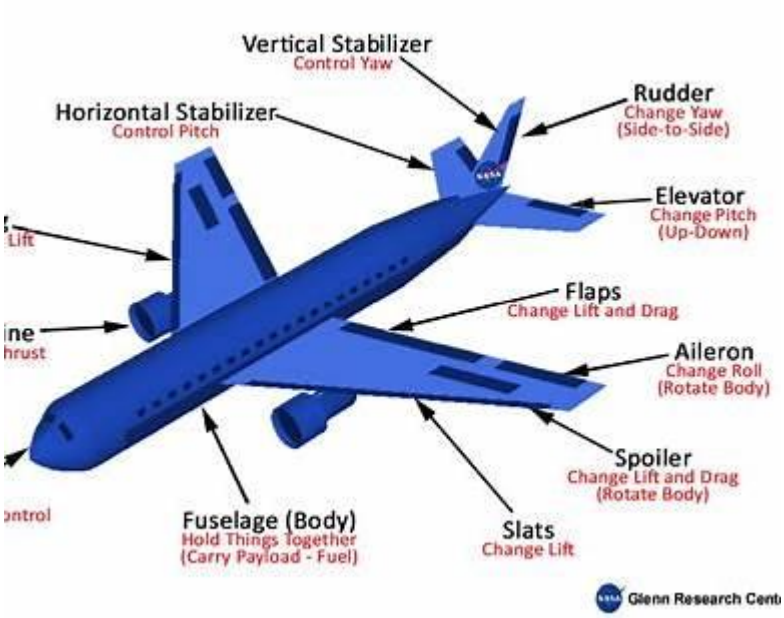
MODULE 1: INTRODUCTION TO AVIATION & RC AIRCRAFT



Wing Structures

Cantilever monoplane

Strut-braced monoplane

Strut-braced monoplane

Number of Wings

Monoplane

Biplane

Triplane

Thrust Method

Tractor

Pusher

In-line/Push-pull

Biplane wing positions

No stagger

Positive stagger

Negative stagger

Class 1: What is an Aircraft?

- What is flight?
- Types: Gliders, RC planes, drones, commercial aircraft
- **Comparison:** RC Plane vs Passenger Aircraft

Class 2: History of Flight

- Wright Brothers → Modern Jets
- Evolution of materials and engines
- **Comparison:** Early aircraft vs modern aircraft vs RC aircraft

Class 3: Types of Aircraft

- Fixed wing, rotary wing
- Civil, military, UAV
- **Comparison:** RC fixed wing vs real fixed wing aircraft

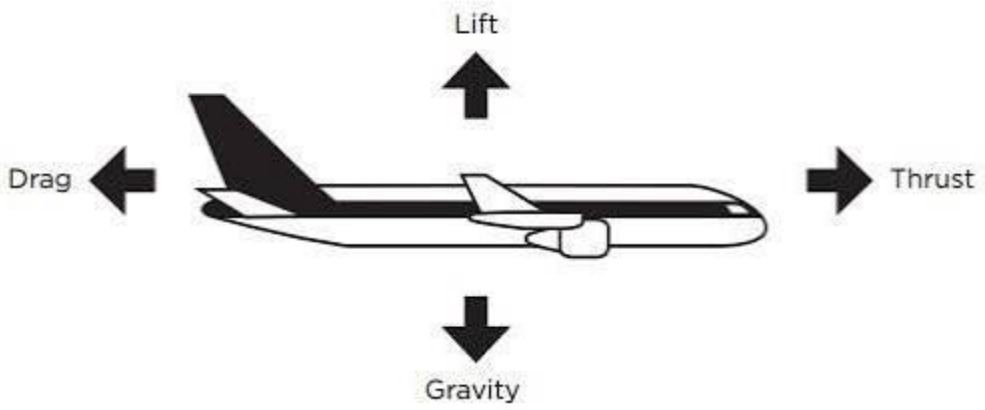
Class 4: Parts of an Aircraft

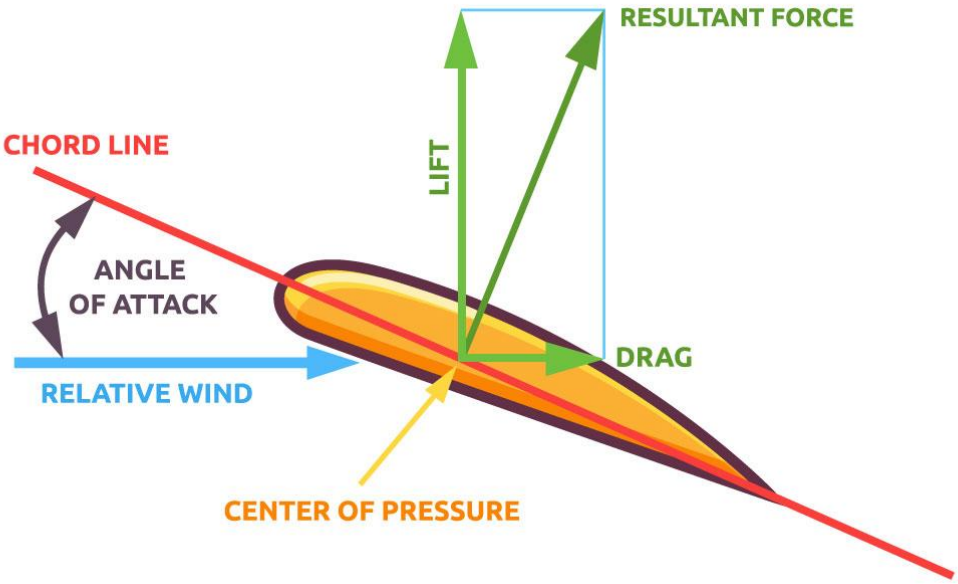
- Wing, fuselage, tail, landing gear
- **Comparison Table:** RC parts ↔ Real aircraft parts

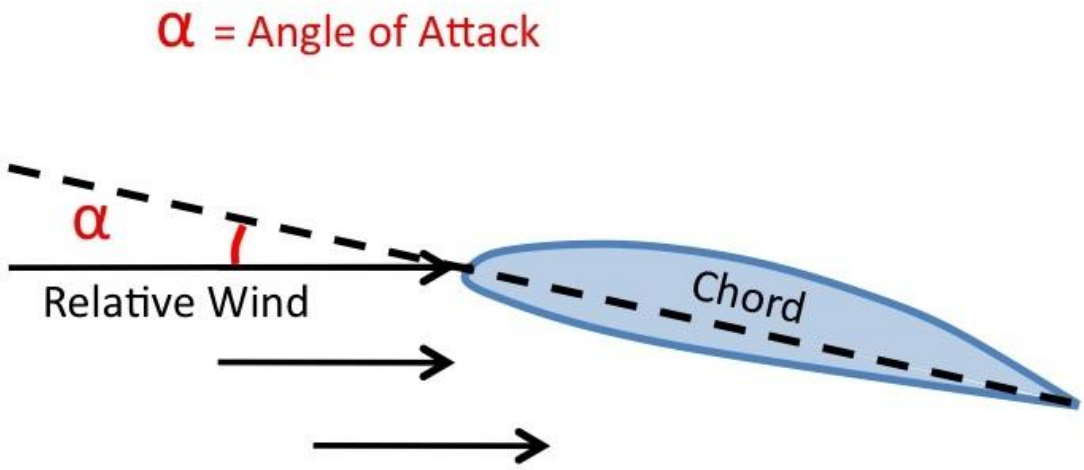
Class 5: Introduction to RC Aircraft

- What is an RC plane?
- Uses in training, research, military
- Career overview in aviation & aerospace

MODULE 2: PRINCIPLES OF FLIGHT & AERODYNAMICS







Class 6: Four Forces of Flight

- Lift, Drag, Thrust, Weight
- **Comparison:** How these act on RC vs real aircraft

Class 7: Lift & Bernoulli's Principle

- Airfoil shape
- Pressure difference
- **Real Aircraft Example:** Jet wing vs RC foam wing

Class 8: Angle of Attack & Stall

- What causes stall?
- Stall speed
- **Comparison:** RC stall vs commercial aircraft stall

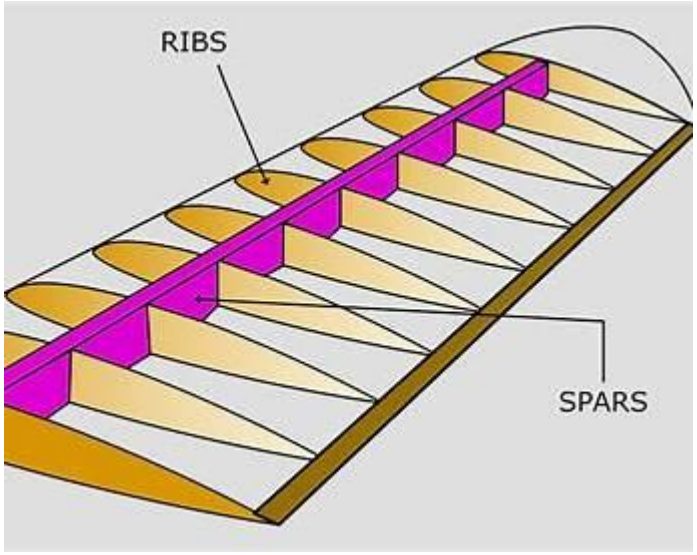
Class 9: Drag Types

- Parasite drag, induced drag
- Why sleek aircraft save fuel

Class 10: Stability & Control

- Longitudinal, lateral, directional stability
- **Comparison:** RC trainer vs passenger aircraft stability

MODULE 3: AIRCRAFT STRUCTURES & MATERIALS



Class 11: Aircraft Structures

- Monocoque, semi-monocoque
- **Comparison:** RC fuselage vs Boeing fuselage

Class 12: Wing Structure

- Spars, ribs, skin
- Load distribution

Class 13: Materials Used

- RC: Foam, balsa, carbon rods
- Aircraft: Aluminum, composites, titanium

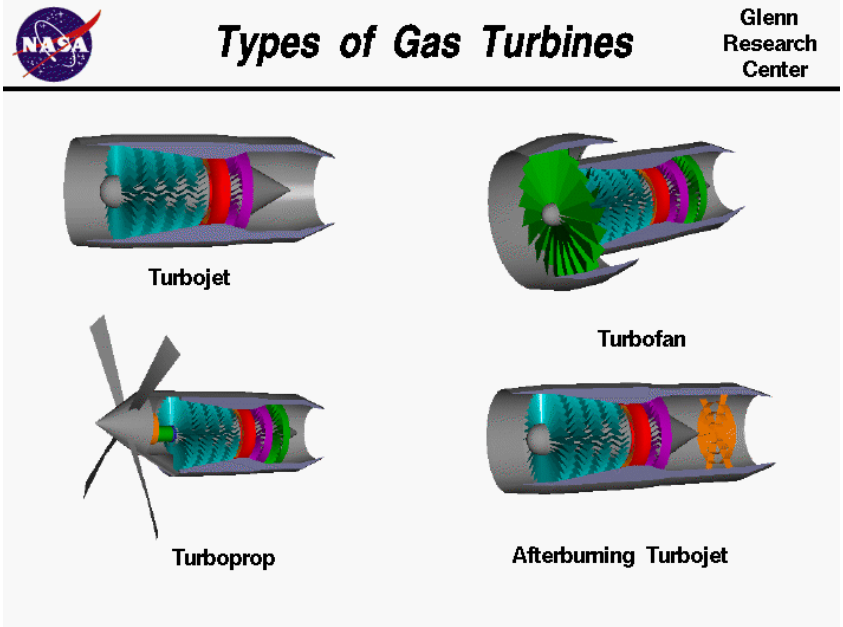
Class 14: Weight & Balance

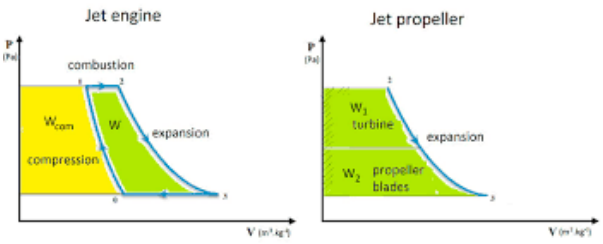
- Center of Gravity (CG)
- **Hands-on:** Finding CG on RC plane

Class 15: Structural Failures

- Why wings fail
- Real accident case studies (simplified)

MODULE 4: PROPULSION SYSTEMS





Class 16: Types of Aircraft Engines

- Piston, turboprop, jet
- **Comparison:** RC motor vs jet engine

Class 17: Propellers

- Pitch, diameter
- Propeller efficiency

Class 18: RC Electric Power System

- Brushless motor

- ESC (Electronic Speed Controller)

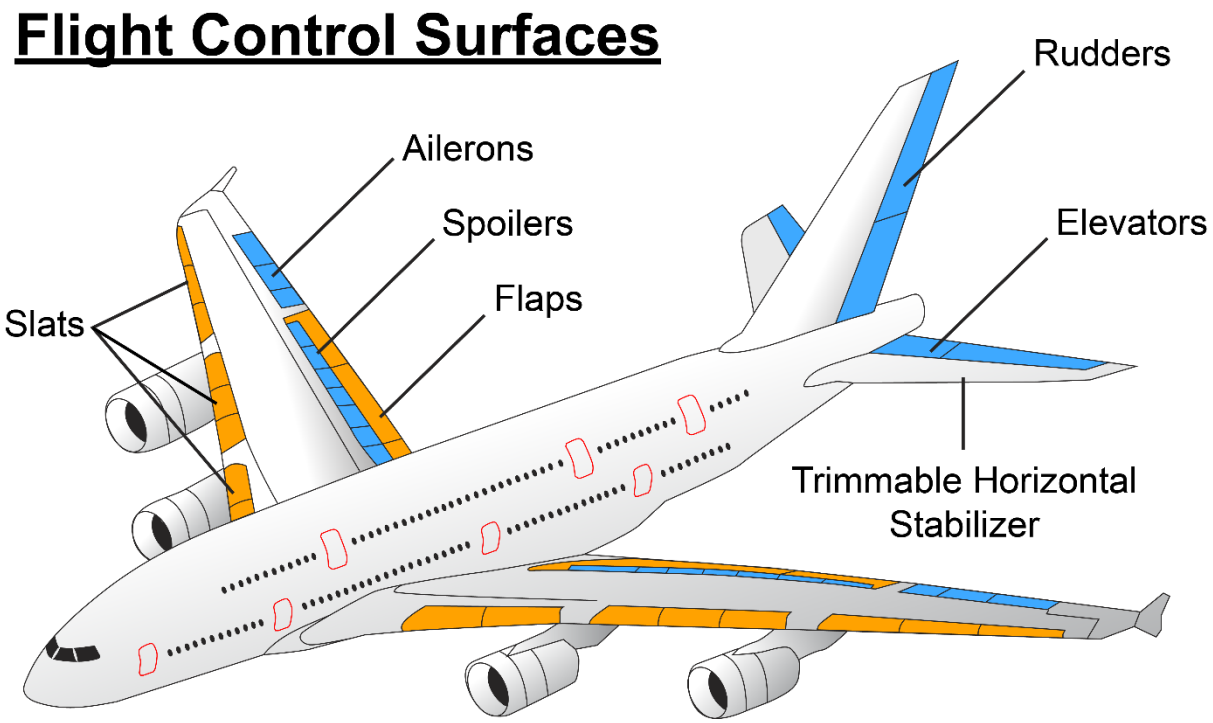
Class 19: Batteries

- LiPo batteries
- Safety and charging

Class 20: Thrust Calculations

- Thrust-to-weight ratio
- **Comparison:** RC vs fighter aircraft

MODULE 5: FLIGHT CONTROLS & ELECTRONICS



Class 21: Control Surfaces

- Elevator, aileron, rudder
- **Comparison:** Cockpit controls vs RC transmitter

Class 22: RC Transmitter & Receiver

- Channels
- Signal transmission

Class 23: Servos & Linkages

- Movement conversion
- Control accuracy

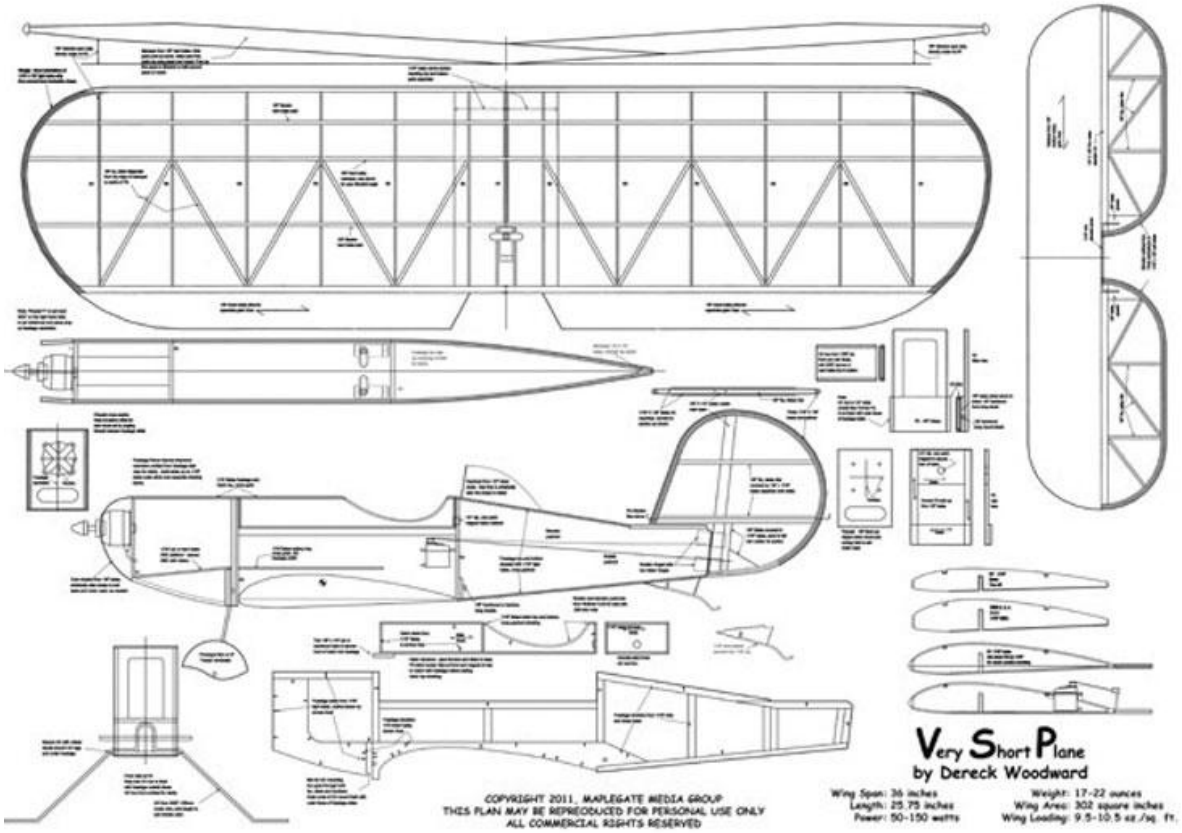
Class 24: Flight Control Logic

- Manual vs fly-by-wire
- **Comparison:** RC stabilization vs Airbus FBW

Class 25: Safety Systems

- Failsafe
- Redundancy in real aircraft

MODULE 6: RC AIRCRAFT DESIGN & BUILDING


Very Short Plane
by Dereck Woodward
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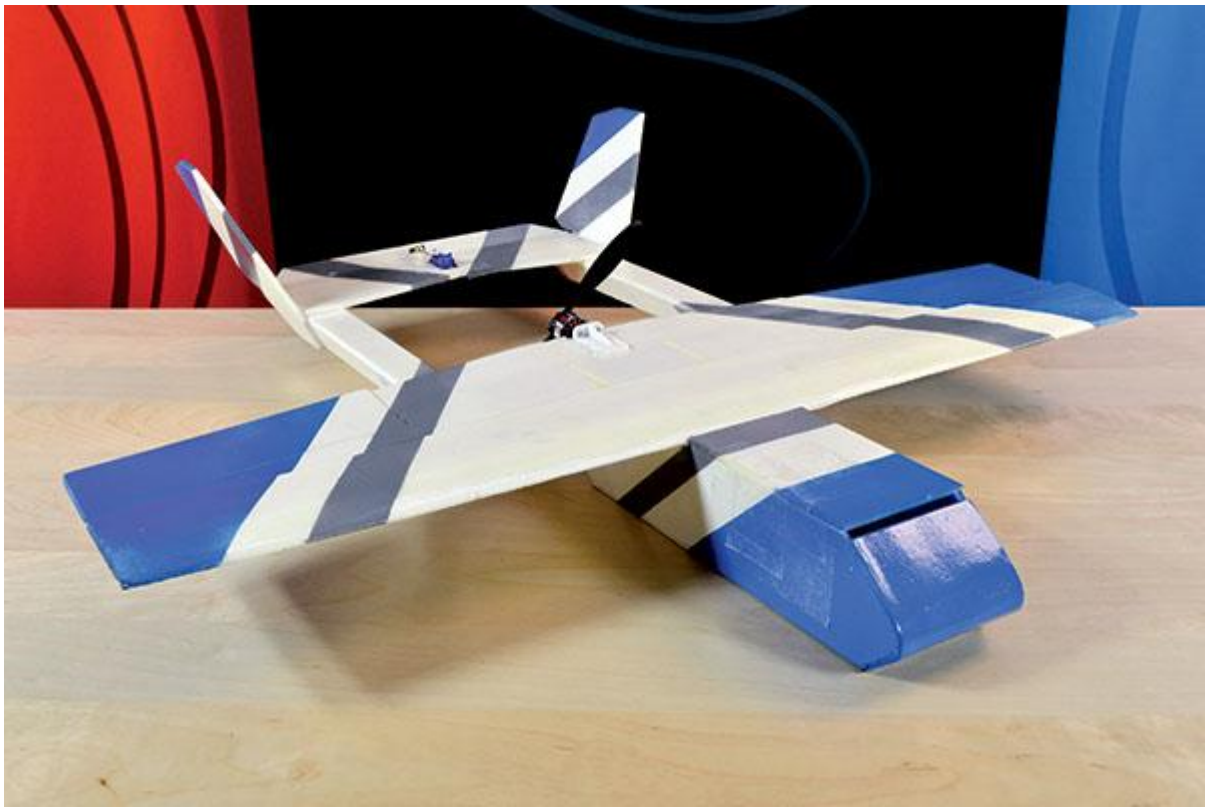
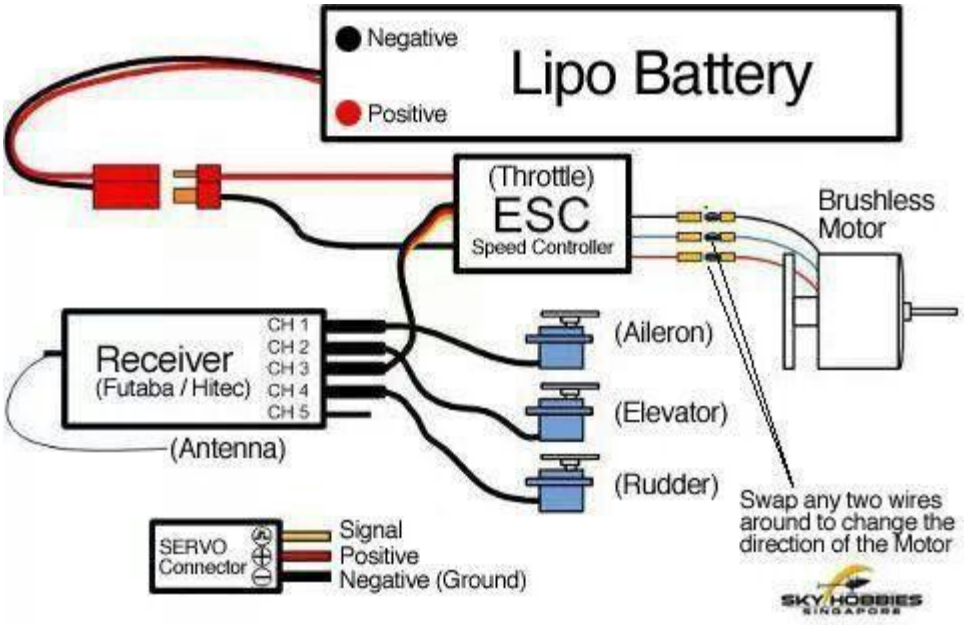
THIS PLAN MAY BE REPRODUCED FOR PERSONAL USE ONLY
ALL COMMERCIAL RIGHTS RESERVED
Wing Span: 36 inches
Length: 25.75 inches
Power: 50-150 watts
Weight: 17-22 ounces
Wing Area: 302 square inches
Wing Loading: 9.5-10.5 oz./sq. ft.





Classes 26–27: Aircraft Design Basics

- Wing loading
- Aspect ratio

Classes 28–29: Blueprint Reading

- Scale drawings
- Aircraft plans vs real aircraft blueprints

Classes 30–31: Building the Fuselage

- Cutting, joining, reinforcement

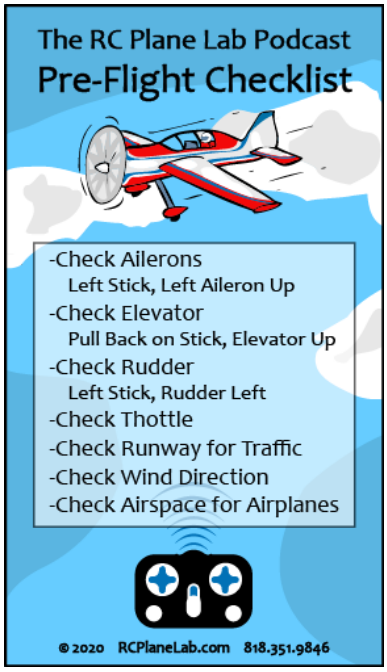
Classes 32–33: Wing & Tail Construction

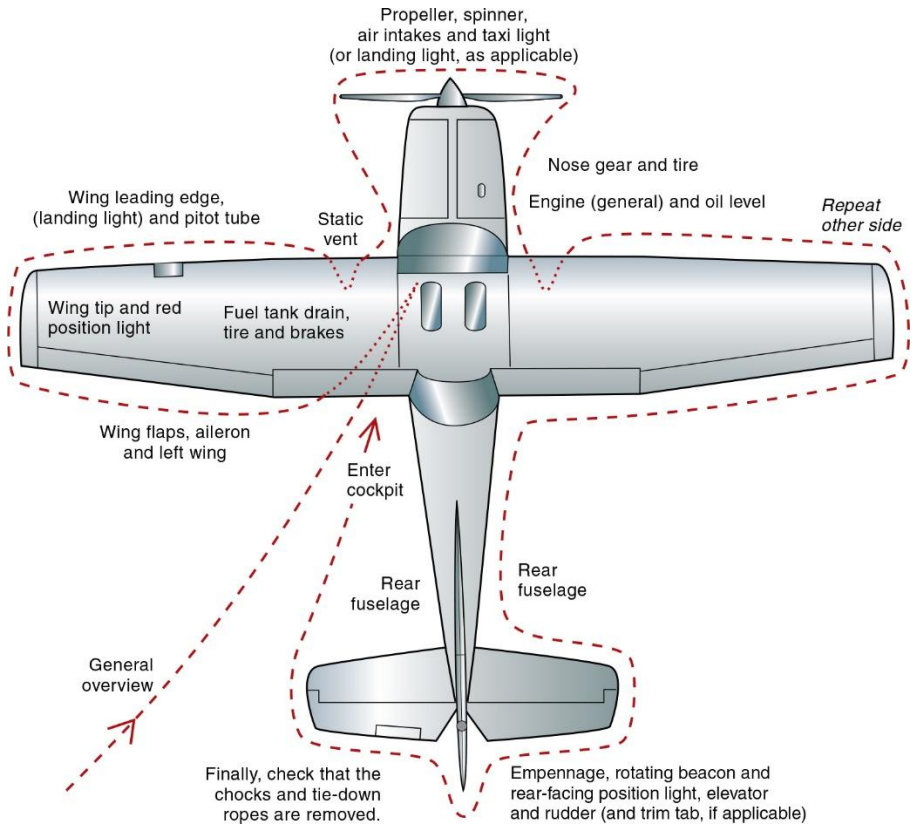
- Dihedral
- Control surface hinges

Classes 34–35: Electronics Installation

- Motor, ESC, battery, receiver

MODULE 7: TESTING, FLIGHT & SAFETY





Class 36: Pre-Flight Inspection

- Checklist culture
- **Comparison:** RC checklist vs airline checklist

Class 37: Ground Testing

- Control direction test

- Throttle test

Class 38: Maiden Flight

- Launch techniques
- Trim adjustments

Class 39: Flight Maneuvers

- Turns, climb, descent
- Basic aerobatics

Class 40: Crash Analysis

- Failure identification
- Learning from mistakes (no blame culture)

MODULE 8: REAL AIRCRAFT CONNECTION & CAREERS

Class 41: Aircraft Maintenance

- Scheduled maintenance
- **Comparison:** RC repair vs aircraft MRO

Class 42: Aviation Safety & Regulations

- DGCA overview (India)
- Airworthiness concept

Class 43: Flight Simulators

- Why pilots train on simulators
- RC simulators demo

Class 44: Careers in Aviation

- Pilot, engineer, technician, ATC
- How RC flying helps aerospace careers

Class 45: Final Project & Demonstration

- Student RC flight demo
- Oral explanation of aircraft systems
