BLACKBIRD FOR TRAINING

# Introduction to Aviation: Aircraft Systems and Operations

11 – 15 January 2027
London (UK)



# Introduction to Aviation: Aircraft Systems and Operations

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Introduction to aviation, aircraft systems and operations is the study of how the parts of the flying industry fit together, how an aircraft is built and powered, and how a flight is planned and run. This 1-week foundation course is for newcomers to the industry, and each delegate produces an annotated flight-cycle map linking every phase of a flight to the systems and roles involved. The subject is taught by Blackbird Training Centre.

## Introduction

The course rests on three reference points. ATA iSpec 2200 is the industry specification whose chapter numbers identify each aircraft system in manuals and maintenance records. The Threat and Error Management TEM model describes how crews spot and contain hazards and mistakes during a flight. The SHELL model explains human factors through the interaction of procedures, equipment, environment and people. The level is foundation, and no technical background is assumed. Teaching uses walkthroughs of aircraft diagrams, cockpit layouts and turnaround sequences, with examples from passenger airlines, business aviation and maintenance organisations.

## Course Objectives

- Define the main parts of the aviation industry and the part each stakeholder plays in getting a flight away on time.
- Distinguish primary from secondary flight controls and describe what each does to an aircraft's attitude and lift.
- Compare turbofan and turboprop engines and the routes and aircraft types each one suits.
- Interpret ATA chapter references in manuals and maintenance records to identify the system concerned.
- Apply the Threat and Error Management model to identify hazards across the phases of a flight.
- Select the right unit or team for a technical query by tracing it to a flight phase and an aircraft system.



## Target Audience

- New joiners in airline, airport and ground handling roles who must judge which team a technical question belongs to.
- Administrative, finance and procurement staff in aviation organisations who handle aircraft records and must decide which system or document a request refers to.
- Customer service and dispatch support staff who relay flight information and must judge what a delay or technical message means for passengers.
- Graduates and career changers entering maintenance organisations who must choose which technical path to pursue next.
- Staff of parts distributors and other industry suppliers who must interpret system references when quoting or sourcing components.

## Course Outline

### Day 1: How the Aviation Industry Fits Together

- Commercial vs General Aviation: Scheduled Airline Services Compared With Private and Business Flying
- Industry Stakeholders: Airlines, Airports, Navigation Service Providers, Manufacturers and Maintenance Organisations
- Airworthiness Concepts: Type Certificate, Certificate of Airworthiness and Continuing Airworthiness
- Aviation Rulemaking: How International Standards Become the Rules Operators Follow
- Aviation Vocabulary: Phonetic Alphabet, Airport Codes and Flight Phase Terms

### Day 2: Principles of Flight and the Airframe

- Four Forces of Flight: Lift, Weight, Thrust and Drag Kept in Balance
- Fixed-Wing vs Rotary-Wing: How Aeroplanes and Helicopters Generate Lift
- Airframe Structure: Fuselage, Wings, Empennage and Landing Gear Explained
- Primary vs Secondary Flight Controls: Ailerons, Elevator and Rudder Compared With Flaps
- Aircraft Materials: Aluminium Alloys and Composites Used in Current Airframes

### Day 3: Aircraft Systems and Their Chapters

- ATA iSpec 2200 Chapters: Standard Numbering Used to Identify Aircraft Systems
- Turbofan vs Turboprop: Two Gas Turbine Designs and Where Each Fits
- Hydraulic and Electrical Systems: Power Sources for Controls, Landing Gear and Brakes
- Avionics Suite: Flight Management System, Autopilot and Navigation Displays
- Environmental Control: Cabin Pressurisation, Conditioning and Emergency Oxygen Explained



## Day 4: Running a Flight

- Flight Phases: Pre-Flight, Taxi, Take-Off, Cruise, Approach and Landing
- Visual vs Instrument Flight Rules: How Weather Decides the Way Aircraft Navigate
- Traffic Control Units: Tower, Approach and Area Control Responsibilities
- Threat and Error Management Model: Recognising Hazards Crews Meet on Each Flight
- SHELL Model: Human Factors Interaction Between People, Equipment and Environment

## Day 5: Mapping a Flight Cycle in Practice

- Ground Handling vs Line Maintenance: Turnaround Tasks Between Arrival and Departure
- Weight and Balance: Load Sheets, Unit Load Devices and Centre of Gravity Limits
- Dangerous Goods in the Hold: Classes, Acceptance Checks and Loading Restrictions
- Systems Walkthrough: Tracing ATA Chapters Through Each Phase of a Sample Flight
- Flight-Cycle Map: Finalising the Annotated Link Between Phases, Systems and Roles

## Skills You Will Gain

- Aviation terminology
- Principles of flight
- Flight control identification
- ATA chapter referencing
- Engine type recognition
- Flight phase sequencing
- Threat and error recognition
- Load sheet reading

## Why Attend This Course

- From hearing unfamiliar aviation terms in meetings to using them correctly with technical colleagues.
- From seeing an aircraft as one machine to naming its main systems and what each one does.
- From passing on flight status messages without context to understanding which phase and unit they relate to.
- From scattered notes on aircraft and flights to a finished flight-cycle map linking phases, systems and roles.

## Conclusion

Put simply, this subject explains how an aircraft stays in the sky and how many people and systems it takes to move it from gate to gate. The course clears up three distinctions: commercial against general aviation, primary against secondary flight controls, and visual against instrument flight rules. It suits newcomers and support staff who need a working understanding of aircraft and flights at foundation level; licensed engineers and pilots would find it too introductory.



## Course FAQs

### What does an introduction to aviation, aircraft systems and operations cover?

It covers how the aviation industry is organised, how aircraft fly, what their main systems do and how a flight is run from planning to arrival, written for people new to the industry.

### What is the difference between visual and instrument flight rules in aviation operations?

Under visual flight rules pilots navigate and keep clear of other traffic by looking outside; under instrument flight rules they rely on cockpit instruments and air traffic control, which allows flight in cloud and poor visibility.

### Which standard does the introduction to aviation and aircraft systems course follow?

It uses ATA iSpec 2200 chapter numbering to organise aircraft systems, and draws on the Threat and Error Management model and the SHELL model to explain how crews and ground staff manage risk.

### Is the introduction to aviation and aircraft systems course right for a new ground handling agent?

Yes. A new ground handling agent learns the aircraft parts, turnaround tasks, load sheet basics and dangerous goods restrictions met on the ramp, and how that work links to the flight crew and maintenance staff.

### What does a delegate produce on the introduction to aviation and aircraft systems course?

Each delegate produces an annotated flight-cycle map that follows a sample flight from pre-flight to arrival and links every phase to the aircraft systems, ATA chapters and staff roles involved.

