



## Subject card

Subject name and code	Technological process design, PG_00055055						
Field of study	Management and Production Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2024/2025		
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	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Mariusz Deja				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	15.0	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		6.0		49.0	100
Subject objectives	The ability to select technological processes for the production of typical machine parts. Design for manufacturing.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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	Implementation of tasks related to planning the production process depending on the assigned function in the project group.	[SK1] Assessment of group work skills
	[K6_W06] has knowledge of the life cycle of products and mechanical devices and systems, in the field of machine parts manufacturing techniques, as well as the possibilities and trends in the development of machines and production devices and process control	Analysis of the life cycle of a specific product with a high level of technological advancement.	[SW3] Assessment of knowledge contained in written work and projects
	[K6_W09] knows the general principles of creating and developing forms of individual entrepreneurship and stimulating employee creativity, using knowledge in the field of design, production and operation of machinery and technical devices	Determining manufacturing costs for specific production conditions.	[SW3] Assessment of knowledge contained in written work and projects
	[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	Process planning for typical mechanical components.	[SU1] Assessment of task fulfilment
	[K6_W03] has knowledge of the design record (the record structure) for the preparation of the manufacturing process documentation and basic knowledge of the implementation and management of production systems, including the principles of designing machine parts and manufacturing technologies using information techniques	Technological process planning with the use of computer systems, databases, and calculators for the selection of technological parameters.	[SW3] Assessment of knowledge contained in written work and projects
	[K6_U05] is able to prepare and present a presentation on the results of analysis of the tasks in the area of production engineering, is able to plan and carry out experiments, measurements, computer simulations and analyses and interpret the results and draw conclusions is able to use analytical methods, simulation and experiments for formulating and solving problems associated with production engineering	Simulation of specific manufacturing processes with the analysis of the obtained results.	[SU4] Assessment of ability to use methods and tools

Subject contents	<p>LECTURE The production process and its components. Data for the technological design process, documentation and technical time standard. Selection of machining allowances. Design of semi-finished products. Technological construction. Machining bases and rules for determining objects on machine tools and machining accuracy. Technological methods of shaping the surface layer of machine parts and their influence on operational properties. Technological processes of typical machine parts for various types and degrees of automation of machining and assembly. Process typification. Group processing. Flexible manufacturing systems. Computer-aided manufacturing. Programming of numerically controlled machine tools and robots. LABORATORY Determining the technical standard of time. Influence of machining bases and the way of setting the lathe on errors in machining the shaft. Technological analysis of shafts finishing by burnishing and grinding. Influence of hole processing technology on the accuracy of spacing their axes. Helical gear technology. Analysis of the assembly of machine components. Basics of programming and machining on CNC machine tools. PROJECT Designs of technological processes for typical machine parts: e.g. shaft and lever. Preparation of documentation, selection of: allowances, instrumentation, tools, technological parameters, determination of the technical standard of time.</p>														
Prerequisites and co-requisites	Engineering drawing, manufacturing processes														
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="453 698 794 725">Subject passing criteria</th> <th data-bbox="799 698 1141 725">Passing threshold</th> <th data-bbox="1145 698 1492 725">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="453 732 794 759">Laboratory reports and tests</td> <td data-bbox="799 732 1141 759">80.0%</td> <td data-bbox="1145 732 1492 759">35.0%</td> </tr> <tr> <td data-bbox="453 766 794 792">Projects</td> <td data-bbox="799 766 1141 792">80.0%</td> <td data-bbox="1145 766 1492 792">35.0%</td> </tr> <tr> <td data-bbox="453 799 794 826">Exam</td> <td data-bbox="799 799 1141 826">60.0%</td> <td data-bbox="1145 799 1492 826">30.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Laboratory reports and tests	80.0%	35.0%	Projects	80.0%	35.0%	Exam	60.0%	30.0%
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Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>Feld M.: Podstawy projektowania procesów technologicznych typowych części maszyn. WNT, Warszawa, 2013.</li> <li>Gawlik E. i inni: Procesów technologicznych obróbki skrawaniem. Wydawnictwa AGH, Kraków 2019.</li> <li>Poradnik inżyniera. Obróbka skrawaniem. T. I-III. WNT, Warszawa, 1993.</li> <li>Przybyłski i inni: Technologia maszyn i automatyzacja produkcji. Laboratorium. Wyd. PG, Gdańsk, 2001.</li> </ol>													
	Supplementary literature	<ol style="list-style-type: none"> <li>Olszak W.: Obróbka skrawaniem. WNT, Warszawa, 2008. Cichosz P.:</li> <li>Piotr Cichosz. Narzędzia skrawające. WNT, Warszawa, 2006.</li> <li>Sobolewski i in.: Projektowanie technologii maszyn. Oficyna Wydawnicza Politechniki Warszawskiej. Warszawa 2007.</li> </ol>													
	eResources addresses	Adresy na platformie eNauczanie:													
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>Selected production processes for parts of the selected class, with specific design and technological requirements.</li> <li>Basic principles of selecting machining parameters for technological operations.</li> <li>Influence of the manufacturing technique on the properties of the surface layer.</li> <li>Technical standard of working time.</li> <li>Methods of generating programs for controlling technological devices.</li> </ol>														
Work placement	Not applicable														