

## t.AEFM - Aerodynamics and Flight Mechanics

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**Person responsible for the course:** Leonardo Manfriani, mani

**Credits:** 4

**Valid for:** 2010/2011

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### Learning objectives:

The main objectives of the dual course "Aerodynamics and Flight Mechanics" are the following :

- the students understand and can apply the fundamental principles of aircraft aerodynamics and flight mechanics;
  - at the same time, interested students also receive basic knowledge for the ATP theoretical examination "Aircraft General Knowledge" according to JAR-FCL 1.470.
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### Course content:

Fundamental concepts of aerodynamics

- airspeed measurement
- aerodynamic forces: lift and drag
- inviscid and viscous flow; boundary layers
- characteristics of wing sections
- wings: induced drag
- high lift devices
- flow separation on a wing; stall characteristics
- transonic and supersonic flow; shock waves and wave drag
- static and dynamic longitudinal stability
- static and dynamic directional and lateral stability
- flight controls

The following JAR-FCL 1.470 topics are integrated in the AEFM course:

- 080 00 PRINCIPLES OF FLIGHT
  - 081 01 Subsonic aerodynamics
  - 081 02 Transonic aerodynamics
  - 081 03 Supersonic aerodynamics
  - 081 04 Stability
  - 081 05 Control
  - 081 08 Flight mechanics
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### Previous knowledge:

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**Teaching method:**

Type of lesson:	Number of lessons per week:
Lecture	14*2
Tutorial/Practicum	14*2
Group teaching	
Block instruction	
Seminar	

**Assessment:**

According to the table or as specified in writing by the lecture at the beginning of the semester!

Number	Type	Weighting
1	Final exam	60%
4	Short tests during the semester	40%
	Further assessments	

**Language of instruction:**

English

**Instruction material:**

Textbook: John D. Anderson, Jr.: Introduction to Flight, McGraw-Hill

The textbook will be complemented by presentations, script and exercises.

Additional literature:

- Hugh H. Hurt, Aerodynamics for Naval Aviators, U.S. Navy
- Houghton and Carpenter, Aerodynamics for Engineering Students, Elsevier
- Principles of Flight, Nordian ATS

The NORDIAN book is recommended for those students who intend to take the ATP theoretical knowledge examination.

**Comments:**

The course is obligatory for candidates to the ATP licence. Attendance to the course will correspondingly be checked.