



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Modern materials in aviation

Course

Field of study

Aerospace Engineering

Area of study (specialization)

-

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

2/2

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

15

Number of credit points

1

Lecturers

Responsible for the course/lecturer:

mgr inż. Karolina Ostrowska

Responsible for the course/lecturer:

Instytut Maszyn Roboczych i Pojazdów

Samochodowych

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Prerequisites

Knowledge: Basic knowledge of physics, mathematics and chemistry.

Skills: The ability to effectively self-study.

Social competences: Is aware of the social role of the engineer. He is willing to expand his competences. He can work in a team.

Course objective

Understanding microbudding and selected properties of solids used in engineering practice.

Understanding the theoretical foundations of construction and durability properties of selected materials used in aviation.



Course-related learning outcomes

Knowledge

1. has extended knowledge necessary to understand the profile subjects and specialist knowledge about the construction, methods of construction, production, operation, air traffic management, safety systems, impact on the economy, society and the environment in the field of aviation and cosmonautics for selected specialties: Civil Aviation, UAV
2. has an extensive knowledge of the strength of materials, including the theory of elasticity and plasticity, stress hypotheses, calculation methods for 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
3. has an extended 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

Skills

1. is able to communicate using various techniques in the professional environment and other environments using the formal notation of construction, technical drawing, concepts and definitions of the scope of the study field
2. has the ability to self-educate with the use of modern teaching tools, such as remote lectures, websites and databases, teaching programs, e-books
3. can obtain information from literature, the Internet, databases and other sources. Can integrate the obtained information, interpret and draw conclusions from it, and create and justify opinions

Social competences

1. Understands the need for lifelong learning; can inspire and organize the learning process of other people.
2. Is ready to critically evaluate the knowledge and content received, recognize the importance of knowledge in solving cognitive and practical problems, and consult experts in case of difficulties in solving the problem on its own

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: written credit covering the issues discussed in the lecture

Programme content

Discussion of modern materials used in aircraft structures. Presentation of their physical characteristics, as well as methods of their study. Discussion of issues related to shaping the strength properties of selected structural elements.

Teaching methods



Informative (conventional) lecture (providing information in a structured way) - may be of a course (introductory) or monographic (specialist) character

Bibliography

Basic

1. C. Kittel, Wstęp do fizyki ciała stałego, PWN, Warszawa 1974
2. B. N. Buszmanow, J. A. Chromow, Fizyka ciała stałego, WNT, Warszawa 1973
3. D. R. Askeland, The science and engineering of materials, PWS Publishers, Boston 1985
4. S. Rudnik: Metaloznawstwo. PWN, Warszawa, 1996
5. F. Staub; Metaloznawstwo, 1979
6. W. Luty [i in.]: Poradnik inżyniera. Obróbka cieplna stopów żelaza, 1977
7. L. Dobrzański: Metaloznawstwo z podstawami nauki o materiałach. WNT, Warszawa, 1996

Additional

1. M. F. Ashby, D. R. H. Jones, Materiały inżynierskie, t.1 i 2, WNT, Warszawa 1996

Breakdown of average student's workload

	Hours	ECTS
Total workload	30	1,0
Classes requiring direct contact with the teacher	20	1,0
Student's own work (literature studies, preparation for test) ¹	10	0,0

¹ delete or add other activities as appropriate