STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Construction aircraft		**1010601141010633992**
Field of study: **Aerospace Engineering**	Profile of study (general academic, practical): **general academic**	Year /Semester: **2 / 4**
Elective path/specialty: **Aircraft Engines and Airframes**	Subject offered in: **Polish**	Course (compulsory, elective): **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time): **full-time**	
No. of hours: Lecture: **2** Classes: **-** Laboratory: **-** Project/seminars: **-**		No. of credits: **2**
Status of the course in the study program (Basic, major, other): **other**	(university-wide, from another field): **university-wide**	
Education areas and fields of science and art: **technical sciences** **Technical sciences**		ECTS distribution (number and %): **2 100%** **2 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge in the field of mechanics, airframe construction, metrology, strength of materials, non-destructive testing
2	**Skills**	He can apply the scientific method in solving problems, carrying out experiments and gain conclusions
3	**Social competencies**	He knows the limits of his knowledge and skills; can precisely formulate questions, understands the need for further education

Assumptions and objectives of the course:

-Familiarize students with the problems of aircraft operation (elements of the airframe structure). Understanding the currently used operation and diagnosis systems increasing the safety of aircraft operation. Acquainting with basic aerial structures and methods of testing their strength. Familiarizing students with the principles of strength calculations for aircraft structures. To acquaint students with currently used systems supporting the design of aircraft structures.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Has knowledge in the field of mathematics, including algebra, analysis, theory of differential equations, probability, analytical geometry - [[K1A_W01]]
2. Has a structured basic knowledge in the main branches of technical mechanics: statics of kinematics and dynamics of the material point and rigid body - [[K1A_W04]]
3. Has basic knowledge in the field of machine construction and theory of machines and mechanisms - [[K1A_W05]]
4. Has basic knowledge of standardized principles of construction record and engineering graphics - [[K1A_W07]]

Skills:

1. Is able to use verbal communication in one additional foreign language at the level of everyday language - [[K1A_U07]]
2. Is able to prepare technical documentation descriptively - drawing an engineering task - [[K1A_U06]]
3. Can use the acquired mathematical theories to create and analyze simple mathematical models of machines and their components and simple technical systems. - [[K1A_U09]]
4. Able to draw a diagram, a simple machine element and a component of the airframe according to the principles of technical drawing - [[K1A_U16]]

Social competencies:

1. Can think and act in a creative and enterprising way - [[K1A_K06]]
2. Is aware of the importance and understands the non-technical aspects and effects of engineering activities, including its impact on the environment and the related responsibility for decisions - [[K1A_K02]]
3. Understands the need and knows the possibilities of continuous learning - [[K1A_K01]]

Assessment methods of study outcomes

-Written test

Course description

-General information on the types of aircraft structures. Materials used for the production of airframe components. Concepts related to the probability and reliability of aircraft structures. The probability of working in the state of fitness. Technical operation of aircraft. Aircraft maintenance

in practice. The influence of various factors on aircraft airframe wear. Non-destructive testing of aircraft structures. Problems of assessing the technical condition of the aircraft's reliability and operational durability. Technical services for servicing and repairing airframe structures. Operational flight safety factors. Safety of aircraft against the background of aviation law and regulatory requirements.

Basic bibliography:

1. K. Kaw, Mechanics of Composite Materials, second edition, Taylor & Francis Group, LL, 2006;

2. M. Chun-Yung Niu, Airframe structural design. Practical Design Information and Data on Aircraft Structures, Conmilit Prcss Ltd., 1988

3. T. H. G. Megson, Aircraft Structures for engineering students (fourth edition), Elsevier Ltd., 2007;

4. E. ÜNAY, Load analysis of an aircraft using simplified aerodynamic and structural models, February 2015;

5. W. Błażewicz, Budowa samolotów ? obciążenia, Wydawnictwo Politechniki Warszawskiej, Warszawa 1979;

6. M. Skowron, Budowa samolotów ? obciążenia. Zbiór zadań, Wydawnictwo Politechniki Warszawskiej, Warszawa 1979

7. C. Galiński, Wybrane zagadnienia projektowania samolotów, Biblioteka Instytutu Lotnictwa, Warszawa 2016;

8. M. N. Szulżenko, A.S. Mostowoj, Konstrukcja samolotów, Wydawnictwa komunikacji i łączności, Warszawa 1980;

9. Danilecki S., Projektowanie samolotów, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2000

10. Błaszczyk J., Konstrukcja samolotów, cz.I., Obciążenia zewnętrzne, WAT, Warszawa 1984

Additional bibliography:

1. A. Milikiewicz, Praktyczna aerodynamika i mechanika lotu samolotu odrzutowego w tym wysokomanewrowego, Wydawnictwo ITWL, Warszawa 2011;

2. M. Dębski, D. Dębski, Wybrane zagadnienia wytrzymałości zmęczeniowej konstrukcji lotniczych, Wydawnictwa Naukowe Instytutu Lotnictwa, Warszawa 2014

3. A. Abłamowicz, W. Nowakowski, Podstawy aerodynamiki i mechaniki lotu, Wydawnictwa komunikacji i łączności, Warszawa 1980

4. M. Bijak-Żochowski, Mechanika materiałów i konstrukcji, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2006

5. R.P.L. Nijssen, Composite materials an introduction, Inholland University of Applied Sciences, 2015

Result of average student's workload

Activity	Time (working hours)
1. Preparation for the exam	5
2. Participation in the exam	2
3. Participation in lectures	30

Student's workload

Source of workload	hours	ECTS
Total workload	37	2
Contact hours	32	2
Practical activities	0	0