



Subject card

Subject name and code	Artificial organs for Medical and Mechanical Engineering, PG_00024948						
Field of study	Medical and Mechanical Engineering, Mechanical and Medical Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2022/2023		
Education level	first-cycle studies	Subject group			Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish		
Semester of study	6	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Machine Design and Vehicles -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		Jerzy Lasek				
	Teachers		Jerzy Lasek				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		5.0		40.0	75
Subject objectives	The aim of the course is to provide students basic information about the indications and applications of artificial organs in modern medicine, as well as possibilities for solutions in this area in the future. Attention is drawn to biomaterials that are used for artificial organs to replace ailing or even insufficient natural organs. The student should acquire knowledge about the natural elements of artificial organs using omnipotent stem cells.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W13		The student uses the medical knowledge of the main areas of medicine for the needs of medical engineering.		[SW1] Assessment of factual knowledge		
	K6_U10		Assesses the structure and functioning the human body.		[SU1] Assessment of task fulfilment		
	K6_K02		The student is aware of the importance of the procedure and complies with the rules of ethics.		[SK2] Assessment of progress of work		

Subject contents	<p>1. Characteristics of diseases demanding possible application of endoprotheses</p> <p>2. Characteristics of implants applied in the treatment of locomotor system diseases (screws, plates, tension wire band, nails, rods, wires, external stabilizers)</p> <p>3. Endoprotheses of the hip joint, knee, joint, scapulo-humeral joint and elbow joint - presentation of surgical procedures recorded on DVD</p> <p>4. Implants applied in diseases of various systems and organs (vascular stents, heart pacemakers, brain pacemakers, vascular prostheses, biliary tract prostheses and other) - examples of clinical application</p> <p>5. Artificial organs - heart, skin, liver, pancreas, eye, larynx and other</p> <p>6. "Artificial blood" - non-hemoglobin carriers of oxygen</p> <p>7. Perspectives of artificial organs application in future</p>		
Prerequisites and co-requisites	credit of "Selected knowledge in surgery" , "Selected knowledge on orthopaedics".		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
Recommended reading	Basic literature	<p>1. W. Noszczyk: Chirurgia, PZWL Warszawa 2005.</p> <p>2. J. Szmidt: Podstawy chirurgii, Medycyna Praktyczna Kraków, 2009</p> <p>3. T. Tylman: Traumatologia narządu ruchu, PZWL Warszawa, 1985.</p> <p>4. P. Ruedi et al: AO principles of Trauma Management, AO Publishing, Thieme, Davos, 2008.</p> <p>5. W.C. de Vries: The artificial heart. Clinical Symposia, vol. 35,6, 1983</p> <p>6. G. Woo: Artificial organs produce genuine benefits. Med.Dev.Diagn.Industry Mag., 1-6, 1998.</p>	
	Supplementary literature	L. Brongel, J.Lasek, K. Słowiński: Podstawy chirurgii urazowej, Wyd. Med. Kraków, 2008.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		