COURSE DESCRIPTION CARD - SYLLABUS

Course name
Constructions of air transport means [S1Lot2>BŚTL]

Course

Field of study
Aviation

Year/Semester
1/1

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
0

Other
0

Tutorials
15

Projects/seminars
0

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

Knowledge: Basic knowledge of physics and geography Skills: Is able to analyze the interdependencies between the effects and causes of phenomena and events resulting from the laws of physics. Social competences: Prepared for teamwork.

Course objective

The subject covers issues related to the construction of air transport means, including: airframe, propulsion systems, landing gear. The historical development and operation of air transport were also taken into account. The course also discusses installations used in modern aircraft that are responsible for the proper functioning of basic components.

Course-related learning outcomes

Knowledge:
1. has ordered, theoretically founded general knowledge in the field of technology and various means of air transport, about the life cycle of means of transportation, both hardware and software, and in particular about the key processes taking place in them
2. has ordered and theoretically founded general knowledge in the field of key technical issues and

detailed knowledge of selected issues related to air transport, knows the basic techniques, methods and tools used in the process of solving tasks related to air transport, mainly of an engineering nature
3. has detailed knowledge related to selected issues in the field of manned and unmanned aircraft construction, in the field of on-board equipment, control systems, communication and recording systems, automation of individual systems, has basic knowledge of flight simulation training devices and simulation methods used to solve air transport issues
4. has extended knowledge in the field of material strength, including the theory of elasticity and plasticity, stress hypotheses, methods of calculating beams, membranes, shafts, joints and other structural elements, as well as methods of testing the strength of materials and the state of deformation and stress in structures, and has basic knowledge of the main departments of technical mechanics: statics, kinematics and dynamics of a material point and a rigid body
5. has basic knowledge of metal, non-metal and composite materials used in machine construction, in particular about their structure, properties, methods of production, heat and thermo-chemical treatment and the influence of plastic processing on their strength, as well as fuels, lubricants, technical gases, refrigerants e.t.c.
6. has basic knowledge of environmental protection in transport, is aware of the risks associated with environmental protection and understands the specificity of the impact of mainly air transport on the environment as well as social, economic, legal and other non-technical conditions of engineering activities

Skills:
1. is able to properly select materials for simple aviation structures, and can indicate the differences between the fuels used in aviation
2. is able to design elements of means of transport with the use of data on environmental protection
3. is able to design means of transport with appropriate internal requirements (e.g. regarding environmental protection).
4. can analyze objects and technical solutions, can search in catalogs and on manufacturers" websites, ready components of machines and devices, including means and devices, assess their suitability for use in their own technical and organizational projects
5. student is able to make a comprehensive assessment of ecological parameters of an aircraft propulsion unit, based on the values of emission factors for harmful gaseous compounds and particulate matter

Social competences:
1. understands that in technology, knowledge and skills very quickly become obsolete.
2. is aware of the importance of knowledge in solving engineering problems and knows examples and understands the causes of faulty engineering projects that have led to serious financial and social losses, or to a serious loss of health and even life
3. is aware of the social role of a technical university graduate, in particular understands the need to formulate and provide the society, in an appropriate form, with information and opinions on engineering activities, technological achievements, as well as the achievements and traditions of the engineer profession
4. correctly identifies and resolves dilemmas related to the profession of an aerospace engineer

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Final exam, test and completion of exercises.

Programme content

Division of means of air transport
Construction of particular types of means of air transport
Equipment for air transport
Installations used in exemplary means of air transport
Production technologies of means of air transport
Technical documentation and instructions for the use of exemplary means of air transport
Design calculations for individual means of air transport (basic principles of aerodynamics, structural strength)

Selection of materials for means of air transport

Course topics

The course discusses basic issues related to the construction of air transport means, including: airframe, propulsion systems, landing gear. The historical development and operation of air transport were also taken into account.

Teaching methods

Informative (conventional) lecture (providing information in a structured way) - may be of a course (introductory) or monographic (specialist) character.
The exercise method (subject exercises, practice exercises) - in the form of auditorium exercises (application of acquired knowledge in practice - may take various forms: solving cognitive tasks or training psychomotor skills; transforming a conscious activity into a habit through repetition).

Bibliography

Basic:
1. Błaszczyk J., Wprowadzenie w technikę lotniczą, WAT, Warszawa 1982
2. Cheda W., Malski M., Techniczny poradnik lotniczy. Płatowce, WKŁ, Warszawa 1981
3. Karpowicz J., Współczesne konstrukcje lotnicze, AON, Warszawa 2003.
4. Lewitowicz J., Podstawy eksploatacji statków powietrznych. Tom I, ITWL, Warszawa 2001

Additional:
1. Pilecki S., Lotnictwo i kosmonautyka, WKŁ, Warszawa 1984

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	50	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00