

## Aeroplanes (E061960)

**Course size** *(nominal values; actual values may depend on programme)*

**Credits 3.0**                      **Study time 90 h**

**Course offerings and teaching methods in academic year 2025-2026**

A (semester 1)                      English                      Gent                      lecture

**Lecturers in academic year 2025-2026**

Marinus, Benoît                      TW08                      lecturer-in-charge

**Offered in the following programmes in 2025-2026**

	crdts	offering
<a href="#">Master of Science in Electromechanical Engineering(main subject Control Engineering and Automation)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering(main subject Electrical Power Engineering)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering(main subject Maritime Engineering)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering(main subject Mechanical Construction)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering(main subject Mechanical Energy Engineering)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering</a>	3	A
<a href="#">Master of Science in Mechanical and Electrical Systems Engineering</a>	3	A

### Teaching languages

English

### Keywords

Aerodynamics, performance, systems, airframe

### Position of the course

Introductory course about aeroplanes: gain insights in the working of aeroplanes and discussion of the essential components and structural aspects.

### Contents

- Aerodynamics: lift, drag, planforms, high lift apparatus, drag reduction, supersonic flight
- Propulsion: characteristics, altitude dependency, the challenge of hydrogen, electric propulsion
- Performance: aircraft equations of motion, available propulsion power, performance parameters
- Stability and control: flight manoeuvres, static stability, dynamic stability, equations of motion
- Aeroelasticity: structure, wing divergence, aileron reversal
- Navigation systems: instruments for position, height, velocity, attitude, principles of radio navigation
- Discussion of some aeroplane systems: structure, climate-pack, hydraulic, electric, fuel, propulsion, oxygen, pneumatic, fly by wire, etc.

### Initial competences

- Physics I ([E020061](#))
- Dynamics of Rigid Bodies ([E040030](#))
- Fluid Mechanics ([E040560](#))
- Transport Phenomena ([E045120](#))

### Final competences

- 1 To understand and distinguish drag and drag reduction mechanisms
- 2 To understand and distinguish lift and lift augmentation mechanisms

- 3 To understand and explain stability characteristics
- 4 To understand and explain performance parameters
- 5 To understand the principles of the instruments for visual and instrumental flight conditions
- 6 To understand the principles of the most important aircraft systems
- 7 To understand and explain the principles of aeroelasticity applied to a wing

#### Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

#### Conditions for exam contract

This course unit cannot be taken via an exam contract

#### Teaching methods

Lecture

#### Study material

Type: Syllabus

Name: Aeroplanes by Prof. Benoît MARINUS

Indicative price: € 20

Optional: no

Language : English

Number of Pages : 388

Oldest Usable Edition : 2023

Available on Ufora : Yes

Online Available : No

Available in the Library : No

Available through Student Association : Yes

Type: Slides

Name: Aeroplanes

Indicative price: Free or paid by faculty

Optional: yes

Language : English

Number of Slides : 528

Oldest Usable Edition : 2024

Available on Ufora : Yes

Online Available : No

Available in the Library : No

Available through Student Association : No

Additional information: Slides are design as a support to education and do not contain all elements of the discussion.

The reference is the syllabus.

Type: Audiovisual Material

Name: Aeroplanes - Course recordings

Indicative price: Free or paid by faculty

Optional: no

Language : English

Available on Ufora : Yes

Online Available : No

Available in the Library : No

Available through Student Association : No

Usability and Lifetime within the Course Unit : regularly

Usability and Lifetime within the Study Programme : regularly

Usability and Lifetime after the Study Programme : not

#### References

- R. Barnard. Philpott. Aircraft flight: A description of the physical principles of aircraft flight. Addison-Wesley. ISBN 0582236568
- R. Nelson. Flight stability and automatic control. McGraw-Hill ISBN 0070462739
- J. Anderson: Introduction to flight. McGraw-Hill. ISBN 0071160345
- DP. Raymer. Aircraft Design: A Conceptual Approach. ISBN 9781600869112
- JR. Wright. JE. Cooper. Introduction to Aircraft Aeroelasticity and Loads, ISBN 9780470858400

#### Course content-related study coaching

**Assessment moments**

end-of-term assessment

**Examination methods in case of periodic assessment during the first examination period**

Oral assessment

**Examination methods in case of periodic assessment during the second examination period**

Oral assessment

**Examination methods in case of permanent assessment****Possibilities of retake in case of permanent assessment**

not applicable

**Extra information on the examination methods**

During examination period: oral closed-book exam, written preparation

**Calculation of the examination mark**

Main question 8pt

Side question 1 4pt

Side question 2 4pt

Side question 3 4pt

**Facilities for Working Students**

Course recordings are available and the syllabus is comprehensive.