

t.ADA - Advanced Aerodynamics

Person responsible for the course: Leonardo Manfredini, mani
Responsible OU: ZAV
ECTS: 4
Valid for: 2012/2013
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Expertise:

Understand and apply advanced aerodynamic concepts

Methodological skills:

Apply simple theoretical methods to calculate aircraft aerodynamic characteristics

Social skills:

Be able to work and learn effectively in a small group

Personal skills:

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Learning objectives:

The scope of this course is to convey the theoretical foundations of aircraft aerodynamics.

At the same time, the lecturer will share with the students practical experiences collected during thirty years as an aerodynamicist.

This shall allow the students to read and understand advanced literature on aerodynamics during their professional careers. Moreover, they shall know the limits and the possibilities of different methods, so that they will be able to apply them appropriately and understand the results correctly.

Course content:

- Review of basic concepts
- Governing equations of fluid mechanics
- Potential flow
- Two-dimensional wing theory
- Finite wing theory
- Compressible flow
- Viscous flow and boundary layers
- Flow control and wing design
- Wind tunnel testing
- Preliminary aircraft sizing

Tools:

- Computational, experimental and handbook methods
- Principles of wind tunnel testing

Previous knowledge:

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Teaching method:

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

Assessment:

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

description	type	form	scope	assessment	weighting
Performance records during school hours					
Semester end exam	Exam	oral	45 min		100%

Language of instruction:

Englisch

Instruction material:

Textbook:

- Houghton and Carpenter: Aerodynamics for Engineering Students, Elsevier, ISBN 0-7506-5111-3

Presentation slides and complementary course notes

Additional literature:

- Anderson: Fundamentals of Aerodynamics, McGraw-Hill, ISBN 978-0-07-339810-5

- Ed Obert: Aerodynamic Design of Transport Aircraft, TU Delft, ISBN 978-1-58603-970-7

- Jenkinson, Simpkin and Rhodes: Civil Jet Aircraft Design, AIAA Education Series, ISBN 1-56347-350-X

Comments:

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