COURSE DESCRIPTION CARD - SYLLABUS

Course name

Studies of the properties of biomaterials and tissues

Course

Field of study

Biomedical engineering

Year/Semester

1/1

Area of study (specialization)

-

Profile of study

general academic

Level of study

Second-cycle studies

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

dr inż. Adam Piasecki

e-mail: adam.piasecki@put.poznan.pl

tel. +48 61 665 37 77

Institute of Materials Science and Engineering

Poznan University of Technology

Responsible for the course/lecturer:

Prerequisites

Knowledge related to physics, chemistry, materials science.

Understanding the need to learn and acquire new knowledge.

Course objective

Knowledge of modern methods of research of biomaterials and tissue.

Course-related learning outcomes

Knowledge

has knowledge related to testing methods to assess physical and mechanical properties of biomaterials and tissues, testing methods to assess microstructure: optical microscopy, scanning electron

microscopy, transmission electron microscopy, X-ray diffraction, testing methods to assess biomaterial surfaces

Skills

can obtain information from literature, databases and other properly selected sources in the area of biomedical engineering; can integrate, interpret and critically assess obtained information as well as draw conclusions, formulate and justify opinions; can apply methods used to carry out research into biomaterials and tissues in biomedical engineering;

Social competences

understands the need for lifelong learning; can inspire and organize the learning process of others; can cooperate and work in a group, adopting various roles;

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: - credit on the basis of a test consisting of both open and test questions carried out at the end of the semester.. Scale of estimate: 51-60% - dst(C), 61-70% - dst+(C+), 71-80% - db(B), 81-90% - db+(B+), 91-100% - bdb(A).

Laboratory classes: evaluation of students knowledge necessary to prepare, and carry out the lab tasks and evaluation of reports.

Programme content

Lecture: Testing methods to assess physical and mechanical properties of biomaterials and tissues. Testing methods to assess microstructure: optical microscopy, scanning electron microscopy, transmission electron microscopy, X-ray diffraction, testing methods to assess biomaterial surfaces. Testing methods to assess the chemical and phase composition of materials. Calorimetric methods. Tribology.

Laboratory classes: 1. Examination of mechanical properties. Part 1; 2. Examination of mechanical properties. part 2; 3. Scanning electron microscopy. 4. EDS X-ray microanalysis. 4. Atomic force microscopy. 6. Dilatometric method. 7. Tribological research.

Teaching methods

multimedia presentations

Bibliography

Basic

1. Barbacki A. (red.), Metody i techniki strukturalnych badań metali, Wyd. Politechniki Poznańskiej, Poznań 1994.

2. Barbacki A. (red.), Mikroskopia elektronowa, Wyd. Politechniki Poznańskiej, Poznań 2005.

3. Jurczyk M., Jakubowicz J., Biomateriały, Wyd. Politechniki Poznańskiej, Poznań 2008.

4. Leda H., Materiały inżynierskie w zastosowaniach biomedycznych, Wyd. Politechniki Poznańskiej, Poznań 2011.

Additional

1. Dobrzański L., Nowosielski R., Metody badań metali i stopów. Badania własności fizycznych, WNT, Warszawa 1987.

2. Senczyk D., Wybrane metody badania materiałów, Wyd. Politechniki Poznańskiej, Poznań 1988.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	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)[1]	20	1,0

[1] delete or add other activities as appropriate