

t.AERO - Aerodynamics

Person responsible for the course: Leonardo Manfredini, mani

Credits: 4

Valid for: 2011/2012

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Learning objectives:

The main objectives of this course are the following :

- the students understand and can apply the fundamental principles of aircraft aerodynamics and flight mechanics;
 - at the same time, interested students 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 and flight mechanics:

- 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
- drag and power required in level flight
- 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 | End of term exam | 60% |
| 2 | Lab reports | 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.

Further reading:

- Hugh H. Hurt, Aerodynamics for Naval Aviators, U.S. Navy
- Bertin and Cummings, Aerodynamics for Engineers, Pearson
- 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:

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