Event Report

1. Name of Event: Drone Technician Program

2. Nature of the Event: Mentoring Session

3. Date: 6th February 2025 to 8th February 2025

4. Time: 09:30 to 05:30 P.M.

5. Mode of Event: Offline session

6. Organized by: GUIITAR Council and GSFC University In collaboration with Garuda Aerospace Pvt. Ltd., Chennai

7. Number of Participants: 15

8. Speaker: Dr. K Ramesh Kumar, Head - RPTO Establishments, Garud Aerospace Pvt. Ltd., Chennai

9. Major discussions in the event:

DAY 1:

We started with an introduction to The Garuda Aerospace Pvt. Ltd. that maufactures DRONE (*Dynamically Remote Operated Navigational Equipment)* which include Vajra (for defense), Agridrone (for agriculture), and videography drones. We explored their uses in chimney cleaning, solar panel maintenance, defense, transportation, delivery, and surveillance. The session also touched on key historical figures like Nikola Tesla (1898) and Reginald Denny (1930s-1940s), who contributed to drone innovation.

Additionally, we discussed regulatory bodies such as ICAO and DGCA, along with important weight terminologies like dry weight and MTOW (Maximum Takeoff Weight). We explored the key components that make up a drone such as: flight controller (FC), Power Module, LiPo battery, power distribution board, BLDC motors, ESCs (Electronic Speed Controllers) and propellers with their functions.

We also learned about the 4 main controls of the remote controller and the 4 forces that act on a drone during their flight. We also discussed the classification of drones depending on various classes such as weight, rotor/wing, frames. We were then taught about the pre-flight check that needs to be conducted in India and the different zones that we observe on the airspace map. We

were given a brief about the operation of drones: VLOS and BVLOS as well as drone insurance and introduction to Drone data and Analysis.

DAY 2:

After the completion of the theory portion on day 1, we held a simulated flying practice session and test on day 2. We divided into groups and took turns to practice on Phoenix Software - A drone flying simulator. We were given three practicals:

1. To follow a square path without using Yaw control, only the Roll controls.
2. To follow a square path using Yaw control.
3. To follow a circular path.

Later in the day, the test was held and everyone present individually performed the practicals on the phoenix software with our mentor grading us. A quiz was conducted regarding the theory that was taught to us on Day 1, it was a 20 marks quiz.

DAY 3:

On Day 3 was the hands-on training. We were taken to an open farm field and the session started off with the mentor showing us how to assemble a drone and how to arm and disarm the drone. After a demo flight and teaching us about the pre-flight checks that need to be observed on the remote controller , each participant went in turn twice to perform the practicals that we had simulated on Day 2. On each battery, the flight time of the drone was a mere 15-20 min and had to be changed frequently and throttle up and down was the most power consuming step of the drone flight.

10. Learning outcomes of the event:

The drone program provided a comprehensive understanding of drones, their applications, and hands-on piloting experience. We began by learning about Garuda Aerospace Pvt. Ltd. and its various drone models, including Vajra (for defense), Agridrone (for agriculture), and videography drones. The sessions covered historical contributions and the role of regulatory bodies in drone licensing and operations. We explored drone components, including the flight controller, BLDC motors, ESCs, LiPo batteries, and power modules, and studied flight

dynamics, such as the forces acting on drones and remote control operations. Additionally, we gained insights into pre-flight checks, airspace regulations, and operational modes. The program included a drone flight simulation using Phoenix Software, where we practiced various flight maneuvers before transitioning to hands-on training in an open field. We learned how to assemble, arm, and disarm drones, as well as perform controlled flight exercises. The practical sessions also emphasized battery management, highlighting flight duration constraints and power consumption. This program helped us gain a foundational understanding of drones.

11. Photos