



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Composite materials

Course

Field of study

Aerospace Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

Requirements

compulsory

Number of hours

Lecture

9

Laboratory classes

9

Other (e.g. online)

1

Tutorials

Projects/seminars

Number of credit points

1

Lecturers

Responsible for the course/lecturer:

prof. dr hab. inż. Leszek Małdziński email:

leszek.maldzinski@put.poznan.pl

Responsible for the course/lecturer:

Prerequisites

Knowledge: Basic knowledge of composite materials, classification in terms of matrix and reinforcing elements. Selected properties and material processing composites. Selected examples of the use of composites in passenger and military aircraft as well as in space vehicles.

Course objective

Providing students with knowledge on: struktura, selected properties, composites, their

processing, application in practice, selection of engineering materials for the construction of facilities

engineering

Course-related learning outcomes

Knowledge

Student has basic knowledge of metal, non-metal and composite materials used in machine construction, in particular about their structure, properties, manufacturing methods, thermal and thermochemical treatment and the impact of plastic tooling on their strength



Skills

Student is able to communicate using various techniques in a professional environment and other environments using a formal record of construction, technical drawing, concepts and definition of the scope of the studied field of study. Student has the ability to self-study using modern teaching tools, such as remote lectures, websites and databases, didactic programs, e-books

Social competences

Student understands the need to learn throughout life; he can inspire and organize the learning process of other people. Student 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 the case of difficulties in solving the problem

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Methods of verification of learning outcomes and assessment criteria The learning outcomes presented above are verified as follows:

Written and oral exam.

Programme content

Definition of composites. Basic knowledge of composite materials, classification in terms of matrix and reinforcing elements. Structure and properties of various types of materials for the matrix and for reinforcing elements Selected properties and material processing composites. Selected examples of the use of composites in passenger and military aircraft as well as in space vehicles.

Teaching methods

Lecture with multimedia presentation. Laboratory classes.

Bibliography

Basic

1. Michael Ashby i in.: Materials selection in Mechanical design, 2017, ISBN: 978-0-08-100599-6
2. Michael Ashby i in.: Materials Engineering, science. Procrssing and Design. North Amerrican Edition: ISBN-13: 978-1-85617-743-6
3. Budinski, K.G. et all: Engineering Materials, Properties and Selection, 2010, ISBN 978-0-13-712842-6
4. Callister, W.D.: Material Science and Engineering, ISBN 978-1-118-54689-5
5. Mechanical Properties of Matter. New Yourk Congress Number 65-14262

Additional

1. Shackelford J.F.: Introduction to Materials Science for Engineers, 2014, ISBN 978-0133789713
2. Metal hanndbook ASM 2012



2. Burakowski T., Wierzchoń T.: Surface engineering of metals – principles, equipment, technology. CRS Press, Boca Raton – London-New York-Washington, D.C., 1999.

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	1,0
Classes requiring direct contact with the teacher	24	0,4
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	27	0,5

¹ delete or add other activities as appropriate