



## Subject card

Subject name and code	Technology of medical products, PG_00055740						
Field of study	Mechanical and Medical Engineering						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2022/2023		
Education level	first-cycle studies		Subject group		Obligatory subject group in the field of study 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	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Manufacturing and Production Engineering -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Sławomir Szymański				
	Teachers		dr inż. Sławomir Szymański				
			dr hab. inż. Daniel Chuchala				
			prof. dr hab. inż. Kazimierz Orłowski				
			dr inż. Agata Sommer				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	0.0	0.0	45
	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	45		5.0		50.0	100
Subject objectives	To familiarize students with the basic techniques of producing construction elements and quality assurance requirements of different manufacturing systems. Basics of selection of processing method to fit the application requirements for components being assembled in medical devices.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U09] he/she is able to select proper constructive materials to design the device		The student is able to select a manufacturing method appropriate to the application requirements in terms of: accuracy of execution, surface condition, type of material and others.		[SU4] Assessment of ability to use methods and tools		
	[K6_U07] he/she is able to identify the problem and list simple engineering tasks to solve this problem in practice, he/she is able to critically analyze the proposed technical solutions and conclude whether these solutions can be implemented to solve problems related to design of mechanical devices and mechanical-medical devices		Student zna podstawowe techniki wytwarzania. Student zna podstawowe elementy procesu technologicznego w wytwarzaniu części.		[SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_W10] he/she has knowledge in the field of machine part manufacturing and metrology		The student knows basic manufacturing techniques. The student knows basic elements of the technological process in production of parts.		[SW1] Assessment of factual knowledge		

Subject contents	LECTURES: Aspects of accuracy in manufacturing, methods of measurement and determination of quality performance due to machining accuracy, machining base, base manufacturing systems, the basics of planning processes, computer aided manufacturing. Tools uses in different part processes. Finishing, abrasive machining technologies, non subtractive techniques. Use of technology for polishing and burnishing parts of different classes. Basis of design of technological process for elements using in medical devices.		
	LABORATORY: Fundamentals of design elements in systems CAD3D, basic manufacturing systems including production system turning, milling system for producing, processing, finishing, production of gears, measurement workshop in various aspects and quality control requirements.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Raports	60.0%	40.0%
	Coloquium	60.0%	60.0%
Recommended reading	Basic literature	1. Feld M.: <i>Technologia budowy maszyn</i> , PWN, Warszawa 2000. 2. Feld M.: <i>Podstawy projektowania procesów technologicznych typowych części maszyn</i> , WNT, Warszawa, 2000. 3. Poradnik inżyniera. <i>Obróbka skrawaniem</i> , T. I-III, WNT, Warszawa 1993. 4. M. P. Groover: <i>Fundamentals of modern Manufacturing</i> , JOHN WILEY&SONS, INC. 5. S. Kalpakjian, S. R. Schmid: <i>Manufacturing Engineering and Technology</i> , Pearson Prentice Hall.	
	Supplementary literature	1. Meyer Kutz: <i>Mechanical Engineers' Manufacturing and management</i> , JOHN WILEY&SONS, INC.	
	eResources addresses	Adresy na platformie eNauczanie: Inżynieria Wyróbów Medycznych /W/L/ IMM sem.03 lato 2022/2023 - Moodle ID: 28818 <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=28818">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=28818</a>	
Example issues/ example questions/ tasks being completed	1. Characterize the materials for cutting blades. 2. Discuss the geometry of the cutting edge 3. Discuss the basic types of finishing. 4. Datum in the manufacturing process, 5. The relationship between class of the accuracy of the components and the structure of the surface 6. What is the technological base?, 7. Operation in the manufacturing process, 8. Characterize the machining process, 9. Characterize the grinding process, 10. Abrasive grains and micrograns.		
Work placement	Not applicable		