GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Srenght Modelling of Laminate Structures, PG_00056269						
Field of study	Design and Construction of Yachts						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2024/2025		
Education level	first-cycle studies		Subject group				
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	practical profile		Assessment form		assessment		
Conducting unit	Institute of Naval Architecture -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Maciej Kahsin				
	Teachers		dr inż. Maciej Kahsin				

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	30.0	0.0	45
	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	45	5.0	25.0	75

Subject objectives	Lectures scope is to present methods of laminated composites structural analysis with use of classical laminate theory and numerical tools.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K6_K03	Student gains knowledge of composite laminate material characteristics.	[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice
	K6_W06	Student uses FEA software in design process of laminated structures.	[SW3] Assessment of knowledge contained in written work and projects
	K6_U05	Student is able to use numerical tools in problems concerning design of laminate composites.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
	K6_W05	Student is able to use Classical Laminate Theory (CLT in problems concerning yacht design.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents	Introduction to FEM, basic characteristics of laminates, constitutive equations of laminates, stress and strain in laminate, coupling load/deformation (ABD matrix), strength of laminate composites

Prerequisites and co-requisites	Strength of Materials, Numerical Methods

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Reports assessment	51.0%	100.0%

Recommended reading	Basic literature	
		Carlsson, L. A., Gillespie, J. W., (eds.), Delaware Composites Design Encyclopedia, TechnomicPublishing Company, Lancaster, PA
		Hull, D., An Introduction to Composite Materials, Cambridge University Press, 1981.
		Gere, J. M., Timoshenko, S. P., Mechanics of Materials, II ed., PWS-Kent Publishing Company,Boston, 1984.
	Supplementary literature	John D. Fenton, Numerical methods, Institute of Hydraulic Engineering and Water Resources Management Vienna University of Technology, 2019
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Reduction of twist-bending coupling in composite laminate. Determine stress pattern in composite laminate section. Determine maximum load in composite laminate structure.	
Work placement	Not applicable	

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