Subject card

Subject name and code	Computer-aided design and modeling of hydraulic systems, PG_00058898
Field of study	Mechanical Engineering

Date of commencement of studies	February 2024	Academic year of realisation of subject	2024/2025
Education level	second-cycle studies	Subject group	
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment

Conducting unit	Zakład Hydrauliki i Pneumatyki -> Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology

Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Paweł Załuski
	Teachers	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	18.0	0.0	0.0	9.0	0.0	27
	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	27	0.0	0.0	27

Subject objectives	Introduction of Graphic, computing programs, and configurators of hydraulic and pneumatic elements of leading companies. Additonaly introduction of good-practices in preparation of technical documentation of hydraulic elements and circuits.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W06] possesses organized, profound knowledge necessary for designing and optimization of complex technological processes, modelling and calculations using numerical methods, knows modern manufacturing methods and tools for designing manufacturing processes of machines, devices, their elements and components	The student is able to independently use the available CAD and CAE software	[SW3] Assessment of knowledge contained in written work and projects
	[K7_U01] is able to acquire information from specialist literary sources and other sources regarding the construction and operation of machines and related disciplines in polish and in a foreign language, is able to conduct a self-learning process, is able to synthesize the information, form conclusions and justify opinions	The student is able to independently find and use the information necessary to carry out the design process	[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
	[K7_W11] possesses organized knowledge useful in understanding ex-technical conditioning connected with performing the profession of an engineer and taking it into consideration in engineering practice; possesses well-established knowledge within the range of intellectual property, management and organization of manufacturing processes, including the management and life-cycle of a product	The student is able to make a project in accordance with engineering practice. During its implementation, it takes into account the minimization of costs as well as the availability and rational use of production resources	[SW3] Assessment of knowledge contained in written work and projects

Subject contents	1. General rules of hydraulic and pneumatic circuits design,
	2. Hydraulic and Pneumatic schemes drafting rules,
	3. Using Autocad Mechanical in preparation of hydraulic and pneumatic schemes
	4. Static and dynamic blocks in Autocad
	5. Drafting and analysis of Hydraulic and pneumatics schemes using Fluid-Sim and Scheme editor
	6. Rules of piping design
	7. Routing in Solidworks,
	8. Rules of hydraulic manifolds design
	9. Drafting of manifolds in Autodesk Inventor,
	10. Basics of Matlab and Simulink
	11. Simulation of hydraulic and pneumatic circuits in Matlab Simulink (Simscape)
	12. Ansys in design of hydraulic and pneumatic elements
Prerequisites and co-requisites	Knowlage of hydraulics and pneumatics
	Knowledge of drafting and machine desing

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	final paper	56.0%	100.0%

Recommended reading	Basic literature	AutoCAD - handbook user AutoCAD - adaptive textbook AutoCAD - programmer"s guide
		Andrzej Osiecki - Hydraulic Drive
		Group work- **Hydraulics Trainer Volume 3, Planning and Design of Hydraulic Power Systems**
	Supplementary literature	No requirements
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	Prepare technical documentation of manifold
	Draw hydraulic scheme

Work placement	Not applicable

Document generated electronically. Does not require a seal or signature.