Aeronautical structures (MECA0028-1)

Arctic STOL Aircraft

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The project

The structure of the Arctic STOL Aircraftdesigned by the master students during the **2025-2026** conceptual design class shall be studied.

The students will be organized in groups of students following APRI0004 and consider the airplane they are designing during their conceptual project.

Each group of students shall deliver a report –and a code—related to the following points.

A/ Manoeuver and Gust envelopes

Both envelopes shall be computed.

Weight and center of gravity position of each component shall be given.

B/ Aerodynamic loads

For the main points of the envelopes, the aerodynamics loads shall be computed on
- The wing;
- The empennage (if any).

For those points
- A pitch acceleration following the relevant norm:
  - FAR 23.423, https://www.risingup.com/fars/info/23-index.shtml
- A maximum yaw angle following the relevant norm:
  - FAR 23.441 https://www.risingup.com/fars/info/23-index.shtml

C/ Structural loads:

The following structural loads shall be computed for the different envelope points
- At the fuselage directly aft/front of the wing for tail/canard configuration (if any);
- At the wing root (or at two relevant sections for flying wing configuration).

D/ Structural design:

Using the material of the analytical analysis presented during the class, the structure shall be designed based on the results of C/.

E/ FEM

The results of D/ shall be assessed using a FEM model

F/ Deadline

Printed version of the extended chapter Structure (or equivalent), with all the details to be handed by 22nd of May 2026, 6pm. Electronic version with relevant code to be sent by e-mail.