

# Weight & Balance and Load Planning – 3 Days

## Introduction

Both Weight and Balance are essential to the well being for an aircraft to experience safe flight. The Root Cause of Multiple Aircraft Incidents can be attributed to overloaded aircraft or where they have been incorrectly balanced in their distribution of weight. There are various factors involved in weight and balance accidents/incidents such as errors in the load sheet, shifting of cargo, incorrect loading. (The risk of having a weight and balance related accident with cargo flights is 8.5 times higher than with passenger flights.)

Weight & Balance should also consider the Loading & Burning of Fuel, Loading & Unloading of Baggage's and Boarding & Deboarding of all Passenger's in Commercial Planes as well as Loading & Unloading of External Stores in Military Planes at any time during the preparation, loading, operation, disembarkation and unloading of the aircraft. This course is focused on the need to ensure, that at all times safe loading as well as weight & balance are ensured to maintain Safety of the Flight at all times and in particular during Take-off & Landing.

## Who is the course for?

It is for Regulatory Authorities and persons who are involved in the Technical Engineering Management, Design Engineering Team, Pilots, Marketing Team, Procurement Team, Manufacturing/Tooling Team, Technical Publications, Flight Operations, Customers.

## What is the Benefit of this Training – What will I learn?

- a) Understand the basic Principles of Flight, related to Aircraft Weight and Balance
- b) Familiarize with all terms used in the Aircraft Weight & Balance Eng. Domain
- c) Consider the various weights used in the compilation of a load sheet and how to act on them
- d) Understand the use of Indexes and % Mean Aerodynamic Chord (MAC)
- e) Familiarize with the Design of Load and Trim charts
- f) Be Able to Ensure the correct Weight & Balance of an Aircraft prior to dispatch to Customers.

tel + 359 2 821 08 06  
email team@sassofia.com

[www.sassofia.com](http://www.sassofia.com)

|                 |                      |
|-----------------|----------------------|
| <b>Date</b>     | On Demand            |
| <b>Category</b> | Personal Development |
| <b>Venue</b>    | On Demand            |
| <b>Level</b>    | Basic                |
| <b>Price</b>    | On Demand            |

## Detailed Content / Topics - The following Subjects will be addressed

- Terminology
- Definitions
- Abbreviations
- Phonetic alphabet
- IATA & ICAO codes and Hierarchy
- Work Safely
  - a) Safety Philosophy
  - b) Safety Regulations
  - c) Hazards
  - d) Personal Protection
  - e) Incidents & accidents
    - I. Injuries and Prevention
    - II. Cost of injuries
    - III. Risk Assessment
    - IV. Reporting
- Security Awareness
  - a) Regulations, considerations
  - b) Airside security – restricted and secure areas
  - c) Security procedures including increased security threats
  - d) Documents and data security and protection and GDPR
- Emergency response module to be in accordance with state, airport, local, company and customer airline specifics.
- Operational reporting - Advanced
- Event investigation methods
- Risk Assessment
- Motivation & attitude
- Human behaviour
- Communication skills
- Stress
- Ergonomics
- Effects of psychoactive substances (drugs & alcohol)
- Fatigue management
- Time pressure
- Peer management pressure
- Situational awareness
- Teamwork
- Aircraft Weight & Balance Principles
  - a) Theory of flight
  - b) The 4 forces
  - c) Flight Controls
  - d) Consequences of an overweight or out of balance aircraft

tel + 359 2 821 08 06  
email team@sassofia.com

[www.sassofia.com](http://www.sassofia.com)

|                 |                      |
|-----------------|----------------------|
| <b>Date</b>     | On Demand            |
| <b>Category</b> | Personal Development |
| <b>Venue</b>    | On Demand            |
| <b>Level</b>    | Basic                |
| <b>Price</b>    | On Demand            |

## Detailed Content / Topics - The following Subjects will be addressed

- Structural Weights
  - a) Maximum Zero Fuel Weight
  - b) Maximum Taxi Weight
  - c) Maximum Take Off Weight
  - d) Maximum Landing Weight
  - e) Maximum weight restrictions
- Structural and actual weights
  - a) Basic Weight
  - b) Dry Operating Weight
  - c) Operating Weight (wet operating weight)
  - d) Zero Fuel Weight
  - e) Payload
  - f) Traffic load
  - g) Underload
  - h) Service weight & adjustments
- Fuel
  - a) Ramp (Block) Fuel
    - I. Contingency Fuel
    - II. Alternate Fuel
    - III. Landing Fuel
    - IV. Fuel Loading (Standard/Non-Standard)
  - b) Taxi Fuel
  - c) Take-off Fuel
  - d) Trip Fuel
  - e) Ballast Fuel
  - f) Trapped Fuel
  - g) Fuel density
- Principles of Balance
  - a) General Principles of Balance
  - b) Definition: Ref sta., LEMAC, MAC, %MAC, Index Unit %RC
  - c) Principles of Centre of Gravity (CG)
  - d) Movement of CG
  - e) Aircraft CG
  - f) Mean Aerodynamic Chord (MAC) / Reference Chord (RC)
  - g) Safe Range of MAC/RC by percent
    - I. BI-index for BW
    - II. DOI-index for DOW
    - III. DLI-dead load index
    - IV. LIZFW-index for ZFW
    - V. LITOW-index for TOW
    - VI. LILAW-index for LAW
    - VII. MACZFW-%MAC for ZFW
    - VIII. MACTOW-%MAC for TOW
    - IX. MACLAW-%MAC for LAW
  - g) Stab Trim
  - h) Ground stability
- Structural Strength Limits
  - a) The Structure
  - b) General Design Limits
  - c) Fuselage Limits

tel + 359 2 821 08 06

email team@sassofia.com

[www.sassofia.com](http://www.sassofia.com)

|                 |                      |
|-----------------|----------------------|
| <b>Date</b>     | On Demand            |
| <b>Category</b> | Personal Development |
| <b>Venue</b>    | On Demand            |
| <b>Level</b>    | Basic                |
| <b>Price</b>    | On Demand            |

## Learning Objectives

After Completion of this Training Course, Designers should be able to Perform all steps necessary to Perform Weight and Balance within the Flight Safety Limits and Capable to obtain Flight Clearance from Certifying Authority.

## Target Groups

Regulatory Authority Members, Pilots Team, Technical Engineering Management, Design Engineering Team, Marketing Team, Procurement Team, Manufacturing/Tooling Team, Technical Publications, Flight Operations, Customers.

## Pre-requisites

- Participants should know Mathematical Calculations and must be Familiar with SAWE Handbook.
- CATIA and Enovia Database access knowledge.- Knowledge on Complete Aircraft Structures and Systems.

## What do People Say about Sofema Aviation Services Training?

*"I found satisfying answers to all my questions."*  
*"The instructor demonstrated very deep knowledge of the subject."*  
*"The length of the course fit my needs and expectations."*  
*"The content was really effective, I gained a lot of new knowledge."*  
*"The practical examples were perfectly delivered."*

## Duration

3 days – Start at 09.00 and finish at 17.00, with appropriate refreshment breaks.  
To register for this training, please email [team@sassofia.com](mailto:team@sassofia.com) or Call +359 28210806

tel + 359 2 821 08 06  
email [team@sassofia.com](mailto:team@sassofia.com)

[www.sassofia.com](http://www.sassofia.com)

|                 |                      |
|-----------------|----------------------|
| <b>Date</b>     | On Demand            |
| <b>Category</b> | Personal Development |
| <b>Venue</b>    | On Demand            |
| <b>Level</b>    | Basic                |
| <b>Price</b>    | On Demand            |