



Subject card

Subject name and code	Advanced CAD/CAE design, PG_00057027						
Field of study	Mechatronics						
Date of commencement of studies	February 2022	Academic year of realisation of subject			2021/2022		
Education level	second-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	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Machine Design and Vehicles -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Artur Olszewski				
	Teachers		dr hab. inż. Artur Olszewski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	15.0	0.0	15
	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	15	11.0		24.0	50	
Subject objectives	A student knows philosophy of designing of elements of machines by means of modern computer tools using 3D modelling. A student has knowledge of history and possibilities of modern CAD and FEM programmes. A student can create virtual computer model of an element of machine. A student analyses limits of computer simulation simulation and the influence of different parameters of the model on final results.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_U08] is able identify and formulate tasks specification in terms of design of non-stationary mechatronic systems and processes, including non-standard problems and taking into consideration its non-technical aspects	The student is able to independently develop a model of restraints and forces acting on the analyzed object.			[SU4] Assessment of ability to use methods and tools		
	[K7_U10] is able - according to a given specification and taking into consideration non-technical aspects - to design or modify non-stationary mechatronic system or process, calculate costs of design and development and perform the project - at least partially - utilising techniques of mechatronics design	The student is able to use 3D and FEM solid models to solve a technical problem.			[SU3] Assessment of ability to use knowledge gained from the subject		
	[K7_U09] is able to evaluate feasibility of advanced methods and tools (including programmistic and for computer aided design and manufacturing) for solving complex, practical engineering task, characteristic for mechatronics, and to choose and apply proper method and tools	The student is able to independently prepare a 3D computer model of a technical object			[SU4] Assessment of ability to use methods and tools		
	[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	The student is able to use 3D and FEM solid models to solve a technical problem.			[SW2] Assessment of knowledge contained in presentation		

Subject contents	A philosophy of designing of elements of machines by means of modern computer tools using 3D modelling. The history and current possibilities of up-to-date CAD and FEM programmes. Methodology of modern designing from an idea to a product using 3D virtual models and optimisation methods. Methodology of engineering calculations using FEM. Advantages and disadvantages of FEM. Designing of objects and processes. Computer models - loads, constraints, environment and the influence of structure of model on final results.		
Prerequisites and co-requisites	Knowledge in field of Basis of machine design Knowledge in field of Mechanics Knowledge in field of Strength of materials. Basis knowledge of 3D CAD systems.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		60.0%	100.0%
		0.0%	0.0%
Recommended reading	Basic literature	1. www.ansys.com/products/designspace.asp 2. www.autodesk.com ; 3. scripts and books from Machine Design and Strength of Materials.	
	Supplementary literature	No requirements.	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		