COURSE DESCRIPTION CARD - SYLLABUS

Course name
Composites [S2MiBM2>KOM]

Course

Field of study
Mechanical Engineering

Year/Semester
1/1

Area of study (specialization)
–

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
30

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

Prerequisites

Basic knowledge of materials science of polymeric materials. The ability to think logically, to use information obtained from basic and specialist literature in the field of materials science. Student understanding the need to learn and acquire new material knowledge.

Course objective

Learning about polymer materials, determining the influence of structure on the properties of composites. Learning about modification methods.

Course-related learning outcomes

Knowledge:
1. The student should characterize the basic properties of plastics
2. The student should characterize the basic design features of composites. Has deepened and extended knowledge of these engineering materials. He knows modern engineering materials with specific properties and their use as elements of machinery and tools.
3. The student should characterize the components of composites.
4. It has detailed knowledge in the field of modern technologies used in composites. He knows modern

tendencies and technology development directions.

Skills:
1.The student is able to select the appropriate modification method to obtain a polymer composite.
2. The student is able to propose material for the produc.
3.The student is able to identify composites and perform their material classification.
4. He can work individually and in a team. He is able to use information and communication techniques appropriate for the implementation of tasks, communicate using various techniques in the team and the environment in the field of mechanics and machine construction. He can manage the work of a team of people.

Social competences:
1.The student is able to cooperate in a group.
2. Understands the need for lifelong learning.
3. He is aware of the importance and understands the non -technical aspects and effects of engineering activities, including its impact on the environment, and the related responsibility for the decisions made.
4. He can think and act in a creative and entrepreneurial way.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:
Written exam at the end of the semester (credit if at least 50.1% of correct answers are obtained). Up to 50.0% - ndst, from 50.1% to 60.0% - dst, from 60.1% to 70.0% - dst +, from 70.1 to 80.0 - db, from 80.1% up to 90.0% - db +, from 90.1% - very good.
Labolatories:
Credit based on an oral or written answer regarding the content of each laboratory exercise performed, a report on each laboratory exercise according to the instructions of the laboratory instructor. To pass the laboratories, all exercises must be completed (positive grade for answers and reports).

Programme content

Plastics
Lecture:
1. Introduction, division of material, definition of composite
2. Types of carriers and matrices used in composites
2. The influence of input ingredients and additives, structure on the properties of polymer materials
3.Physicochemical properties of plastics
4. Mechanical properties of polymer composites
5. Chemical resistance of polymer materials.
6. Application of polymer composites in industry
Labolatories:
1. Preparation of polymer composites - manual techniques, pressing
2. Assessment of the cross-linking exotherm of raw materials
3. Assessment of structural properties
4.Determination of mechanical properties in a static bending test
5.Determination of impact resistance
6.Determination of thermal properties

Course topics

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Teaching methods

lecture: multimedia presentation, illustrations, sample multimedia films of technological processes
laboratories: work with devices, production of pipe and laminate products,

Bibliography

Basic:
1. Sikora R.: Tworzywa wielkocząsteczkowe . Rodzaje, właściwości i struktura
2. Galina H.: Fizykochemia polimerów.
3. Łączyński. Tworzywa sztuczne

Additional:
Haponiuk J.T.: Tworzywa sztuczne w praktyce. Wyd. Verlag Dashofer, W-wa 2008r.
Czasopisma: Plastics Review, Rubber Review, Plast News, Tworzywa Sztuczne.

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	47	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	53	2,00