GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Computer-aided statistical process control, PG_00055067		
Field of study	Management and Production Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2024/2025
Education level	first-cycle studies	Subject group	Obligatory subject group 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	5	ECTS credits	2.0
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. Aleksandra Wiśniewska	
	Teachers	dr inż. Aleksandra Wiśniewska mgr inż. Karolina Chodnicka-Wszelak	

Lesson types and methods of instruction							
	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	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	4.0	16.0	50

Subject objectives	The aim of the course is to provide the student with knowledge of the efficient functioning of the product and service quality management system based on statistical process control.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W12] has detailed, theoretically founded knowledge of methods and techniques used in production quality control processes, statistical process control, modern techniques and measurement systems in quality assurance and information techniques in production systems	The student knows and is able to use and solve simple and complex engineering problems, methods and tools of quality control products based on computer-aided systems in statistical process control.	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation
	[K6_K02] is able to interact and work in a group, assuming different roles, can inspire and organize the learning process of others, properly identifies priorities for realization of a task specified by themselves or others	The student is able to organize work on solving engineering problems. The student is able to distribute tasks and supports the process of carrying out these tasks by preparing practical and theoretical tools increasing the efficiency of the team's work.	[SK1] Assessment of group work skills [SK4] Assessment of communication skills, including language correctness [SK3] Assessment of ability to organize work
	[K6_U04] is able to develop documentation in the area of preparation, implementation and control of production processes in Polish and in a foreign language considered basic for scientific fields, is able to identify and formulate the basic objectives of quality management in the product life cycle, is able to use information and communication techniques appropriate to the implementation of tasks typical in engineering activities including preparation, production and supervision of the manufacturing process	The student is able to develop reports, procedures and instructions using the principles of standardization and visualization and in accordance with the principles, methods and tools of information and communication. At the same time, the student operates freely technical and industry vocabulary in the areas of the analyzed problems, speaking freely in Polish and English.	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
	[K6_U08] can assess the usefulness of routine methods and tools for solving practical production tasks in measuring in order to supervise processes and analyze the functioning of production systems	The student is able to evaluate the methods and tools used and choose the methods and tools that allow to achieve the expected results in full.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
	[K6_W08] has basic management knowledge, including process and product quality management, and detailed knowledge of integrated and standardized quality, environmental, health and safety management systems	The student uses the knowledge of system management to identify opportunities and threats, identify the level of risk and build risk management systems in the area of quality and safety.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
	[K6_U02] has the ability of self-learning and expanding knowledge in a specialized field of engineering production	The student is able to plan the implementation of tasks and is ready to learn how to function and use new methods and tools needed to perform a task in the field of production engineering.	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
	[K6_U10] " using appropriate techniques and methods, measuring tools, is able to plan, prepare and carry out the measurement of geometrical specifications of products and conduct a critical analysis of the results	The student knows the rules and tools of workshop metrology. The student is able to make measurements and calculations and interpret the obtained measurement results.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment

Subject contents	**Lecture content:** 1. Statistical process control in quality engineering. 2. Basics of probability calculus and mathematical statistics used in statistical process control. 3. Analysis of the stability and capacity of the production process. 4. Analysis of the stability and capability of measurement systems. 5. Six Sigma methodology. 6. Tools and techniques supporting the statistical control of processes. 7. Computer aided quality. **Laboratory content:** 1. Regulation of processes by means of control cards. 2. Methodology of the analysis of the stability and capability of measurement systems. 3. Uncertainty and measurement error. 4. R&R method for measuring system evaluation. 5. Tools for analyzing problems in quality engineering: Ishikawa Diagram, Pareto Diagram, Block Diagram.
Prerequisites and co-requisites	Basic knowledge of production and service management. Knowledge of the basic principles, methods and tools of quality management.
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
Lectures	60.0%	50.0%
Laboratory	60.0%	50.0%

Recommended reading	Basic literature	1. Hamrol A.: Zarządzanie jakością z przykładami. PWN. Warszawa, 2005 2. Hamrol A., Mantura W.: Zarządzanie jakością. Teoria i praktyka. PWN. Warszawa, 2002 3. Koronacki J., Nieckuła J., Thompson J.R.: Techniki zarządzania jakością. Od Shewharta do metody Six Sigma. Wyd. EXIT. Warszawa, 2005 4. Sałaciński T.: Elementy metrologii wielkości geometrycznych. Przykłady i zadania. OWPW. Warszawa, 2006 5. Płaska S.: Wprowadzenie do ststystycznego sterowania procesami technologicznymi. WPL. Lublin, 2000

	Supplementary literature	1 Smith G.M.: Statistical Process Control and Quality Improvement. Pearson Education. New Jersey, 2004. 2. Dwiliński L.: Zarządzanie jakością i niezawodnością wyrobów. OWPW. Warszawa, 2000 3. Montgomery D.C.: Introduction to Statistical Quality Control. John Wiley & Sons. USA, 2005.
	eResources addresses	Adresy na platformie eNauczanie: Komputerowo wspomagane statystyczne sterowanie procesami (SPC), ZiIP, Ist., sem05, zima 24/25 - Moodle ID: 39577 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=39577
Example issues/ example questions/ tasks being completed	1. SPC and quality management systems based on ISO 9001 standards. 2. Acquiring, sorting, collecting and presenting measurement data. 3. Distribution of variability of features. 4. Plausibility tests. 5. Control cards. 6. Capacity analysis of the production process. 7. 6 Sigma method. 8. Computer Aided Quality	
Work placement	Not applicable	

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