



## Subject card

Subject name and code	Geometric specification of the product (Geometric product specification), PG_00059493						
Field of study	Management and Production Engineering						
Date of commencement of studies	February 2023		Academic year of realisation of subject		2022/2023		
Education level	second-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	1		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Zakład Technologii Maszyn i Automatyzacji Produkcji -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Michał Dobrzyński				
	Teachers		dr inż. Michał Dobrzyński  dr hab. inż. Mariusz Deja  dr inż. Aleksandra Laska				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	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		25.0	75
Subject objectives	The aim of the course is to familiarize students with the proper definition of geometry product specifications (GPS)						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_K01] is aware of the need to expand knowledge and verify the methods of solving problems by consulting experts	Orientation in access to scientific and journal databases related to modern solutions used in metrology	[SK5] Assessment of ability to solve problems that arise in practice
	[K7_K05] is able to integrate the possessed knowledge from various scientific disciplines, and in the innovative implementation of engineering tasks also take into account system and non-technical aspects, including ethical ones	Interpretation of the results of geometric measurements in terms of the technology used to produce machine parts	[SK2] Assessment of progress of work
	[K7_W03] has an orderly, theoretically founded knowledge related to selected areas of production engineering.	Geometric tolerance for specific types of machine parts and manufacturing technologies	[SW3] Assessment of knowledge contained in written work and projects
	[K7_U05] is able - in accordance with a given specification, taking into account non-technical aspects - to design a complex device, object, system or process related to the studied engineering discipline, and to implement this project - at least in part - using appropriate methods, techniques and tools, if necessary, adapting to it the purpose of existing or developing new tools	Designing the quality control process for complex mechanical components	[SU1] Assessment of task fulfilment
	[K7_U07] is able to communicate fluently using various techniques in professional environment and in other environments, also in English or another foreign language recognized as the language of international communication in a given engineering discipline	Analysis of literature in English related to metrology, in particular with the specification of product geometry	[SU2] Assessment of ability to analyse information
Subject contents	Geometric model. Shape tolerances. Bases, base elements and base element mappings. Methods of establishing measuring bases. Direction tolerances. Location tolerances. Tolerances for the shape of a designated outline or the shape of a designated surface with or without a base. Spatial description of surface roughness. Functional selection, marking and interpretation of geometric tolerances. Tolerances of selected complex geometric elements. Dimensional chains - analysis and synthesis. The use of coordinate measuring machines to control dimensional and geometric deviations. Computer-aided tolerating and checking. Differences between EN-ISO and other standards.		
Prerequisites and co-requisites	Fundamentals of metrology, technical drawing, manufacturing techniques		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Completion of tasks carried out in laboratories	60.0%	30.0%
	Completion of tasks carried out during the exercises	60.0%	30.0%
	Exam	60.0%	40.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>Humienny, Z. (Ed.). (2004). <i>Specyfikacje Geometrii Wyrobów (GPS): podręcznik europejski</i>. WNT.</li> <li>Wieczorowski, M., &amp; Gapiński, B. (2015). <i>Odchyłki kształtu i położenia Parametry i metody pomiaru</i>. Stal, Metale &amp; Nowe Technologie.</li> <li>Gao, W., Haitjema, H., Fang, F. Z., Leach, R. K., Cheung, C. F., Savio, E., &amp; Linares, J. M. (2019). On-machine and in-process surface metrology for precision manufacturing. <i>CIRP Annals</i>, 68 (2), 843-866.</li> <li>Adamczak, S., &amp; Makiela, W. (2014). <i>Metrologia w budowie maszyn: zadania z rozwiązaniami</i>. Wydawnictwa Naukowo-Techniczne.</li> <li>Adamczyk, S. (2008). <i>Pomiary geometryczne powierzchni, zarysy kształtu, falistość i chropowatość</i>. Wydawnictwa Naukowo-Techniczne, Warszawa.</li> </ol>	

	Supplementary literature	<p>Selected journals available on-line in the databases of the Gdańsk University of Technology, concerning modern metrology, e.g.:</p> <ol style="list-style-type: none"> <li>1. Measurement - <a href="https://www.sciencedirect.com/journal/measurement">https://www.sciencedirect.com/journal/measurement</a></li> <li>2. Metrology - <a href="https://www.mdpi.com/journal/metrology">https://www.mdpi.com/journal/metrology</a></li> </ol>
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Specyfikacja geometryczna wyrobu, PG_00059493 - Moodle ID: 30061  <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30061">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30061</a></p>
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. Introduce the general concept of external and internal dimensions.</li> <li>2. Specify shape and position tolerances for the specific mechanical component.</li> <li>3. Select the technology for making parts for the assumed dimensional and shape tolerances.</li> <li>4. Based on the measurement data from the coordinate measuring machine, select the possible technologies used to make the part.</li> <li>5. Characterize the parameters used in the spatial description of surface roughness.</li> </ol>	
Work placement	Not applicable	