



## Subject card

Subject name and code	Mechanics of Laminated Structures, PG_00056255						
Field of study	Design and Construction of Yachts						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2023/2024		
Education level	first-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		3.0		
Learning profile	practical profile		Assessment form		assessment		
Conducting unit	Zakład Mechaniki Konstrukcji Oceanotechnicznych -> Institute of Ocean Engineering and Ship Technology - > 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	15.0	15.0	0.0	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	Scope of topics presented aims towards illustration of design methods concerning thin walled composite structures.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_U05		Student is able to choose appropriate physical problem formulation and suitable solving tools.		[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject		
	K6_W05		Student is capable of using Classical Laminate Theory (CLT) during yacht design process.		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	K6_W03		Student can conduct Multiphysics FE simulations.		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
Subject contents	Material characteristics of laminates, mixture law, stiffness matrix of single generally oriented lamina, stiffness matrix of laminate, load-deformation coupling analysis, buckling of laminates, solution of dynamics problems.						
Prerequisites and co-requisites	Mechanics, Strength of Materials, Numerical Methods.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Report valuation		50.0%		60.0%		
	Test		50.0%		40.0%		

Recommended reading	Basic literature	<p>1. J. Reddy: An Introduction to The Finite Element Method, McGraw-Hill, New York, 2005</p> <p>2. D. Chapelle, K. Bathe: The Finite Element Analysis of Shells Fundamentals, Springer-Verlag Berlin Heidelberg 2011</p> <p>3. Carlsson, L. A., Gillespie, J. W., (eds.), Delaware Composites Design Encyclopedia, Technomic Publishing Company, Lancaster, PA</p> <p>4. Gere, J. M., Timoshenko, S. P., Mechanics of Materials, II ed., PWS-Kent Publishing Company, Boston, 1984.</p>
	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	Generate code computing laminates stiffness matrix, Compute ABD matrix and present conclusions concerning load-deflection coupling, Compute first 10 eigen modes of laminated yacht hull, Analyse behaviour of laminated structure operating in undulation condition.	
Work placement	Not applicable	