ghosh	SC26B126	CSE (Data Science), 1st Year
Member 2 · CAD	Abhinav	SC26B001	Aerospace, 1st Year
Member 3	Shreshth Sharma	SC26B121	Dual Degree Engineering†
Member 4 · CAD	Kalaiventhan	SC26B016	Aerospace, 1st Year

Winner photographs



Prize distribution / group photo of winners

3. Participants

Source: Orion Team Registry. Teams 13-15 were added after the original registration sheet.

#	Team	Track	Team leader	Members	Submitted
01	Ballistic Battalion	First-Year Special Track	Utkarsh Pradip Nibe	4	Yes
02	codeX	Senior Track	Loka Grishma Kiranmayee	4	No
03	Zephyr (Senior)	Senior Track	Aditya Ashutosh Chincholkar	4	Yes
04	PHSS	Senior Track	Saarang A Nair	4	Yes
05	BASH	First-Year Special Track	Avrodeep Ghosh	4	Yes
06	VectorCraft	Senior Track	Nandana Doss V	4	Yes
07	Team Varuna	Senior Track	Ishaan Mundhra	4	Yes
08	SKYFORCE	Senior Track	Yuvraj Singh Tomar	4	Yes
09	Bombardino Crocodilo	Senior Track	Ayush Bharati	4	Yes
10	Zephyr (First-Year)	First-Year Special Track	Kamalrajan R	4	Yes
11	Apex 4	First-Year Special Track	Daniel Inigo A	4	Yes
12	VSAB	Senior Track	Bhushan Mohod	4	Yes
13	Prudhvi's Team	Senior Track	Koppineedi Prudhvi	3	No
14	Aero Drift	Senior Track	TBC	4	Yes
15	Shrihari's Team	First-Year Special Track	Shrihari	2	No

Registered: **57 participants** in 15 teams (10 Senior, 5 First-Year). 12 teams submitted a project; codeX, Prudhvi's Team and Shrihari's Team have no submission in the results file.

† The branch or year was cut off in the registration sheet. TBC means it was not provided. The first name 'Vishnu' appears in both Team VSAB and Shrihari's Team; these are recorded as registered and should be verified as two people. Team Aero Drift's registration does not name a leader. Two teams registered as Zephyr and are shown as Zephyr (Senior) and Zephyr (First-Year).

Team Rosters and Problem Statements

Shaded rows are the CAD / 3D modellers. Teams appear in registry order.

01 Ballistic Battalion			First-Year Special Track
Role	Name	SC Code	Branch & Year
Team Leader · CAD	Utkarsh Pradip Nibe	SC26B035	Aerospace Engineering, 1st Year
Member 2	Yash Kolhe	SC26B123	Dual Degree, 1st Year
Member 3	Atharva Tambe	SC26B006	Aerospace, 1st Year
Member 4	Archit Sharma	SC26B004	Aerospace Engineering†
Problem statement: Small Precision Spraying Drone (Beginner problem) Design a small multirotor that sprays a 0.25 ha crop plot evenly.			
Outcome: Rank 3 · First-Year Special Track (final 81.5)			

02 codeX			Senior Track
Role	Name	SC Code	Branch & Year
Team Leader · CAD	Loka Grishma Kiranmayee	SC25B191	Aerospace Engineering, 2nd Year
Member 2	Aelupula Snigdha	SC25B001	Aerospace Engineering†
Member 3	Yerukula Prisha	SC25B067	Aerospace Engineering†
Member 4	Revoori Hasya	SC25B026	Aerospace Engineering†
Problem statement: Flood Relief and Survivor Location Drone Drop food, water and a life-jacket kit to people stranded by floods, and locate survivors at night using a thermal camera.			
Outcome: No submission in the results file			

03 Zephyr (Senior)			Senior Track
Role	Name	SC Code	Branch & Year
Team Leader	Aditya Ashutosh Chincholkar	SC25B192	ECE, 2nd Year
Member 2	Naman Gandhi	SC25B092	ECE, 2nd Year
Member 3	Rudra Pratap Singh	SC25B130	ECE, 2nd Year
Member 4 · CAD	Prathmesh Pachling	SC24B116	Aerospace, 3rd Year
Problem statement: Mobile-Network Relay Drone for Disaster Zones Restore temporary 4G or LoRa connectivity over a disaster area using a tethered or free-flying relay platform.			
Outcome: Rank 4 · Senior Track (final 81)			

04 PHSS			Senior Track
Role	Name	SC Code	Branch & Year
Team Leader · CAD	Saarang A Nair	SC25B029	Aerospace, 2nd Year
Member 2 · CAD	Harsharaj R	SC25B009	Aerospace, 2nd Year
Member 3	Pramodh Bala T	SC25B096	Avionics, 2nd Year
Member 4	Sonit Nooney	SC25B106	Avionics, 2nd Year
Problem statement: Rapid-Response Defibrillator Drone Reach a cardiac-arrest site within 5 minutes across a 5 km radius and deliver an AED with voice-guided instructions.			
Outcome: Rank 6 · Senior Track (final 78.5)			

05 BASH			First-Year Special Track
Role	Name	SC Code	Branch & Year
Team Leader	Avrodeep Ghosh	SC26B126	CSE (Data Science), 1st Year
Member 2 · CAD	Abhinav	SC26B001	Aerospace, 1st Year
Member 3	Shreshth Sharma	SC26B121	Dual Degree Engineering†
Member 4 · CAD	Kalaiventhan	SC26B016	Aerospace, 1st Year
Problem statement: Crop Health Monitoring Drone (Beginner problem) Design a small survey drone that photographs a 5 ha farm to spot unhealthy crop patches.			
Outcome: Rank 1 · First-Year Special Track (final 89)			

06 VectorCraft			Senior Track
Role	Name	SC Code	Branch & Year
Team Leader	Nandana Doss V	SC25B195	ECE, 2nd Year
Member 2	S Bhanu Sanjana	SC25B103	ECE, 2nd Year
Member 3	Harshini Balakrishnan	SC25B148	CSE, 2nd Year
Member 4 · CAD	Nikileshwar Pakala	SC25B022	Aerospace, 2nd Year
Problem statement: Power-Line and Tower Inspection Drone Inspect high-voltage lines and towers at close range and report defects such as damaged insulators and loose fittings.			
Outcome: Rank 3 · Senior Track (final 85.5)			

07 Team Varuna			Senior Track
Role	Name	SC Code	Branch & Year
Team Leader · CAD	Ishaan Mundhra	SC24B021	Aerospace, 3rd Year
Member 2	Ishaan Shankar	SC24B094	Avionics, 3rd Year B.Tech
Member 3	Yash Gupta	SC24B069	Aerospace, 3rd Year B.Tech
Member 4	Pusala Prashanth	SC24B117	Avionics, 3rd Year B.Tech
Problem statement: Ship-to-Shore and Island Supply Drone Deliver 5 kg of supplies between a vessel and an island, 15 km each way, landing on or dropping to a moving platform.			
Outcome: Rank 1 · Senior Track (final 95) ★ WINNER			

08 SKYFORCE			Senior Track
Role	Name	SC Code	Branch & Year
Team Leader	Yuvraj Singh Tomar	SC24B137	ECE, 3rd Year
Member 2 · CAD	Aditya Kaundilya	SC24B002	Aerospace, 3rd Year
Member 3	Shaurya Singh	SC24B124	ECE, 3rd Year
Member 4 · CAD	Dipanshu Kumar Kushwaha	SC24B014	Aerospace†
Problem statement: Anti-Drone Interceptor Detect, track and safely neutralise rogue drones near airports or events, with the target recovered intact.			
Outcome: Rank 7 · Senior Track (final 73.5)			

09 Bombardino Crocodilo			Senior Track
Role	Name	SC Code	Branch & Year
Team Leader	Ayush Bharati	SC25B200	Aerospace, 2nd Year
Member 2 · CAD	Raktim Mandal	SC25B203	Aerospace, 2nd Year
Member 3	Kartik Kumar	SC25B055	Aerospace, 2nd Year
Member 4	Shlok Jha	SC25B213	Engineering Physics, 2nd Year
Problem statement: Hill-Station Logistics Drone Replace porters and mules on steep terrain by carrying 10 kg to an altitude of 3,000 m.			
Outcome: Rank 5 · Senior Track (final 79)			

10 Zephyr (First-Year)			First-Year Special Track
Role	Name	SC Code	Branch & Year
Team Leader	Kamalrajan R	SC26B074	ECE, 1st Year
Member 2	Pranev D R	SC26B134	CSE, 1st Year
Member 3	Sanjay V	SC26B093	ECE, 1st Year
Member 4 · CAD	Hrithikesh Premakumar	SC26B013	Aerospace, 1st Year
Problem statement: Campus First-Aid Delivery Drone (Beginner problem) Design a drone that delivers a 1 kg first-aid kit across campus or between nearby villages.			
Outcome: Rank 2 · First-Year Special Track (final 82.5)			

11 Apex 4			First-Year Special Track
Role	Name	SC Code	Branch & Year
Team Leader	Daniel Inigo A	SC26B062	B.Tech Avionics, 1st Year
Member 2 · CAD	Sathish Nirmal M	SC26B030	B.Tech Aerospace, 1st Year
Member 3	Akshith Chittiprolu	SC26B061	B.Tech Avionics†
Member 4	A.V. Varshith Vilochan	SC26B104	B.Tech Avionics†
Problem statement: Campus Patrol and Surveillance Drone (Beginner problem) Design a small drone that flies a fixed patrol route around a campus perimeter and streams live video.			
Outcome: Rank 4 · First-Year Special Track (final 79)			

12 VSAB			Senior Track
Role	Name	SC Code	Branch & Year
Team Leader · CAD	Bhushan Mohod	SC25B004	B.Tech Aerospace, 2nd Year
Member 2	Vishnu	SC25B039	B.Tech Aerospace, 2nd Year
Member 3	Arnav Chamate	SC25B003	B.Tech Aerospace, 2nd Year
Member 4	Shreehari Vinod	SC25B034	B.Tech Aerospace, 2nd Year
Problem statement: Cold-Chain Medical Delivery Drone Carry temperature-sensitive vaccines or blood from a district hospital to a remote health centre.			
Outcome: Late submission, not scored · not ranked			

13 Prudhvi's Team			Senior Track
Role	Name	SC Code	Branch & Year
Team Leader	Koppineedi Prudhvi	SC25B172	TBC
Member 2	Krishna Tejaswin Suvvari	SC25B216	TBC
Member 3	Naini Surya	SC25B181	TBC
Problem statement: Payload Mass Estimation from Flight Telemetry (Intermediate problem) Estimate an unknown additional payload mass without direct measurement, using flight telemetry while accounting for sensor noise and external factors.			
Outcome: No submission in the results file			

14 Aero Drift			Senior Track
Role	Name	SC Code	Branch & Year
Member 1	Aditya Mohanty	SC24B003	TBC
Member 2	Mainak Maity	SC24B100	TBC
Member 3	Parth Goel	SC24B043	TBC
Member 4	Sanidhya Rungta	SC24B053	TBC
Problem statement: Propulsion Fault Detection from Vibration Signatures (Advanced problem) Use simulated accelerometer signals to distinguish healthy propulsion from abnormal conditions and build a condition monitoring system.			
Outcome: Rank 2 · Senior Track (final 90) ★ RUNNER-UP			

15 Shrihari's Team			First-Year Special Track
Role	Name	SC Code	Branch & Year
Team Leader	Shrihari	TBC	TBC
Member 2	Vishnu	TBC	TBC
Problem statement: Adaptive Landing Mechanism for Inclined Surfaces (Basic problem) Design a landing mechanism that lets a UAV land on inclined surfaces, adapting mechanically to different heights without active electronics.			
Outcome: No submission in the results file			

4. The Orion Submission and Judging Portal

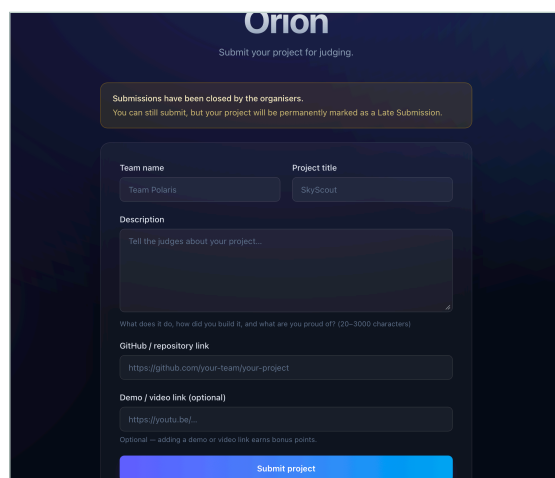
The club built a web portal to run the full pipeline of the event: project submission, deadline enforcement, judge scoring and ranking. It is a Next.js and React application with a Postgres database, hosted on Vercel. It replaced spreadsheets and email submissions with a single source of truth that organisers, judges and teams could rely on.

4.1 Team submissions

Each team completed one public form:

- Team name and project title
- Description of the project (20–3,000 characters)
- Repository link (GitHub or similar)
- Optional demo or video link, encouraged with bonus points
- A hidden trap field that filters out automated spam submissions

A team could submit more than once. Judges always saw the latest submission, with earlier ones listed beneath it. After submitting, the team received a reference number and the exact recorded time.



Screenshot: public submission form

4.2 Deadline and late-submission handling

Lateness was decided by the portal itself, so no team could alter it:

- A submission is flagged **Late** if it arrives after the configured deadline, or after an organiser clicks **Close Submissions**.
- The decision uses the database server's clock in the same step that saves the entry, so the timestamp and the late flag can never disagree.
- The flag is permanent. A database rule blocks later edits, and reopening submissions never clears earlier late flags.
- Late projects were still accepted and clearly marked to judges and organisers.

4.3 How judges scored

1	Judge accounts The organiser added each judge on the admin page. The portal generated an 8-character passcode per judge, avoiding look-alike characters such as 0/O and 1/I.
2	Sign-in Judges signed in at the judge page with their passcode and saw the list of all teams and their submissions.
3	Review For each team the judge read the description and opened the repository and demo links.
4	Scoring Six criteria were scored in whole or half marks. The portal rejected out-of-range values and showed the running total out of 100.
5	Comments and conflicts Judges could add written comments, or tick a conflict-of-interest box to recuse themselves. A recused judge's marks are excluded from the average.
6	Edit and lock Scores could be edited until the organiser locked scoring. After the lock, no judge could change anything, which makes the results final.

Scoring rubric (100 marks)

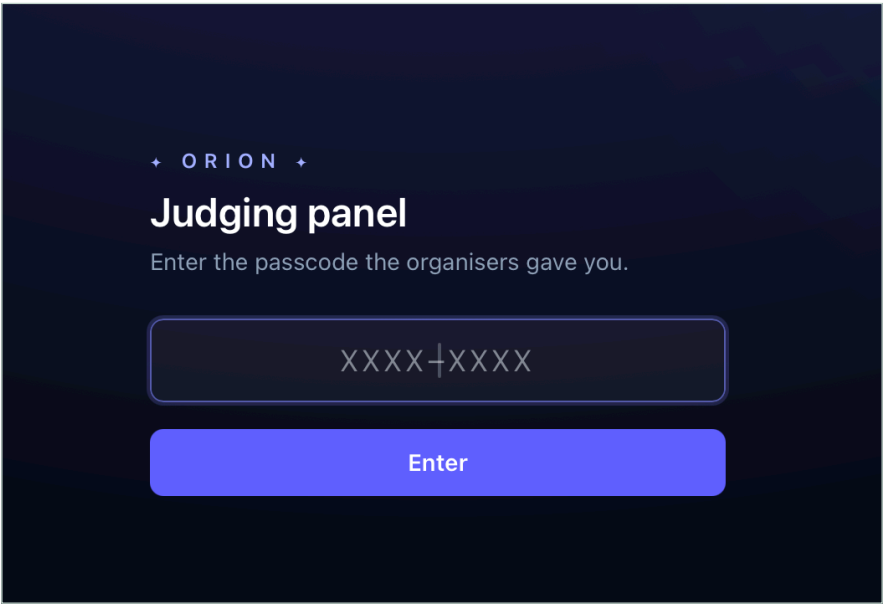
Criterion	Marks	What judges looked for
Innovation & Creativity	25	An original, sensible approach to the assigned problem
Technical Complexity & Feasibility	20	Engineering depth across aerodynamics, avionics and software; analysis that backs the claims; a realistic design
Problem Relevance	15	How well the design answers its brief and the real need behind it
Scalability	15	Potential to grow: modularity, manufacturability, cost, wider deployment
Presentation & Pitching	15	Clarity, structure, teamwork in delivery, handling of questions
CAD Detailing	10	Model accuracy, assembly quality, drawings, level of detail
Total	100	

4.4 How results were calculated

Final score = average rubric total (out of 100) + interdisciplinary bonus (max 5) – penalties

- Each team is scored by at least two judges, and the judges' totals are averaged. Every evaluated team in this event had two judges.
- The organisers entered each team's track, interdisciplinary bonus and penalties on the admin page, with a note giving the reason.
- The two tracks are ranked separately.
- Tie-break order: higher Innovation average, then higher Technical average, then a panel vote. No ties occurred.
- If a team's two judges differed by more than 15 marks, the portal flagged it for review (Ballistic Battalion and Apex 4).
- The admin page exports the results as a CSV file, which is the source of Section 5.

Portal screenshots



Screenshot: judge sign-in

Track, bonus & penalties			
Interdisciplinary Bonus (5.2): proposed +2 for two branches, +4 for three, +5 for four (max 5). Penalties: a Level 2 offence costs 3–10 marks (15.2); a submission up to 10 minutes late loses 5 marks and anything later is not evaluated (11.3). Those amounts are marked [to confirm] in the rulebook, so enter whatever the organisers decide.			
Aero Drift	Senior Track · submitted 11 Oct 2026, 3:32:24 pm IST	Late +3 min	Final: 90
Apex 4	First-Year Special Track · submitted 11 Oct 2026, 3:31:48 pm IST	Late +2 min	Final: 79
Ballistic Battalion	First-Year Special Track · submitted 11 Oct 2026, 3:27:29 pm IST		Final: 81.5
Bombardilo Crocodilo	Senior Track · submitted 11 Oct 2026, 4:00:17 pm IST	Late +31 min	Final: 79
PHSS	Senior Track · submitted 11 Oct 2026, 3:33:07 pm IST	Late +4 min	Final: 78.5
SKYFORCE	Senior Track · submitted 11 Oct 2026, 3:41:22 pm IST	Late +12 min	Final: 73.5
Team BASH	First-Year Special Track · submitted 11 Oct 2026, 3:27:11 pm IST		Final: 89
Team Varuna	Senior Track · submitted 11 Oct 2026, 3:28:00 pm IST		Final: 95
Team03_Zephyr_Senior	Senior Track · submitted 11 Oct 2026, 3:29:40 pm IST		Final: 81
VectorCraft	Senior Track · submitted 11 Oct 2026, 3:28:52 pm IST		Final: 85.5
VSAB	Senior Track · submitted 11 Oct 2026, 4:14:47 pm IST	Late +45 min	Final: —
ZEPHYR_First year	First-Year Special Track · submitted 11 Oct 2026, 3:28:15 pm IST		Final: 82.5

Screenshot: admin track, bonus & penalties

5. Orion Hackathon Results

Criterion columns are the average of the two judges' marks. Rubric is the average total out of 100. Final = Rubric + Bonus – Penalty. Penalties were entered by the organisers; the Late column is the portal's automatic flag. Team names follow the registry spelling.

Senior Track

Rank	Team	Innov. /25	Tech. /20	Relev. /15	Scal. /15	Pres. /15	CAD /10	Rubric /100	Bonus	Penalty	Final	Late
1	Team Varuna	23.5	17	13.5	13.5	13.5	9	90	5	0	95	No
2	Aero Drift	24.5	17.5	13	14.5	14.5	9.5	93.5	0	3.5	90	Yes
3	VectorCraft	22.5	16.5	13	12	12.5	8	84.5	1	0	85.5	No
4	Zephyr (Senior)	18	16.5	12.5	11	12.5	9.5	80	1	0	81	No
5	Bombardino Crocodilo	21.5	18	13	13	13.5	10	89	0	10	79	Yes
6	PHSS	21	16.5	13.5	11.5	13.5	6	82	0.5	4	78.5	Yes
7	SKYFORCE	20.5	16.5	14	12.5	13.5	9	86	0	12.5	73.5	Yes
-	VSAB	-	-	-	-	-	-	-	0	45	-	Yes

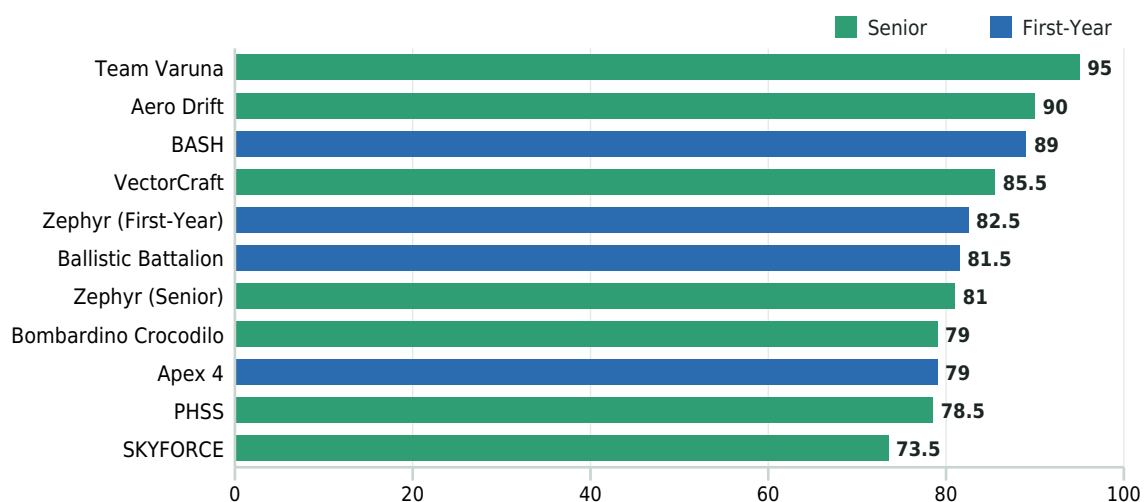
VSAB (Cold-Chain Medical Delivery Drone) submitted late, was not scored by any judge, and carries a 45-mark penalty, so it has no final score or rank.

First-Year Special Track

Rank	Team	Innov. /25	Tech. /20	Relev. /15	Scal. /15	Pres. /15	CAD /10	Rubric /100	Bonus	Penalty	Final	Late
1	BASH	18.5	17.5	14	13.5	13	9.5	86	3	0	89	No
2	Zephyr (First-Year)	19	15.5	12.5	12.5	13.5	9.5	82.5	0	0	82.5	No
3	Ballistic Battalion	17.5	15.5	13.5	13	12.5	8.5	80.5	1	0	81.5	No
4	Apex 4	17.5	15.5	13	13	13.5	9.5	82	0	3	79	Yes

Ballistic Battalion and Apex 4 were flagged by the portal for a large gap between their two judges' scores.

Final scores at a glance



6. Event Photographs



Teams working on their designs

7. Conclusion

The Orion UAV Design Challenge brought 15 registered teams and 57 students together for 48 hours of UAV design work. Twelve teams submitted projects, and every project was scored by two judges against a common 100-mark rubric. The portal's server-side deadline check, passcode-based judge access, per-criterion scoring and score lock kept the process fair, consistent and auditable. Team Varuna (1st), Team Aero Drift (2nd) and Team BASH (First-Year Special Track) led the results. The club thanks the administration, the judges, S.K.E.T.C.H., CCGP IIST and every participating team.

President
P.E.G.A.S.U.S. Club

Vice - President
P.E.G.A.S.U.S. Club

Faculty Coordinator
P.E.G.A.S.U.S. Club