

Aircraft Constructions

Code: MK3RESZJ04JL20-EN

ECTS Credit Points: 4

Evaluation: mid-semester grade

Semester: 5th semester

Its prerequisite(s): Vehicle and Drive Elements I

Further courses are built on it: Yes/No

Number of teaching hours/week (lecture + practice): 2+2

Topics:

Description of the main structural units of an aircraft (wing, fuselage, control surfaces, landing gear, engine suspension), specifications related to their strength, load situations based on EASA-CS and FAR. Calculation of aerodynamic forces acting on the wing and control surfaces. Strength calculation of semimonocoque construction elements. Calculation of the buckling stress of covering skin and the effect of the buckling on the whole structure. Effect of construction methods on the realized structure. Construction solutions for aircraft structural elements. Fasteners for the aircraft industry. Composite materials and processes. Options for supporting construction with CAD applications (parametric design, digital mock-up, etc.).

Literature:

Recommended literature:

- Ansel Ugural, NEW JERSEY INSTITUTE TECH: Mechanical Design: An Integrated Approach, 1st Edition Hardcover with access card, ©2004, ISBN-13 9780072921854
- David J. Peery: Aircraft structures. Dover Publications, Inc. Mineola, New York, ISBN-13 9780486485805
- Pilot's Handbook of Aeronautical Knowledge 2008, Aviation Supplies and Academics, Inc.
- Ardelean, Aurelian Flavius: Finite Element Analysis: Course book. 2012 ISBN978 963 473 529 8

Schedule

1st week Registration week

2nd week:

Lecture: The structural element of the aircraft: fuselage, specifications related to their strength, load cases based on EASA-CS and FAR

Practice: Strength calculation of semimonocoque construction elements. Calculation of the buckling stress of covering skin.

4th week:

Lecture: The structural element of the aircraft: wing, specifications related to their

3rd week:

Lecture: The structural element of the aircraft: fuselage, specifications related to their strength, load cases based on EASA-CS and FAR

Practice: Strength calculation of semimonocoque construction elements. Calculation of the buckling stress of covering skin

5th week:

Lecture: The structural element of the aircraft: wing, specifications related to their

strength, load cases based on EASA-CS and FAR Practice: Calculation of wind loads acting on the wing. Composite materials and processes. 6th week: Lecture: The structural element of the aircraft: control surfaces, specifications related to their strength, load cases based on EASA-CS and FAR Practice: Calculation of aerodynamic force loads acting on the control surfaces	strength, load cases based on EASA-CS and FAR Practice: Composite materials and processes. 7th week: Lecture: The structural element of the aircraft: control surfaces, specifications related to their strength, load cases based on EASA-CS and FAR Practice: Calculation of aerodynamic force loads acting on the control surfaces
8th week: 1st drawing week	1st Mid-term test
9th week: Lecture: Structural element of the aircraft: landing gear, specifications related to their strength, load cases based on EASA-CS and FAR Practice: Construction solutions for aircraft structural elements. 11th week: Lecture: Structural element of the aircraft: landing gear, specifications related to their strength, load cases based on EASA-CS and FAR Practice: Fasteners for the aircraft industry. Composite materials and processes. 13th week: Lecture: Structural element of the aircraft: engine suspension Practice: Options for supporting construction activities in CAD applications include parametric design, digital mock-up,...	10th week: Lecture: Structural element of the aircraft: landing gear, specifications related to their strength, load cases based on EASA-CS and FAR Practice: Construction solutions for aircraft structural elements. 12th week: Lecture: Structural element of the aircraft: engine suspension Practice: Fasteners for the aircraft industry. Composite materials and processes. 14th week: Lecture: Structural element of the aircraft: engine suspension Practice: Options for supporting construction activities in CAD applications include parametric design, digital mock-up,...
15th week: End-term test	

Requirements

A, for a signature:

- Active participation in seminars

- Submitting the calculation tasks

B, for a grade:

Based on the average of midterm tests and the grades of home assignments.