COURSE DESCRIPTION CARD - SYLLABUS

Course name
Composites

Course

Field of study
Materials science

Year/Semester
2/4

Area of study (specialization)
-

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15	30	
Tutorials	Projects/seminars	

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
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Materials Science and Technical Physics Faculty

Piotrowo 3 Str., 60-965 Poznań

Responsible for the course/lecturer:
dr inż. Kamil Kowalski

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Prerequisites

The student has a basic knowledge of chemistry, physics, mechanics. Skills of logical thinking, use of information obtained from the library and the Internet.Student understanding the need to learn and acquire new knowledge

Course objective

1.Providing students with basic knowledge of cmposites, to the extent specified by the curriculum content specific to the field of study.

2.Develop students' ability to solve simple problems related to the selection of composite materials, distinguish materials and analyze the results of microscopic observations based on the acquired knowledge.

3.Shaping teamwork skills in students.

Course-related learning outcomes

Knowledge

1. The student is able to characterize the types of composite materials and their components - [K_W03, K_W08, K_W10].

2. The student is able to characterize and select suitable methods of making composites for specific applications. - [K_W10, K_W12].

3. The student can determine the static and dynamic stresses generated in the composite material during operation - [K_W09].

4. The student knows the applications of specific composite materials - [K_W14].

Skills

1. The student can choose the right composite material for the application, knowing the operating conditions. - [K_U01, K_U03, K_U05, K_U13, K_U14, K_U21].

2. The student can choose the appropriate method for obtaining the material and its composition and construction. - [K_U01, K_U03, K_U04, K_U05, K_U16, K_U21].

3. The student can identify by microscopic methods defects and mechanisms of destruction of elements made of composites. - [K_U03, K_U04, K_U10].

Social competences

1. Student potrafi współpracować w grupie - [K_K03].

2. Student jest świadomy znaczenia właściwego doboru materiałów kompozytowych do konkretnych zastosowań oraz znaczenia ich wyboru dla środowiska, rozwoju gospodarki oraz wdrażania innowacyjnych rozwiązań. - [K_K02].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Pass on the basis of a colloquium consisting of 5 general questions (pass in case of correct answer to min. 3 questions: <3 ? ndst, 3 ? dst, 3.5 ? dst+, 4 ? db, 4.5 ? db +, 5 ? bdb) carried out at the end of the semester.

Laboratory: Based on an oral or written response to the content of each laboratory exercise performed, a report of each laboratory exercise according to the indications of the laboratory exercise operator. In order to be counted in laboratories, all exercises must be completed (positive assessment from the response and report).

Programme content

Wykład:

1.Podstawowe informacje, definicje, znaczenie kompozytów jako materiałów konstrukcyjnych i funkcjonalnych, kierunki rozwoju materiałów kompozytowych, przykłady zastosowań

2.Włókna i ich właściwości: rodzaje, budowa, właściwości, wytwarzanie, porównanie poszczególnych rodzajów włókien.

3.Osnowy w kompozytach, ich rola, rodzaje oraz właściwości; osnowy polimerowe, metalowe, ceramiczne.

4.Kompozyty naturalne.

5.Mechanika materiałów kompozytowych.

6.Technologie wytwarzania kompozytów.

7.Nanokompozyty.

8.Kompozyty wykorzystywane w przemyśle energetycznym.

Laboratorium:

1.Kompozyty z osnowa metalową.

2.Wyroby z włóknami ciągłymi.

3.Kompozyty z osnową polimerową.

4.Wytwarzanie kompozytów z osnową polimerową 1.

5.Wytwarzanie kompozytów z osnową polimerową 2.

Teaching methods

1. Lecture: multimedia presentation, presentation illustrated by examples given on the board.

2. Laboratory exercises: practical exercises, experimentation, discussion and development of results in the form of a report.

Bibliography

Basic

1. A. Boczkowska, Kompozyty, Wydawnictwo Politechniki Warszawskiej 2000

2. J. Śleziona, Podstawy technologii kompozytów, Wydawnictwo Politechniki Śląskiej 1998

3. H. Leda, Kompozyty polimerowe z włóknami ciągłymi, Wydawnictwo Politechniki Poznańskiej, 2000

Additional

1. D.R. Askeland, The Science and Engineering of Materials, PWS-KENT Publishing Company, Boston, Massachusetts

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	35	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	18	1,0

[1] delete or add other activities as appropriate