

# Syllabus Selection Exam: First-Year Aerospace Engineering Topics - v2025

The first-year Aerospace Engineering topics for the selection exam cover a number of elements representative of the courses that prospective students will encounter in the bachelor first year. Topics include aerospace structures and materials, aerodynamics, flight mechanics, and space. The study material is composed of sections from a (digital) textbook and video lectures. To understand this study material, we assume that the candidates are familiar with the aerospace engineering concepts explained in the Digital Learning Environment in the section *Exploring the AE materials*. However, the materials covered there are not study material for the selection exam.

For the first-year Aerospace Engineering topics of the selection exam, the candidate is expected to study the following sections of **Chapter 5** of the book *Introduction to Aerospace Structures and Materials* by R.C. Alderliesten:

- Section 5.1 - Introduction
- Section 5.2 - Airframe
- Section 5.3 - Structural Concepts
- Section 5.4 - Fuselage structures
- Section 5.5 - Wing structures
- Section 5.6 - Torsion box
- Section 5.7 - Structural details
- Section 5.8 - Typical spacecraft structures
- Section 5.9 - Typical launch vehicle structures

In addition to the contents of the book, the following video lectures are also study material:

- Module A, Lecture 3 - How aircraft fly
- Module B, Lecture 1 - Fundamentals of aerodynamics
- Module C, Lecture 1 - Introduction to flight mechanics
- Lecture 11 - Flight Mechanics
- Lecture 4 - Space (launch vehicles)
- Lecture 5 - Space (orbits)

It should be noted that all the videos presented on each lecture page are considered study material, and can be examined. These are 17 videos in total.

## Access to study materials

The study materials can be accessed through:

- **Book** - <https://textbooks.open.tudelft.nl/textbooks/catalog/book/15>
- **Module A** - <https://ocw.tudelft.nl/course-lectures/3-aircraft-fly/>
- **Module B** - <https://ocw.tudelft.nl/course-lectures/1-fundamentals-aerodynamics/>
- **Module C** - <https://ocw.tudelft.nl/course-lectures/1-introduction-flight-mechanics/>
- **Lectures 4, 5 and 11** are not open-access materials and can only be found in the online selection platform.

Links to the study materials are also available on the online selection platform.

Notes related to the selected material:

1. The estimated study time required for the videos and books is 10 to 20 hours.
2. It is possible that the text contains some references to sections/figures/equations that are not included at this stage. In such cases the information referred to is considered not essential in order to understand the concept being discussed. Naturally, the candidate is free to access the referred sections for further reading.

## Bibliography

- [1] Alderliesten, R., *Introduction to Aerospace Structures and Materials*, Open Textbook Library, 2018.