COURSE DESCRIPTION CARD - SYLLABUS

Course name
Implants and artificial organs [S1IBio1E>IiSN]

Course

Field of study
Biomedical Engineering

Year/Semester
3/5

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
english

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other (e.g. online)
0

Tutorials
0

Projects/seminars
15

Number of credit points

2,00

Coordinators

Lecturers

Prerequisites

- Basic knowledge from biology and chemistry

Course objective

Learning the basics of the knowledge about artificial tissues, preliminary familiarity with the conditions of support of functions and control of internal organs in the biological life cycle

Course-related learning outcomes

Knowledge:
1. student should describe the basics of transplantology and the use of artificial tissues and organs in medicine.
2. student should have knowledge about immunological and hematological problems related to the use of artificial organs in medicine.
3. student should describe the technical aspects of organ substitutes.

Skills:
1. student can acquire information regarding the area of medical knowledge.
2. student is able to assess the medical conditions in the field of biomedical engineering.
3. student is able to integrate the obtained information, interpret and draw conclusions.

Social competences:
1. student is aware of the importance and understanding of non-technical aspects of engineering.
2. student is able to set priorities for the implementation of a specific project.
3. student is able to interact in a group, taking on different roles.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Forming rating:
a) for the lectures:
- Based on answers to questions concerning the material discussed in previous lectures
b) for the laboratories:
- On the basis of an assessment of the current progress of tasks,
Summary rating:
Lecture
Credit based on a test consisting of 50 general questions (pass in the case of a correct answer to at least 3 questions at the end of the semester (grades: <60% 3-ndst, >60% 3-sufficient, 75% 3.5-fairly good, 80% 4-good, 85% 4 , 5-over good, 90% 5-very good)
Laboratory
Evaluation of the report and oral response from each laboratory exercise as indicated by the laboratory instructor. Getting a pass on the basis of a positive assessment of the answer and report.

Programme content

Lecture
1. The role of clinical transplantation in modern medicine - selected issues.
2. Methods of assisting the operation and control of internal organs by external and implanted stimulators. Use of artificial organs and implants in various fields of medical surgery.
3. The influence of the immune and hematological system on the work of artificial tissues and organs.
4. Anatomy and physiology of the organ of sight. Diagnostic methods. Basic diseases related to the organ of sight.
5. The skin as an organ. Human epidermis models, artificial skin models, full thickness skin substitutes.
Exercises
1. Construction, operation and use of artificial organs in selected disease entities - part 1.
2. Basics of using and using pacemakers.
3. Basics of audiology. Hearing devices and implants.
4. Use of artificial prosthetic materials improving morphologies and functions of the eye.
5. Structure and skin eruptions. Non-invasive skin examination techniques: ultrasonography, dermatoscopy, erythometry, Temptest.

Teaching methods

1. Lecture: multimedia presentation.
2. Laboratory exercises: performing exercises, discussion, team work.

Bibliography

Basic
1. Kozłowski S., Nazar K., Wprowadzenie do fizjologii klinicznej, PZWL, Warszawa 1995
Additional
-

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	40	1,60
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	35	1,40