



## Subject card

Subject name and code	Computer Aided Machine Design and Manufacturing, PG_00060425						
Field of study	Mechatronics						
Date of commencement of studies	February 2022	Academic year of realisation of subject			2022/2023		
Education level	second-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			English		
Semester of study	3	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Zakład Technologii Maszyn i Automatykacji Produkcji -> 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		Angelos Markopoulos				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
Computer Aided Machine Design and Manufacturing (PG_00060425) - Moodle ID: 30435 <a href="https://enauzanie.pg.edu.pl/moodle/course/view.php?id=30435">https://enauzanie.pg.edu.pl/moodle/course/view.php?id=30435</a>							
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		0.0		0.0	30
Subject objectives	Acquainting with the subject of computer-aided manufacturing and development trends in modern manufacturing and design						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W06] has detailed, supported by the theory knowledge in terms of mechatronic design, mechatronic systems and machines, devices and process where they are used		Knowledge of modern technological equipment allowing for their selection in manufacturing processes		[SW3] Assessment of knowledge contained in written work and projects		
	[K7_W02] has organised, general, supported by the theory knowledge in terms of systems theory and techniques, mechatronic design, mechatronic systems and exploitation of mechatronic devices		Knowledge of control systems and issues related to the operation of technological devices		[SW2] Assessment of knowledge contained in presentation		
[K7_W10] knows development trends and most important new achievements in technical sciences and science disciplines: Mechanical Engineering, Automation, Electronics and Electrical Engineering and related: Informatics and Materials Engineering		Orientation in the means of production automation, taking into account the energy efficiency of transport equipment in production systems		[SW1] Assessment of factual knowledge			
Subject contents	Emergence of multitasking machining systems, applications and best selection practices. Manufacturing System classification. Flexible Manufacturing. Group Technology. Cell formation. Extra clustering algorithms. FMS control introduction. Petri nets fundamentals. CIM Concepts - information integration. Machine tool metrology. Robots in Manufacturing.						

Prerequisites and co-requisites	Technical drawing, manufacturing techniques, basics of cutting technologies, Computer Aided Design CAD		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written or oral evaluation	60.0%	100.0%
Recommended reading	Basic literature	<p>1. Karkalos, N. E., Markopoulos, A. P., &amp; Davim, J. P. (2019). Computational Methods for Application in Industry 4.0. Springer International Publishing.</p> <p>2. McMahon, C., &amp; Browne, J. (1999). CAD/CAM: principles, practice and manufacturing management. Addison-Wesley Longman Publishing Co., Inc.</p> <p>3. Rao, R. V. (2010). Advanced modeling and optimization of manufacturing processes: international research and development. Springer Science &amp; Business Media.</p> <p>4. Scallan, P. (2003). Process planning: the design/manufacture interface. Elsevier.</p> <p>5. Choi, B. K., &amp; Jerard, R. B. (2012). Sculptured surface machining: theory and applications. Springer Science &amp; Business Media.</p> <p>6. Rawat, D. B., Brecher, C., Song, H., &amp; Jeschke, S. (2017). Industrial Internet of Things: Cybermanufacturing Systems. Springer.</p> <p>7. Gunal, Murat M. (Ed.) (2019). Simulation for Industry 4.0 Past, Present, and Future Series: Springer Series in Advanced Manufacturing.</p> <p>8. Przybylski, W., &amp; Deja, M. (2007). Komputerowo wspomagane wytwarzanie maszyn. Warszawa: Wydawnictwo WNT.</p> <p>9. Deja, M., Dobrzyński, M., &amp; Rymkiewicz, M. (2019). Application of Reverse Engineering Technology in Part Design for Shipbuilding Industry. Polish Maritime Research, 26(2), 126-133.</p> <p>10. Deja, M., &amp; Siemiatkowski, M. S. (2018). Machining process sequencing and machine assignment in generative feature-based CAPP for mill-turn parts. Journal of Manufacturing Systems, 48,49-62.</p> <p>11. Deja, M., Dobrzyński, M., Flaszynski, P., Haras, J., &amp; Zieliński, D. (2018). Application of Rapid Prototyping technology in the manufacturing of turbine blade with small diameter holes. Polish Maritime Research, 25(s1), 119-123.</p> <p>12. Deja, M., &amp; Siemiatkowski, M. S. (2013). Feature-based generation of machining process plans for optimised parts manufacture. Journal of Intelligent Manufacturing, 24(4), 831-846.</p>	
	Supplementary literature	<p>Selected articles from the scientific journals available on-line, e.g. :</p> <p>1. Computer-Aided Design</p> <p>2. Computers in Industry</p> <p>3. Journal of Micro and Nano Manufacturing</p> <p>4. Journal of Mechanical Design</p> <p>5. Journal of Manufacturing Systems</p>	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Development of CAD/CAM systems. Modelling of manufacturing processes. Parts grouping. Machine tool selections with high level of automation/		
Work placement	Not applicable		