

6-WEEK INTERACTIVE ONLINE DRONE INTERNSHIP

Build • Code • Fly

This internship is designed for school, college, and beginner-to-intermediate learners who want to enter the world of drones.

The program combines live interactive sessions, browser-based simulations, and a real programmable ESP32 drone kit delivered to the student's home.

Every week includes hands-on tasks, quizzes, and practical submissions.

**FREE
DRONE KIT**



PROGRAM HIGHLIGHTS



No prior drone experience required



Live online classes with mentor support



Hands-on software labs in every session



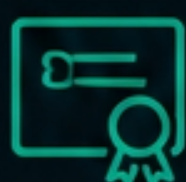
Real ESP32 programmable drone kit



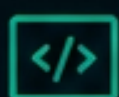
Mobile app flight control



Basic drone coding and firmware introduction



Project showcase and certificate



CS



ECE



MECHANICAL



AEROSPACE

WEEK 1 

DRONE FOUNDATIONS & AIRSPACE

Build the knowledge. Understand the sky.

WHAT YOU'LL LEARN

1



DRONE TYPES & COMPONENTS

- Explore different types of drones
- Understand key components and their functions



Quadcopter



Hexacopter



Fixed Wing



VTOL

2



LIFT, THRUST & STABILITY

- Learn the science behind flight
- How drones stay stable in the air

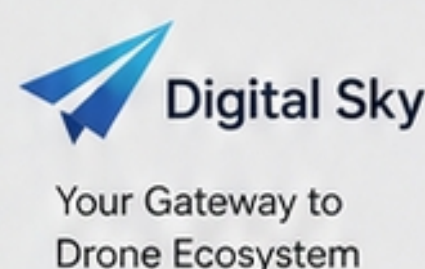


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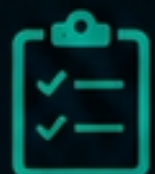
DGCA RULES & DIGITAL SKY PORTAL

- Introduction to DGCA regulations
- How to use the Digital Sky portal for permissions



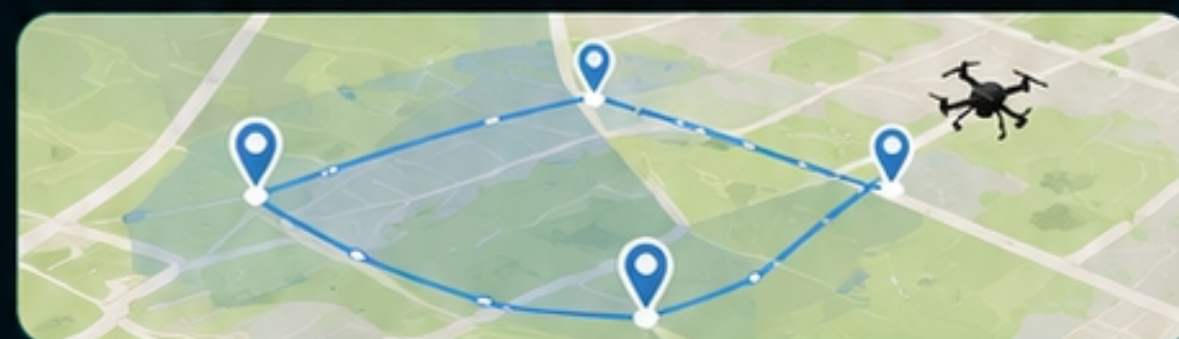
DGCA
GOVERNMENT
OF INDIA

4

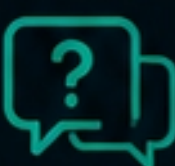


MISSION PLANNING ACTIVITY

- Plan a drone mission
- Set waypoints, check constraints, and optimize routes



5



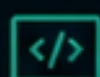
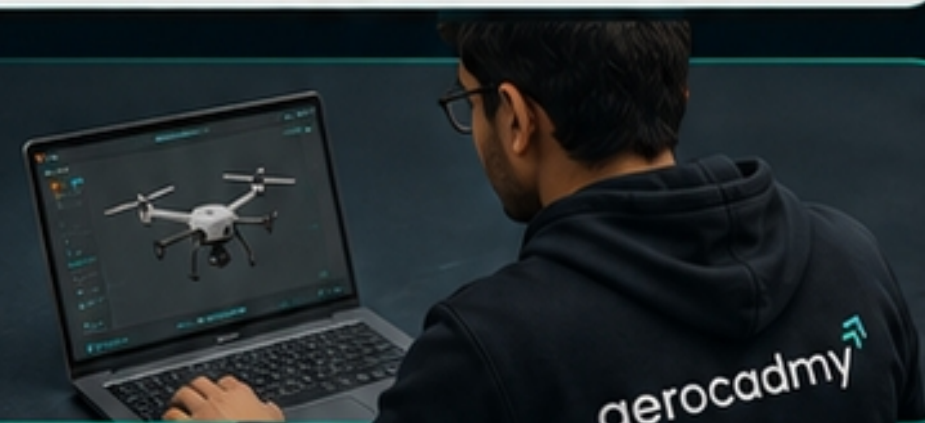
LIVE QUIZ & AIRSPACE EXPLORATION

- Test your knowledge with a live quiz
- Explore controlled, restricted, and prohibited airspaces



WEEK 1 GOAL

Understand the basics of drones and the rules of the sky to fly safely and responsibly.



CS



ECE



MECHANICAL



AEROSPACE

WEEK 2

AERODYNAMICS & VIRTUAL DRONE DESIGN

Design smarter. Simulate better. Fly further.

WHAT YOU'LL LEARN

1



THRUST-TO-WEIGHT RATIO

- Understand key performance metrics
- Calculate and optimize for stable flight

2



MOTOR, PROPELLER & BATTERY SELECTION

- Compare different motors and propellers
- Match battery capacity with flight time
- Build the right power system

3



FRAME DESIGN CONCEPTS

- Explore different frame types and layouts
- Learn about weight distribution and balance

4



3D MODELING IN TINKERCAD

- Design your drone components in Tinkercad
- Build and export for simulation and 3D printing

5



VIRTUAL FLIGHT PHYSICS EXPERIMENTS

- Simulate real-world flight behavior
- Test stability, drag, lift, and control
- Analyze and improve your design



MOTORS



PROPELLERS



BATTERIES



X FRAME



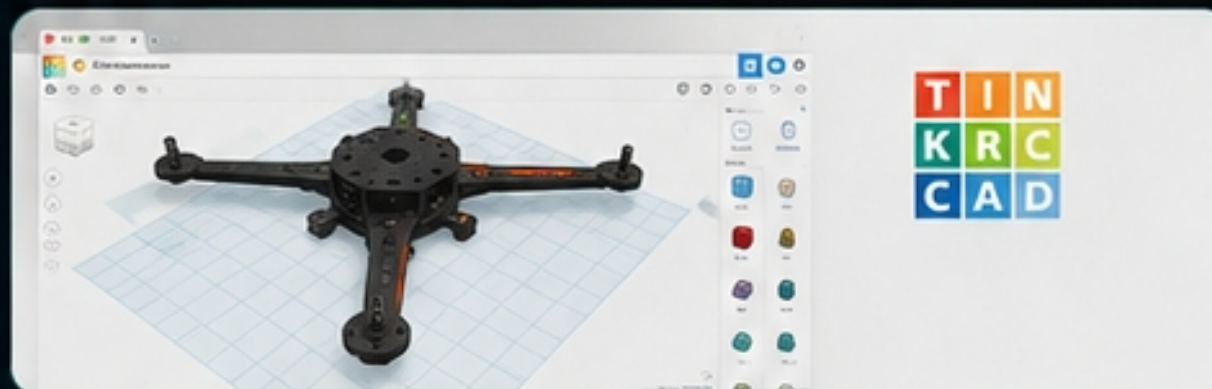
H FRAME



HEX FRAME



CUSTOM FRAME



Lift
+2.35 N

Drag
-0.85 N

Thrust
4.20 N



WEEK 2 GOAL

Design and simulate your drone virtually with the right balance of power, performance, and physics.



WEEK 3

ELECTRONICS & DRONE HARDWARE

Understand the core. Build with confidence. Fly with control.

WHAT YOU'LL LEARN

1



MOTOR, ESC, BATTERY, IMU, AND FLIGHT CONTROLLER

- Understand each component and its function
- How they work together in a drone

MOTOR



ESC



BATTERY



IMU



FLIGHT CONTROLLER

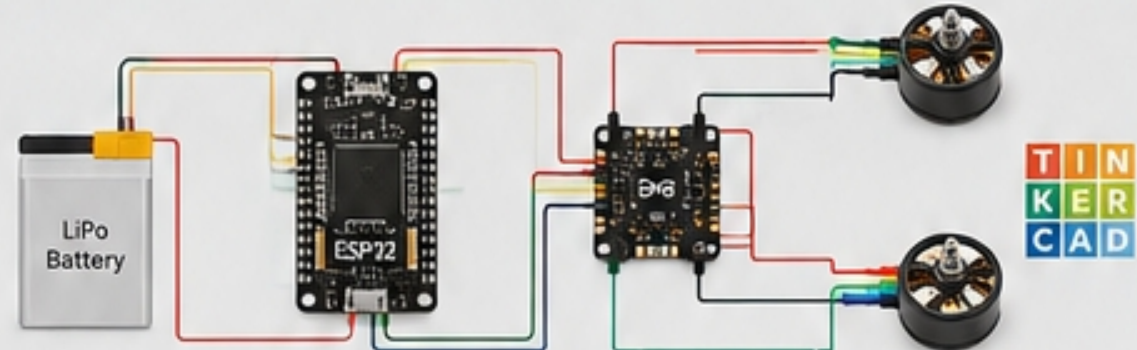


2



CIRCUIT BUILDING IN TINKERCAD CIRCUITS

- Build and test circuits virtually
- Learn wiring without risking hardware



3



POWER DISTRIBUTION & SAFETY

- Power distribution board and wiring best practices
- Safety guidelines for building reliable drones



Use Proper
Battery



Check
Polarity



Secure
Connections



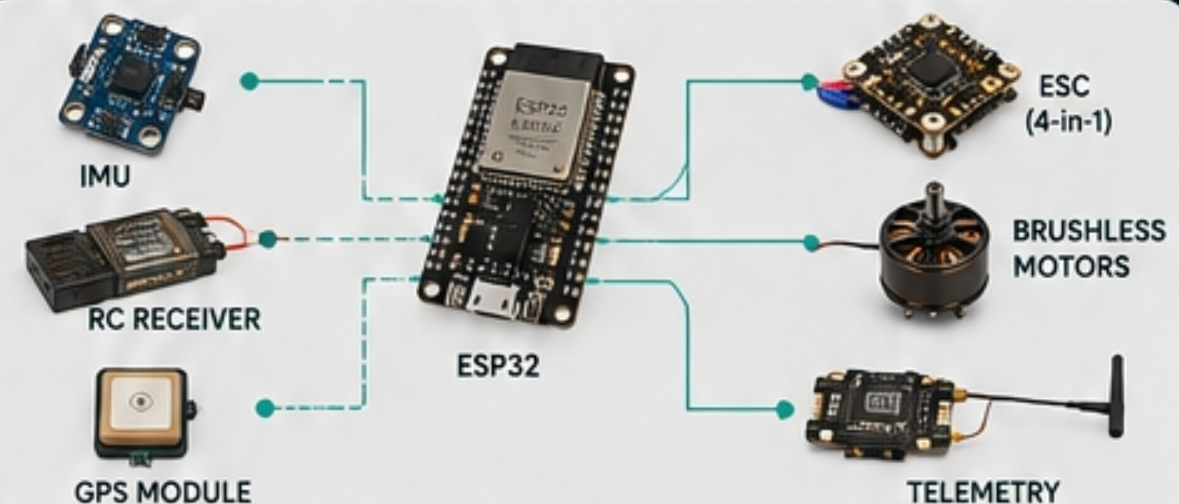
Test Before
Flight

4



ESP32 DRONE ARCHITECTURE

- Overview of ESP32 in drone systems
- Sensors, communication and control flow

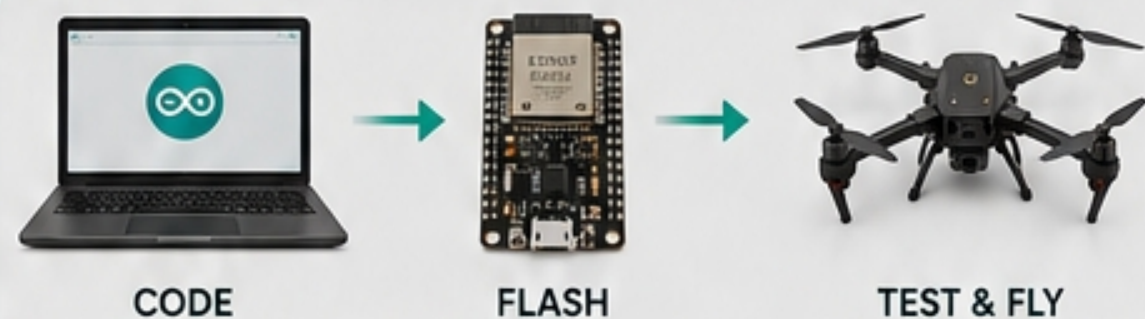


5



FIRMWARE FLASHING OVERVIEW

- Introduction to firmware and its importance
- Flashing firmware using ESP32 tools (basic overview)



WEEK 3 GOAL

Build and understand the electronic heart of your drone and prepare it for takeoff.



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MECHANICAL



AEROSPACE

WEEK 4

FLIGHT CONTROL & PROGRAMMING

Code it. Control it. Fly it.

WHAT YOU'LL LEARN

1



GYROSCOPE AND ACCELEROMETER BASICS

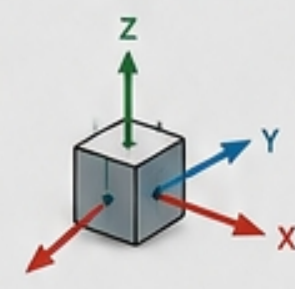
- Understand orientation and movement
- How sensors help drones stay stable



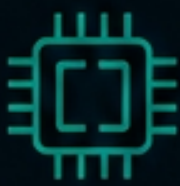
GYROSCOPE



ACCELEROMETER



2



FLIGHT CONTROLLER WORKING PRINCIPLE

- Role of the flight controller in a drone
- Sensors input → Processing → Motor output

SENSORS



FLIGHT CONTROLLER



MOTORS



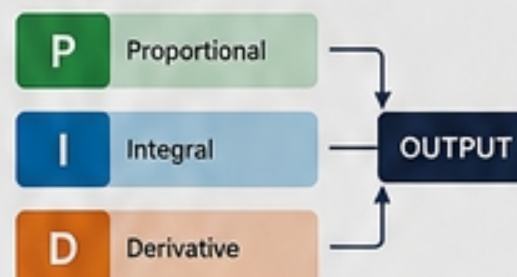
3



PID TUNING IN SIMULATOR

- Learn P, I, D and how they affect stability
- Tune and test in a flight simulator

PID CONTROLLER



4



ARDUINO / ESP32 PROGRAMMING BASICS

- Introduction to Arduino IDE & ESP32
- Variables, loops, functions and basic syntax



```
void setup() {
  pinMode(LED_BUILTIN, OUTPUT);
}

void loop() {
  digitalWrite(LED_BUILTIN, HIGH);
  delay(1000);
  digitalWrite(LED_BUILTIN, LOW);
  delay(1000);
}
```



5



MODIFY AND RUN SIMPLE DRONE CODE

- Modify existing code for drone functions
- Upload, test, and see real-time response

MODIFY CODE



UPLOAD



TEST & OBSERVE



WEEK 4 GOAL

Understand how drones think, respond, and fly — and start controlling them with code.



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AEROSPACE

WEEK 5

PHYSICAL KIT ASSEMBLY & FIRST FLIGHT

Unbox. Assemble. Connect. Fly.



WHAT YOU'LL LEARN

1



UNBOXING AND SAFETY INSPECTION

- Unbox your Aerocadmy drone kit
- Check all components
- Safety guidelines before assembly



SAFETY CHECKLIST

- ✓ No loose wires
- ✓ Props not damaged
- ✓ Battery in safe condition
- ✓ Frame & screws tight
- ✓ Work in a clear area

2



MOBILE APP CONNECTION

- Install and open the Aerocadmy app
- Connect your drone via Wi-Fi / Bluetooth
- Explore the dashboard and controls



3



CALIBRATION PROCEDURE

- Calibrate accelerometer
- Calibrate gyroscope
- Calibrate compass
- Ensure accurate and stable flight

ACCELEROMETER



Place flat & calibrate

GYROSCOPE



Keep still & calibrate

COMPASS



Rotate slowly 360°

CALIBRATION COMPLETE



You're ready to fly!

4



MOTOR TESTING

- Test each motor individually
- Check rotation direction
- Verify smooth and consistent response

FRONT LEFT CW



FRONT RIGHT CCW



REAR LEFT CCW



REAR RIGHT CW



ALL MOTORS
OK

5



FIRST INDOOR HOVER FLIGHT

- Take off in a safe indoor environment
- Maintain stable hover
- Small throttle adjustments
- Land smoothly



WEEK 5 GOAL

Assemble your drone confidently, connect and calibrate everything correctly, and take your first hover flight.



WEEK 6

FLIGHT IMPROVEMENT & FINAL PROJECT

Practice. Improve. Build. Present. Fly Beyond.

WHAT YOU'LL LEARN

1



TRIM AND DRIFT CORRECTION

- Understand trim concepts
- Correct roll, pitch, yaw drift
- Achieve stable and level flight



ROLL TRIM

TRIM CORRECTION



PITCH TRIM



YAW TRIM

2



BASIC TUNING AND PERFORMANCE IMPROVEMENT

- Adjust PID values for better stability
- Improve responsiveness and control
- Optimize for smooth flights

PID TUNING IN SIMULATOR

PARAMETER	P	I	D
ROLL	1.2	0.03	20
PITCH	1.3	0.03	22
YAW	1.0	0.00	0
ALTITUDE	1.5	0.10	25



3



MINI DRONE PROJECT

- Plan your mini project
- Integrate hardware and software
- Build a useful feature or functionality

PROJECT IDEAS



Waypoint Navigation



Altitude Hold



Live Camera Stream



Auto-Landing System

4



FLIGHT DEMONSTRATION VIDEO

- Record your best flight
- Show features and performance
- Edit and submit your video



5



FINAL PRESENTATION AND CAREER ROADMAP

- Present your project and learnings
- Get feedback from mentors
- Explore career paths in the drone industry

PRESENT YOUR PROJECT



- Problem
- Solution
- Features
- Demo
- Learnings

CAREER ROADMAP

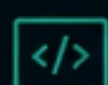


WEEK 6 GOAL

Refine your skills, complete your project, and take the next step in your drone journey.



GET CERTIFIED.
SHOWCASE YOUR SKILLS.
BUILD YOUR FUTURE.
IN DRONES.



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AEROSPACE



SOFTWARE TOOLS USED DURING INTERNSHIP

PURPOSE	TOOLS
1 Polls & quizzes	Mentimeter slido
2 Airspace exploration	Digital Sky
3 Drone calculations	ecalc by eCalc.ch XCopterCalc
4 3D design	Tinkercad
5 Circuit simulation	Circuits
6 ESP32 coding	WOKWI Online ESP32 Simulator

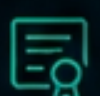


WHAT STUDENTS WILL BE ABLE TO DO

- ✓ Explain drone flight principles and safety rules
- ✓ Calculate basic thrust-to-weight ratio
- ✓ Design a simple drone frame
- ✓ Understand drone electronics and wiring
- ✓ Tune a PID controller in simulation
- ✓ Write and modify basic ESP32 drone code using Browser PID Simulator
- ✓ Pair, calibrate, and fly a drone safely indoors
- ✓ Present a mini drone project

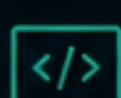


Browser PID Simulator



ASSESSMENT & CERTIFICATION

Certification is awarded based on attendance, weekly lab submissions, quizzes, flight milestones, and the final project presentation. Students must complete the required practical activities to receive the internship certificate.



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