



Subject card

Subject name and code	Production Systems Components, PG_00055504						
Field of study	Mechanical Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group			Optional subject group 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	3	Language of instruction			Polish		
Semester of study	6	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Piotr Sender				
	Teachers		prof. dr hab. inż. Adam Barylski				
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	8.0		37.0	75	
Subject objectives	Principles of using of universal fixtures. Designing of special fixtures.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U08] is able to design a technological manufacturing process for typical elements of machines or devices, using analytical and numerical calculating tools		Rules for using the modular fixtures and design of special holders.		[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		
	[K6_W11] possesses knowledge on design, technology and manufacturing of machine parts, metrology, and quality control; knows and understands methods of measuring and calculating basic values describing the operation of mechanical systems, knows basic calculating methods applied to analyse the results of experiments		Rules for using of universal fixtures.		[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		
	[K6_U04] is able to perform a critical analysis of the existing technical solutions, present the specification of the technology of manufacturing basic construction elements of machines and engineering assemblies		Principles of calculating the forces fixing the workpiece in the machining fixture.		[SU3] Assessment of ability to use knowledge gained from the subject		
Subject contents	<p>LECTURE: The role of tooling in the machine parts manufacturing system. Errors affecting the accuracy of execution in the fixtures. Arrangement the workpieces in the fixtures. Fixing the workpieces in the fixtures. Fixing and mounting the fixturing equipment in the machine tool. Rules for designing of fixtures: lathe fixtures, drill fixtures, milling fixtures, modular fixtures. Tool holders. Fixing accessories. Equipment for transport, manipulators and robots. Principles of computer design and management of workshop aids. principles of using universal fixtures. Tooling costs. Calculation of clamping forces.</p> <p>LABORATORY (computer): Acquisition of the ability to apply the principles of basing and fixing workpieces in fixtures in practice and designing a machining fixtures for the indicated operation.</p>						

Prerequisites and co-requisites	Knowledge in the field of preparing of construction and machine technology's drawings.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Design of fixture	60.0%	50.0%
	Written test	60.0%	50.0%
Recommended reading	Basic literature	Feld M.: Machining fixtures. WNT, Warssaw, 2002.Dobrzański T.: Machining fixtures. Constructor's guide., WNT,Warszawa, 1987.Standards	
	Supplementary literature	Engineer's handbook. Machining. Volume I-III, WNT, Warsaw 1993. Manufacturers Catalogs. Studying studies (books, presentations, lectures) from Polish and foreign technical universities.	
	eResources addresses	Uzupełniająca https://nptel.ac.in/courses/112/105/112105127/ - Jigs and Fixtures for Machine shops	
Example issues/ example questions/ tasks being completed	Describe fixture used on lathes and milling machines. Describe ways to calculate fixturing forces. List the principles of construction of turning and milling machining equipment.		
Work placement	Not applicable		