ME-202(Machine Drawing)

Project Report

Name - Rajeev Kumar Entry No. - 2022MEB1335 Section - C

Title: CAD modelling of Quadcopter Drone.

Objective:

The primary objective is to design an autonomous drone that have advanced navigation capabilities for obstacle avoidance and precise positioning.

Problem Statement:

Designing an Autonomous Drone for Efficient and Safe Operations like Autonomous Navigation, Safety and Regulations.

Description:

The rapid advancements in drone technology have led to their increased application across various industries, from photography and surveillance to delivery services and agriculture. However, several challenges persist in maximizing their efficiency, safety, and usability. The primary goal is to develop an autonomous drone system that addresses these challenges to enhance its functionality and reliability.

Working Principle:

Autonomous drones operate using a combination of sensors gathering real-time data, advanced algorithms for decision-making, and flight control systems. Sensors such as GPS, cameras, and environmental sensors collect information about the drone's surroundings, which is processed by algorithms to navigate, avoid obstacles, and plan paths. These algorithms guide the drone's flight control systems to adjust rotor speeds and ensure stable and safe autonomous flight.

Flying Mechanism:

The flying mechanism of a quadcopter drone revolves around its four rotors strategically positioned in a cross-like layout. These rotors, each powered by an individual motor, function as propellers generating lift. As the motors spin the propellers, they create upward thrust, counteracting gravity and allowing the drone to take flight. Flight control is achieved through the manipulation of rotor speeds: altering the rotational speed of these four rotors enables the quadcopter to manoeuvre in various directions. By adjusting the speeds differentially, it tilts forward, backward, sideways, or rotates, thus enabling controlled movement along multiple axes. Ultimately, the quadcopter's flight capability relies on the harmonious coordination of its rotors, powered by motors, and controlled by an intricate system, enabling precise movement and stability in the air.

Applications of Quadcopter Drones:

Aerial Photography and Videography: Quadcopters equipped with high-resolution cameras are extensively used in filmmaking, photography, and videography for capturing stunning aerial shots and footage.

Surveillance and Security: They serve as valuable tools for surveillance in monitoring large areas, enhancing security measures, and aiding search-and-rescue missions due to their ability to access hard-to-reach locations.

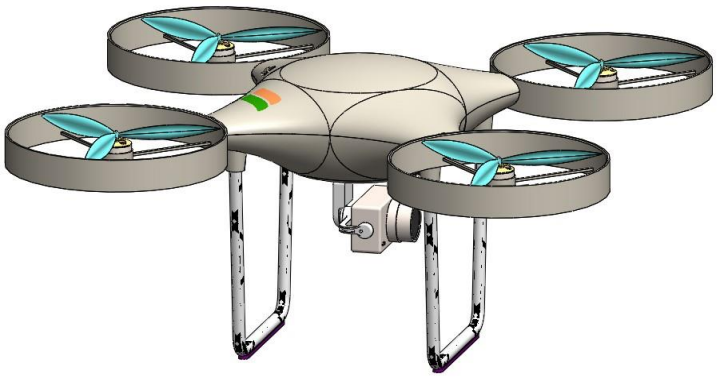
Agriculture: Drones equipped with sensors and cameras assist in precision agriculture by monitoring crops, assessing crop health, optimizing irrigation, and spraying fertilizers or pesticides efficiently.

Delivery Services: Companies explore drone delivery for transporting goods in areas with challenging terrain or in urgent situations, providing swift and efficient delivery of small packages.

Environmental Monitoring: Drones aid environmentalists and researchers by collecting data on wildlife, ecosystems, and environmental changes in remote or inaccessible areas.

Emergency Response: In disaster management scenarios, quadcopter drones are utilized for assessing damage, delivering medical supplies, and providing situational awareness to emergency responders.

CAD Model:



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Bottom Base	Tough Plastic	1
2	Camera	For Footage	1
3	Camera holder	M.S.	1
4	Camera stand	M.S.	1
5	DC Motor	Electric Component	4
6	Landing Base	Metal	2
7	Propeller	High RPM Plastic	4
8	Upper Cover	Tough Plastic	1