COURSE DESCRIPTION CARD - SYLLABUS

Course name
Joining techniques in bio-constructions [S2IBio1E-UMiR>TLwB]

Course

Field of study
Biomedical Engineering

Year/Semester
1/2

Area of study (specialization)
Medical and Rehabilitation Devices

Profile of study
general academic

Level of study
second-cycle

Course offered in
English

Form of study
full-time

Requirements
elective

Number of hours

Lecture
15

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
15

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

Basic in the field of physics, chemistry and material science, logical thinking, using information obtained from the library and the Internet, understanding the need to learn and acquire new knowledge

Course objective

The essence of the technique of constructing and manufacturing connections in bio-constructions with the use of knowledge in the field of medicine, material engineering, mechanics and implant manufacturing techniques

Course-related learning outcomes

Knowledge:
The student should characterize the connection techniques of bio-constructions, should know the classification of bioconstruction connections, should define the elements of construction of bioconstruction connections.

Skills:
Student potrafi zaprojektować połączenie biokonstrukcji, potrafi dobrać tworzywo na połączenia

biokonstrukcji, potrafi przygotowywać i opracować elektroniczną dokumentację techniczną biokonstrucji

Social competences:
The student is able to work in a group and is aware of updating his knowledge, is aware of the role of the broadly understood rehabilitation of people in modern society.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Wykład: Egzamin na podstawie pisemnego kolokwium składającego się z 4 pytań ocenianych w skali od 0 do 1. Zaliczenie w przypadku uzyskania minimum 2,4 punktów. Projekt: Zaliczenie na podstawie wykonanego projektu

Programme content

Lectures:
Types and characteristics of connections in bioconstructions. Analysis of the accuracy of the dimensions of bioconstruction connections. Definition and classification of biomaterials used in joints. Technology of bioconstruction connections. Characteristics of the geometric structure of the connection surface of the bioconstruction. Physicochemical processes taking place in the combination of bioconstruction - the human body and the mechanisms of their destruction. Examples of modern combinations of bioconstruction used in human rehabilitation.
Design:
1. Concept of building a bioconstruction
2. Selection of the connection technique in the bioconstruction
3. Characteristics and selection of material for the selected bioconstruction
4. 3D modeling of bioconstruction in the 3DCAD environment using the reverse engineering technique
5. Analysis of the destruction process of the bioconstruction connection

Course topics

none

Teaching methods

Lecture: multimedia presentation - leading, discussion
Project: each student presents a multimedia presentation of the progress of the project implementation, discussion

Bibliography

Basic
1. M. Nałęcz: Biocybernetyka i Inżynieria Biomedyczna 2000. Biomateriały IV tom, PAN, Akademicka Oficyna Wydawnicza EXIT, Warszawa 2003
2. Marciniak J.: Biomateriały. Wydawnictwo Politechniki Śląskiej, Gliwice 2002
3. Łaskawiec J., Michalik R.: Zagadnienia teoretyczne i aplikacyjne w implantach. Wydawnictwo Politechniki Śląskiej, Gliwice 2002
Additional
1. Będziński R.: Biomechanika inżynierska. Zagadnienia wybrane. Oficyna Wyd. Politechniki Wrocławskiej. Wrocław 1997
2. Manual User Inventor. Autodesk 2010
3. Manual User Solidworks 2009
4. Augustyn K.: EdgeCAM. Komputerowe wspomaganie wytwarzania. Wydanie II
5. P. Kęska: SolidWorks 2013. Modelowanie części. Złożenia. Rysunki. CADvantage, Warszawa 2013

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	1,00