



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Novel polymer materials

Course

Field of study

Materials Science

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3/6

Profile of study

general academic

Course offered in

polish

Requirements

elective

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

DSc. Eng. Karol BULA

Responsible for the course/lecturer:

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Faculty of Mechanical Engineering

Piotrowo 3 st., 60-965 Poznań

Prerequisites

The student should have basic knowledge of the material science of polymer materials, methods of microstructure testing and functional properties of polymeric materials.

Course objective

Getting to know modern polymer materials, their functional properties and directions of application.

Course-related learning outcomes

Knowledge

1. Students have detailed knowledge of novel polymer engineering materials, functional materials with special physical properties. - [K_W03, K_W08].



2. Students have basic knowledge of development trends in materials engineering, regarding material design, can define the principles of selection of engineering materials. - [K-W010, K_W011].

Skills

1. Students are able to describe the groups of materials, knows the material selection system, can integrate the obtained information and interpret it. - [K_U01].

2. Students are able to formulate engineering tasks concerning the selection of materials for specific applications, can compare the operational properties of materials. - [K_U04].

Social competences

1. Students are aware of the non-technical aspects and effects of engineering activities, including the impact on the environment. - [K_K02].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture

Written colloquium at the end of the semester, contains 5 to 6 questions (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% to 90.0% - db +, from 90.1% - very good.

Programme content

Self healing polymers, chemosetting and light-curing, super-barrier materials for packaging applications, biodegradable and biocidal polymeric materials, special materials - polymer gels, polymer capsules. Polymer materials for applications in bone implants. Polymer materials for use in ballistic shields. Thermostable polymeric materials, chemically resistant to high temperatures. Material science of new thermoplastic elastomers.

Teaching methods

Lecture: multimedia presentation illustrated with examples given on a board.

Bibliography

Basic

1. Rabek J.F.: Polimery i ich zastosowania interdyscyplinarne, tom 1 i 2, wyd. PWN, W-wa 2020.

2. Ehrenstein G. W., Brocka-Krzemińska Ż.: Materiały polimerowe, wyd. PWN, W-wa 2016.

3. Garbarski J. i in.: Części maszyn z tworzyw sztucznych, Oficyna Wydawnicza Politechniki Warszawskiej, W-wa 2016.

Additional

1. Rabek J.F.: Polimery, wyd. PWN, W-wa 2017.



2. Zazakowny K.: Nowe materiały polimerowe dla potrzeb biomedycznych, Wydawnictwo Bezkrę Wiedzy, Chisinau 2014.

3. Inamuddi A.M., Asiri M. (Ed.): New Polymeric Composite Materials - Environmental, Biomedical, Actuator and Fuel Cell Applications, wyd. Materials Research Forum LLC, 2016.

Breakdown of average student's workload

	Hours	ECTS
Total workload	40	2,0
Classes requiring direct contact with the teacher	15	1,0
Student's own work (literature studies, preparation for laboratory classes, preparation for colloquium) ¹	25	1,0

¹ delete or add other activities as appropriate