



Subject card

Subject name and code	Fundamentals of the Manufacturing Technologies, PG_00060535						
Field of study	Naval Architecture and Offshore Structures						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2025/2026		
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			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Zakład Wyposażenia Okrętu -> Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Wojciech Leśniewski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	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	60	6.0		9.0	75	
Subject objectives	The student acquires basic knowledge of manufacturing processes and processing of engineering materials. acquiring the ability to select and use machining methods to shape machine elements and give them specific functional properties.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U05] can formulate a simple engineering task and its specification within the range of design, construction and operation of ocean technology objects and systems		Prepares technical and technological documentation of a selected machine element.		[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task		
	[K6_W03] has knowledge of hydromechanics, thermodynamics, machine design, ecology, materials science necessary to understand the principles of construction and operation of ocean engineering facilities and equipment		Understands the basic principles of technological processes used in the production of components of ocean technical devices.		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	[K6_U01] can obtain information from literature, databases and other sources, can verify and organize the obtained information, interpret them and form conclusions and justified opinions		The student searches for and collects information regarding the designed technological process.		[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools		

Subject contents	<p>1. Classification of techniques for producing machine and device parts. machine technology, technological efficiency of the structure.</p> <p>2. Properties and principles of selection of engineering materials. Mechanical properties materials. Technological properties. Corrosion resistance of engineering materials.</p> <p>3. Techniques of obtaining metals and alloys. Metallurgy of steel and non-ferrous metals.</p> <p>4. Top layer technological and operational top layer. Change curve wear and tear over time. Shaping the operational properties of selected machine parts.</p> <p>5. Machining and advanced machining technologies. Technology machining. Turning cutting parameters, classification of methods, geometry tools. Milling. Abrasive processing technology grinding, abrasive blasting. Hole machining methods.</p> <p>6. Modern methods of shaping materials, surface engineering methods and applying coatings. Unconventional manufacturing techniques. Additive technologies: 3D printing FDM, DMLS.</p> <p>7. Methods of connecting machine parts.</p> <p>8. Production and technological process. Basics of process design technological.</p>		
Prerequisites and co-requisites	<p>Knowledge of basic issues regarding the structure and properties of materials engineering and knowledge of engineering graphics in the field of dimensioning machine parts and determination of surface roughness, tolerance and fit.</p>		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		50.0%	50.0%
		50.0%	50.0%
Recommended reading	Basic literature	<p>[1] Wiesław Olszak: Obróbka skrawaniem - Wyd. 2. Wydawnictwa Naukowo-Techniczne, Warszawa, 2009.</p> <p>[2] Zenon Opiekun, Władysław Orłowicz, Feliks Stachowicz: Techniki wytwarzania - Wyd. 2, dodr. Oficyna Wydawnicza Politechniki Rzeszowskiej, Rzeszów, 2016.</p> <p>[3] Mieczysław Feld: Technologia budowy maszyn - Wyd. 3 zm. Wydaw. Naukowe PWN, Warszawa, 2000.</p> <p>[4] Mieczysław Korzyński: Inżynieria wytwarzania. Uniwersytet Rzeszowski, Katedra Mechatroniki i Automatyki, Rzeszów, 2013.</p> <p>[5] Tadeusz Dobrzański: Rysunek techniczny maszynowy. Wydawnictwo WNT, Warszawa, 2013.</p> <p>[6] Leszek Adam Dobrzański: Podstawy nauki o materiałach i metaloznawstwo: materiały inżynierskie z podstawami projektowania materiałowego. Wydawnictwa Naukowo Techniczne, Warszawa, 2002.</p> <p>[7] Edward Gawlik, Stanisław Gil, Krzysztof Zagórski: Projektowanie procesów technologicznych obróbki skrawaniem. Wydawnictwa AGH, Kraków, 2019.</p> <p>[8] Czesław Rzeźnik, Piotr Rybacki: Podstawy technologii maszyn. Wydawnictwo Uniwersytetu Przyrodniczego, Poznań, 2017.</p> <p>[9] Andrzej Klimpel: Technologie laserowe: spawanie, napawanie, stopowanie, obróbka cieplna i cięcie. Wydawnictwo Politechniki Śląskiej, Gliwice, 2012.</p> <p>[10] Przemysław Siemiński, Grzegorz Budzik: Techniki przyrostowe: druk drukarki 3D. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2015.</p>	
	Supplementary literature	<p>[1] Maria Porębska, Andrzej Skorupa: Połączenia spójnościowe - Wyd. 2 popr., dodr. 1. Wydawnictwo Naukowe PWN, Warszawa, 2013.</p> <p>[2] Wit Grzesik, Adam Ruszaj: Hybrydowe metody obróbki materiałów konstrukcyjnych. Wydawnictwo Naukowe PWN, Warszawa, 2021.</p> <p>[3] Krzysztof Jemieliński: Obróbka skrawaniem: podstawy, dynamika, diagnostyka. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2018.</p>	
	eResources addresses	Adresy na platformie eNauczanie:	

<p>Example issues/ example questions/ tasks being completed</p>	<ol style="list-style-type: none"> 1. Drawing documentation 2. Locksmith work. 3. Cutting materials. 4. Machining - turning (lathe construction, tools). 5. Turning of end faces. 6. Turning cylindrical surfaces. 7. Turning cones. 8. Thread cutting. 9. Machining - milling (construction of a milling machine, tools). 10. Milling of flat surfaces, selection of cutters. 11. Milling keyways and pockets. 12. Grinding of flat and cylindrical surfaces. 13. Soldering. 14. Joining metals by welding.
<p>Work placement</p>	<p>Not applicable</p>