



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Construction of air transport means

### Course

Field of study

Aviation

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/1

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

### Number of hours

Lecture

30

Laboratory classes

0

Other (e.g. online)

Tutorials

15

Projects/seminars

### Number of credit points

3

### Lecturers

Responsible for the course/lecturer:

dr inż. Mateusz Nowak

Responsible for the course/lecturer:

mateusz.s.nowak@put.poznan.pl

Wydział Inżynierii Lądowej i Transportu

ul. Piotrowo 3, 60-965 Poznań

### 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

Getting to know the basic structure of air transport

### 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:

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

### 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. Błaszczak 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	3,0
Classes requiring direct contact with the teacher	47	2,0
Student's own work (literature studies, preparation for classes, preparation for tests,) <sup>1</sup>	28	1,0

<sup>1</sup> delete or add other activities as appropriate