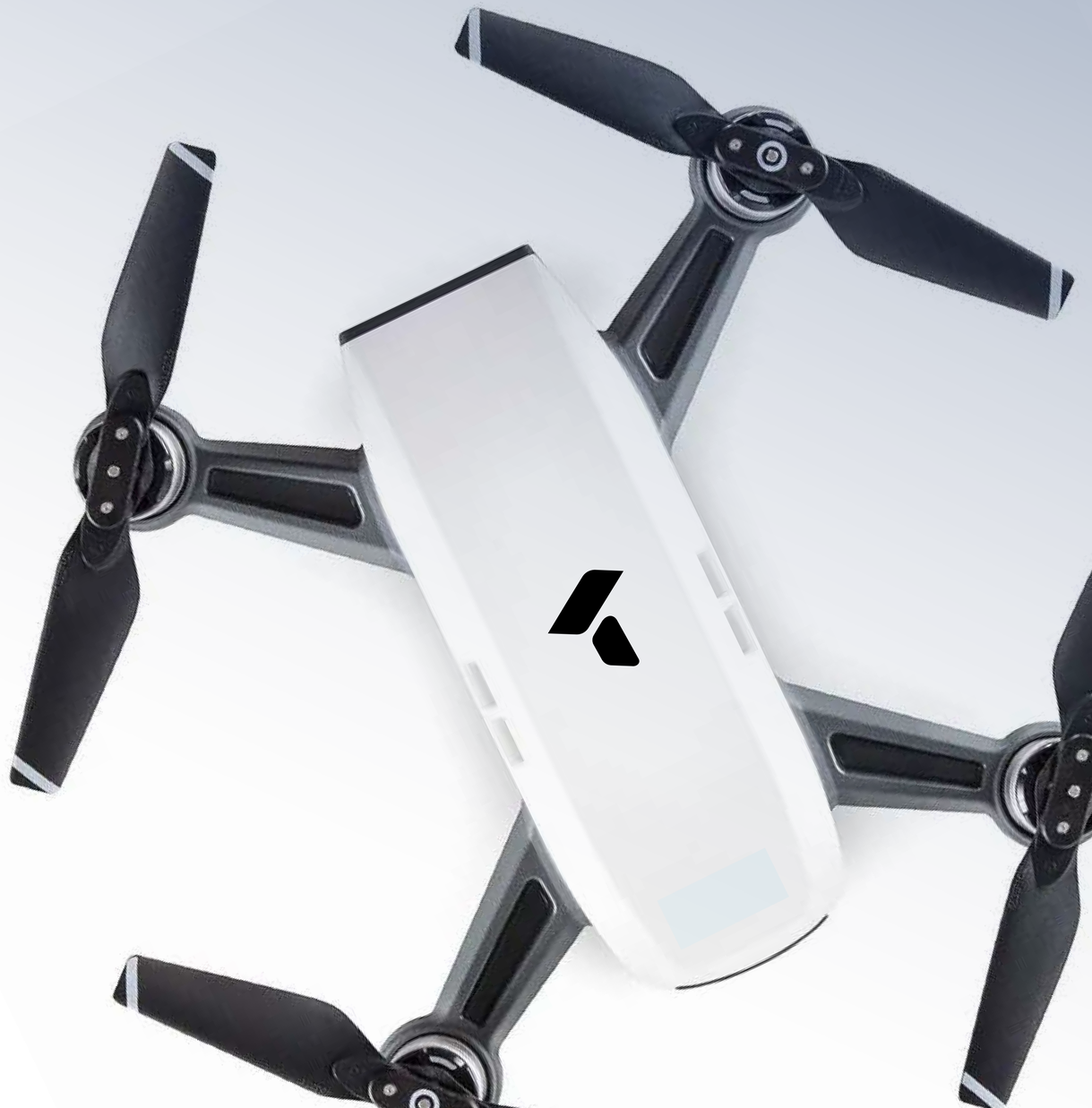
Teachnook
STARTING POINT FOR YOUR CAREER PATH

DRONA AVIATION

WE'RE NOW LinkedIn™ TOP STARTUP 2023

# Drone Engineering

The next generation is here,Exploring generational Perspectives through the lens of drones.



FREE DRONE

# Who We Are?

## The Starting Point For Your Career Path

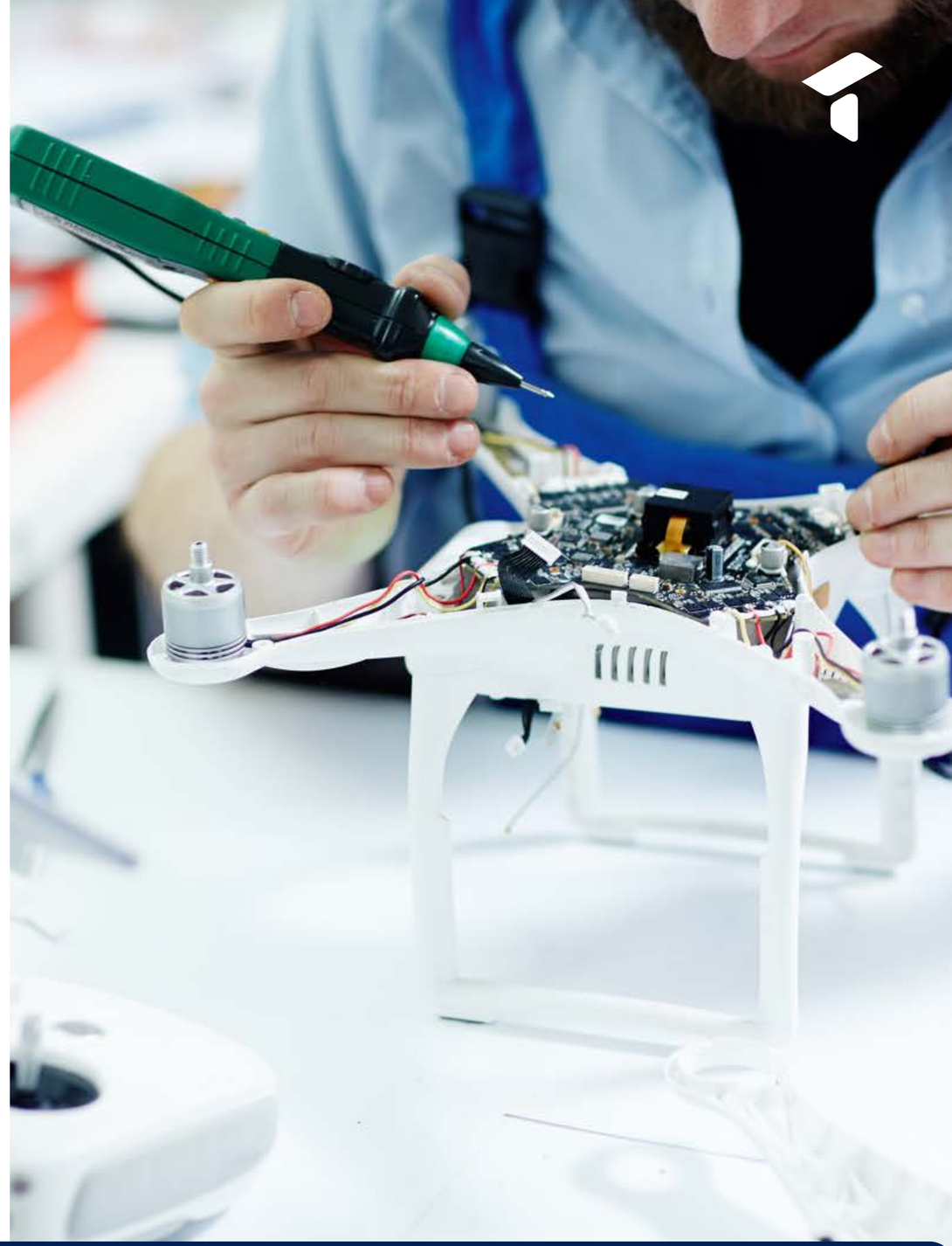
We help undergrad and post grad students struggling to get industrial experience with our Training + Internship programs which help them to become corporate-ready individuals and possess the skillset to take on any challenges without any self-doubt.

## Take the Right Turn, With Us

www.teachnook.com

# About Drona Aviation:

We are an IIT Bombay startup working with drone for last 10 years. We have won awards in competitions globally including **IMAV France,ICUG Spain, MICAV Bengaluru, Techfest Mumbai** among many others. Through the open source Pluto platform, we plan to democratise the process of drone innovation.



### The Starting Point For Your Career Path

# Our Mission & Vision

We help undergrad and post grad students struggling to get industrial experience with our Industry Grade Mentorship programs wich help them to become corporate-ready individuals and possess the skillset to take on any challenges without any self-doubt.

## Mission

Our aim is to become one of the most preferred education technology platforms accross the globe.

## Vision

We envision a world in which each students receives the effective, eqitable, and engaging education they need to reach thier full and unique potential.



# About Program :

## Experience India’s first Physical Project Submission.

Don't limit yourself, Unlock the skies with our carefully curated program with

- 36+ Hours of live training
- 10+ Minor projects to strengthen your topics and
- 1 Capstone Project to obtain practical experience about Drones

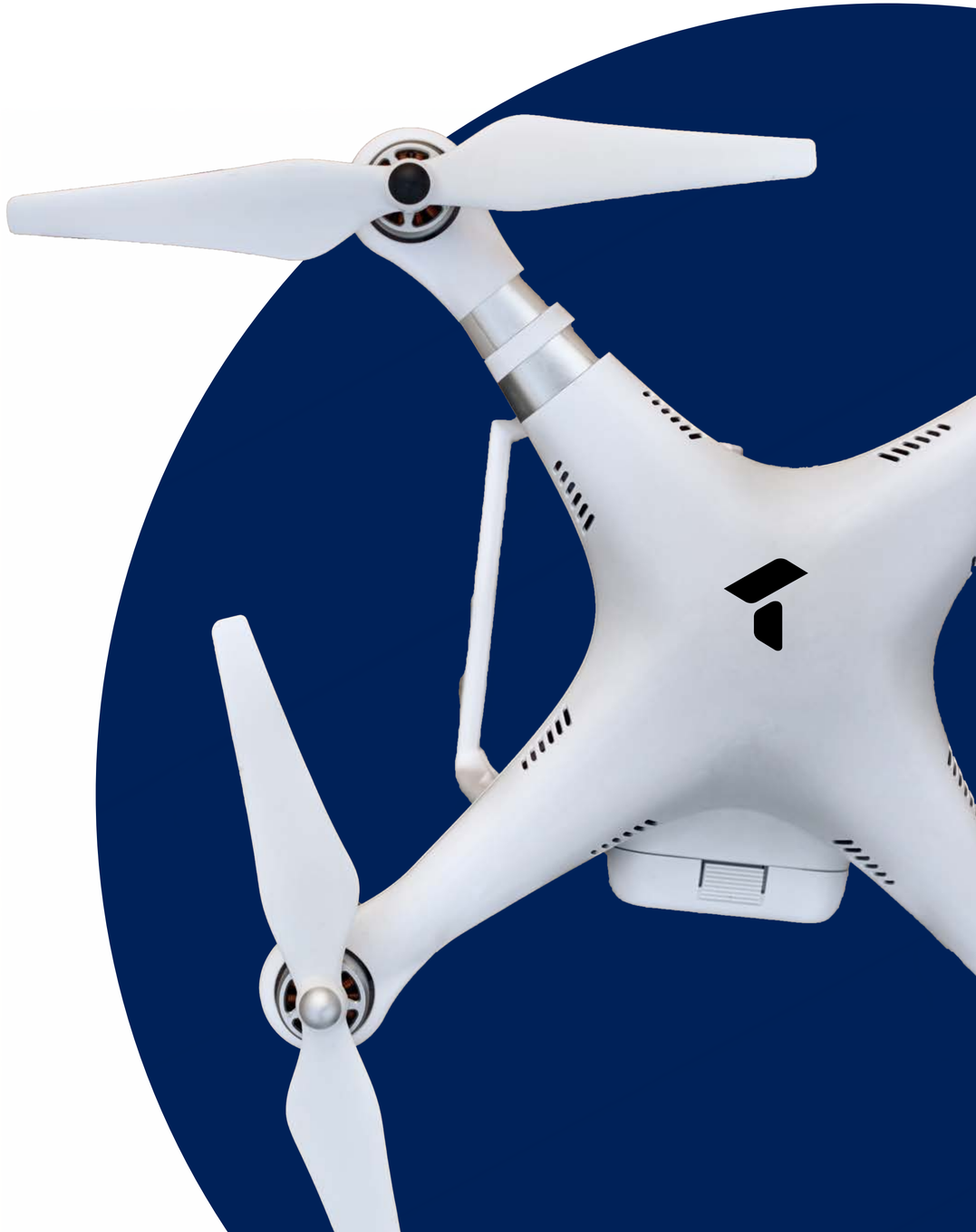
Learn, program and fly your own drone with Teachnook’s Drone Engineering Program.

Excel your projects and

Get a live internship opportunity with Dronaaviation and skyrocket your career.

# Lesson Plan 01:
# Month 01

- Introduction to basics of Drone
- Basic of Aerodynamics and paper planes
- Forces of flights and Introduction to Aromodelling
- Dynamic of Aerial systems
- Practical projects



# Week 1: Introduction to Basics of Drone

## Introduction to Drones and Basics

DAY 01 (1 hour)

Mechanical and Electronics
Overview of drone technology
Components: Frame, motors, propellers, flight controller
Basic aerodynamics principles

## Paper Planes and Basics of Aerodynamics

DAY 02 (1 hour)

Mechanical and Aerospace Engineering
Introduction to aerodynamics
Lift, drag, thrust, and weight
Paper plane construction and principles

## Forces of Flight

DAY 03 (1 hour)

Mechanical and Aerospace Engineering
Detailed study of aerodynamic forces
Role of surfaces: wings, rudder, elevator, and ailerons
Equations governing flight forces

## Introduction to Aeromodelling

DAY 04 (1 hour)

Mechanical and Aerospace Engineering
Basics of aeromodel construction
Materials and design considerations
Overview of different aeromodels

## Dynamics of Aerial Systems

DAY 05 (1 hour)

Mechanical and Aerospace Engineering
Understanding the motion of aircraft
Stability and control in flight
Role of control surfaces

## Practical-Model Plane Building

DAY 06 (1 hour)

Mechanical and Aerospace Engineering
Step-by-step model plane construction
Hands-on experience with basic tools
Safety measures in workshop environments

# Week 2: Basic of Aerodynamics and Paper Planes

## Introduction to Drones and UAVs

DAY 07 (1 hour)

Electronics and Computer Science
Drone classifications and applications
Overview of Unmanned Aerial Vehicles (UAVs)
Integration of electronics in drone systems

## Types of Drones and Their Structures

DAY 08 (1 hour)

Electronics and Mechanical Engineering
Quadcopters, hexacopters, octocopters
Frame materials and designs
Mechanical considerations for different drone types

## Applications and Future Trends of Drones

DAY 09 (1 hour)

Electronics and Computer Science
Commercial and industrial applications
Emerging trends in drone technology
Ethical and legal considerations

## Forces of Flight in Drones

DAY 10 (1 hour)

Mechanical and Aerospace Engineering
Applying aerodynamic principles to drones
Effects of weight distribution and balance
Impact of design on flight dynamics

## Controls of an Airplane

DAY 11 (1 hour)

Mechanical and Aerospace Engineering
Ailerons, elevators, rudders, and flaps
Control mechanisms in traditional aircraft
Adaptation of aircraft controls for drones

## Controls of a Drone

DAY 12 (1 hour)

Electronics and Computer Science
Flight controllers and their role
PID controllers for stabilization
Programming controls for specific maneuvers

# Week 3: Introduction to Aeromodeling

## Building the Drone – Pluto

Electronics and Mechanical Engineering
Hands-on assembly of a drone kit
Component integration and wiring
Testing and calibration procedures

DAY 13 (1 hour)

## Test Flight and Troubleshooting

Electronics and Mechanical Engineering
Pre-flight checklist
Common issues and how to troubleshoot
Ensuring safe and stable flights

DAY 14 (1 hour)

## Types of Systems and Stability

Mechanical and Aerospace Engineering
Understanding stability in dynamic systems
Control systems in drones
Redundancy and fail-safes in drone design

DAY 15 (1 hour)

## Need for Sensors in Drones

Electronics and Computer Science
Role of sensors in drone technology
Overview of gyros, accelerometers, GPS, etc.
Sensor fusion for accurate data

DAY 16 (1 hour)

## How Sensors Work in Drones

Electronics and Computer Science
Detailed workings of drone sensors
Calibration and precision considerations
Real-world applications of sensor data

DAY 17(1 hour)

## Accelerometer Experiment

Electronics and Computer Science
Practical experimentation with accelerometers
Understanding data output
Calibration techniques

DAY 18 (1 hour)

# Week 4: Sensor and it’s Applications

## Gyro Sensor Experiment

DAY 19(1 hour)

Electronics and Computer Science
Hands-on experience with gyro sensors
Gyroscopic principles and stability
Fine-tuning gyro settings

## Magnetometer Experiment

DAY 20 (1 hour)

Electronics and Computer Science
Exploration of magnetometer functionality
Magnetic field considerations
Calibration and interference mitigation

## Barometer Experiment

DAY 21 (1 hour)

Electronics and Computer Science
Utilizing barometric sensors for altitude
Understanding atmospheric pressure
Calibration techniques

## Distance Sensors and Applications

DAY 22 (1 hour)

Electronics and Computer Science
Types of distance sensors (ultrasonic, lidar, etc.)
Applications in drone technology
Integration and calibration

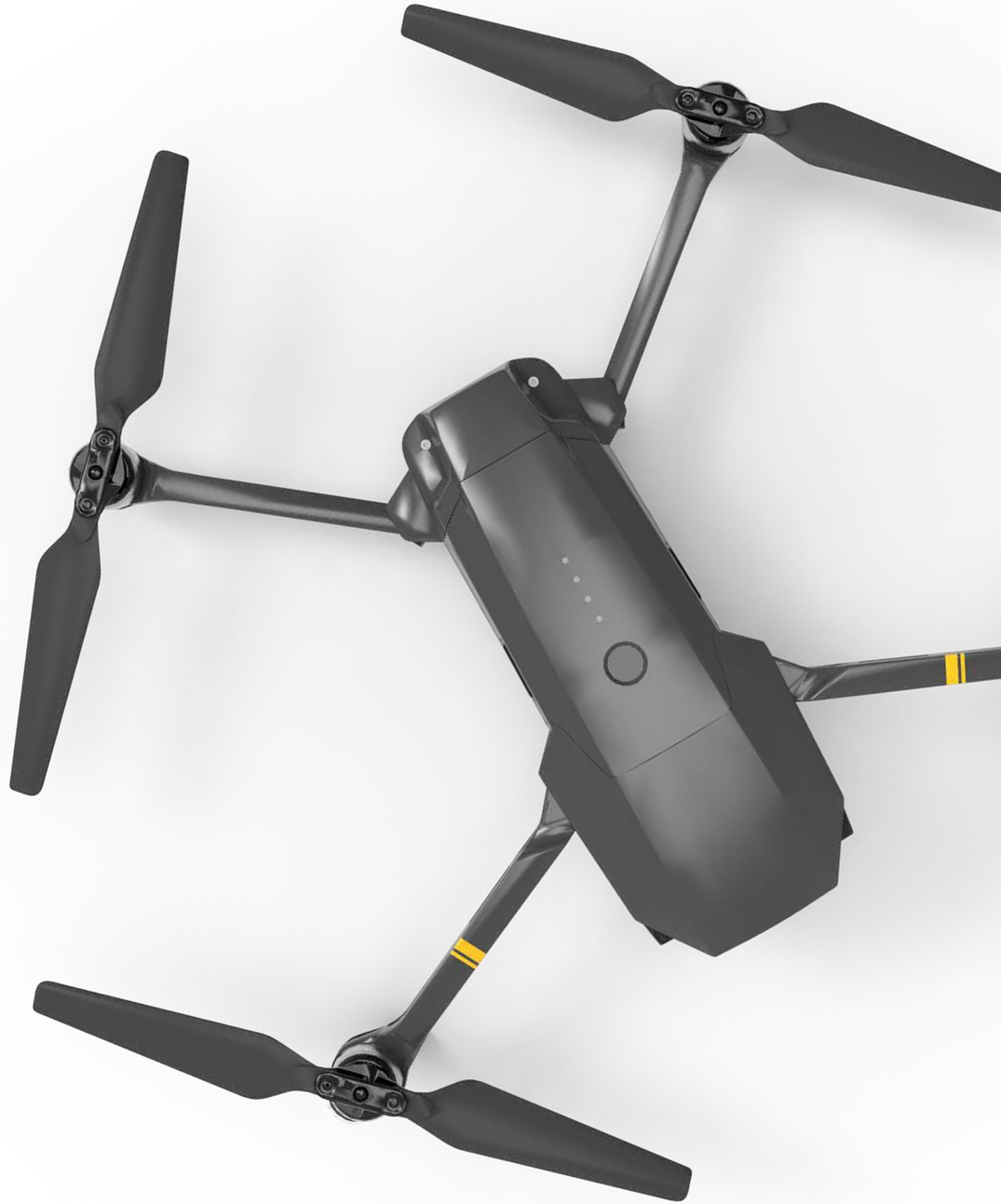
## Time of Flight Sensors, Thermal Sensors, Chemical Sensors

DAY 23 (1 hour)

Electronics and Computer Science
Exploring advanced sensors
Thermal imaging and chemical sensors
Specialized applications in drones

# Lesson Plan 02:
# Month 02

- Configuration of  Propellers & Parameters
- Motors and Their Functions in drone
- Batteries and Their Types used
- Block Programming for Drones – Basics
- Practical projects



# Week 1: Configuration of  Propellers & Motor Parameters

DAY 24(1 hour)

## Propellers and Their Parameters

Mechanical and Aerospace Engineering
Role of propellers in drone propulsion
Design considerations for efficiency
Material choices and their impact

DAY 25(1 hour)

## Configuring Propellers on Drones

Mechanical and Aerospace Engineering
Understanding pitch, diameter, and blade count
Propeller matching for different applications
Balancing and optimizing performance

DAY 26 (1 hour)

## Motors and Their Functions

Mechanical and Aerospace Engineering
Electric motor fundamentals
Types of motors used in drones
Factors influencing motor selection

DAY 27 (1 hour)

## Homopolar Motor Experiment

Mechanical and Aerospace Engineering
Hands-on experiment with homopolar motors
Understanding basic motor principles
Comparison with conventional drone motors

DAY 28 (1 hour)

## Working of Motors in Drones

Mechanical and Aerospace Engineering
Integration of motors in drone systems
Motor control mechanisms
Impact of motor performance on drone flight

# Week 2: Batteries and Parameters of LiPo Batteries

DAY 29(1 hour)

## Batteries and Their Types

Electronics
Battery basics and types
Considerations for drone power
Voltage, capacity, and discharge rates

DAY 30(1 hour)

## Parameters of LiPo Batteries

Electronics
Lithium Polymer (LiPo) batteries in drones
Understanding battery specifications
Safety measures and proper handling

DAY 31 (1 hour)

## Block Programming for Drones – Basics

Computer Science and Electronics
Introduction to block programming
Overview of visual programming languages
Creating simple drone commands using blocks

DAY 32 (1 hour)

## Measuring Height with Pluto Blocks

Computer Science and Electronics
Practical exercise in block programming
Implementing height measurement algorithms
Troubleshooting common programming errors

# Week 3-4: Block Programming for Drones

DAY 33(1 hour)

## Color Wheel Project with Pluto Blocks

Computer Science and Electronics
Creating a color-based drone project
Utilizing sensors and actuators
Understanding color recognition algorithms

DAY 34(1 hour)

## Truth or Dare Game with Pluto Blocks

Computer Science and Electronics
Developing a simple interactive drone game
Implementing decision-making algorithms
Testing and refining the game

DAY 35 (1 hour)

## Spirit Level Project with Pluto Blocks

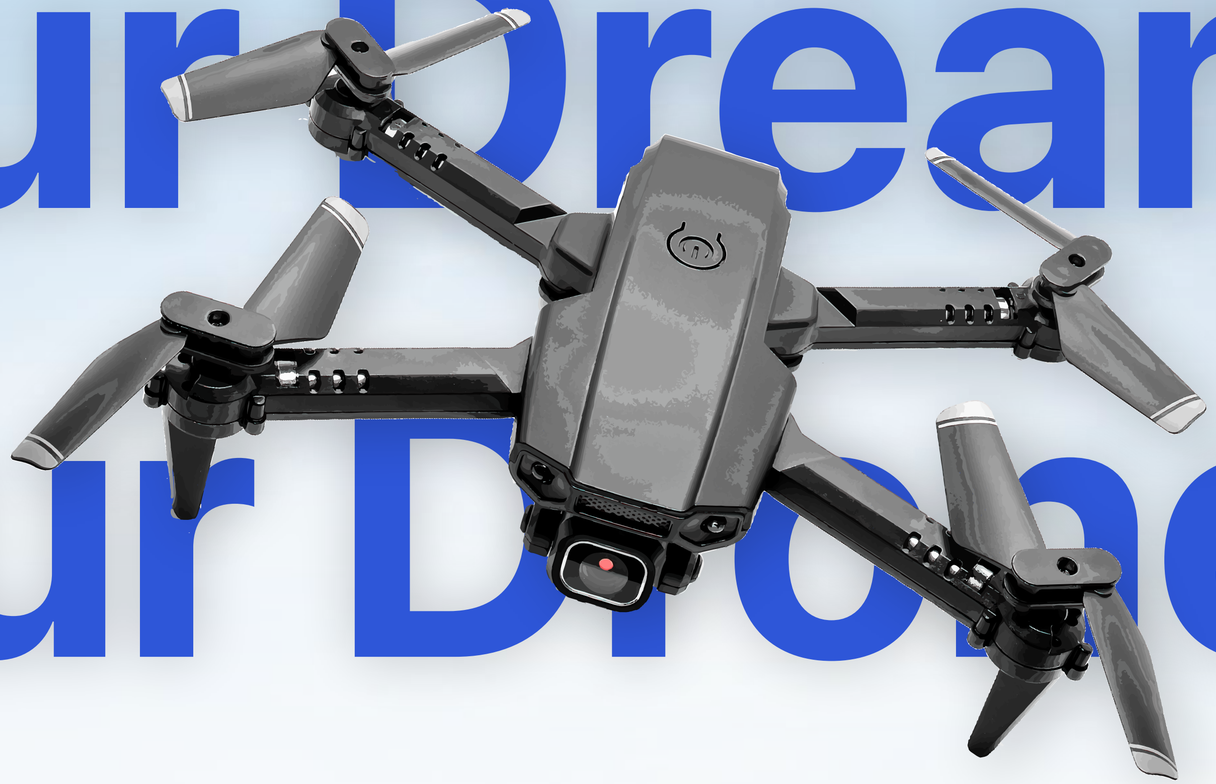
Computer Science and Electronics
Building a drone spirit level system
Understanding sensor fusion for stability
Implementing and calibrating the project

DAY 36 (1 hour)

## Logic Drone Project with Pluto Blocks

Computer Science and Electronics
Advanced block programming concepts
Developing a logic-based drone project
Integrating multiple sensors and controls

# Your Dreams, Our Drones.



Register with us &
get an exclusive drone

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# CAREER COUNSELING

Expert counseling is a specific consultation service that helps people in making perfect career choices by using their skIls and abilities. With Teachnook career counseling you will be able to explore various opportunities you have never thought about and you will be given complete guidance in the below mentioned areas.

- Personalised support
- 1:1 career counselling to help land your dream job
- Get counselled by industry experts
- Networking opportunities
- Tailored career paths
- Access to Industry insights

www.teachnook.com