



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Biopolymers and composites in medical application

### Course

Field of study

Biomedical Engineering

Area of study (specialization)

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Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

Polish

Requirements

elective

### Number of hours

Lecture

15

Tutorials

Laboratory classes

15

Projects/seminars

Other (e.g. online)

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

dr inż. Monika KNITTER

Responsible for the course/lecturer:

### Prerequisites

A student starting this course should have basic knowledge of biopolymers used in medicine and techniques for assessing their properties and production.

### Course objective

Acquainting with biopolymers and their composites in the context of their applications for special medical devices.



## Course-related learning outcomes

### Knowledge

The student has in - depth knowledge on physics and chemistry needed in biomedical engineering. The student knows the rules of measuring of selected physical and mechanical properties of biomaterials. The student has fundamental knowledge on the life-cycle of medical product.

### Skills

The student knows how to retrieve information from literature, databases and other sources (also in English) in the area of biomedical engineering.

The student knows how to identify and formulate simple engineering tasks of a practical character, typical for biomedical engineering especially selecting materials for particular biomedical applications.

### Social competences

The student is aware of the necessity for continuous learning and knows how to inspire and organize the process of learning of other people.

The student knows how to prioritize tasks either defined by him/herself or by others.

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired during the lecture is verified by the colloquium carried out during last lecture. The test consists of 10 differently scored questions. Counting threshold: 50% . Final issues will be sent to students by email

Project: Credit on the basis of the completed and presented (defended) project. The project is performed in groups of 2 students.

## Programme content

Lecture: Special polymers for intracorporeal applications, including implants, tendons, etc. with specific biodegradability. Polymer materials as dressing materials, including polymers modified with pharmacological agents. Biopolymers based on proteins and polysaccharides used in pharmacy for the production of drugs with controlled drug release. Polymers used in optics for contact lenses and eyeglass lenses with a number of different refining coatings. Characteristics of physiological interactions between polymer and organism (biodegradation process). Methods of manufacturing selected medical details. Recycling of post-hospital polymer elements.

Project of selected medical polymeric product.

## Teaching methods

1. Lecture: multimedia presentation, illustrated with films
2. Project: Project involving the development of a selected medical device/product made of polymer material



## Bibliography

### Basic

Leda H., „Materiały inżynierskie w zastosowaniach biomedycznych”, Wydawnictwo Politechniki Poznańskiej, 2012.

Nałęcz M., „Biomateriały” Akademicka Oficyna wydawnicza EXIT, 2000

Mazurkiewicz A., „Wprowadzenie do biomateriałów”, Wydawnictwa Uczelniane Uniwersytetu Technologiczno-Przyrodniczego, 2014.

### Additional

## Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	30	1,0

<sup>1</sup> delete or add other activities as appropriate