



Subject card

Subject name and code	Modelling methods in design (CAD, FEM), E:41043W0									
Field of study	Space and Satellite Technologies									
Date of commencement of studies	February 2025		Academic year of realisation of subject		2024/2025					
Education level	second-cycle studies		Subject group							
Mode of study	Full-time studies		Mode of delivery		at the university					
Year of study	1		Language of instruction		English					
Semester of study	1		ECTS credits		2.0					
Learning profile			Assessment form		assessment					
Conducting unit	Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology									
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Grzegorz Rotta							
	Teachers		dr inż. Grzegorz Rotta							
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM			
	Number of study hours	15.0	0.0	0.0	15.0	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		0.0		0.0	30			
Subject objectives	To familiarise students theoretically and practically with the basics of CAD design Finite Element Method.									
Learning outcomes	Course outcome		Subject outcome		Method of verification					
	K7_W06		Student knows the basics of CAD design and Finite Element Method.		[SW1] Assessment of factual knowledge					
	K7_U09		Student knows and applies the rules of creating calculation models in machine design.		[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools					
	[K7_K03] Can analyse and implement assigned tasks while maintaining high technical standards. Is able to work and interact in a group, taking on different roles. Adheres to the principles of professional ethics and respects the diversity of views and cultures.		Student implements his tasks related to modelling in design maintaining high technical standards.		[SK2] Assessment of progress of work					
Subject contents	Basics of finite difference method, finite volume method and finite element method. Problem of properly defined boundary conditions and basics of turbulence modeling. Basic features of computational fluid dynamics solvers, mesh generators, convergence criteria and results analysis. Students run the simulations for 3D flows by means of available CFD code. Students generate the mesh for selected geometry, select model and solver settings, run the simulations for steady and unsteady case, analyse the convergence and visualize results.									
Prerequisites and co-requisites	-									
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade					
	exam		50.0%		50.0%					
	project		50.0%		50.0%					
Recommended reading	Basic literature		Students will receive a reading list at the beginning of the semester.							
	Supplementary literature		-							
	eResources addresses		Adresy na platformie eNauczanie: Modelling methods in design (CAD, FEM) - Moodle ID: 45892 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=45892							

Example issues/ example questions/ tasks being completed	-
Work placement	Not applicable

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