

Competence Cluster Aeronautical Engineering

Aeronautical engineering has gotten an extended meaning, including a large variety of disciplines, but basic aeronautical engineering can be summed up in the [Wright brothers Flyer I](#). To make this airplane airborne the brothers had to make a sound aerodynamic design and include a strong enough engine for propulsion. Another key factor to the success was the brothers invented control system that included a way to twist the wings to bank the airplane left and right. If this is summed up the following disciplines are included: Aerodynamics, Propulsion, Flight mechanics, Flight control system, Flutter and Loads.

Today's airplanes are way more advanced than the Flyer I and have to meet very strict regulations and demands on availability. Furthermore, there is today a focus on environmental and economical issues, for example studied in the European research project [Clean Sky](#). The competence cluster Aeronautical Engineering focuses on:

- Design
 - Passive/Active laminar flow for increased efficiency and environmental friendly flight
 - Control law design for safer flight
- Modeling
 - Turbulence modeling for more accurate numerical computations
 - Aerodynamic modeling for increased quality and more reliable analyses and simulations
 - Aeroelastic modeling for a better understanding of coupling effects between aero- and structural dynamics
- Simulation
 - Mass-simulation for better understanding of flying qualities and thereby produce support for more reliable design in many disciplines